

# ITALIAN SPACE INDUSTRY

Products - Services - Applications - Technologies  
Catalogue 2020



# Italian Space Industry

This Catalogue collects the company profiles of the enterprises operating in the Space Sector in Italy, with its products, services, applications and technologies.

The initiative is jointly edited by ASI and ICE, in collaboration with the National Industrial Associations AIAD, AIPAS, and ASAS.

The data contained in this Catalogue were provided directly by the companies, under their responsibility.

This initiative complements the ASI tool D.V.

**(Distretto Virtuale web 2.0 interactive portal)**



# Giorgio Saccoccia

## President of the Italian Space Agency (ASI)

I am pleased to present the fourth edition of the Italian Space Industry Catalogue. This edition comes with a new graphic design and a wider and more detailed coverage of the national industrial system, including a new session devoted to start-ups.

Italy has always believed in the huge benefits of space activities, both from a technological and a social perspective. We are convinced that Space is a terrific tool for a dynamic and modern society because it enables services and applications for a large community, much wider than space users. With the aim to leverage and encourage socio-economic benefits deriving from space activities, a Space Economy Strategic Plan has been defined also at National level, to broaden and use space systems, products and applications in non-space markets and push our industrial system towards the New Space Economy.

Italy has a very wide and well articulated industrial value chain. On the one side there is a competitive space industry with solid and long lasting capabilities, from system integration, payload design and subsystems to value added services and applications. There are Large System Integrators (satellites, ground infrastructures and launching systems), small system integrators (payload and satellites of all sizes) and a vibrant and wide community of small and medium companies, including start-ups and spin-offs with very good performances and an excellent potential for growth.

Industrial competitiveness and growth is one of the pillars of ASI mandate. Italian space industry has a long tradition of internationalization: there are cooperation initiatives and commercial relationships with a very large number of countries in all continents, both at bilateral and multilateral level.

This Catalogue intends to provide a general overview of the space industrial capabilities in Italy. Although it is not an exhaustive representation of the entire Space Italian industry (in particular for the SMEs), it is an extensive representation, thus enabling international public and private stakeholders to identify potential Italian industrial partners in space activities.

May 2020

Giorgio Saccoccia

ASI President





# Carlo Ferro

## President of ITA | Italian Trade Agency

The aerospace industry plays a leading role in the national economy. It stands out among the high tech industries producing innovation capable of cross-fertilizing the whole value chain, between large champions and many innovative SMEs, as well as spilling-over to other national industries and technology enablers.

Today, the Italian aerospace industry ranks fourth in Europe and seventh worldwide. The activities carried out in Italy generate 13 billion euros revenues and employ 64,000 people, out of which more than 52,000 in the fields of aeronautics and space. Furthermore our national players achieved an international profile through cross-border acquisitions, partnership and new products jointly developed which bring the total size of business for the Italian companies at around 18 billion euros.

I have highlighted in other occasions the relevance of R&D spending to boost a virtual cycle of innovation-export-growth, funding new research and fuelling more growth on the global market. Here we are in front of a very substantial investment in R&D, accounting for 15% of turnover, resulting into technological innovations and spill-over effects in other technology-intensive industrial fields such as nanotechnology, new materials, microelectronics, defense, communications and electronics.

Those capabilities are open to cross-border cooperation. Indeed, the Italian aerospace industry is a vibrant, rapidly growing sector, eager to establish new relationships around the world. Our task, at the Italian Trade Agency, is to facilitate these connections, together with a substantial investment of promotional resources for the aerospace.



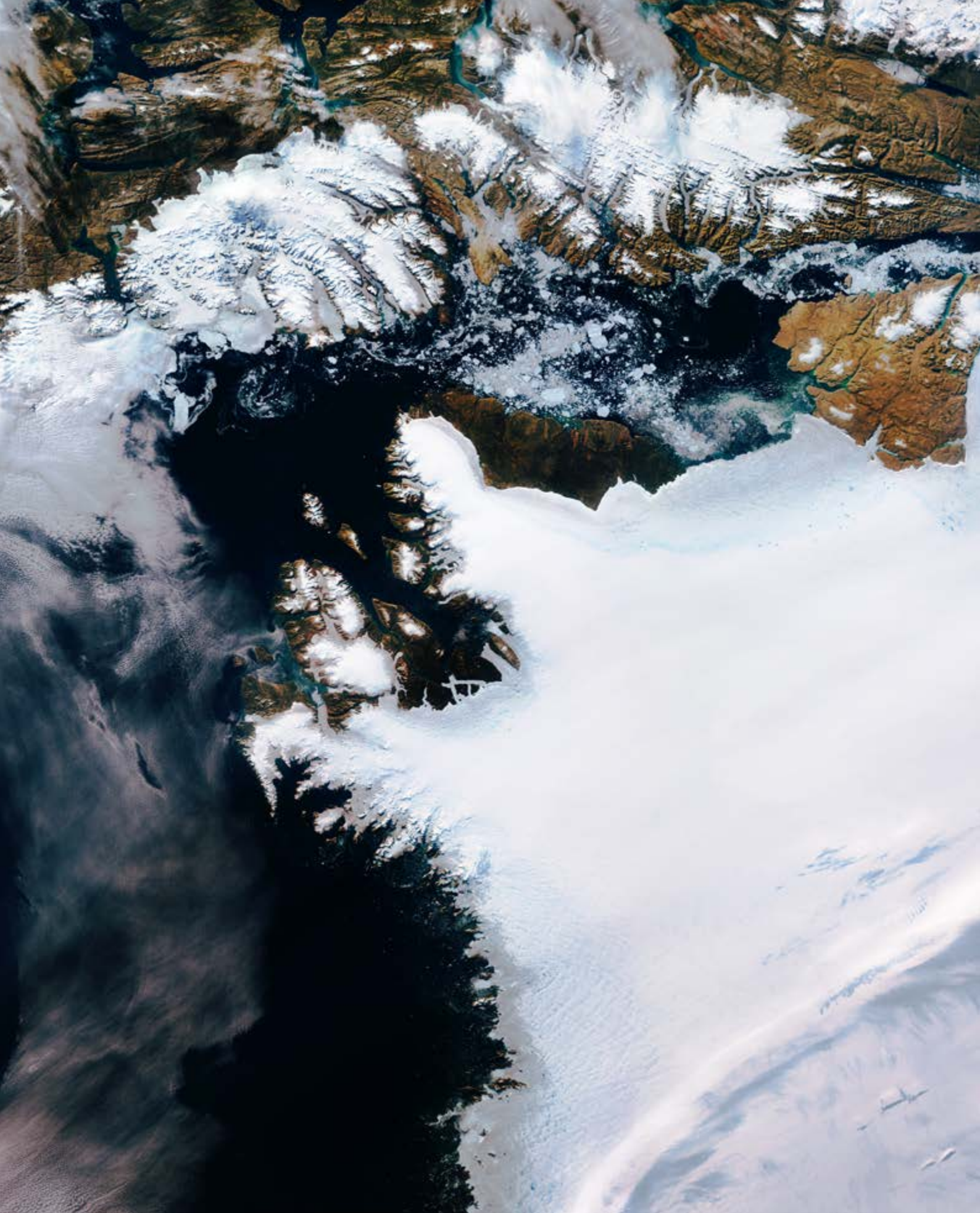
This catalogue of the Italian Space Industry aims to give the reader a comprehensive vision of our companies' activities, specialization and achievements, a working tool in the process of starting a dialogue to create new opportunities for industrial, commercial or technical cooperation. In this current edition, we also created a section dedicated to the start-ups, aware that new ventures and young brains can help the entire sector to grow even more. The catalogue has been realized during the emergency caused by the Covid-19 pandemic. Allow me to conclude with a warm wish for the health of all people, the prompt recovery of the industrial activities and of global trades in this and any industry.

May 2020

Carlo Maria Ferro

President of ITA - Italian Trade Agency







A satellite photograph of Northwest Greenland. The image shows a rugged coastline with dark, rocky terrain interspersed with patches of white snow or ice. The surrounding waters are a deep blue, with visible whitecaps and swirling patterns. The overall scene is a high-contrast, detailed view of a remote, cold environment.

# Northwest Greenland

Photo Credits: ESA



# Associazioni

## AIAD | AIPAS | ASAS

AIAD, AIPAS and ASAS are very glad to participate and to contribute for the success of this National space companies catalogue.

The Italian space industry plays a leading role in the Italian economy and stands out as one of the high-tech industries able to produce innovations generating positive ripple effects in other industrial sectors.

Space is one of the few high-tech sectors in which Italy holds a global leadership position. Italy belongs to the exclusive club of spacefaring nations in the world that have a complete supply chain and a full range of expertise in the field.

Moreover, Italy is characterized by an advanced technology, a wide range of available applications (civil, military and dual-use) and a fruitful interaction between research and industry.

The Italian leadership leverages on the unique capabilities (skills and infrastructure) developed by the different actors of the sector (research institutes, universities and industry) and on a broad spectrum of enabling technologies, ranging from the manufacture of systems (satellites, launchers, inhabited infrastructure, etc.) to the operational management of space centres, to the provision of services in different areas of civil society (security, environmental monitoring, transport, telecommunications, science, critical infrastructure monitoring, etc.).

The national ranking is the result of the continuity of investments which have been a priority since many years by the Italian Government, it materialized through the policies and the programs of the Italian Space Agency (national programs, ESA programs) and the initiatives of other national organizations and institutions.

In Italy the Space sector has a significant number of both large companies and small and medium-sized enterprises (SMEs). They are represented by three different national organizations:

### **AIAD, Italian Industries Federation for Aerospace, Defence and Security**

00184 Rome (Italy), Via Nazionale 54  
aiad@aiad.it, +39 064880247, [www.aiad.it](http://www.aiad.it)

### **AIPAS, Association of Italian Space Companies**

00186 Rome (Italy), Via del Tempio 1  
info@aipas.it, +39 066869222, [www.aipas.it](http://www.aipas.it)

### **ASAS, Association for Space-based ICT Technologies, Applications and Services**

00187 Rome (Italy), Via Barberini 3  
asas@asaspazio.it, +39 06421401,  
[www.asaspazio.it](http://www.asaspazio.it)





Photo Credits: ESA | Canadian Arctic Archipelago





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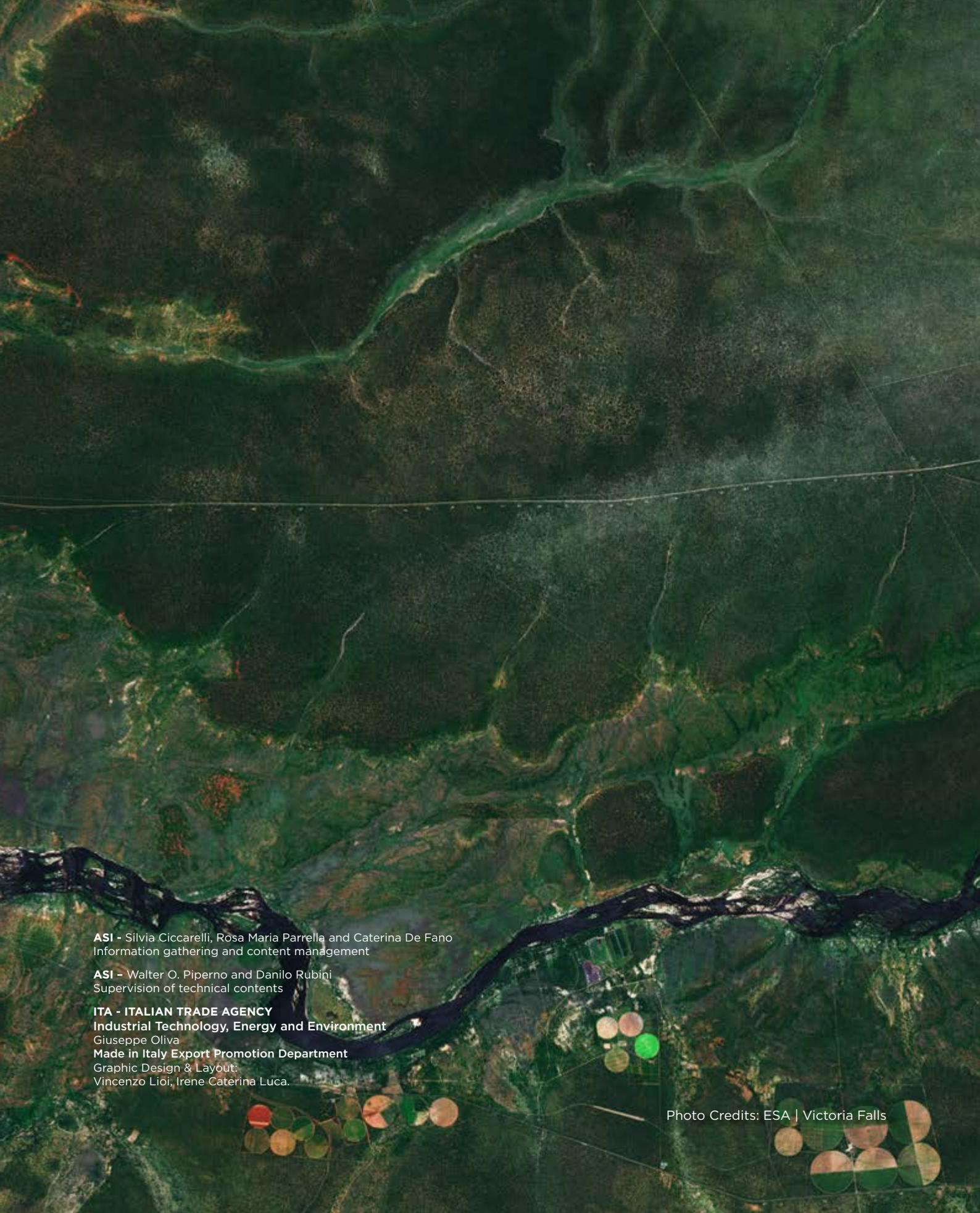
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A satellite image of a river delta, likely the Niger River delta, showing a complex network of channels and wetlands. The image is overlaid with several circular graphic elements in the bottom left and bottom right corners. These circles are arranged in a grid-like pattern and contain various colors, including red, orange, yellow, green, and blue. The text is located in the bottom left corner of the image.

**ASI** - Silvia Ciccarelli, Rosa Maria Parrella and Caterina De Fano  
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**ASI** - Walter O. Piperno and Danilo Rubini  
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# Application domains and enabling technologies

Photo Credits: ESA



# Application domains and enabling technologies



LARGE COMPANY



SMALL AND MEDIUM ENTERPRISE (SME)



START-UP

COMPANY NAME	APPLICATION DOMAINS									ENABLING TECHNOLOGIES			SYSTEM CAPABILITY						
	Earth observation	Satellite navigation	Telecommunication	Space transportation, launch and re-entry services	Human spaceflight and microgravity (incl. International space station, cis-lunar gateway, etc.)	Integrated applications, security services and others (incl. IoT, cybersecurity)	Observing the universe, science and robotic exploration	Space situational awareness and in orbit servicing (incl. Debris, near earth objects, space weather)	Materials, structures, thermo-mechanical, mechanisms and others (e.g. Additive manufacturing)	Electronics, photonics, optics, integrated sensors and cryogenic components (incl. Quantum technologies)	Software,data management and signal processing (incl. Big data and ai)	Technologies for space transportation	Platform design and integration			Payload design and integration	Launch vehicle mission design and integration	*Other (max 3 keywords)	
													Nano/micro up to 50 kg	Small 50-500 kg	Medium 500-2000 kg	Large more than 2000 kg			
AEREA S.p.A.	x	x	x						x										HDRM, Additive Manufacturing, Deployables
AEROSPAZIO TECNOLOGIE s.r.l.				x						x		x	x						Electric Propulsion, Testing, Thermal Vacuum
AGT	x			x		x			x	x	x								Technology Transfer, Expert and semantic systems, Internationalization
AIKO	x		x		x	x	x	x			x		x	x	x	x	x		Edge AI, Artificial Intelligence, Safety Critical
Airbus Italia	x	x	x			x	x			x	x						x		
Airgloss					x	x				x	x								gas sensor, air quality
ALFA MECCANICA SRL	x	x	x	x	x		x		x										MGSE, PRIMARY STRUCTURES (MODULES AND SATELLITES), HONEYCOMB
ALI Scarl	x		x	x					x	x	x	x	x	x			x		Re-entry; Deployable; Earth-Observation
ALMA SISTEMI SRL	x						x		x		x		x				x		Transport Containers for satellites, MGSE, EGSE
ALPHA Consultants srl (ALPHA)	x	x	x																Exploitaion, Dissemination/Communication, Business consultancy
Altec				x	x	x	x			x	x						x		Earth Station Feed/Horn ACU - Antenna Control Unit
Angelantoni Test Technologies	x	x	x	x	x		x		x				x	x	x	x			SPACE SIMULATION, TESTING
Antech Space	x		x						x										Earth Station Feed/Horn ACU - Antenna Control Unit



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APR srl				x	x				x	x		x						Thermal and Environmental Control Equipment, Design, Development and Manufacturing
ARCA Dynamics	x					x	x	x		x	x		x					proximity operations, collision avoidance, AI
Arescosmo S.p.A.				x	x		x		x			x						Entry/Descent/Landing, Agrospace, Planetary Protection
ARESIS	x					x				x	x							
Argotec Srl		x			x		x		x	x			x				x	microsatellites for deep space, payloads, human factor
AVIO S.p.A.				x					x	x	x	x						Solid and Liquid Propulsion
Aviospace s.r.l.		x	x	x	x				x	x			x	x				
BEAMIT		x	x	x					x	x			x	x	x	x	x	Additive Manufacturing application
BERCELLA									x									dissemination
Blu Electronic srl	x	x		x	x		x			x	x		x	x			x	design, manufacturing and technologic transfer
BLUE Engineering Srl	x			x	x	x	x		x		x						x	advanced materials, new manufacturing technology, digital modelling, simulation and testing.
Bright Aerospace Srl	x	x	x				x	x	x	x							x	Laser, Optical, Lidar
Bright Solutions Srl	x	x	x				x	x	x	x							x	Laser, Optical, Lidar
CBL ELECTRONICS S.R.L.	x	x	x		x		x		x	x			x	x				Electronic design
Centrale Valutativa	x										x							precision-farming, downstream services, agriculture
CESI SpA	x	x	x			x			x	x								Multijunction, solar cells, GaAs compound
Cistelaier S.p.A.	x	x	x	x	x	x	x			x								Printed Circuit Boards
Compolab S.r.l.									x	x	x		x				x	Simulation, Prototype, Additive



COMPANY NAME	APPLICATION DOMAINS									ENABLING TECHNOLOGIES			SYSTEM CAPABILITY						
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Consorzio di ricerca Hypatia						x			x	x									Technology Transfer
DAVI									x										bending machines, profile bending, metal sheets bending
DEMA SPA						x			x			x					x		Engineering, tooling.
DIGIMAT	x	x	x			x		x			x								PROCESSING, ACQUISITION, MONITOR & CONTROL
D-Orbit SpA	x			x				x		x	x	x	x	x			x		Systems, Debris, Mission Control Software
DTM srl	x			x	x		x		x		x	x	x	x	x		x		Mechanical, Fluidic and Thermal GSE
DUE2LAB SRL							x	x	x	x	x								Radiation detection, Solid-state detectors, X- and gamma-rays dosimetry.
Dune srl	x		x							x	x						x		dissemination
Ecor International	x	x			x		x		x										Propulsion, Fluidic, Pipes
e-GEOS	x					x					x								Big Data Analytics, Geoinformation, Artificial Intelligence
EICAS Automazione S.p.A.		x						x		x	x								Multicamera star tracker, Autonomous Attitude Determination
EIE GROUP Srl	x		x				x		x	x									GSE, Ground Stations
ELETTRONICA Group	x	x				x				x	x						x		education, dissemination
ELITAL	x	x	x	x	x		x		x				x	x	x	x	x		MGSE, EGSE, Space Qualified PCB, Brazing, Satcom
Engineering	x					x						x							dissemination,ICT Infrastructural Services
Esri Italia	x	x				x					x								GIS, GNSS, EO
ESSETI MECCANICA DI PRECISIONE SRL	x	x		x		x	x						x	x	x				Flight safety, Parts manufacturing
Euro.Soft srl	x	x	x			x				x	x								
EXprivia S.p.A.	x					x					x								PDGS Data Processing EO applications



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FLYSIGHT SRL	x	x	x			x					x						Remote Sensing, Big Data Analytics, Real-time analysis		
G & A ENGINEERING	x	x	x		x	x	x	x	x	x		x	x	x		x	PRIVATE RESEARCH CENTER FOR MICROELECTRONIC FOR SPACE		
GAROFOLI SPA	x		x	x		x			x	x		x	x	x	x	x	MGSE; Space Application;		
GAUSS SRL	x		x	x			x		x	x	x	x	x			x	dissemination		
Gelco Spa										x							Harnesses design and manufacturing		
Geocart S.p.A.	x	x								x	x			x			Remote Sensing, Integrated Multi-Sensor Platform		
GEO-K S.r.l.	x					x					x						Artificial intelligence, Education, Drone services		
GEO PHYSICAL APPLICATIONS PROCESSING (GAP) srl	x							x			x						dissemination, training, transponder		
GMSPAZIO	x	x	x	x		x					x						Modeling & Simulation		
GP Advanced Projects		x	x			x			x	x			x			x	Sensors, cubesat, constellation		
HTT									x	x									
IMT srl	x	x	x			x	x		x	x			x			x			
IngeniArs S.r.l.	x	x	x		x	x	x			x	x	x					IP Cores Ground Test Equipments Communications (SpaceWire, SpaceFibre, CCSDS 131.2-B)		
INNOVA	x					x					x								
Intecs Solutions S.p.A.	x	x	x			x		x	x		x					x			
Intelligentia S.r.l.		x	x		x	x				x	x						Software Embedded Systems Industry 4.0		
Interconsulting S.r.l.	x		x							x	x								
IPTSAT	x										x						PRECISION FARMING AGRICULTURE, DEM-DSM-DTM, CHANGE DETECTION, earth observation, big data		



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Issel Nord S.r.l.			x			x					x								Integrated Logistics Support
Italconsul				x	x	x	x		x		x						x		
Italspazio	x		x					x		x	x		x	x					Satellite Bandwidth, Cubesat, Geo Localization Systems
ITS Srl	x	x	x		x	x					x						x		Supercomputer, Antispoofing, OBDH
Kayser Italia Srl					x		x		x	x	x		x	x			x		
KELL Srl	x	x	x			x				x	x								Space applications, e-health, HW/SW integration
L.M.A. srl	x	x	x	x	x				x			x							Machining, Quality, Competitiveness
Labormet Due									x										Industrial Computed Tomography, Metrology, Quality Control
Latitudo 40 S.r.l.	x										x								Artificial Intelligence
Leaf Space S.r.l.	x		x			x				x	x		x	x					Ground segment as-a-service, ground stations
Leonardo SpA	x	x	x	x	x	x	x	x	x	x	x						x		Technology transfer; Training; On-orbit robotic servicing
MAPSAT	x					x					x			x					direct broadcast, VHR, near real time
MEC SRL	x	x	x				x		x	x									MICROWAVE TECHNOLOGY
Media Lario S.r.l.	x		x				x		x	x							x		Optics, EO, Communications
MEEO Srl	x					x					x								-big data - remote sensing -datacube
Nadir				x	x				x	x		x	x						Plasma Surface Modification, Polymer composite, Nanotechnology
NAIS Srl	x	x	x	x	x	x		x	x		x								Applications, EO Mapping, System Dependability
Nanoracks Space Outpost Europe srl (NRSOE)					x							x					x	x	Education, Cubesat Deployment
NCM TECHNOLOGY SRL	x						x		x										SAR SATELLITES MECHANICAL COMPONENTS



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Neohm Componenti s.r.l.	x	x	x				x			x							x	PSUs, DC/DC Converters, Hybrid circuits	
NEXT INGEGNERIA DEI SISTEMI S.p.A.	x	x	x			x					x							Ground Segment, Cal/Val, Software	
NOVOTECH									x			x						dissemination	
NPC Spacemind				x			x	x	x			x	x				x	x	Telescope mounts; Cubesat; Deployers
NURJANA TECHNOLOGIES	x						x	x			x								DATA FUSION, SENSORS INTEGRATION, VIRTUAL REALITY
OFFICINA STELLARE SPA	x						x	x	x	x							x		dissemination
OHB Italia	x			x	x		x	x	x	x	x	x	x	x	x		x	x	Ground Telescope - ISRU
Optec S.p.A.	x	x	x	x				x	x	x							x		
PICOSATS S.R.L.	x		x				x		x	x			x	x					Transceivers, antennas, structural bus
Planetek Italia	x	x				x	x				x						x		SaaS, OBSW, Info as a Service
Progem srl					x				x				x						structural health monitoring / machining / window
Progetti Speciali Italiani Srl	x	x	x		x				x	x	x	x	x	x			x		Elint, Observation, Navigation
Progressive Systems	x					x					x								EO-based solutions, Scalable processing, Validation support
Radio Analog Micro Electronics srl	x		x			x				x	x		x				x		ASIC, MW&RF, Ground Segment
RADIOLABS		x	x			x					x								localisation systems, data analysis, security
RedCat Devices	x									x									dissemination/education
RF MICROTECH	x		x			x				x			x	x	x		x		antennas, filters, radiofrequency
RGM S.p.A.	x	x		x		x				x									EEE Parts Testing and Procurement
RINA Consulting S.p.A.	x	x	x			x			x		x						x	x	Project/Program management, Modelling, Training

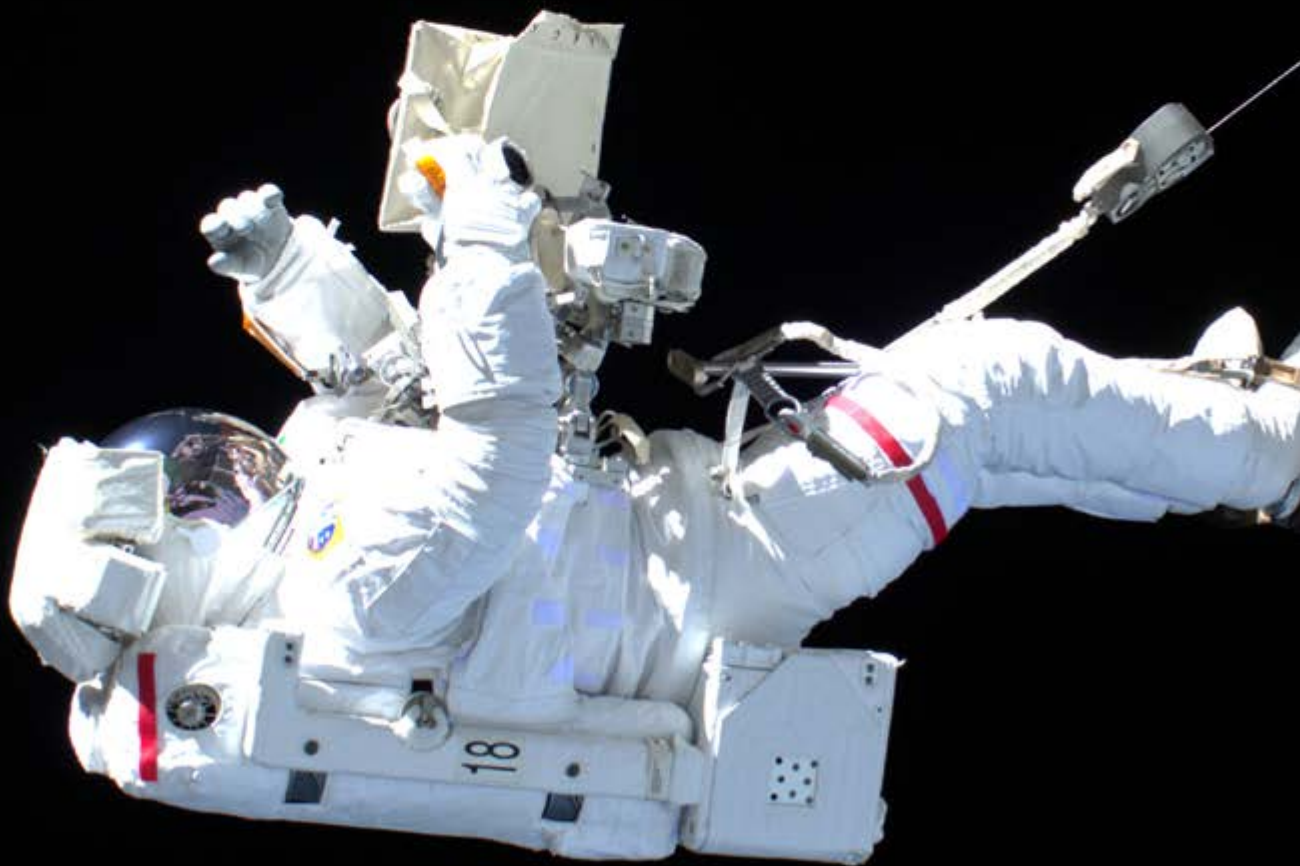


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S,A,B. Aerospace S.r.l.				x	x		x		x	x		x									
S,A,T,E - Systems & Advanced Technologies Engineering srl		x	x		x	x					x								simulation, control, data analysis		
S2G Technologies S.r.l.	x						x		x	x	x										
SAB LAUNCH SERVICES S.r.l.	x			x				x	x		x								Launch Services		
Sabell S.p.A				x	x	x		x	x			x	x	x	x	x	x		cargo organization system		
SAM srl	x						x												Telescopes, ground antennas		
Serco SpA	x					x					x								EO Data processing & dissemination; Ground Segment operations		
SICILSAT Communications s.r.l.	x	x	x																Antenna& RF Components design		
Sigma Consulting			x			x				x	x										
SITael	x	x	x		x	x	x	x	x	x	x	x	x	x			x		space economy, electric propulsion, In-Orbit Validation		
SOMACIS SpA										x									High Technology PCB		
Sòphia High Tech									x			x	x	x			x				
SPACE DYNAMICS SERVICES		x				x	x				x										
Space Factory			x	x				x	x				x						AEROSPACE RE-ENTRY; DEPLOYABLE ANTENNAS; SPACE OPENING MECHANISMS		
Spacearth Technology Srl	x	x								x	x										
SpaceeXe s.r.l.		x	x			x				x	x								GALILEO, monitoring, GNSS		
SPACELAB				x					x	x	x	x							propulsion. Avionic, software		
SPAZIOFUTURO srl	x	x	x	x				x													
ST4I - Space Technologies for Innovation	x	x	x	x		x			x	x			x				x		active antenna, satellite payload, RF sub-system		



COMPANY NAME	APPLICATION DOMAINS										ENABLING TECHNOLOGIES			SYSTEM CAPABILITY					
	Earth observation	Satellite navigation	Telecommunication	Space transportation, launch and re-entry services	Human spaceflight and microgravity (incl. International space station, cis-lunar gateway, etc.)	Integrated applications, security services and others (incl. IoT, cybersecurity)	Observing the universe, science and robotic exploration	Space situational awareness and in orbit servicing (incl. Debris, near earth objects, space weather)	Materials, structures, thermo-mechanical, mechanisms and others (e.g. Additive manufacturing)	Electronics, photonics, optics, integrated sensors and cryogenic components (incl. Quantum technologies)	Software,data management and signal processing (incl. Big data and ai)	Technologies for space transportation	Platform design and integration		Payload design and integration	Launch vehicle mission design and integration	*Other (max 3 keywords)		
													Nano/micro up to 50 kg	Small 50-500 kg	Medium 500-2000 kg	Large more than 2000 kg			
Stam S.r.l.	x					x	x	x	x		x							mechanisms, space debris, EO applications	
STELLAR PROJECT SRL	x		x			x	x	x	x	x	x		x	x					
STMicronics										x								Semiconductors Manufacturer	
Studiomapp s.r.l.	x										x							Artificial Intelligence, SaaS, Object detection	
Survey Lab	x										x							Geomatic Monitoring, engineering	
T4i				x									x					Electric Propulsion, Chemical Propulsion	
Taitus Software Italia s.r.l.	x							x			x							analysis, simulation, visualisation	
Techno system development srl (TSD)	x	x			x		x	x		x	x			x	x		x		
TELEMATIC SOLUTIONS				x									x					GROUND SEGMENT, GROUND STATION, LAUNCH PAD DESIGN	
TELESPAZIO	x	x	x	x		x		x			x							Teleport infrastructures and operations	
TEMIS	x		x	x			x	x		x	x	x							
THALES ALENIA SPACE	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	technology transfer	
THERMAL SPRAY SERVICE SRL									x									TECHNOLOGIES DEVELOPMENT- COATINGS PROCESSES- AEROSPACE COMPONENT MANUFACTURING	
TIBERLAB srl						x			x	x								device and material modeling and simulation	
Trans-Tech		x		x		x		x	x	x	x	x	x	x		x		GSE, technology transfer, Space tourism	
Tyvak International SRL	x	x	x	x		x			x	x	x	x	x			x		high performance ADCS; mission design; launch integratiron services;	
Vitrociset SpA		x	x	x		x		x	x	x	x								
Wise Robotics						x				x	x							Structural Health Monitoring, IoT, GNSS	
YETITMOVES		x	x			x				x	x							dissemination	

# Spacewalk!





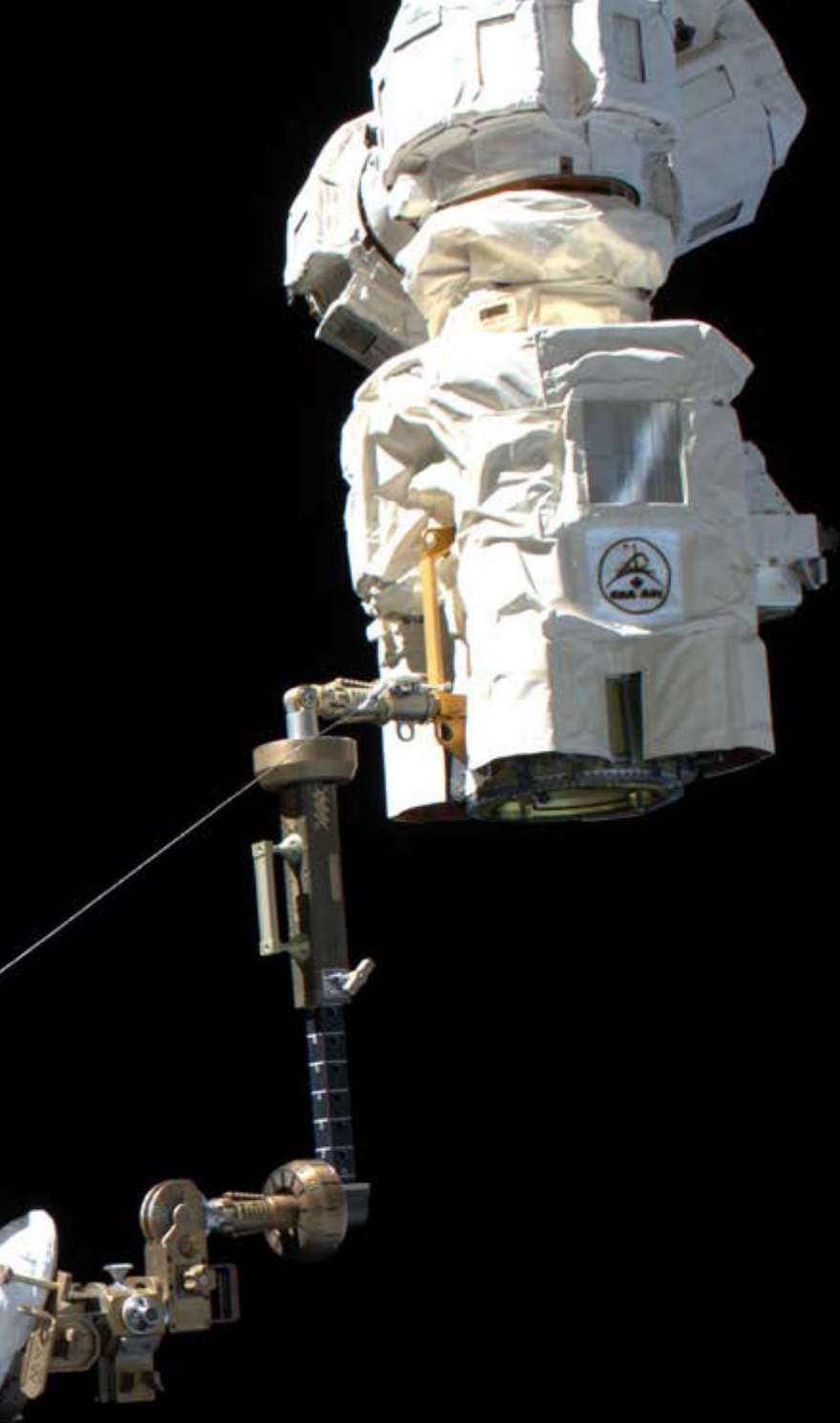


Photo Credits: NASA / ESA | Luca Parmitano





# STARTUP



Photo Credits: ESA

## Company profile

AIKO S.r.l. ([www.aikospace.com](http://www.aikospace.com)) is an innovative deep-tech company with a unique mission: "Introducing Artificial Intelligence to space, to catalyze the evolution of space systems towards smarter, more autonomous and more efficient satellites"

AIKO is a deep tech company, delivering state of the art Artificial Intelligence solutions for flight and ground software with the goal of enabling autonomous space missions. AIKO has active contracts, collaborations and partnerships with many European institutions and companies, including European Space Agency and the European Commission.

AIKO has been the first European company to publicly announce the in-orbit demonstration of Deep Learning algorithms, in October 2019.

Founded in 2017 in Torino and registered in the list of innovative Italian companies, since May 2017 is incubated in I3P ([www.i3p.it](http://www.i3p.it)), one of the most important public incubators in the world (15th worldwide in 2014, 1st worldwide in 2019). AIKO business focuses on the development of Artificial Intelligence software for space applications, targeting automation of operations, support to operators and advanced mission autonomy. Key areas of expertise are Machine and Deep Learning, Knowledge-Based Systems and embedded software design applied to space missions, in the domains of autonomous decision-making, payload data information extraction, failure detection, and mission replanning. AIKO is composed of a team of highly skilled researchers and engineers, boasting years of experience in space programs, including two small satellites launched and operated, publications on international journals and congresses and collaborations with some of the most prominent research institutes, such as ESA, NASA JPL, and MIT. Since June 2018, AIKO is part of the NVIDIA Inception Program, a program reserved for startups that have Artificial Intelligence as the core competence and focus. The program nurtures dedicated and exceptional startups who are revolutionizing industries with advances in AI and data science. AIKO has secured both private and public funding, including investment from VC involved in the field of Artificial Intelligence.

## Products | Services | Applications | Technologies

AIKO provides state of the art technology and expertise in four distinct domains related to the design and development of Artificial Intelligence for space missions:

1. State of the art AI-enabled automation: AIKO main product, MiRAGE (Mission Replanning through Autonomous Goal gEneration) is an AI-based ground and flight software designed to enhance the autonomy level of a spacecraft. MiRAGE is currently at TRL6, and features several AI technologies interacting, such as Deep Learning and Knowledge-Based Systems. The technology enables state of the art functionalities in mission operations automation, such as goal generation and management, event and failure detection including prediction, and mission re-planning, performed by analyzing on-board telemetry and payload data and generating an operations schedule that adapts to the events monitored. MiRAGE enables E4 mission autonomy on spacecraft.
2. Deep Learning and AI on the edge: AIKO unique expertise involves developing and deploying state of art AI to edge devices, including recent releases of AI accelerators. Among the applications developed by AIKO, and compatible with integration on onboard computing platforms, there are: cloud detection and segmentation, terrain and urban detection and segmentation, ship detection, predictive maintenance and failure prediction, attitude and position estimators for Rendez-Vous manoeuvres, and more.
3. Complex automation algorithms: autonomous decision-making algorithms, advanced planning, goal reasoning and goal management. AIKO develops algorithms that enable spacecraft coordination, cooperations and interaction.
4. AI for safety-critical applications: in addition to the expertise in quickly and reliably integrating state of art technologies upstream, AIKO expertise is growing in the field of verification and validation of AI for safety-critical applications, both in the field of supervised AI and in the field of robust and explainable AI.



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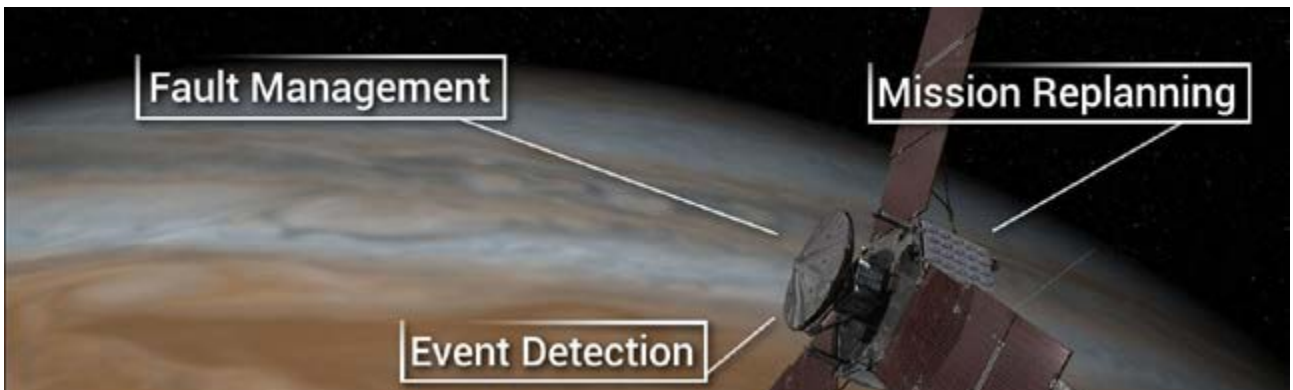


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# Antech Space Srl

## Company profile

Antech Space designs, manufactures and integrates turn-key satellite telecommunications systems and related RF equipment.

The company, founded in 2016, is made up of a team of great experience and already known among the operators of the satellite market, especially between the owners of teleports and their end-users (such as National Broadcasters, Defense and Space Agencies).

Recently the company has specialized in participating in international tenders, organized by State Institutions or private companies.

Antech Space has a large range of products, that include Ka, K, Ku, X, C, S and L Band feed/horn RF solutions, both for fixed and mobile antennas, or electronic parts (as ACU - antenna control unit for GEO/LEO/MEO satellite antenna systems): every solution is configured and customized according to customer needs.

Antech Space team is also able to carry out any kind of refurbishment activities on old satellite telecommunication systems, both from the RF and the mechanical and handling point of view.

## Products | Services | Applications | Technologies

### Satellite Earth Station

Antech Space projects, designs, integrates and installs satellite Earth station with antenna dish dimension from 3.7 mt up to 18 mt.

Frequency range Tx/Rx:

L/S band (1.6 – 2.5 GHz), C band (3.4 – 6.8 GHz), X band (6.7 – 8 GHz), Ku band (10.7 – 14.5 GHz), K band (17.5 – 18.3 GHz), Ka band (20 – 30 GHz)

Configurations:

Prime Focus, Dual Optics, Cassegrain, Gregorian, etc.

Project, Design and Measurements Division

Antech Space projects, designs, produces and sells every kind of satellite passive parts (feed or parts of it) under project or specific customer requirements for any kind of application from L band to Ka band, giving also measures and calibration in its laboratory (equipped with an anechoic chamber). Its main capabilities are:

- RF measures on passive parts of the antenna feed;
- RF measures on power amplifiers with an high level electronic laboratory;
- antenna alignment service (e.g. Teodolite, Laser tracker, Photo Grammetry);
- antenna on site measurement (e.g. Gain, G/T, Waveguide loss).

### DSNG Vehicle for Governative Agencies

Antech Space can provide turn-key coach worked vehicle for the Governative agencies equipped with mobile satellite antenna systems and other RF equipments for disaster recovery, Military and Police services.

Last main installations/refurbishment works

SNRT/Morocco:

Supply and installation of Nr.9 - 2.4mt V-SAT Ku band antenna system, installed in Rabat Italiana Ponti Radio/Italy:

Satellite band management for RPAS (Remotely Piloted Air System), named Falco-EVO, related services

Telespazio/Italy:

New 4ports monopulse Ku band feed for ITA-FOC-04C antenna system installed in Fucino Teleport



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E-Geos/Italy:

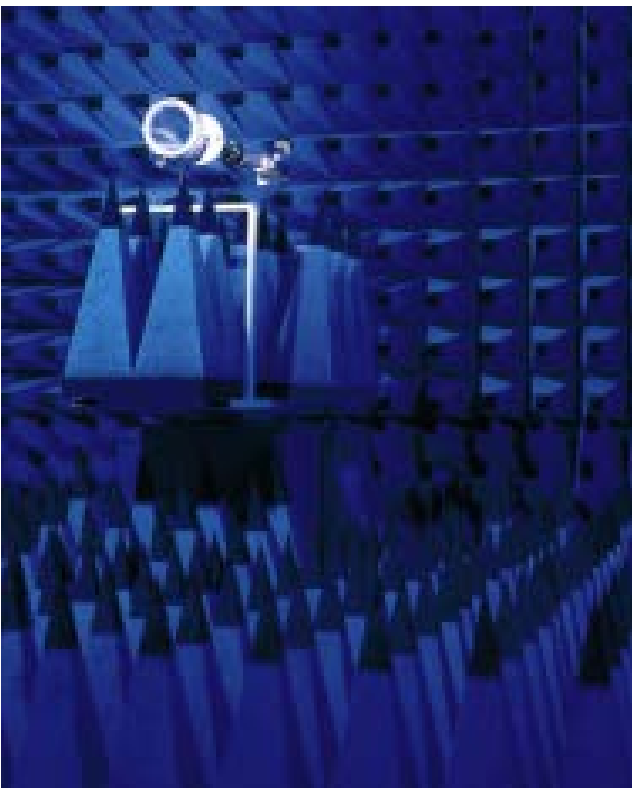
10mt antenna system with a new X band monopulse Feed and high speed motorization sub-system completed with ACU for LEO application

Hellas Sat Teleport/Cyprus:

7mt Antenna system refurbishment activities on Az. & El. motors kit

Dish Media Network/Nepal:

9mt Antenna system refurbishment activities on Azimuth motors kit



# ARCA Dynamics

## Company profile

ARCA Dynamics is an Innovative Startup (Italian law n. 221/2012) active in the field of Space technology R&D. The company provides enabling technologies for space proximity operations (collision avoidance, rendezvous, docking, undocking, berthing, capture, etc.) while increasing space automation. Research & Development activities focus on the need of New Space companies to deliver their value proposal through cost-efficient constellations of small satellites. In this framework, R&D efforts will guarantee autonomous and safe performances of new mission concepts, such as in-orbit servicing, space surveillance, debris mitigation and in-orbit assembly. According to its mission, ARCA Dynamics offers cutting-edge products and services for both flight- and ground-segment like high fidelity simulators, attitude actuators, attitude determination software, control algorithms, sensors firmware, optimization software, propagators, design and development of CubeSat missions enabling New Space enterprises, Attitude Determination and Control Systems (ADCS), design and hardware in the loop testing of autonomous Guidance, Navigation and Control (GNC) systems for proximity operations.

## Products | Services | Applications | Technologies

### Fluid Wheel

An innovative reaction wheel that enables near null angular velocity manoeuvres while providing clean torque. It has no moving mechanical parts (no jitter and very high reliability) and low power consumption (almost 90% less wrt traditional reaction wheels).

Thanks to its customizable design and performances, this innovative device allows to meet New Space customers needs of designing new cost-efficient and sustainable mission concepts for EO, in-orbit servicing/assembly, formation flying.

### Star tracker/Stellar Gyro SW

A computer vision based on-board software for accurate determination of angular velocity and attitude during lost-in-space and tracking phases using on-board optical devices for minimal impact on the satellite architecture.

Its performances, comparable to FOG technology, enable gyroless architectures, hence sensible overall costs reduction. Furthermore, thanks to its design with minimal impact on system architecture, it can be implemented on in-orbit operating satellites.

### AI guidance

A reliable and accurate autonomous Real Time Optimal Control (RTOC) on-board software that uses Artificial Intelligence algorithms to compute optimal guidance with respect to power consumption or time, including keep-out cones.

The implemented AI enables autonomous manoeuvres to promptly react to unexpected events like collision avoidance, autonomus docking/undocking or debris catch.

### New Space mission design&development

Thanks to its know-how, network and expertise with CubeSat missions, ARCA Dynamics is able to design from scratch and develop CubeSat missions enabling New Space companies to deliver their value proposition through a sustainable satellite infrastructure using reliable and cost-efficient cutting edge technologies.

### HIL tests for autonomous GNC systems

Experimental verification and validation of autonomous Guidance Navigation and Control systems through Hardware In the Loop simulations using the following test facilities:

- Autonomous GNC testbed using a main large 3DOF robotic arm (optional 3DOF end-effector, 6DOF small robotic arm, and a rover);
- ADCS for Cubesats test facility using pneumatic suspension.



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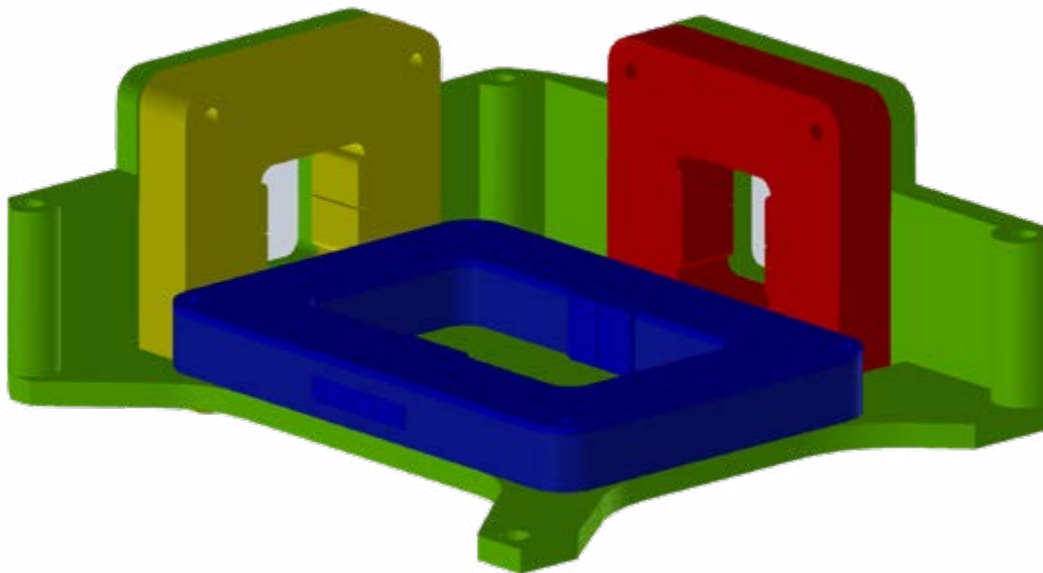
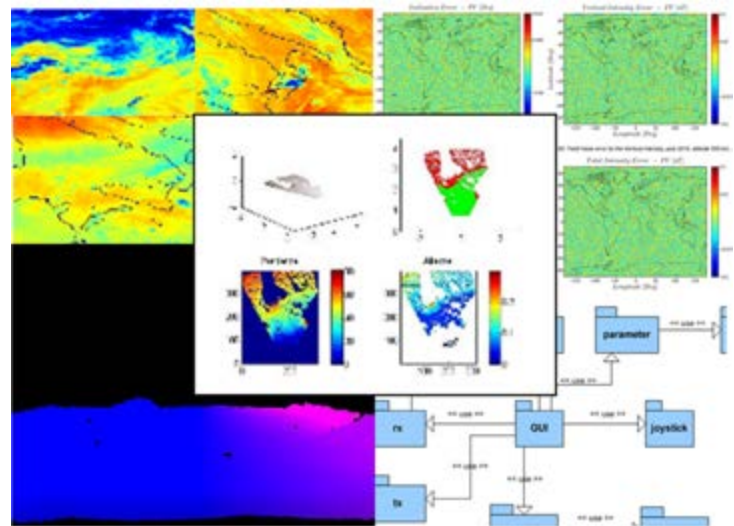
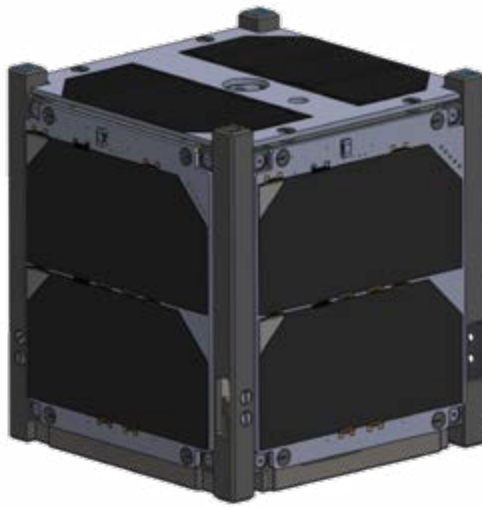
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Date of birth 2016







# Centrale Valutativa

## Company profile

Centrale Valutativa S.r.l. is an innovative start-up founded in January 2016 by seven partners who had been working together over the past decade, as a team, in a big consulting company operating in agro-environmental field.

We have been involved in the past decades in the evaluation services related to rural development programmes as a part of European Common Agricultural Policy (CAP). Evaluation is a discipline which requires the application of research and methods in order to gauge the evidences of policy effects. With this respect, we progressively become aware that part of our evaluative research could have been turned into a business opportunity addressed to the environmental impacts' mitigation of the agricultural and agribusiness activities.

Evaluation still remains company's core business, but we now offer other environment-related services like:

- ❑ EO-based services for farmers, insurance companies and golf courses: TETHYS - Smart Farming;
- ❑ Innovation brokerage and advisory services promoting circular economy solution for a better management of waste in agriculture and agribusiness sector;
- ❑ Carbon foot print applications at farms and industries level in the agriculture and agribusiness sector, to estimate greenhouse gas emissions and to obtain carbon credit certificates.

As for earth-observation based services, we've received some awards:

- Winners of 2017 ESA-BIC Incubation
- Third place in 2017 Copernicus Masters B2B Challenge
- Participation to the 2018 Copernicus Accelerator programme
- Finalist in 2018 Copernicus Masters Land Monitoring Challenge
- Winners of 2019 Copernicus Incubation

The team of Centrale Valutativa is made up of seven partners with 20 years' proven experience in agricultural field.

The strengths of our team rely on:

- The multidisciplinary background (3 agronomists, 2 economists, a statistician, a GIS and EO-data expert)
- The experience gained over the past decades in the agricultural area and the contacts we've built in it
- The applied research and methods carried out in the evaluation activities on environmental impact assessment
- The cooperative network of researchers focusing on environmental and other issues, which has been consolidated in the past decades
- The strong motivational attitude of new entrepreneurs

## Products | Services | Applications | Technologies

TETHYS - Smart Farming is a Decision Support System, using earth observation and other (weather, soil and agronomic) data to enable farmers better manage their day-by-day decision-making process. It includes specific services on crop vigour monitoring, smart irrigation and crop yield estimation.

TETHYS - Crop Monitor is useful to monitor, with proper vegetation indexes, the crop health and maturation in each part of the field.

NDVI (to monitor the health of crops by detecting in advance any occurrence of stress conditions), NDWI (to estimate the percentage of dry matter of the crop) and other vegetation indexes are used to monitor specific agronomic issues.

centrale  
valutativa

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Date of birth 2016





TETHYS - Water Saver guides farmers in irrigating only where, when and how much it is necessary.

Water is a common but precious resource, essential for human life. Agriculture consumes more than 70% of the available fresh water globally, with inefficiencies and waste reaching up to 40% of the total.

It is therefore a pressing imperative, driven and fuelled by public policies, to use farming water resources more efficiently and consciously.

TETHYS - Water Saver is able to estimate the correct amount of water to be distributed in each portion of the field, reducing waste and limiting consumption, with obvious positive effects on the company's balance and on the environmental sustainability of production.

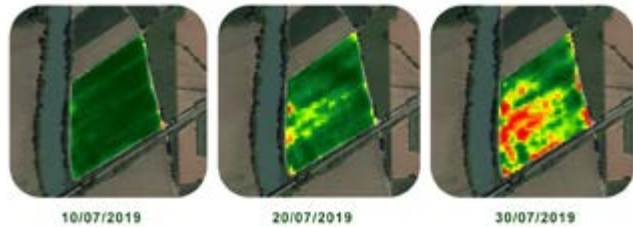
TETHYS - Yield Estimator, to assess the agricultural production of each area of the field.

Estimating agricultural production at harvest time is a difficult and costly task and often leads to inaccurate and generally poor results. New technologies offer different alternatives to traditional estimation methods, from drones to sensors, but they are still expensive and not free of flaws (non-repeatability, high time commitment).

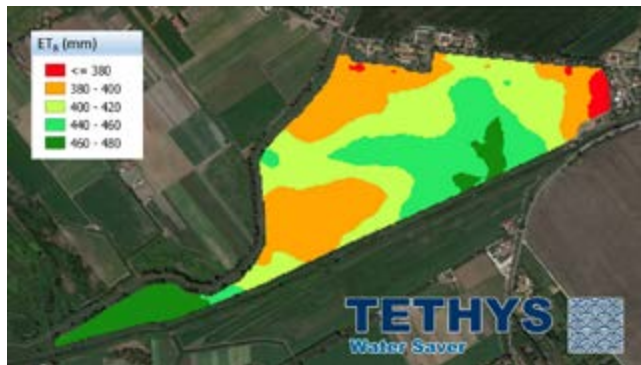
TETHYS - Yield Estimator is able to estimate the daily production of biomass for each area of the field, allowing the user to monitor the progress during the growing season and to create yield maps and prescription maps at the end of the season.

This allows the farmer to better plan the agronomic activities and to differentiate the use of production factors according to the actual needs of each area of the field, reducing the overall use of inputs and maximizing the production capacity of the company, and improving farm accounts.

The services are highly scalable, with interesting possible applications for insurance companies, golf clubs, public bodies and other subjects.



Red spider  
(*Tetranychus urticae*)  
attack on a maize crop



# IngeniArs S.r.l.

## Company profile

Innovative Italian start-up IngeniArs was born in 2014 out of its joint founders' extensive experience in the areas of electronics and advanced computer science engineering research. As a spin-off of the University of Pisa, it continuously promotes technology transfer from research outcomes to the market.

The name IngeniArs, a fusion of the Latin words ingenium and ars, conveys a strong correlation between creative art and engineering skill. The key to IngeniArs' success is the ability to combine these skills to create outstanding products and services. The company responds to the ever-increasing demand for innovation in the strategic aerospace, healthcare and automotive sectors, offering highly advanced hardware/software products and managing the full lifecycle of electronics, microelectronics and embedded systems.

Despite its relative youth, IngeniArs already has several major achievements, such as winning the European Commission's Horizon 2020 SME Instrument Phase 1 and 2 projects with the SIMPLE (SpaceFibre IMPLementation design and test Equipment) proposal. The second phase of the SME Instrument, in particular, is extremely competitive, with only around 3% of applicants being successful. Moreover, IngeniArs has obtained prime contracts with the European Space Agency for the development of highly advanced technologies, i.e. the CCSDS 131.2-B IP Core. Also, the company has contracts with national and international prime companies in the aerospace field.

## Products | Services | Applications | Technologies

In the aerospace field, IngeniArs offers IP Cores which implement the state-of-the-art communication technologies SpaceWire, SpaceFibre, WizardLink and CCSDS 131.2-B. IngeniArs products portfolio includes also Eth-, PCIe- or PXI-based ground test equipments/software for EGSE.

IngeniArs IP Core family includes:

The Gigabit Serial Link Controller (GSLC) IP Core, which implements the digital interface for both simple and complex communication protocols based on the most used Serializer/Deserializer (SERDES) available on the market. It can be customised to be compatible with a very simple hand-shake/flow control protocol or with a more complex communication standard including FDIR and Quality-of-Service such as SpaceFibre.

The SpaceWire CODEC IP Core, a very compact macrocell providing a complete and configurable interfacing solution for high data-rate communications compliant with the standard ECSS-E-ST-50-12C.

The SpaceWire Router IP Core, a macrocell offering a configurable and flexible solution for high data-rate routing switch functionality for on-board satellite networking. It is based on the SpaceWire protocol, defining bi-directional, full-duplex, serial data communication link, and it is compliant with the SpaceWire standard ECSS-E-ST-50-12C.

The CCSDS Telemetry Transmitter IP Core, fully compliant with the CCSDS 131.2-B standard, combining powerful Serially Concatenated Convolutional Codes (SCCC) with modulations ranging from QPSK to 8PSK and 16-, 32- and 64-APSK, offers precisely such benefits, together with a high degree of flexibility. Such flexibility, thanks to the number of modulation and coding formats (ModCod) provided, will help configuring the system to better adapt to the specific target requirements.

IngeniArs EGSE family includes:

The SpaceWire/SpaceFibre Analyser, based on PXI which is a modular instrumentation standard from National Instruments. It can count on more than 1,500 products from more than 70 vendors, speeding up testing, improving productivity, faster throughput, and increasing scalability, resulting in an overall great cost reduction. It is built upon the PXIe-6591R National Instruments high-speed FPGA board which guarantees a seamless integration with the LabVIEW environment.



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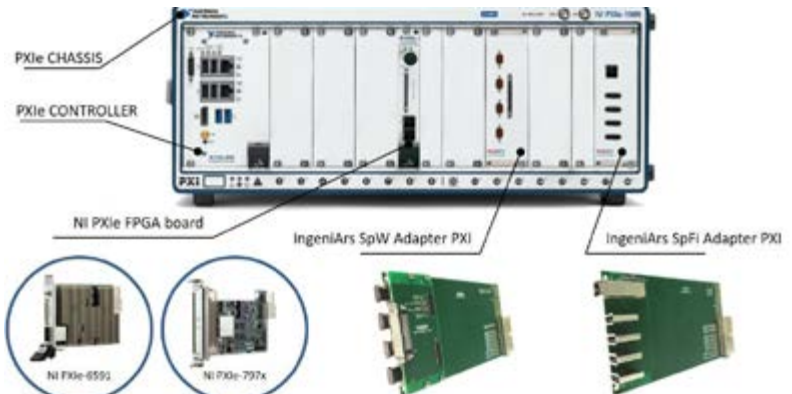


SpaceART - SpaceWire/SpaceFibre Analyser Real-Time - , a complete testing solution for high-speed links in space applications. SpaceART supports both SpaceWire and SpaceFibre standards. It can operate as a SpW/SpFi EGSE, generating, processing and consuming SpW/SpFi packets in real time, allowing the validation of SpFi/SpW based devices at their full bandwidth. SpaceART can also act as a SpW/SpFi link analyser, which allows the monitoring of the link. SpaceART is available in two different versions, Standalone and CompactPCIe.

IngeniArs Test Software family includes:

SpaceWire / SpaceFibre Network Simulator: this allows simulation of complex, mixed SpaceWire / SpaceFibre networks.

SCCC SW EGSE: this is fully compliant with CCSDS 131.2-B standard and simulates the entire communication from the transmitter to the receiver, passing through a customizable channel.





# Latitudo40 S.r.l.

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## Company profile

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Latitudo 40 has created the easiest and fastest platform to turn satellite imagery into geospatial information to support everyday decisions.

## Products | Services | Applications | Technologies

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We have integrated in a single platform all the technologies necessary to create, manage and use applications of spatial geoanalysis. EarthAlytics automates the entire workflow, from the automatic selection of data sources, based on the final application, to the analysis with automatic processing blocks based on artificial intelligence, up to the representation on an internal GIS and with intuitive information dashboards.

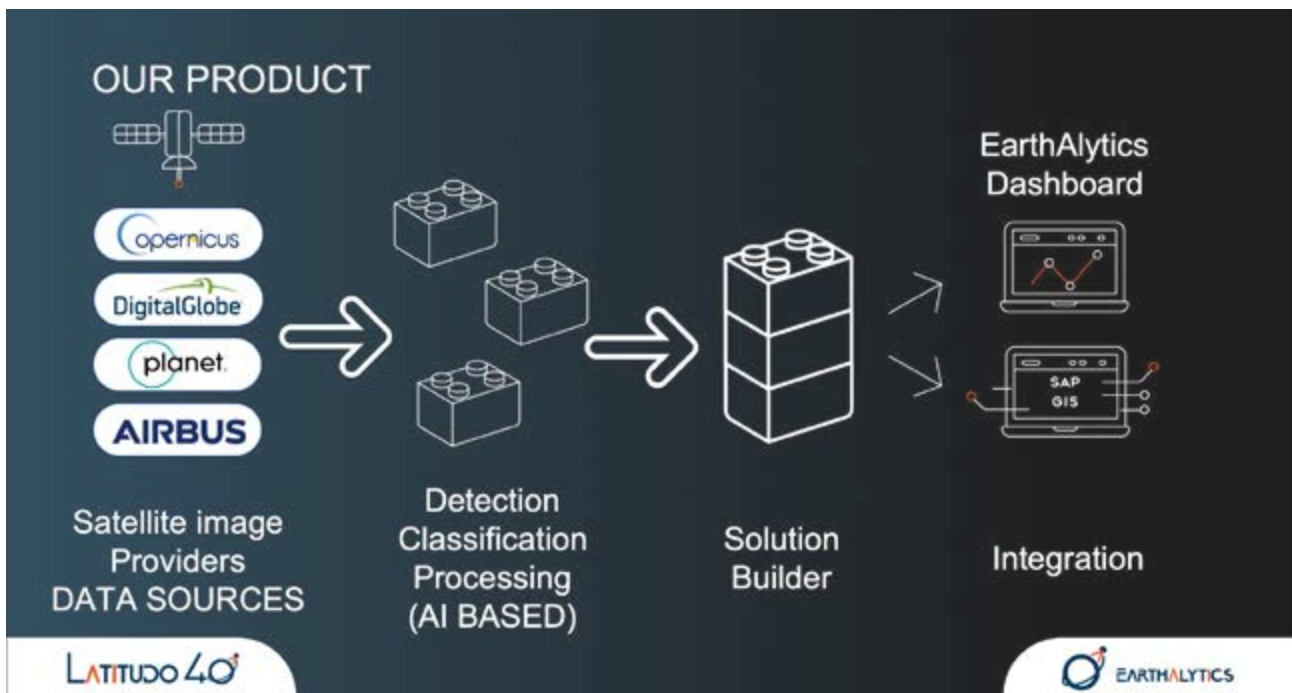


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# S2G Technologies Srl

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## Company profile

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S2G Technologies is a young startup born after an aerospace engineer and a physicist won an ESA contract for ground spinoff application of space technologies. While actively working on this project, we also look forward to take on new challenges, both in the industrial and research fields. Our expertise covers a wide range of skills, from electronics, software development, hardware, additive manufacturing, FEM analysis and simulations, CAD design and project management. We can thus cover the design and prototype manufacturing completely in-house, accelerating the development of new innovative products.

## Products | Services | Applications | Technologies

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Our expertise includes:

Instruments: Particle Sensors, Proximity Electronics, High Reliability FPGA Based DPUs

Software: On-board Data Compression, On-board Software

Hardware: Ground Support Equipment's, professional Additive Manufacturing (3D printing), CAD Design and Assembly

Analysis: Finite Element Method (FEM) Analysis and Computational Fluid Dynamics (CFD) Analysis



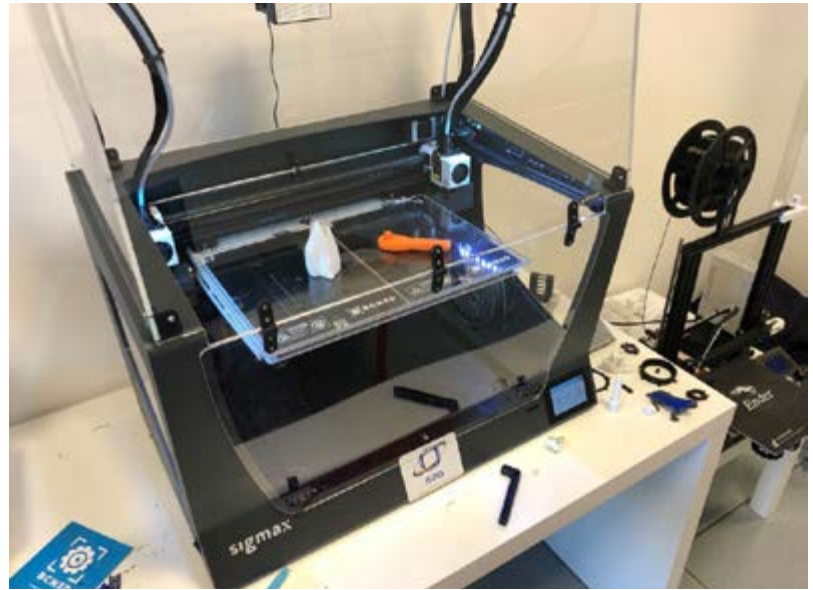
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# SPACE FACTORY S.r.l.

## Company profile

Space Factory (SF) is an innovative start-up born in 2015 whose corporate purpose is the development and the production of innovative products and / or services with high technological value in the field of aerospace, advanced mechanics, ICT and telecommunications. In 2015, SF signed a twenty-year contract with ALI to exploit the patent technology called IRENE (Italian RE-Entry Nacelle).

Multinationals like VIASAT, Lockheed Martin, THALES ALENIA SPACE, ASI with which the first commercial contacts have already begun, have shown interest in the use of the technology called IRENE .

Space Factory participated in the following projects

- MISSION - "Maritime Integrated Satellite System in an Inter Operable service Network"; it is a research contract financed by ASI (Italian Space Agency).
- MINI IRENE "Maxus International Nacelle to Investigate IRENE capabilities": it is a research contract funded by the European Space Agency to develop a "ground demonstrator" technology of the variable-geometry, umbrella-like heatshield of the MINI IRENE capsules.
- TALED - project for the forest fire fighting using an integrated platform of TLR and TLC data. The project was funded by the European Space Agency.
- SISDA - "System of controlled downhill and precision landing". Controlled descent system and precision landing The project was funded by Italian MISE (Ministry of Italian Economic Development).

SF's members have high quality profiles able to creating synergies of high strategic value are Dr. Paolo Lepre, CEO, 70% shareholder, graduated in International Economics in 1998 at the Parthenope University of Naples. Qualified as a chartered accountant and auditor, he has the appropriate expertise in the business environment and in the management of research projects. Former President of the Aerospace Commission of the Order of Chartered Accountants of Naples, and member of the commission for public and private partnerships at the National Council of Chartered Accountants.

He has a ten years' experience in business consultancy for aerospace companies in the Campania Region. Prof. Fabrizio Ferrucci, 30% shareholder, graduated in Nautical Sciences in 1980 at the Parthenope University, has suitable and functional expertise in the scientific field through the realization of design studies and research aimed at favouring technological innovation and to provide innovative solutions to the aerospace market. Professor at the Open University -Dept of Earth Ecology and Environmental Science, Milton Keynes, UK. Professor From 2010 to 2013 he was a first-class professor in Space Geophysics (invited) at the University Paris VII "Denis Diderot" and "Enseignant-Chercheur de 1ère classe" at the Institut de Physique du Globe de Paris, France. In September 2013 he was appointed honorary professor at the Open University in the United Kingdom.

Overall, F.F. he was coordinator or P.I. in 23 projects with budgets of over 25 million euros, with a focus on Europe, Africa and Asia - author or co-author of 5 patents (three international and two Italian) in Electronics and Remote Sensing, author or co-author of over 100 publications (56 in class A international journals) and official reports on Science and Technology, author or co-author of over 150 oral presentations at international workshops and symposia (over a third of them by invitation).

## Products | Services | Applications | Technologies

Space Factory aims to customize IRENE's patented technology in different aerospace applications such as: atmospheric re-entry, landing, movement of space components (i.e. deployable antennas and solar arrays on satellites) aiming to introduce an innovative customized technology in the aerospace market.

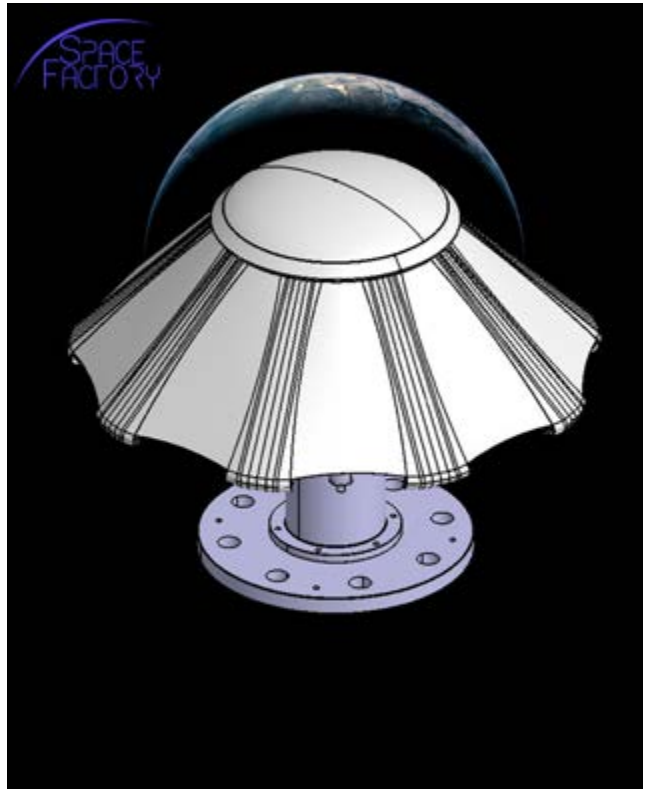
The IRENE patented technology has technological and economic advantages that make it unique compared to other solutions in the space sector, and compared to the inflatable opening systems ("inflatables").



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Date of birth 2015







# Stellar Project srl

## Company profile

Stellar Project is an innovation-based startup and a spin-off of the University of Padova. It develops game-changing products, solutions and unique services to bridge the performance and reliability gap between nano/micro satellites and large spacecraft.

Stellar Project is focused on ground-breaking innovation to provide a step increase in the capabilities of nano/micro satellites and facilitate/ accelerate the transition from traditional spacecraft architectures to future highly capable and widely accessible miniaturized space systems, always with a high degree of care towards environment sustainability

## Products | Services | Applications | Technologies

LaserCube is a laser communication terminal for nano, micro and mini satellites, and is compliant to the CubeSat standard for satellites of size 6U and larger. LaserCube is an enabling technology for future applications based on small satellites, since provides a step change in communication capabilities of nanosatellites, increasing the throughput performance of these miniature spacecraft of more than 10 times compared to state-of-the-art radiofrequency solutions.

LaserCube features two different configurations, one for downlink and the other for intersatellite link applications. The downlink version can downlink data at an unprecedented rate, permitting the full exploitation of optical payloads for high-resolution multispectral imaging; the intersatellite link version represents a fundamental element to realize high-efficient IoT and M2M networks, as well as spaceborne data relay constellations. The system is composed by two main parts: the optomechanical unit and the electronic unit, each made of standardised building blocks. The former features a dedicated dual-stage pointing system based on a technology patented by Stellar Project and the optical head, while the electronic unit contains the laser sources and drivers, as well as ancillary electronics.

Stellar Project offers a unique consultancy service to analyze the risk of mission deterioration for spacecraft and constellations exposed to the current orbital environment, with special focus to the threat posed by space debris. Environment analyses are coupled with the examination of spacecraft design reports provided by manufacturers, in order to derive realistic predictions and/or assessments of satellite anomalies, useful for the Space Insurance market.

Because of the growing interest in large constellation of small satellites, the risk related to space debris and space radiation is going to be better perceived day by day. The debris population in Earth orbits is in fact continuously increasing, and the robustness of nanosatellites to the radiation, plasma and neutral environments is still not at the same level of that of large spacecraft. In respect of these threats, Stellar Project provides advice to operators willing to maximize the environmental robustness of their space systems since early design stages.



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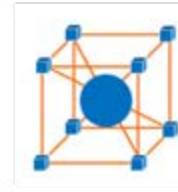
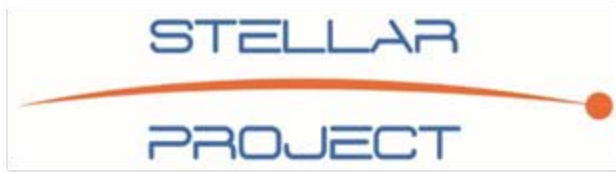
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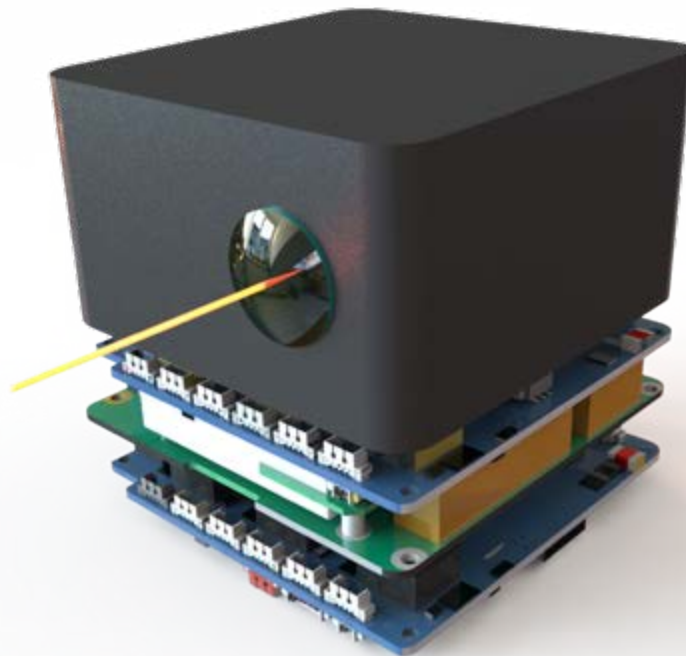
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Date of birth 2015





**Laser**  
**Cube**



**LaserCube**  
creating the  
optical highway  
for small satellites  
communication

[www.stellarproject.space](http://www.stellarproject.space)

# Studiomapp srl

## Company profile

STUDIOMAPP is an innovative startup with offices in Ravenna and Rome (Italy), specialized in AI and advanced ICT.

Using AI applied to Satellite and UAV imagery we deliver solutions for location intelligence.

## Products | Services | Applications | Technologies

Satellite & UAV imagery. Artificial Intelligence object detection SaaS, 100+ categories (maritime, engineering, ports, mining, logistics, buildings and informal settlements, energy assets, defence). Environmental Intelligence for natural resources management and climate change impact evaluation (vulnerability and risk assessment). Smart farming & precision agriculture. Web Gis, Cartography, data modelling.

STUDIOMAPP

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# Wise Robotics srls

## Company profile

Wise Robotics is a startup born in 2015 made up of electronic and IT engineers, data scientists, economists and structural engineers with the mission of improving the quality and security of people's life, through the development of IoT monitoring solutions able to analyse the data to provide information and analysis in real-time.

Wise possess expertise in Software Engineering, Artificial Intelligence, Big Data Analysis, Robotics, System Development and Cloud Computing.

Among the projects developed by Wise, it is worth noting the Quakebots system, which is an innovative structural health monitoring platform based on Internet of Things, Machine Learning and Cloud Computing.

The value of Wise Robotics has been demonstrated by relevant European awards such as SME Instrument Phase I and recognized by several key players such as the Enterprise Europe Network, Microsoft, L'Ventre and Forbes for the development and validation of the Quakebots System.

## Products | Services | Applications | Technologies

Quakebots is an innovative real-time vibrational monitoring system to analyze the dynamic response of buildings and infrastructures. The system is a micro-computer with a high sensitivity accelerometric sensor connected to the Quakebots Cloud platform via Wi-fi, Ethernet or LTE.

Quakebots is a system that combines the latest technologies in AI, IoT and Cloud computing to offer high precision and high-quality services. Wise has worked to create a Cloud platform that is highly scalable and have the potential to handle millions of buildings with very low latency. The system enable a continuous monitoring of the structure over time, which in turn allows to discover deviations of the behaviour the structure from its normal state by means of AI and engineering algorithms, with the aim to help asset managers in the optimization of the maintenance operations.

The Quakebots system has achieved relevant national and international awards that have contributed to the development of the startup.

Among them we can find the European Space Agency grant that allowed Wise developing the Quakebots SAT technology.

The new patented Quakebots SAT system combines the vibrational algorithmic component of measurements on buildings and infrastructures, with a positional component related to the use of GNSS. The Quakebots SAT allows to detect even the smallest displacement, landslides and for the early identification of any slippage of a structure over time.

The GNSS Quakebots SAT was installed on the Basilica of S. Francesco in Assisi, one of the test sites where it remained to perform acquisition and transfer of data. This allows to Wise to integrate these components with vibrational monitoring devices already present on the structure, through external prototypal connections, in order to obtain results and data based on the correlation between the movements registered by the vibrational algorithms and movements registered based on the component of GNSS.

Quakebots is a patented technology and has been tested on ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) vibrating table, together with DICA (University of Perugia), that certified Quakebots system and has already received an important market validation considering clients not only in Italy, but also in Belgium and Israel.



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# YETITMOVES

## Company profile

YETITMOVES is an Italian company, headquartered at EUCENTRE - University of Pavia, whose mission is the scientific research, design, development, production and marketing of innovative and high technology solutions and services in the field of Geomatics. YETITMOVES boasts a consolidated experience in GNSS data processing for high-precision static and kinematic positioning applications. Since its foundation, YETITMOVES has been working with EUCENTRE (European Centre for Training and Research in Earthquake Engineering) participating to international research projects, also with funding from the European Commission and the European Space Agency. YETITMOVES develops and markets innovative solutions, easy-to-use and low-cost, made according to the most advanced practices of Geomatics.

## Products | Services | Applications | Technologies

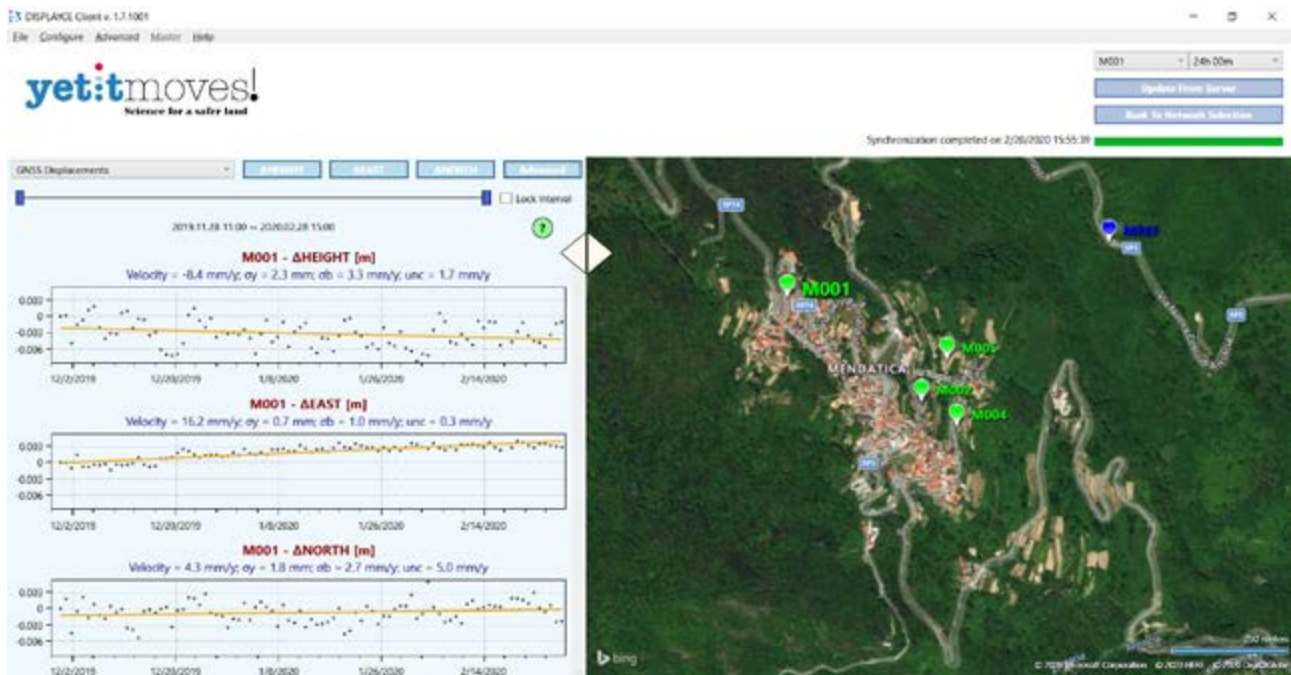
To tackle the problem of creating efficient and economical solutions dedicated to monitoring and early warning of critical infrastructures and areas subject to hydro-geological instability, YETITMOVES has developed DISPLAYCE, an innovative IoT solution based on single-frequency and high-tech GNSS sensors, able to compete, in terms of reliability, efficiency and measurement accuracy, with much more expensive instrumentation. Fields of application are monitoring and early-warning of areas subject to hydro-geological instability (landslides, bradyseism, sinking, subsidence, etc.), monitoring and early-warning of critical infrastructures and sites such as pipelines, geothermal energy plants, dams, towers, high voltage pylons, chimneys, bridges, viaducts, railroads, motorways, ports, natural gas storage sites, schools, historical buildings, archaeological sites, building sites, river basins, quarries, etc. With more than one hundred receivers sold in two years DISPLAYCE has already found its main users in large companies operating in the Energy and Transportation sectors, in the most important Italian Research Institutes, Universities, Civil Protection and Public Administrations.



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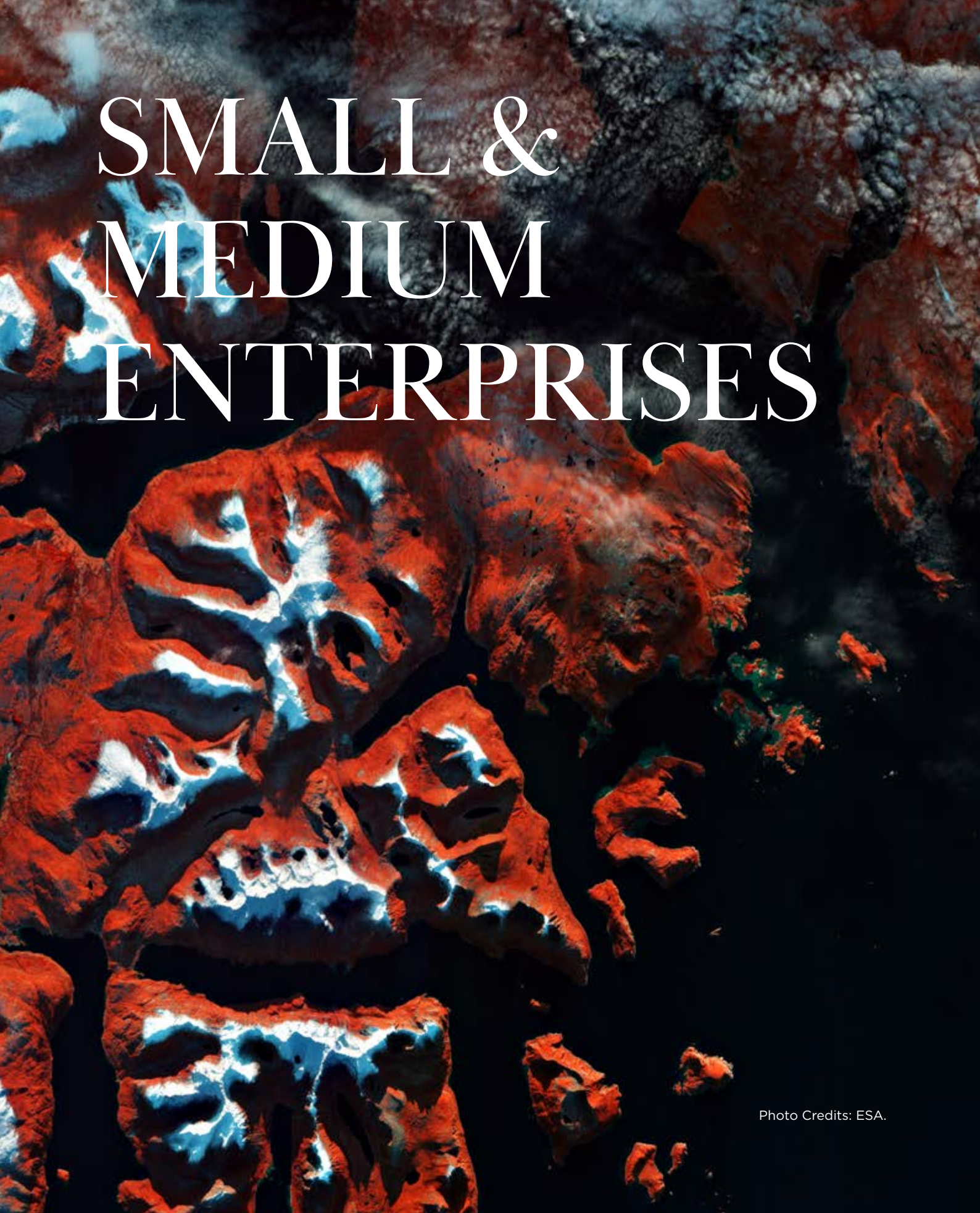












# SMALL & MEDIUM ENTERPRISES

Photo Credits: ESA.

# AEREA S.p.A.

## Company profile

Funded in 1916, and organized as a private S.p.A. (Società per Azioni) in 1927, AEREA is active in the design, development and manufacture of mission equipments for high performance military flying platforms.

Mission equipment are tasked to hold releasable payloads to the platform during carriage phase and, when necessary, to ensure their safe release or ejection.

Since 2011 invested to orientate its technology innovation capability to the space sector closer to its field of application, recognizing the similarity between the requirements for space HDRM's and aeronautic Mission Equipment, both devoted to restrain, release and deploy of payloads.

In 2012, within a technology innovation program, funded by the Italian MISE-MIUR agencies, in collaboration with former Selex Galileo (now LEONARDO Airborne and Space Systems Division) acting in the integrator role, AEREA developed, and subsequently worldwide patented, SHREK (SHockless Release Kinematic), a Hold Down and Release Mechanism, actuated with Shape Memory technology, for solar array panels.

In 2014 AEREA initiated the development of the high pre-load hold down release mechanism ALARM (Advanced Latch And Release Mechanism), actuated with piezo-electric technology, aimed to latch and release satellites/payloads of mass up to 400 kg.

In 2015 AEREA, in collaboration with the Department of Aerospace Sciences of the Polytechnic of Milan, and LDO ASSD, developed the breadboard model of a Nozzle Tool, subsystem of a technology demonstrator for a In Orbit Refueling System between collaborative satellites. This activity was nested within the section STRONG (Sistemi Tecnologie e Ricerche per l'Operatività Nazionale Globale) of the larger project SAPERE (Space Advanced Project Excellence in Research and Enterprise) funded by Italian MIUR.

Since 2015 AEREA introduced the Additive Manufacturing technology for aerospace applications. Initially with EBM technology, applied to Ti6Al4V powders, and lately with technical polymers.

As responsible of the platform mechanisms, AEREA partnered in an RTI (temporary industrial teaming) led by OHB Italy, that, in 2016, was awarded a contract from ASI to carry out the phase A feasibility study for the PLATiNO (Mini Piattaforma spaziale ad Alta Tecnologia) satellite.

In 2017 AEREA did carry out a feasibility study for a HDRM for CubeSat in support of the Argotec proposal to the ESA ITT AO/1-8930/17/NL/PS.

In 2018 AEREA manufactured with Additive Technology, and tested, a set of torsional springs aimed to be integrated in deployment mechanisms.

In 2019 SHREK has been selected to be integrated on the PLATiNO platform as HDRM for the Solar Array and the SAR antenna.

## Products | Services | Applications | Technologies

HDRM (Hold Down Release Mechanisms) for small and mini satellites.

Mini HDRM for CubeSats.

DM (Deployment Mechanisms).

Additive Manufacturing (Techno Polymers and Titanium Alloys)

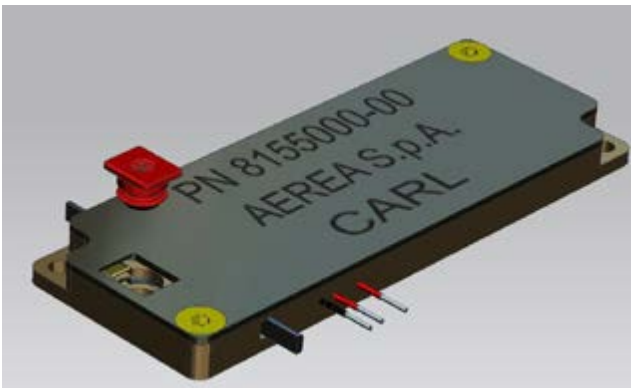


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# AEROSPAZIO TECNOLOGIE s.r.l.

## Company profile

AEROSPAZIO Tecnologie is a leading SME providing testing and engineering services for Aerospace. The company is particularly active in the fields of Thermal Vacuum and Electric Space Propulsion, where provides its services to most of the European space industry.

For its mission, the company operates a test laboratory equipped with several vacuum test facilities some of which are unique in their features.

The expertise of the company includes the development of electric propulsion technologies, diagnostics (plasma probes, thrust balance), vacuum systems and cryogenic equipment, data acquisition & control systems, networking & communications in harsh environments, software tools.

The company has worked in several ESA flight programmes, including the BepiColombo mission to Mercury, the Exomars mission to Mars and the Small-GEO programme.

Products | Services | Applications | Technologies

Electric Space Propulsion

technology development

development & qualification testing

Thermal - Vacuum

thermal cycling

thermal balance

EMI / EMC

In-vacuum EMC testing

electric propulsion testing

ESD - Electro Static Discharges

plasma source and electron gun available

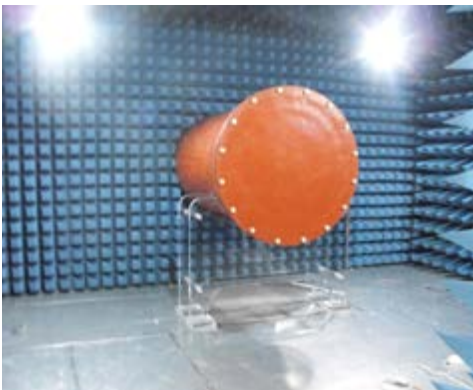
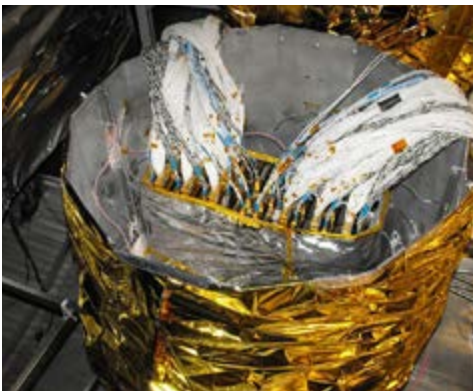
arcing on solar array coupons



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# Airgloss srl

## Company profile

Airgloss provides innovative solutions for real-time air quality monitoring and thermal comfort management for any kind of indoor space, from homes to offices, schools, hotels, healthcare and even transports.

Founded in 2014, the company has developed and patented an advanced technology based on Artificial Intelligence to identify numerous pollutants and improve indoor air quality and wellbeing. Through continuous monitoring and an instant notification system, environmental quality can always be maintained at high standard by creating a proper balance of temperature and humidity, adequate illumination and ambient noise reduction, all while smartly saving energy.

## Products | Services | Applications | Technologies

Three lines of product are available:

- Airgloss ProSense, designed for industrial applications, offices, meeting rooms and other public spaces such as schools and workspaces, where air quality influences occupants' wellbeing and health, with a direct impact on performance and productivity;
- Airgloss ComfortKit, gesture controlled and specifically intended for homes, with air quality monitoring and smart thermostat features, providing heating, ventilation and air conditioning management;
- Airgloss OEM, the core technology, as small as a 2 euro coin, designed to be integrated into third-party devices such as air purifiers, range hoods or portable systems for environmental monitoring.

Airgloss is currently located in the ESA Business Incubation Centre (BIC) Lazio in Rome (Italy) and has a distribution network in EU and US.



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# AGT Engineering s.r.l.

## Company profile

AgT is a scientific, engineering, marketing and sales integrated organization.

AgT enhances its customers products with innovative technologies identified by its sales team, reviewed by its R&D development team, engineered by its engineering team, and repositioned in their respective markets by its marketing team: this way injecting innovation and adding value into its customers products.

In addition, Agt develops horizontal capabilities of technology transfer and consultancies, develops its own prototype products, and operates services based on Artificial Intelligence proprietary patents applications.

AgT is active in the Aerospace, Transportation, Oil and Gas, and Energy production and distribution fields.

## Products | Services | Applications | Technologies

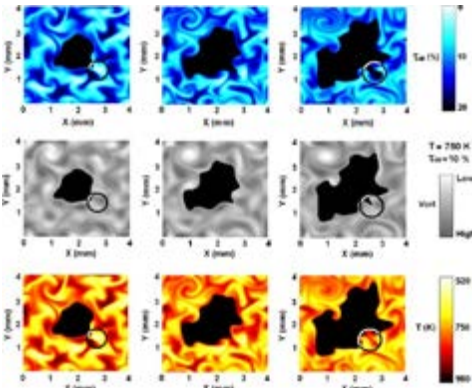
AGT is a company specialised in industrial and applied research, technology transfer, engineering and prototyping, as well as project management, marketing and sales of projects and systems in the areas of transportation (aerospace, terrestrial and marine), energy generation (conventional, advanced and renewable), and of the application of innovative materials and processes to the Industrial companies. The AGT capabilities are: - Ideation and Research: assistance to structure research activities and research financing, when possible through European and national funds, both for customers and on self generated ideas. - Technology Transfer: Scouting of specific technologies to design and manufacture innovative systems and components developed in existing market areas, this way reducing time and costs of the R&D. Conversely, valorisation of technologies, processes, systems or components originated by its own applied research projects to new market areas. - Engineering and Prototyping: Transformation of the results of the research and development into operational projects, systems and products for validation and testing of an innovation.- Production: Streaming of the prototypes developed and tested into pre-series and small batch production. Assistance in the implementation of the series production. - Project Management: Project Management for its customers for high technology content projects. - Marketing and Sales: Build up and management for its customers of methods for strategic marketing; turn-key sales networks structures; follow-up in the European and North American Countries; introduction and sale of high technology systems and components into the European and Italian markets. AGT is therefore operational in the entire value chain of the innovative technologies, from ideation and research to the full commercial deployment of innovative systems and components, generating added value to its Customers through its knowledge of the detailed methods to apply innovation, and the technology transfer of innovative materials, components and processes. A Special Project department has been recently added, to implement the potential of Artificial Intelligence systems to the Industrial applications in various areas, from the energy distribution systems to the aggregation of international clusters and companies. AGT has been partner of the ESA (European Space Agency) to transfer to the European Industries the activities available on the ISS (International Space Station), in the areas of Life Sciences and Advanced Materials; and to the ASI (Agenzia Spaziale Italiana) and NASA to perform two experiments with the Italian Astronaut Luca Parmitano during his mission on the ISS. AGT is also partner in an International Consortium for the development and manufacture of innovative rail structural systems; designs and manufactures special systems and parts for the F1, the transportation and the aerospace markets; runs activities of Project Management for important Multinational Groups; Acts as Technology Broker for the Association Lazio Connect inside the DTA-Filas district of the Aerospace Industries, and for Lazio Innova for the internationalization of the Aerospace cluster companies of the Lazio district.



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# ALFA MECCANICA SRL

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## Company profile

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ALFA MECCANICA is specialized in High Precision Machining (Milling up to 8m and Turning), EDM, FPI (Nadcap Accredited), Precision Cleaning and Cleanliness Inspection (Qualified by GE Aviation), Assembling, Testing and Design&Manufacturing of Jigs and Fixtures (Support Equipment and MGSE).

## Products | Services | Applications | Technologies

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The main products are: Engine and Propulsion subassemblies, Aerostructures, Structures for Space (Cargo Modules primary structures, Hatches, opening and closing mechanisms, honeycomb panels trimming and drilling, wave guides, tie rods and components) Jigs and Fixtures, Support Equipment and MGSE.

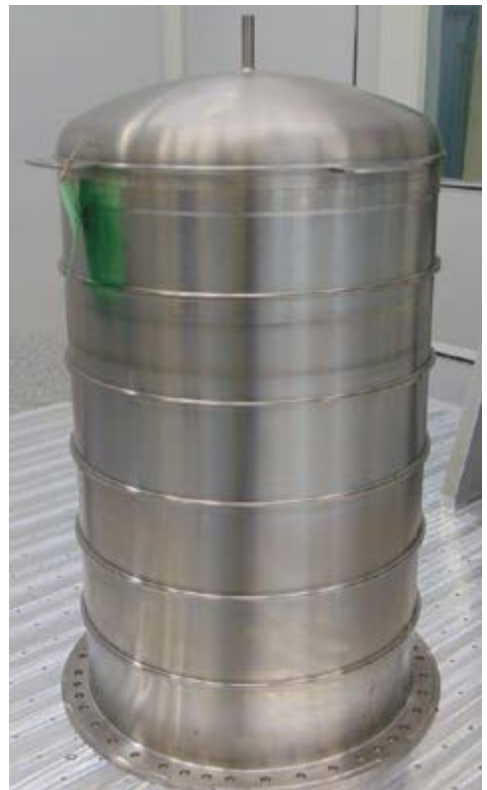
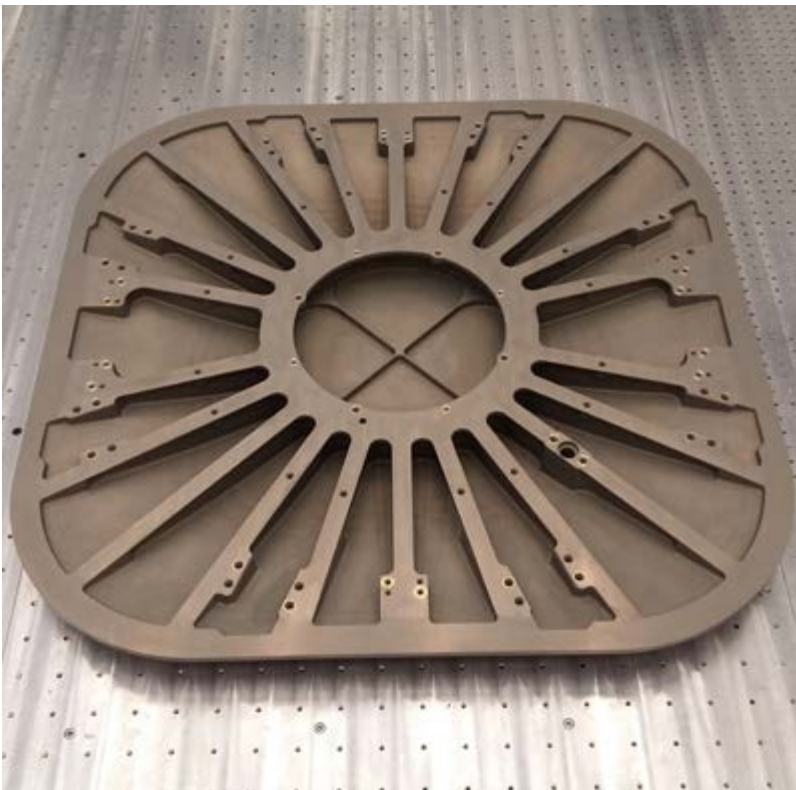


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# ALI - Aerospace Laboratory for Innovative Components - s.c.a r.l

## Company profile

ALI - Aerospace Laboratory for Innovative Components - is a consortium among aerospace and ICT companies, which works in the fields of design, engineering, prototyping and manufacturing of innovative components for aerospace, ground segment for controlling remote platforms, science and technology. The associated companies cover the entire range of competences in the areas of considered activity.

ALI (Aerospace Laboratory for Innovative Components) S.c.a r.l. is a consortium gathering 18 member companies, mainly active in the aerospace sector, operating in the sectors of design, engineering, prototyping and production of aerospace components (SRS Enginnerign Desing Srl, ATM srl, Astro Meccanica Srl, AermecSud Srl, Powerflex Srl), in the integration of systems (Intecs Solution Spa, Space Engineering Spa) in electronics and SW / HW applications, on-board systems and systems for remote control of aerospace platforms (EuroSoft, Techno System Development, Foxbit) in ITC services and advanced applications for aerospace (Lead Tech, ITSLab, Space Factory, Form & Atp, Canale otto, Fabrica Srl). ALI is active in co-operative programs with Italian and foreign organizations such as the European Space Agency (ESA), the Italian Ministry of Research, the Italian National Research Council (CNR), the Italian Space Agency (ASI), the Campania Region.

## Products | Services | Applications | Technologies

ALI was involved in following projects:

IRENE - "Italian Re-Entry Nacelle": research contract founded by the Italian Space Agency to develop a low-cost re-entry capsule, able to return payloads from the ISS to Earth and/or to perform short-duration, scientific missions in Low Earth Orbit (LEO);

MISSION - "Maritime Integrated Satellite System in an Inter Operable service Network", research contract founded by the Italian Space Agency;

SAR4BAT - "SAR data fusion for bathymetric data retrieval in coastal areas and in submarine archaeological sites" research contract founded by the Italian Space Agency;

SIMDEO (ASI) - Landfill monitoring system with EO data;

OCEANSAT (ASI) - Satellite system for the control of marine currents;

TALED (ESA) - "TelecommunicAtion, Localization and real time Environment Detection" Satellite fire monitoring system.

FIT (Technological Innovation Fund) - Experimental development programme: "Technological Developments for the realization of a deployable structure prototype for a space re-entry capsule".

ALI is currently involved in following project:

MINI IRENE - "Maxus International Nacelle to Investigate IRENE capabilities": research contract founded by the European Space Agency to develop a ProtoFlight for a rocket-probe launch;

SMS - "Small Mars Satellite" - research contract founded by the European Space Agency to develop the concept of a small technology mission to Mars, based on the adoption of an IRENE-like technology to deliver one or more payloads to Mars;

SISDA - SIStema di Discesa controllata ed Atterraggio di precision: MiSE-funded project for controlled descent system and precision landing.

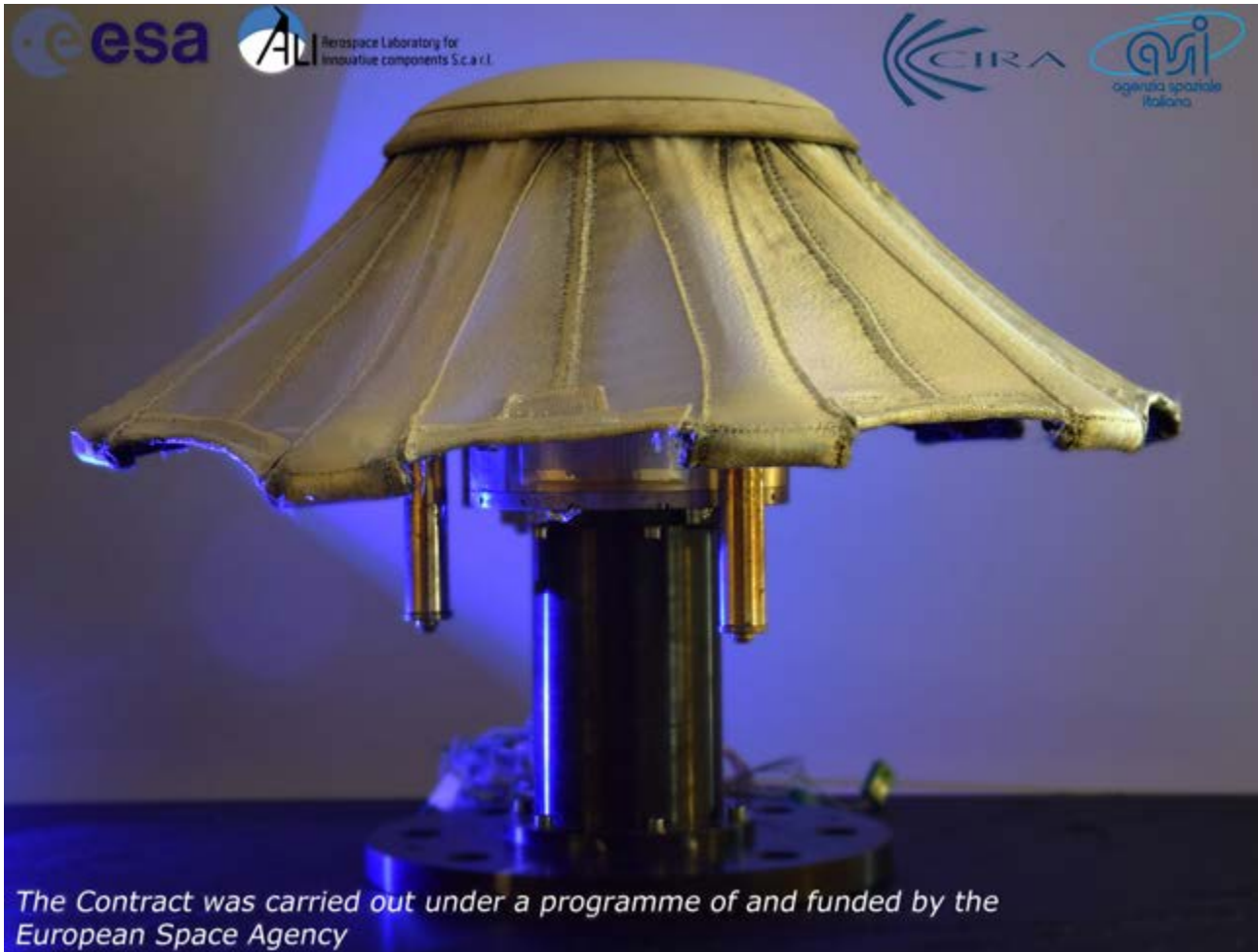


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# ALMA SISTEMI SRL

## Company profile

ALMA Sistemi Srl is an Italian SME established in 2005 providing high-level engineering and consultancy in the space and defence markets. ALMA provides services in Business Development, Project and Proposal Management, Mechanical and Electrical Ground Support Equipment, Software Engineering, image processing for Earth Observation applications with specific focus on Cultural Heritage.

ALMA Sistemi help research organisations and industries to identify potential opportunities, make project proposal, development plan and implement new products and services. ALMA has contributed in behalf of its international clients to a number of key space projects funded by the EU, ESA, NASA and ASI.

In fact ALMA Sistemi has successfully completed 10 research and development projects under FP7, H2020, ESA and national/regional programs. ALMA is currently involved in four H2020 projects of which three as coordinator.

ALMA turn-over in 2018 was 1,5 M€ with a current workforce of 15 employees and consultants. ALMA is certified ISO 9001:2015 for engineering.

## Products | Services | Applications | Technologies

ALMA Sistemi Srl provides turn-in key product and engineering in the frame of Mechanical and Electrical Ground Support Equipment (trolley, stands, transport containers, lifting devices, adapters, Instrument EGSE, Software EGSE, RF and Power Special Check-Out Equipment etc.) for payload and satellites.

Services include Project and Proposal/Bid Management, Business development and market analysis, in the frame of European Space Agency, European Union and Italian Space Agency programs.

ALMA Sistemi is engaged in several international Research & Technology Development projects in the frame of EU (H2020) covering instrument development for planetary exploration for dating rocks and sediments, plasma metamaterials lens and plasma antennas, EO applications for monitoring and assessment of Cultural Heritage structural stability of Historical Centres and archaeological sites risk monitoring.

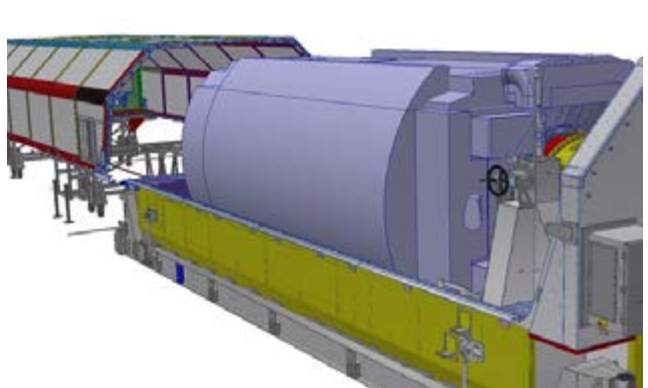
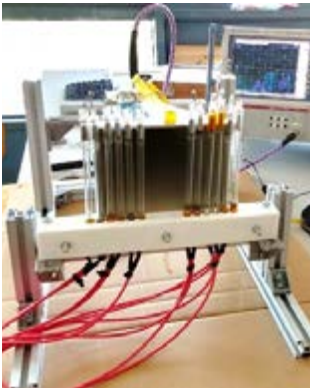
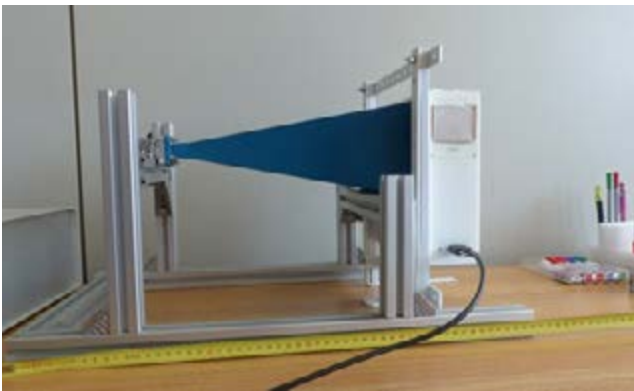
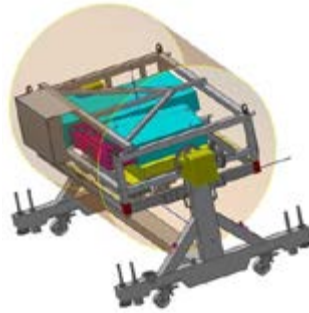
ALMA is certified ISO 9001:2015 for engineering.



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# ALPHA Consultants srl

## Company profile

ALPHA Consult is a European management and technology consultancy supporting businesses, regulators and European institutions. We are recognised as one of the leading independent experts in Satellite Navigation (GNSS), Earth Observation (EO), Intelligent Transport System (ITS) and Unmanned Aerial Vehicles (UAVs), and are increasingly active across other supporting and related markets (chiefly Aerospace, Transportation, Agribusiness, Emergency response and management, and Climate Change).

ALPHA Consult was established as a private limited company in 2009 by an experienced strategy consultant and today is an independent and wholly owned company by its working director and staff. ALPHA Consult's headquarters is Milan (Italy), with offices in London (UK) and Brussels (BE).

We have a staff of consultants with strong business and technical backgrounds and experience in various aspects of GNSS, EO, ITS, and UAVs. Our success is due to:

- The international standing and reputation of our consultants, combining business, technical and linguistic skills
- An outstanding track record of delivering high quality advice and support that encourages repeat business and onward referrals
- The development of long-term working partnerships with our customers
- A successful policy of retention of our consultants.

Our broad staff profile means that we can draw on the internationally-recognized expertise of senior business managers, economists, and technology specialists to create bespoke multi-disciplinary teams tailored to meet customers' needs.

## Products | Services | Applications | Technologies

### Project Management

Stakeholders' Management  
Administrative/ Contractual Management  
Quality Management  
Risk Assessment and Management  
Innovation e knowledge Management

### Technical Support

On-site support  
User requirements analysis  
Independent Technical/ Business Reviewer  
Ad-hoc technical consultancy services  
Support to various R&D projects

### Business strategy

Restructuring  
Strategy Definition  
Market Assessment  
Competitive Analysis  
Selection criteria  
Pricing and Positioning Strategy  
Business Models

### Corporate Finance

Business Plans  
Costs-Benefits Analysis  
Impact assessment  
Business Due Diligence  
Company Evolution  
Financing strategy



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**Go-to-market strategy**

Business Opportunities  
 Roadmap Definition  
 Detailed Market Survey  
 Support to the Implementation Activity  
 Exploitation activities

**Dissemination**

Events, Workshop, Focus Group Organization and Management  
 Web 2.0 Social Tools/ Community Management  
 Web-based Marketing Strategies  
 Web Design and Implementation  
 Publications  
 Materials preparation (e.g. leaflet, videos...)



Business Strategy	Corporate Finance	Go-to-Market Strategy
<ul style="list-style-type: none"> <li>▪ Restructuring</li> <li>▪ Strategy Definition</li> <li>▪ Market Assessment</li> <li>▪ Competitive Environment Analysis</li> <li>▪ Users' Needs Evaluation</li> <li>▪ Pricing and Positioning Strategy</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business Plans</li> <li>▪ Cost-Benefit Analysis</li> <li>▪ Business Due Diligence</li> <li>▪ Company Evaluation</li> <li>▪ Financing Strategy</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business Opportunities</li> <li>▪ Road Map Definition</li> <li>▪ Detailed Market Survey</li> <li>▪ Support to the Implementation Activity</li> </ul>
Project Management	Dissemination	Technical Support
<ul style="list-style-type: none"> <li>▪ Stakeholders' Management</li> <li>▪ Administrative/ Contractual Management</li> <li>▪ Quality Management</li> <li>▪ Risk Assessment and Risk Management</li> </ul>	<ul style="list-style-type: none"> <li>▪ Events and Workshops Definition and Management</li> <li>▪ Web 2.0 Social Tools/ Community Management</li> <li>▪ Web-based Marketing Strategies</li> <li>▪ Website Design and Implementation</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-site Support</li> <li>▪ User Requirements</li> <li>▪ Independent Technical/ Business Reviewers</li> <li>▪ Support to various R&amp;D Projects</li> </ul>

# APR srl

## Company profile

APR is a SME founded in 1998, operating in the production of mechanical parts and equipment for aerospace industries, notably for propulsion applications. Historically APR core-business lays in the production of rotating parts, recently extending to production of aerostructures and production of complex assemblies and kits for integrations.

### Products | Services | Applications | Technologies

Turn-key solutions provided by APR to His Customers including activity of co-engineering / co-design with the Customer, Industrialization of products, Production (based on advanced manufacturing technologies) both for series or small batches or prototypes, Supply Chain management, assembly and Testing.

In space sector, APR is operating on design and manufacturing of fluidodynamic equipment, in particular pumps and valves for TCS, ECLS and propulsion applications.. Leveraging on a strong manufacturing footprint of highly critical rotating parts, APR brings to the space industry its expertise and skills on customized solutions and services for fluidodynamic systems and propulsion applications.



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# Arescosmo S.p.A.

## Company profile

Arescosmo's mission is to supply products and services dedicated to support life and survival of Defense and Security Forces, as well as developing systems for space missions and applications, based on the best and consolidated mechanical technology, software, textiles and innovative materials in a National and International perspective. Arescosmo has gained a significant experience in managing technological programs at system level for space applications; this regards all the lifecycle of the product, starting from the feasibility study up the qualification.

This capability is exploited by means of the consolidated experience of the engineering group and through the capabilities in managing external technological partners.

Engineering has a wide experience in design, testing, test set up configuration and calibration and test correlation with analysis data. Moreover, it is quite usual in Arescosmo to utilize test data acquired on materials and on in house manufactured components as input to perform analyses, covering what is generally required to characterize a space product (in this case mechanical analyses and thermal analyses).

Cooperation with Universities and with Materials Experimental Centres in Italy and in Europe are completing the Arescosmo heritage.

Furthermore, Arescosmo is also involved in European working groups in advanced technologies and processes for space, being active in ablative shielding technologies, composites, inflatable structures.

## Products | Services | Applications | Technologies

Arescosmo experience in space field resides in designing, manufacturing and management of several space programs, involving several systems and subsystems such as:

- Planetary landing
- Planetary descending
- Atmospheric Re-entry
- Inflatable module
- Recovery subsystems
- Space agriculture
- Life Support Systems
- Capture Mechanisms
- Planetary protection

Main programs in which Arescosmo has been involved are: Planetary landing

❑ MLT-Mercury Landing Technologies

Development and manufacturing of a shock attenuation system for the Bepi Colombo mission lander.

❑ ADLT-Alternative Descent and Landing Technologies

Development of a preliminary prototype of the new vented airbag for future ESA robotic missions in the framework of space exploration, with specific reference to EXOMARS Mission.

❑ EXOMARS-Airbag sub-system

Design, development and verification of the airbag sub-system.

❑ Airbag for Small Landers

❑ Design, breadboard and test a complete airbag system which would be used for small landers (130 to 170 kg mass) to be delivered to the surface of Mars.

Planetary descent

❑ EXOMARS 2016-Parachute sub-system

Development of the parachute system for the EXOMARS mission. FM was delivered in July 2014, and was successfully used for the mission on 19/10/2016.

❑ EXOMARS 2018-Parachute sub-system

development, manufacturing and test of the parachute subsystem for the Exomars 2018 mission

Space Rider Descent system



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Responsible for the Descent System.

Atmospheric Re-entry

❑ ARD-Atmospheric Re-entry Demonstrator

Responsible for localization, parachutes and floating systems. ARD capsule in-space flight with Ariane-503 has been performed successfully on 1998.

❑ IRT - Inflatable Re-Entry Technology

Consisting in the development for ESA of an inflatable re-entry system for capsule-type vehicle or payloads.

❑ SPEM-SPacecrew Emergency system

SPEM is a concept designed for use as an escape mechanism by orbiting astronauts, financed 50% by Italian MoD.

❑ Marco Polo

Responsible of the preliminary design of the sample return capsule.

Inflatable module

❑ IMS- Inflatable Materials for Space

❑ FLECS- FLExible EXpandable Commercial Structure  
Responsible for design and manufacturing of bladder and restraint sub-structures.

❑ IMOD- Inflatable MODule

Manufacturing of flexible-rigid parts joints and the potential insertion of windows in habitation modules design.

❑ ICM- Inflatable Capture Mechanism

Study for "Mars Sample Return" mission.

❑ STEPS 2

Developed a flexible module with 2.5 meters diameter and 5 meters high.

Recovery Subsystems

❑ IXV-Recovery Subsystem

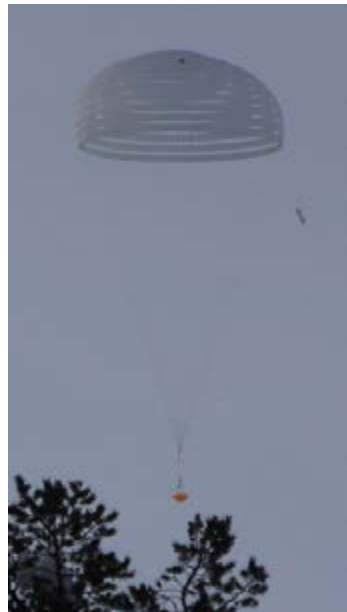
Responsible for Design, Manufacturing, and Testing of the floating Subsystem.

Other Projects

❑ Air Bladders Bonding & Sealing Technologies in Manned Inflatables Structures

❑ Elastic tether design and dynamic testing

❑ IDRA Inflatable Deployable Rigidisable Antenna





# Aresys s.r.l. - Advanced REmote-sensing SYStems

## Company profile

ARESYS, Advanced Remote Sensing Systems, is an Italian SME, spin-off of Politecnico di Milano, founded in 2003, that inherits the internationally renowned expertise of Politecnico di Milano in the field of remote sensing.

ARESYS is a strongly R&D oriented company, that exploits cutting edge technologies to deliver highly customized solutions and services to its customers.

ARESYS expertise covers the following areas:

- Airborne and Spaceborne Synthetic Aperture Radars (SAR) ;
- Ground based SAR, RADARS and GPR;
- Pipeline acoustic monitoring systems;
- Seismic and geophysical prospection systems

Nowadays ARESYS can count on a group of around 45 high skilled professionals and serves customers in Europe, Asia and South America.

## Products | Services | Applications | Technologies

Synthetic Aperture Radars: with our 10+ years experience in SAR systems we can offer product and services encompassing operational software solutions for simulation, processing, focusing, interferometry and best-in-class engineering services for new SAR system design.

SARFOC: is a multi-sensor, versatile kernel for SAR focusing and L1 processing. It handles mono as well as bistatic SAR, ScanSAR, TopSAR, Spotlight and other modes. It is designed with emphasis on geometric accuracy, calibration and phase preserving features. SARFOC comes in two different versions: DESKTOP, a light version that can be used on a desktop PC (for academic and scientific purposes) and HPC, a highly efficient and optimized version suitable for multi-core and high-throughput processing solutions for Ground Segments and Operational Data Centers.

SARINT: provides advanced tools and components for SAR interferometry and interferometric stacking. It supports Stripmap, ScanSAR, TopSAR and Spotlight acquisition modes. SARINT is robust and mature and it is the core of operational interferometric stack processor of the Santinel-1 PDGS. SARINT can be used in combination with SARPS to perform multi-temporal interferometric processing and Persistent Scatterer analysis.

SARFOC, SARINT and SARPS can be managed through simple and easy to use web-application, FreeSAR, that allows to exploit powerful SAR data processing features without any local software installation.

SAR system end-to-end simulations: ARESYS offers a complete SAR simulation framework, for SAR satellites and UAV/airborne systems called GSS-RT. Our solution includes a flexible SOFTWARE raw data simulator (GSS) and a Real-Time optional component (AWG-4k, developed by ARESYS Electronics) that is able to provide simulated data over a real-time IF link or over an high-rate Digital link.

Innovative SAR system design, SAR Engineering support services: ARESYS supports SAR systems manufacturers and designer world-wide offering highly specialised consultancy services. Thanks to the long experience in SAR mission design, through the participation to many national and international SAR projects, ARESYS can offer a unique support service starting from SAR system concept, to SAR operations support, SAR calibration and SAR data processing.

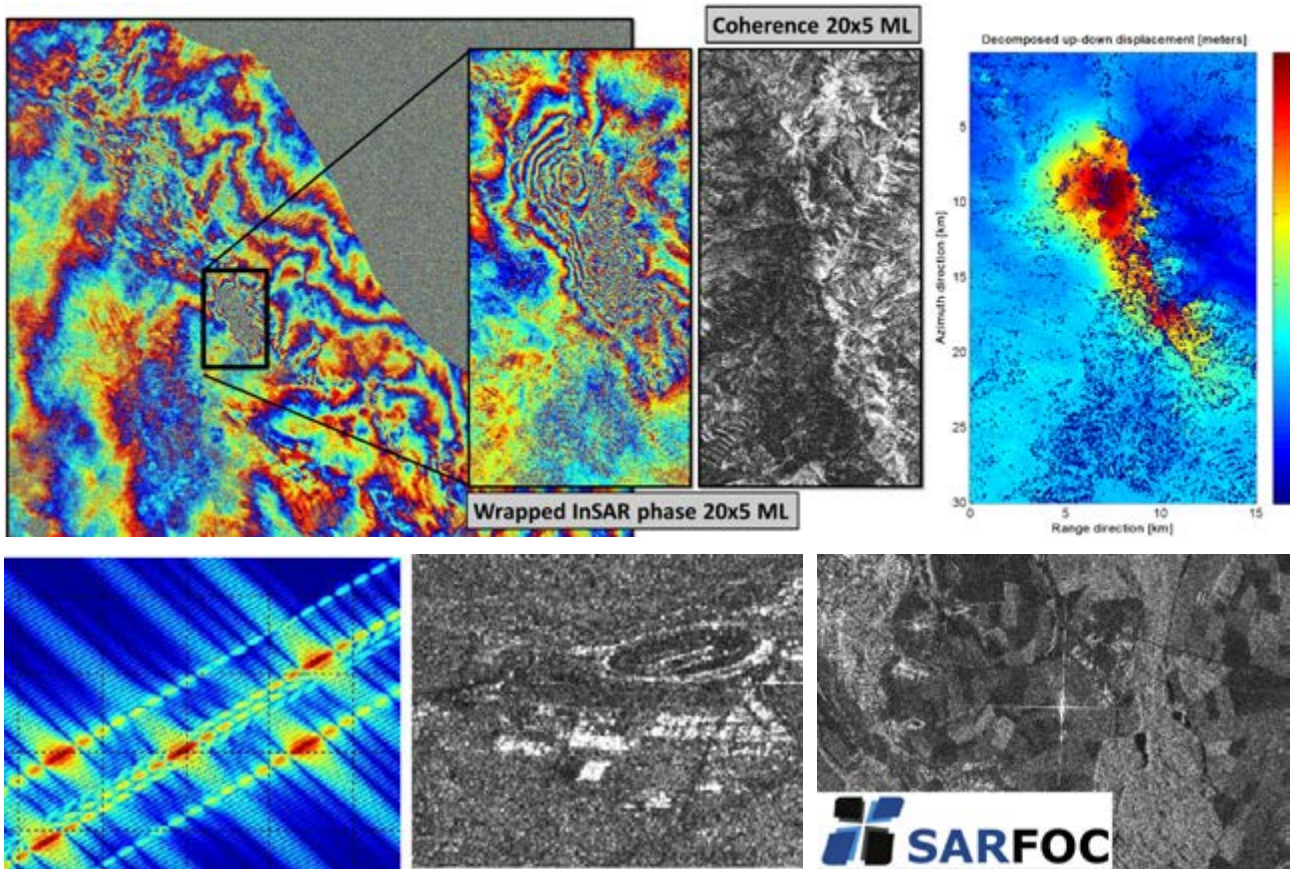
Besides Space activities ARESYS is also active in the following fields: Ground interferometric Radars monitoring solutions, Leak detection systems and pipeline monitoring and Seismic and Geophysics.



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# Argotec Srl

## Company profile

Argotec is an aerospace engineering company founded in 2008 in which research, innovation, and development involve various fields: engineering, information technology, systems integration, "Human Space Flight and Operation", implementation of solutions in the field of renewable energy, as well as design and production of satellite platforms. All these activities have the same objective: realization of systems for space with potential Earth applications. In fact, according to the company's vision, everything that is useful for space activities can have an Earth application, bringing benefits in daily life and responding to needs not yet met.

All Argotec's activities are focused in two main directions. The first one regards the development of microsatellites able to work in deep space; in this area, intense research and development activities are oriented to design compact and reliable technological solutions including using Artificial Intelligence for autonomous operations. The second direction includes the development of technological solutions in order to improve and to support the life and the comfort of future space explorers.

Argotec is a UNI EN 9100:2018 and UNI ISO EN 9001:2015 certified company, and compliant with the ECSS and NASA standards framework. Moreover, the company has the experience, the tools and the laboratories needed to perform all of the activities required for design, integration and testing of space systems in house (e.g. a Clean Room that guarantees cleanliness standard at an ISO 5 level, a Thermal Vacuum chamber, etc).

Since the beginning, the company has always collaborated with the main international space agencies such as the Italian Space Agency (ASI), the European Space Agency (ESA) and NASA. It had promoted the development of innovative technologies which involved universities, research centres and other companies with skills and different backgrounds. This has been substantially translated into partnerships with companies coming from fields other than aerospace. It allowed the realization of innovative systems in order to obtain several patents and international awards.

In recent years Argotec has demonstrated its excellence at a national and international level thanks to its dynamic and flexible working methods supported by a young team of professionals with an average age of 29 years. These aspects have allowed a reduction in the time for the development of company activities and the opportunity to find alternative solutions as compared to current standard processes. This has helped to increase competitiveness and to facilitate achieving the objectives in advance of projected timetable due dates.

## Products | Services | Applications | Technologies

Argotec's activities follow the "all in-house" concept that includes design & development, integration, qualification and operations services. The company is equipped with an Electronics Lab, a Thermal and Mechanical Laboratory, a Mission Control Centre, a Thermal Vacuum Chamber and a Clean Room that guarantees cleanliness standards according to an ISO 5 level. Argotec makes available the company's facilities to other companies as well as universities and research institutions that are interested in integration activities requiring high levels of quality and environmental monitoring.

Argotec has the internal expertise to develop microsatellite platforms from the concept to the design, assembly, integration, testing and in-orbit operations. These platforms are designed to operate in Deep Space for Exploration Missions and as part of Telecom constellations: they are equipped with highly-reliable and rad-hard electronic components while they guarantee large room for payload allocation (2U for the 6U version and >4U for the 12U version) and an integrated propulsion system. Argotec is also working on advanced algorithms based on Artificial Intelligence to increase the capabilities of the platform during on-orbit autonomous navigation. This feature helps the satellites to handle off-nominal events by executing a series of complex tasks without the involvement of the Ground Segment.



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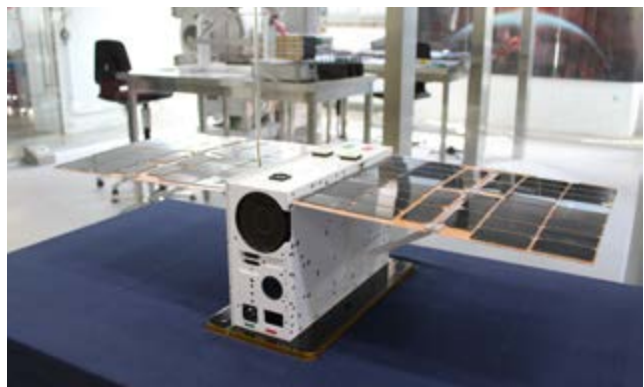
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Argotec's Avionics Unit designs and tests space-capable electronic systems. It operates at every level of the development process; its heritage spreads from LEO applications flown on the ISS to systems designed for deep-space. Usually both hardware and software are designed internally by our team aiming for the optimal implementation. As for the hardware side, the core products include Electrical Power Subsystems and On-Board Computers. From the software perspective, the Unit works on FPGA "Robust" IP Cores, whole On-Board Software solution and AI-based control algorithms.

Argotec develops and supports the development of payloads for human space flight and space exploration. The company deals with the following HW and SW payloads' activities: design, development, assembly, integration, testing, on-orbit operations, logistic and safety support. Argotec has recently awarded a 3-year service contract (UTISS) to support the Italian Space Agency to fly payloads on-board the ISS. In the frame of this contract Argotec is in charge of supporting the management of the Italian ISS resources, interfacing the experiments Principal Investigators and Payload Developers and overseeing the safety evaluation of all Italian payloads. Furthermore, Argotec coordinates the technical team supporting the payload development and supports the payload manifesting process and qualification process leading towards a safe and efficient delivery, utilization and recovery of the payload.



# Aviospace srl

## Company profile

AVIOSPACE is a space company located in Torino. The company was formed in 2004 and its network of partnership includes various SMEs in the field of Engineering and Manufacturing, several Universities, and Professionals.

Between January 2010 and March 2016 Aviospace has been an Airbus Defence and Space company, remaining however an Italian registered company with management and personnel entirely Italian.

Company core competences:

- System Engineering, Space Transportation, Future Launchers, and Space Exploration systems
- Thermal Control, Mechanical structures, Composite materials, and nano-structured material
- Avionics and On-board Software
- Propulsion, Multi-layer thermal insulation equipment (MLI), and Multi-physical simulation
- Human Life in Space and ISS operations

AVIOSPACE can benefit of a network of collaborations with small and medium companies with robust experience in high-quality manufacturing and niche technologies.

The scenario of collaborations is permanently in evolution: agreements across Italy and Europe are already established or are in final preparation in the sector of the automatic space systems for transportation and exploration with the Italian Institute of Technology (IIT), as well as with universities and other academic organizations (e.g. INSTM, Politecnico of Torino, La Sapienza) and manufacturers.

## Products | Services | Applications | Technologies

Project: Multi Purpose Crew Vehicle - European Service Module for NASA's Orion programme (MPCV-ESM)

The activities are developed in the frame of collaboration between Aviospace and Airbus Defence and Space Bremen, it consists in a support for: Design and Manufacturing of mechanical parts of the propulsion systems and for Design and Analysis support for Primary and secondary structure interface for the Propulsion System

Project: Capture and De-orbiting Technologies (CADET)

The project developed and demonstrates, by the development of ground functional breadboards, key technologies for ADR, including the capture systems and a vision based navigation system, including target in-situ recognition and properties assessment

Project: e.Deorbit phase A

The e.Deorbit mission objective is to "Remove a single large ESA-owned Space Debris from the LEO protected zone". The role of Aviospace in the project is the design of a tethered-net capture mechanism.

Project: Activ-jet

The project allowed Aviospace to develop a full process of materials functionalization by means of ink-jet printing, including: 1) Case-by-case nanoparticle-based ink design and formulation (e.g. both conductive and dielectric inks). 2) Printed pattern optimization and printing process set-up. 3) Wide range of possible substrates (e.g. ceramic, metallic, composites). 4) Post-printing thermal treatments. This technology involves the use of a stable and repeatable process, which makes use of less galvanic treatment and waste production. Moreover, mass savings and lower manufacturing costs, as well as



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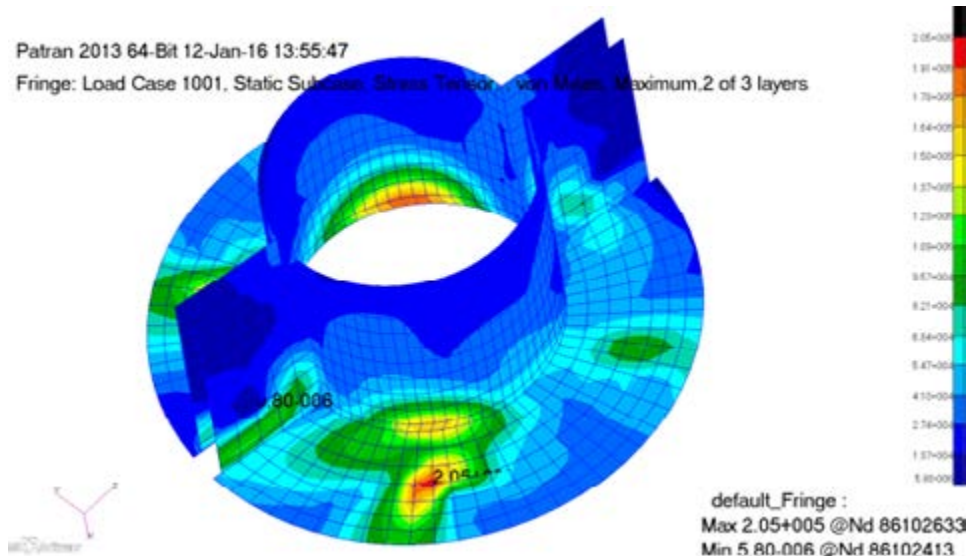
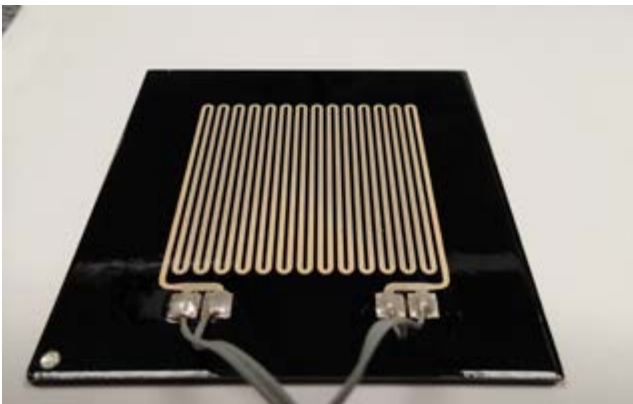
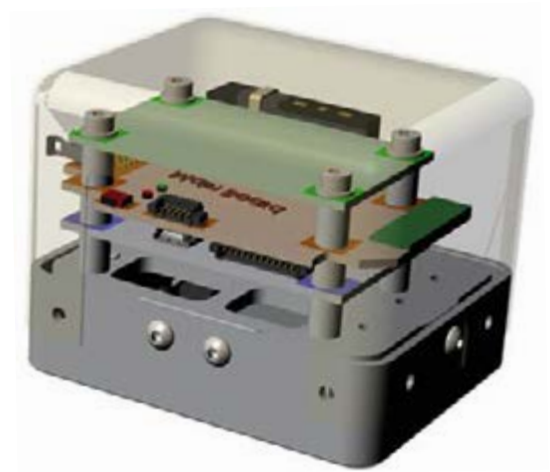
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the possibility to deal with 3D shapes, make it a competitive alternative to traditional manufacturing techniques.

#### Project: Wireless Sensor Network

This project focuses on sensing nodes development, powered by a vibration energy harvesting technologies, developed in the frame of the project. The nodes are conceived to be used on-ground, during storage, pre-launch phase, and during ascent/in orbit phases, e.g. Launcher staging, to allow communication between stages after separation. The communication system is composed by a multi-radio communication platform capable of using, in cognitive and opportunistic mode, heterogeneous wireless communication technologies for monitoring and control of complex systems for industrial and aerospace markets. The communication platform consists of multi-radio nodes able to cooperate for building up an intelligence network, that promotes the opportunistic use of wireless technologies with complementary characteristics in terms of data rate, latency, robustness to radio channel conditions, power consumption, and ability to self-organization in networks.





# BERCELLA

## Company profile

Family owned SME specialized in design and manufacturing of solutions with composites for aerospace and motorsport industry. Turn over of about 9 million euro with over 80 employees and organized with three different production facilities. After more than 20 years of experience with challenging composite parts for different applications, now Bercella can count on a flexible and reactive team of people, with specific expertise and with a solid heritage in different fields.

The regular manufacturing activity is combined with the constant innovation effort and the R&D activity mostly based on composite material and their applications. The Space industry represent a clear trend of development for Bercella, with important accounts such as Airbus DS, Leonardo, OHB, together with many space agencies and other institutions. Among the space projects that belong to the Bercella's heritage we can mention Rosetta and ExoMars2020 Drill box, substrate sandwich panel for Prisma solar array (OHB Italy), SSMS Dispenser for SAB Aerospace (VEGA Launcher), Semi-rigid solar array and yoke for EurostarNeo Airbus DS, support Bipods for Majis-Leonardo and more..

Beside the specialization for the space projects, Bercella is also active in other industrial fields, that require advanced design and manufacturing of composite parts, such as: defense, motor racing and transportation. Sometimes for new space projects it's important to count also on alternative sources of inspiration, to elaborate innovative solutions and cost-effective approaches. Bercella makes it possible thanks to its interdisciplinary experience.

## Products | Services | Applications | Technologies

The manufacturing capabilities of Bercella are mainly based on hand lay-up of prepreg for autoclave curing, filament winding and machining. These processes are supported by a set of 5 autoclaves, 2 Filament Windings machines, 6 CNC machines and 2 robotic arms. The lay-up and the filament winding processing are organized in two different Clean Rooms ISO 8 (ISO 7 at rest). Thanks to the considerable dimensions of some of the autoclaves (4 meters of diameter and 6 meters of lengths) it's possible to process large monolithic composite parts. For many space projects, such as reflectors, large sandwich panels and payload adapters, these industrial capabilities have been very important to save weight and to reach a better performance of the even surfaces.

Bercella can count on a "state of the art" equipped internal laboratory, where it's possible to run all the mechanical and physical test campai-



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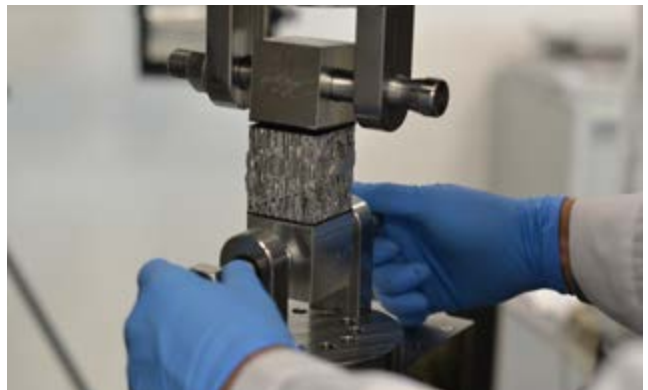
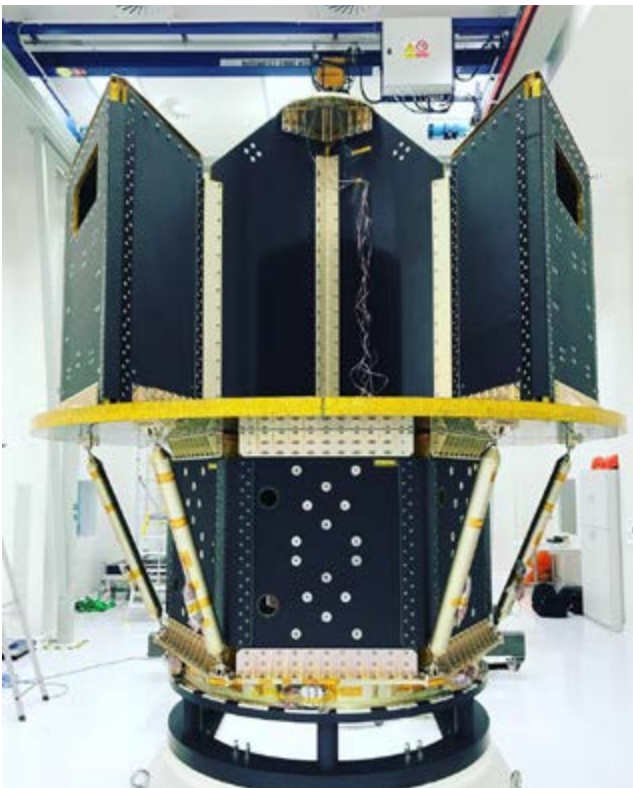
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gns, complementary to most of the design and manufacturing phases of the projects. Incoming, Development and Acceptance Test campaigns can be organized more cost-effectively, within the Bercella's premises.

Design and Co-engineering of composite solutions represent an added value to the proven manufacturing capabilities of Bercella. Especially for the space industry, we noticed how several Prime contracts tend to require more involvement of the manufacturing companies, in different phases of Design, Development and Qualification of important projects. Our Technical Office, together with the Laboratory and the Workshop, are the ingredients of a versatile system, capable to deliver a complete package of product and service to the Space Industry.



# Blu Electronic srl

## Company profile

The company was founded in 1998 and boasts several years experience in the design and development of electronic boards, equipment and sub-system for its Customers. The principal activities are within the space & avionics arena's. The company maintains established collaborations with European Universities for research projects and technological innovation. Blu Electronic is an UNI EN9100 certified company. The Headquarters are located in Desio Italy (Polo Tecnologico Brianza - PTB).

Company Facilities:

ISO8 (Class 100,000) Clean Room

ESA qualified assembly and inspection process line, according to the ESA ECSS-Q-ST-38C standard for space electronics

Electronic Design Automation Tools

Thermal chambers.

Test equipment and facilities for the evaluation, debug, functional test

EMC/EMI laboratory

Mechanical test

Temperature/Altitude test

Temperature/Humidity test

## Products | Services | Applications | Technologies

International Space Station (ISS Columbus FSL)

BLU has designed and developed the following experiment controllers for the Columbus FSL:

GeoFlow (Geophysical flow simulations): first run 2008

FASES (Fundamental and Applied Studies in Emulsion Stability): first run 2013

CIMEX-1 (Convection and Interfacial Mass Exchange): on-hold after EM completion

SMD (Soft Matter Dynamics, was FOAM): first run 2018

RUBI (Reference mUltiscale Boiling Investigation): FM final integration testing on-ground

Scientific Satellites - Large Platform

Power electronics / DC-DC converters

ESA Herschel Payloads.

ESA Sentinel-1 A, B, C & D

Orbital Transportation

Avionics

Pressure and Smoke Detector for the Cygnus Cargo

Expert BAU

Scientific Satellites - Small Platform

Data Processing / Power Conversion and Distribution / Satellite Power System

Design, development, production, testing and qualification of the Power Electronic Box (PEB) for the Italian mission AGILE. Control algorithms include MPPT (Maximum Power Point Tracker)

Other

Power Systems for Small Satellites, Housekeeping boards, Signal Acquisition boards, CPU boards based on: DSP, uC, ARM (Cortex R4 and A9), LEON-III Sparc V8, FPGA boards for custom applications, Stepper and DC motor drivers, Equipment designed according to Customer specifications



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Applications:

EARTH OBSERVATION SYSTEMS

SATELLITE NAVIGATION SYSTEMS

SPACE TRANSPORTATION, LAUNCH AND RE-ENTRY SYSTEMS

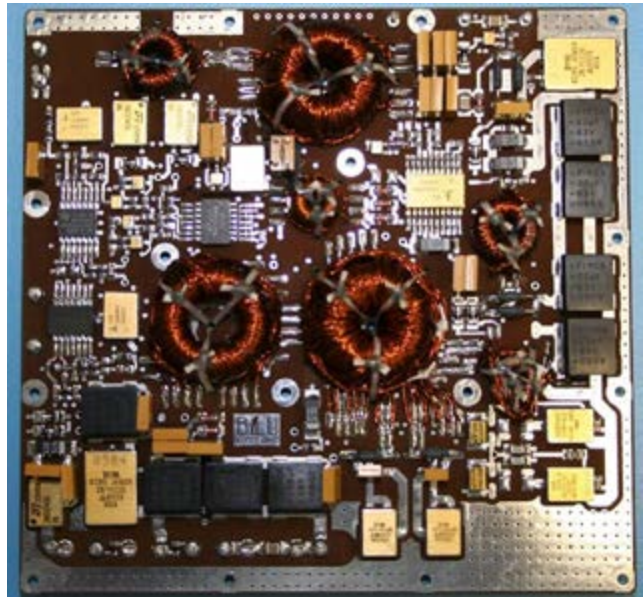
HUMAN EXPLORATION, SPACE STATION, CAPSULE MANNED OBSERVING THE UNIVERSE, SCIENCE AND ROBOTIC EXPLORATION

Technologies:

ELECTRONICS, PHOTONICS, OPTICS, INTEGRATED SENSORS AND CRYOGENIC COMPONENTS

ENABLING TECHNOLOGIES INFORMATICS, DATA AND SIGNAL PROCESSING

TECHNOLOGIES FOR SPACE TRANSPORT



# Bright Aerospace Srl

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## Company profile

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Bright Aerospace is a company of the Bright Solutions Group focused on the development and manufacturing of Solid State Lasers dedicated to Aerospace applications. Our know-how spans from Lasers and Optics to Optical Systems Engineering, Optical Equipment and Instruments Technology.

### Products | Services | Applications | Technologies

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Leveraging on our expertise in manufacturing highly compact/rugged laser units designed for flight, and on our heritage in the development of lasers for satellite instruments, Bright Aerospace can offer design, customization and manufacturing services aimed to the development of laser instruments for space missions.

Bright Aerospace offers Partnership in common R&D Projects, Design, Engineering, Manufacturing, Integration, Industrialisation.



## Contact

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# Bright Solutions Srl

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## Company profile

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Bright Solutions Group is focused on the development and manufacturing of Solid State Lasers dedicated to several applications including industrial, medical and Aerospace applications. Our know-how spans from Lasers and Optics to Optical Systems Engineering, Electronic Design and testing, Mechanical design, Optical Equipment and Instruments Technology.

## Products | Services | Applications | Technologies

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Bright Solutions develops and manufactures highly integrated solid state lasers for applications in the industrial market as well as scientific, medical and aerospace. Our capabilities span from manufacturing of standard DPSS lasers and diode lasers manufactured in volumes to customised developments of single units for unique and specific application fields.



## Contact

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The green beam of a WEDGE-HF laser (Bright Solutions)  
used in the FB lidar model by ALA srl



# CBL ELECTRONICS S.R.L.

## Company profile

CBL Electronics is an electronic design engineering company focused on avionics, space, defence and naval markets. We can manage the complete workflow from specification acquisition to product manufacturing and testing, with built-to-print, built-to-specification and R&D capabilities.

### **Products | Services | Applications | Technologies**

Our core business is: test benches, test fixtures, custom Electronic boards, telemetry Systems, custom systems integration, system integration for avionics, space and defence application, management and data acquisition softwares for STTEs (dreamTest and Cloudless).

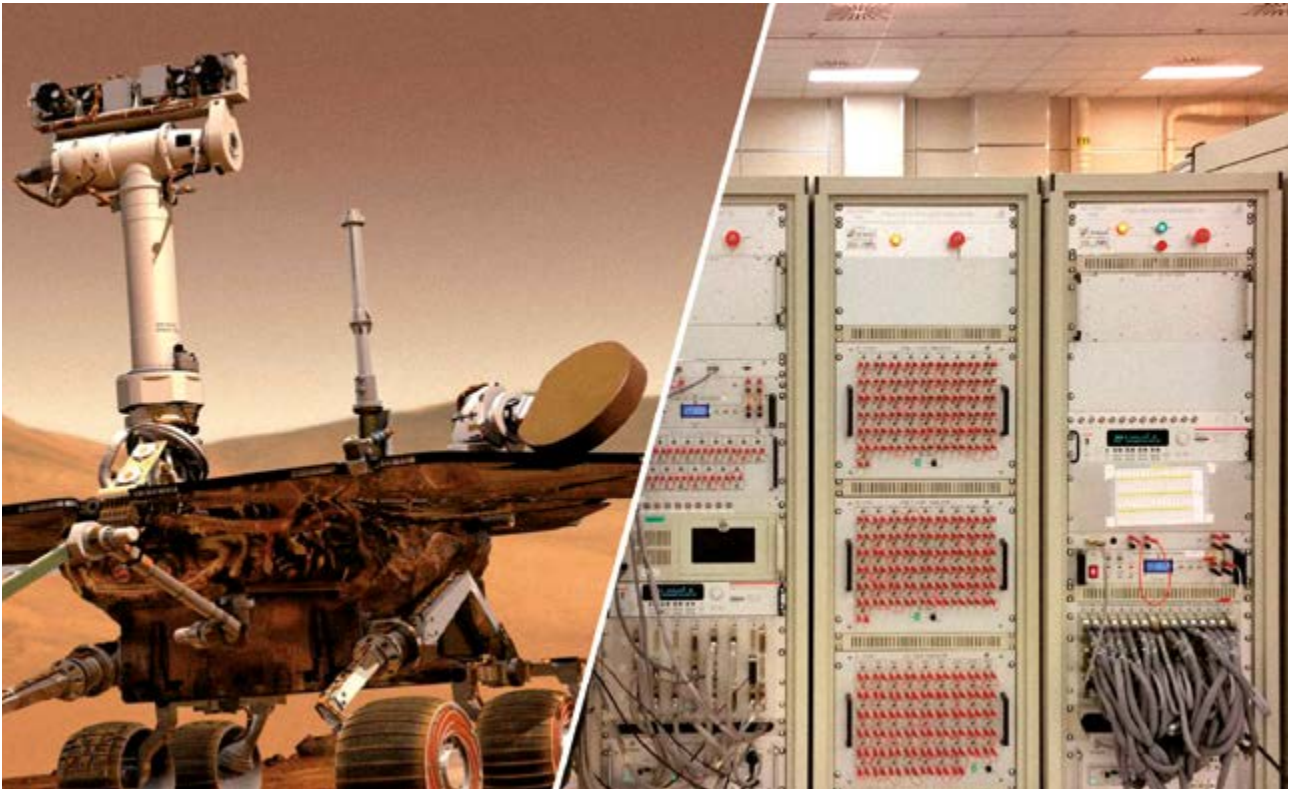


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# Compolab Srl

## Company profile

We are a multi purpose hub able to meet the demand for qualified and customized services, creating value through smart precesses for product and process innovation and through accelerated time to market. We make available to our stakeholders: over 400 square meters of technical and productive space; high computing capacity; many years of multidisciplinary experience, in design and calculation. It is also able to actually realize the demonstrator and/or the prototype, up to (the supply of) the industrialized product. It entirely realises special machines for tests, stations for the automation and the robotics of the process

## Products | Services | Applications | Technologies

Starting from customers necessities and requirements (including ECSS), Compolab technicians are able to design and follow the definition and the development stages of experimental tests, example HALT (Highly accelerated life testing), Robotics test; in different contest of R&D industrial.

We perform FEM calculations and simulations, both structural and thermal, relying on a wide professional expertise and using the most advanced computational tools and taylor made. Process simulation, including Stir Welding, and Additive Manufacturing.

Design and costruction prototypes, product demonstrators, test systems and equipment for benchmark activities are here studied and realized. Here at Compolab we are able to develop complete software solutions, based on commercial languages, for specific purpose (embedded) and general purpose devices. Design, construction and testing developing UAV control electronic boards.

Our CAD designers are highly skilled and focused on the client's needs; moreover we own equipments and devices for the scanning, the measurement and the reverse engineering of mechanical components. Closing the circle the digital production in metal and polimers.

Other product/services:

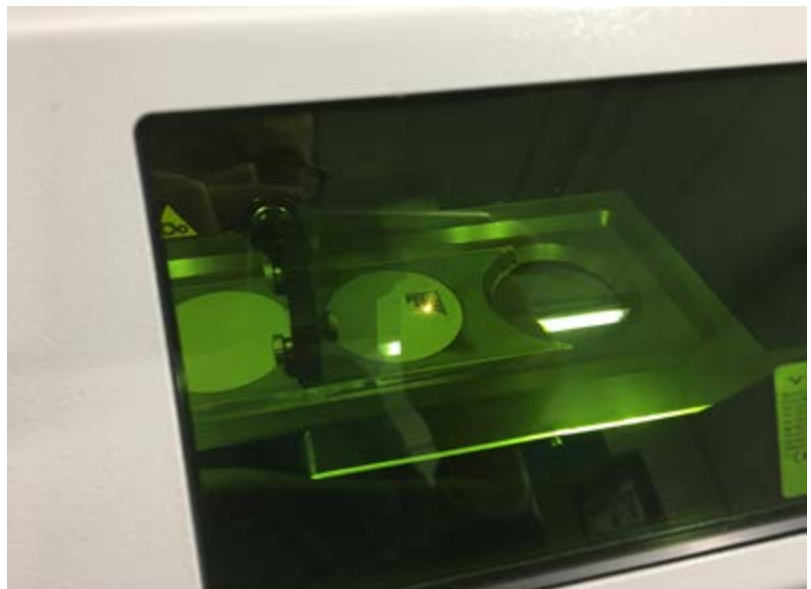
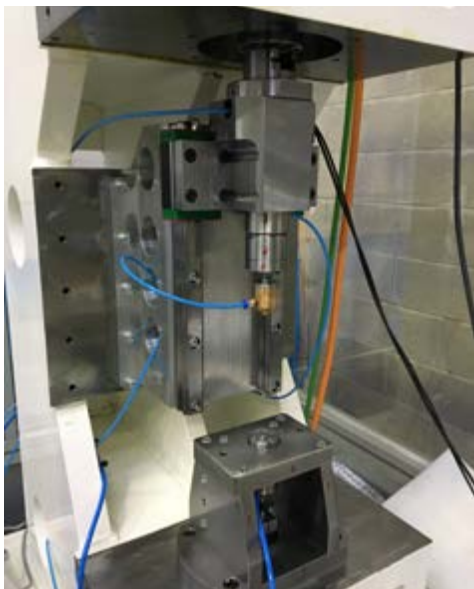
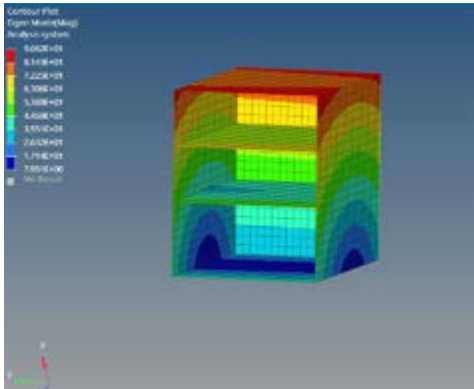
- Data correlation
- Quality
- Support to company management
- FMEA / PFMEA / DFMEA
- Courses and training
- Production start up
- Business management
- Design and calculation CFD
- Calculation and verification of 3D tolerances
- Industrial automatetion



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# Consorzio di ricerca Hypatia

## Company profile

HYPATIA is a Research Consortium of private companies devoted to applied research and space-earth technology transfer to enhance R&D and SMEs' innovation. Research Consortium Hypatia operates to create a shared space for research entities and companies promoting open innovation, at national and european level. Hypatia contributes to the New Space economy, the full range of activities and the use of resources that create value and benefits to human beings in the course of exploring, researching, understanding, managing, and utilising space.

## Products | Services | Applications | Technologies

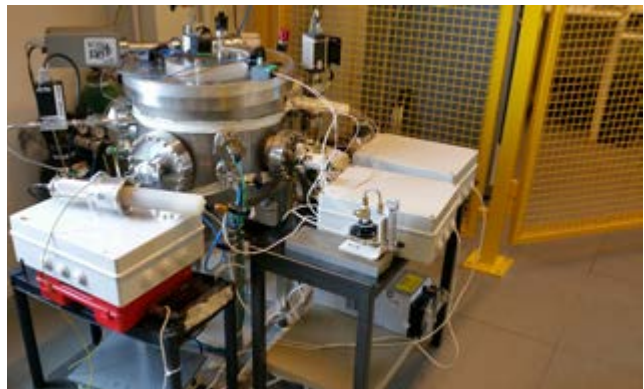
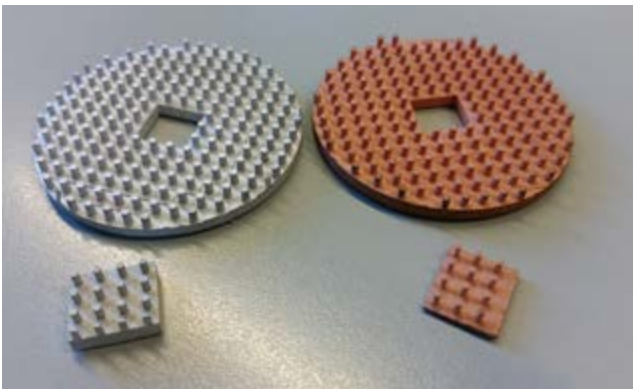
The principal technology areas covered by Hypatia activities include: Advanced Manufacturing, Advanced Materials, Biomaterials, and Renewable Energies. Consortium Hypatia is also active in business services, providing assistance to those who want to fully exploit the growth opportunities in the R&D sector, through the participation in European, national and regional programmes.



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# Davi - Promau srl

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## Company profile

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DAVI, manufacturer of the most sold plate and angle rolls worldwide, produces plate rolls to roll up to a thickness of 400mm as well as angle rolls for beams up to a height of 1250mm and pipes up to 1000mm. All the products are completely made in Italy. DAVI customer care follows the customer from installation and training up to online support, with the most experienced technicians in the sector

## Products | Services | Applications | Technologies

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DAVI plate rolls are able to roll every kind of components used in the space industry: whatever the material, the dimension and the bending radius requested, DAVI range presents an optimal alternative to offer to the customer. Whether we are talking about building parts of capsules, nacelles or boosters, in different materials (any type of steel, aluminium, titanium or other alloys), DAVI can supply the ideal solution, through both standard machines and products deeply customized, that are granted by a Research & Development Division that is in constant growth and evolution.



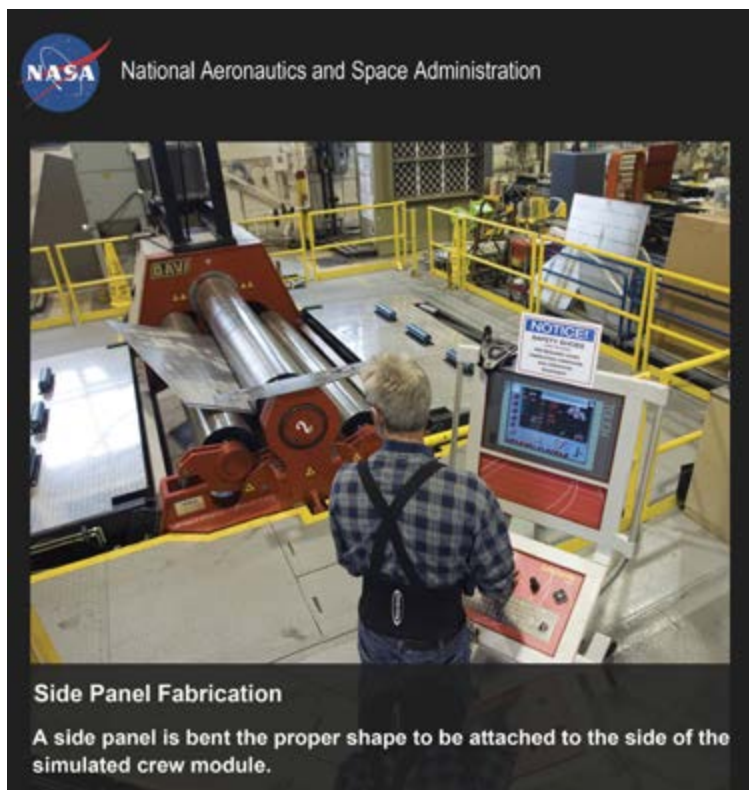
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# DIGIMAT S.p.A.

## Company profile

Digimat is an Innovative SME, founded in the year 2001 in Matera with the aim to become an important point of reference amongst other ICT businesses, both locals and nationals. In 2018 it was the transformation into a public limited company this permits a greater expansion and leads to more prestige. Innovation and research are fundamental elements of the company, our skills focus on several areas of ICT: Software Engineering, IoT, Virtual and Augmented Reality, Cloud Services, Downstream Services, Precision Farming and Industry 4.0.

Our team is composed highly specialized staff that provides customers with its scientific methodological rigor, practical experience on the market and the constant comparison with colleagues from international research centers. A Board of Directors composed of three working partners manages the company: Donvito Angelo - Chairman and Manager of the Software Development and R&D Section, Acito Andrea - Managing Director and Head of the IT Services & Consultancy Section, Pentasuglia Giuseppe - Director and Manager of the Quality Management System. There are two-business units "Software Development and Research & Development" and "IT Services and Consulting". The first section develops Software for SMEs, large companies, public bodies and research institutes. The research laboratory has the knowledge, expertise, professionalism and equipment to carry out the study, development and development of SW systems oriented to the management of geo-located data for indoor and outdoor environmental monitoring.

In the telecommunication context, Digimat is a partner with TIM, Fastweb and Huawei Technologies, in the MISE call for 5G technologies, on experimentation activities in the Matera/Bari area (Smart Building, agriculture/environment, Tourism). Furthermore, Digimat, cooperated with Ericsson, Fastweb and CNR-IBAM on the project #Roma5G at Diocletian Baths, consisting of high-speed connection networks that offer powerful new solutions to virtual reality and augmented reality.

Within the field of "Aerospace", Digimat has developed important technological and know-how skills thanks to the numerous research projects carried out. These collaborations have also been formalized through participation in networks such as operational consortia in the field of Earth Observation and Environmental Monitoring: TeRN (recognised by the Basilicata Region and the Ministry of Scientific Research as the Basilicata Technology District for Environmental Monitoring and Earth Observation), Createc and IRIS (with Digimat being one of the founding members), EXO, CETMA. Digimat is also involved as partner of Telespazio in the SPACE-ECONOMY-Mirror GovSatCom Program and in several research projects in Precision Farming, recently including also the UAE (agriculture and food security).

## Products | Services | Applications | Technologies

Matera Space Center is dedicated to Earth observation activities and also provides operational services for the Space Geodesy Centre. Digimat developed the ASMC (Antenna Station Monitoring and Control) supplying the following features:

1. Monitoring of the acquisition devices, aimed at the acquisition and display of status and parameters of the antenna system components;
2. Control of the components of the antenna systems, in order to set the various components with the parameters necessary to allow the acquisition of satellite data, according to the acquisition schedules;
3. Resource Conflict Manager, aimed at analyzing and solving conflicts in the use of resources

Monitor & Control system for Supervision and Remote Control of the CSG Ground Segment functional plants located at the Matera Space Centre. The system includes hardware and software components to manage: the air conditioning system; the UPS power generation system No-Break; CEDE air conditioning system.



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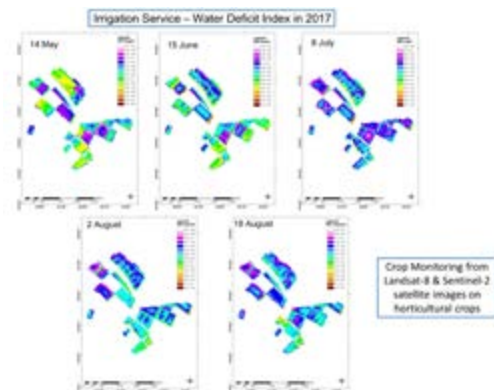
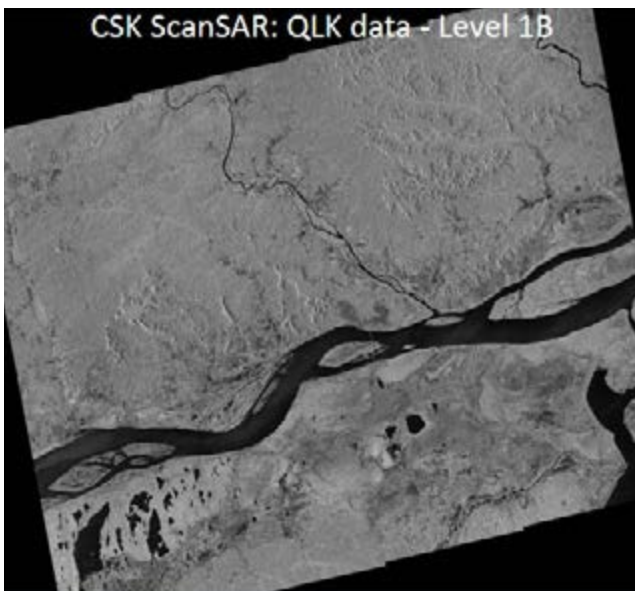
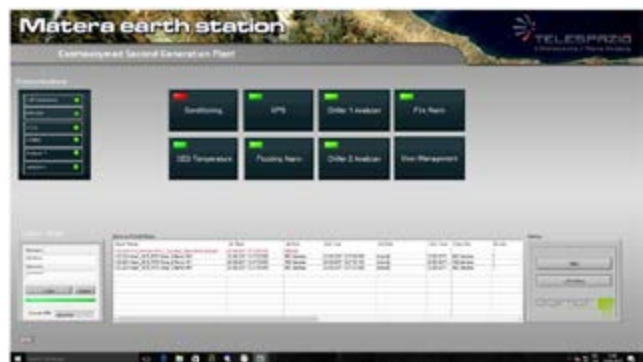
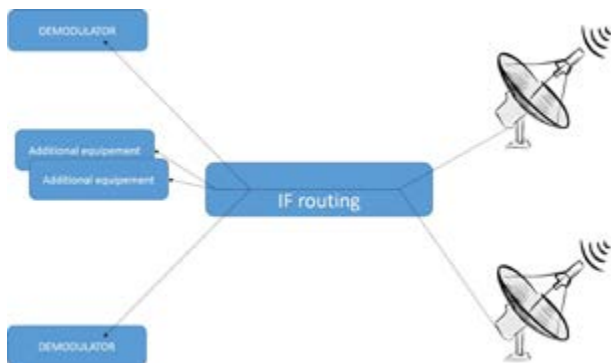


ACQ: Digimat is involved in the COSMO-SkyMed (CSK/CSG) space project together with Telespazio and TASI about the analysis, design and development of Ground Segment, and image processing on satellite data and its applications. Digimat has developed the ScanSAR data processor and the CCSDS payload data formatter. In addition, together with Thales Alenia Space, Digimat has worked on the KOMPSAT 5 project and has developed the geocoding and orthoencryption processor for all SAR data and the validation system.

eMAGE is the e-GEOS distributed framework for data analysis and processing. It is currently used in e-GEOS for operational services dedicated to SAR and Optical data management, viewing and processing. Digimat is currently developing a new version of eMAGE server from scratch, featuring many enhancements including authentication, subtask execution, frontend/backend modules, enhanced logging.

Research and development projects to create innovative services based on interoperable downstream services and use of Earth Observation technologies (both satellite and on-site sensors).

- The Web-GIS for precision agriculture provides two operating services: one related to the management of variable rates fertilization and one related to the management of irrigation resources. The use of such products allows to monitor vegetation health and plan appropriate variable irrigation and fertilization rates. The objective is to optimize the use of water resources and to reduce the environmental impact of nitrogen fertilization improving the yield;
- SPOT, web platform for security of the territory and energy sustainability to be implemented through monitoring of wildfires, wind and infrastructures;
- Monitoring and security for the Colosseum's Archaeological Park Area.





# D-Orbit SpA

## Company profile

D-Orbit is a New Space company with solutions covering the entire lifecycle of a space mission, including mission analysis and design, engineering, manufacturing, integration, testing, launch, and end-of-life decommissioning.

Committed to pursuing business models that are profitable, friendly for the environment, and socially beneficial, D-Orbit is the first certified B-Corp space company in the world. Headquartered in Como, Italy, D-Orbit has subsidiaries in Lisbon, Portugal, Harwell, UK, and Washington DC, USA.

## Products | Services | Applications | Technologies

The company's competitive advantage is the versatility of its launch and deployment services that can be tailored to the customer's needs, from the launch procurement of a single spacecraft using standard deployment strategies to the precise deployment of a full constellation with ION Satellite Carrier, a satellite dispenser developed and operated by D-Orbit.

ION Satellite Carrier can host any combination of CubeSats with a total volume of up to 48U and release them individually into distinct orbital slots, enabling deployment schemes previously unavailable to spacecraft with no independent propulsion.

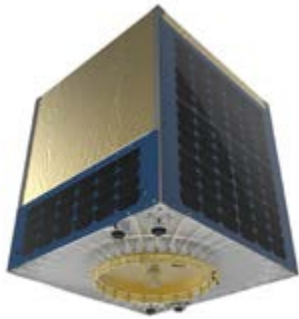
D-Orbit also offers launches services through its proprietary standard CubeSat deployers, and a configurable and convenient mission control software (Aurora).



## Contact

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# DTM srl

## Company profile

DTM is active since 1994 in the design, development and testing of aerospace structures, testing equipments and GSE (mechanical, fluidic, thermal ground support equipments) for satellites, launchers and experiments for manned or unmanned missions.

Design tools include 3D CAD drafting and modelling software, structural, thermal and fluidic analysis as well as fracture control analysis software.

DTM facilities include grey areas for integration of small equipments, ISO6 clean room (ISO5 ready), tools and test equipments for manufacturing and testing of composite parts (autoclave), three thermal vacuum thermal chambers with temperature ranges from cryogenic up to 200°C and above, static and fatigue test jigs, shaker and many acquisition systems.

DTM head office and laboratory is located in Modena (1100 m2). A second laboratory / integration area is located in Bastiglia (Modena) and provides 500 m2 area (including an ISO 8 clean room) for integration and testing of large equipments like mechanical ground support equipments and other large structures and testing facilities (20 tons crane).

DTM quality management system is certified according to ISO 9001:2015 and EN-9100:2016. Main customers in the space field are ESA, ASI, Airbus, Thales Alenia Space and Leonardo. DTM is also involved in activities in industrial fields like marine, automotive and biomedical sectors.

## Products | Services | Applications | Technologies

In the space field DTM main product services are related to design, manufacturing integration and testing of flight mechanical and fluidic systems like satellites primary, secondary and tertiary structures, cold plates for temperature control of flight hardware, as well as mechanical parts belonging to payloads, instruments or antennas.

DTM since many years is developing facilities for manned and unmanned missions: International Space Station, sounding rockets and parabolic flights.

For ground support equipments main product services are related to design, manufacturing integration and testing of mechanical, fluidic and thermal GSE for integration, transportation and testing of flight components.

Main technology applications are focused on materials with special focus on composite technologies. For components technology DTM is developing since many years fluidic parts (including custom ones like valves, filling equipments) for special applications with demanding cleanliness, molecular and contamination requirements including extra high pure gas delivery systems.

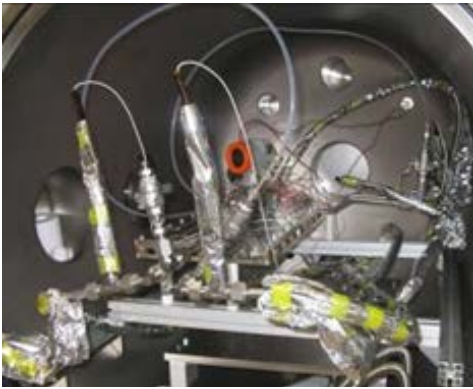


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# DUE2LAB SRL

## Company profile

Due2lab s.r.l. is a small Italian enterprise specialized in the realization of fully integrated spectroscopic radiation detectors based on Cadmium Zinc Telluride (CZT) technology for research projects and industrial applications.

Due2lab was founded in January 2014 by a research group with years of experience in the field of ionizing radiation detection working at the Institute of Materials for Electronics and Magnetism (IMEM-CNR) in Parma. In 2015 the company changed its shareholder structure turning to only two majority ownership associates and moved the headquarter in Scandiano (Reggio Emilia). Since then, Due2lab has become one of the few European companies providing state-of-the-art CZT radiation detectors on the national and international market.

CZT technology is based on a direct conversion semiconductor material whose use has incredibly spread in the last 10 years thanks to a great improvement in the growth yield and quality of CZT raw crystals, and its associated cost reduction. Due2lab team masters the whole value chain of CZT technology, from sensor processing of CZT raw crystals to assembly of the electronic chain for precise signal read-out and final digitalized signal elaboration.

Nowadays Due2lab portfolio includes products and services for manifold applications. Due2lab is involved as technology supplier of radiation detection solutions for pioneering research projects in the field of Astrophysics (observation of X- and gamma-rays coming from universe and their polarization) and Medical Imaging and Therapy (prototype for prompt gammas real-time dosimetry during cancer neutron-capture treatment). Besides the participation to these projects at the forefront of innovation, Due2lab is key technology provider for several industrial partners interested in innovative solutions for in-line smart production control and zero-defect manufacturing: Due2lab mission is to drive non-destructive inspection system into the hyperspectral X-ray world. Indeed in the years prior to Due2lab creation, several demands for radiation sensors from the industrial sector came to IMEM institute: this kind of demands were better suited for a company than a for a research institution, and this was one of the main driving forces that led to Due2lab foundation.

Thanks to the synergy with IMEM-CNR Institute (Parma) and the know-how of its highly skilled team, Due2lab aims to become, in the coming years, one of the global reference points for the creation of highly innovative detectors and systems based on CZT technology.

## Products | Services | Applications | Technologies

### Products

- Hyperspectral X-ray Spectrometer (HXS) equipment.
- Single CZT Sensor Unit with collimation kit (D2L001)
- Multichannel Digital Pulse Processor Unit (D2L009).
- CZT sensors customized according to client needs.
- Fabrication of state-of-the-art CZT highly segmented sensors prototypes for cutting-edge applications in aerospace and/or medical imaging

### Services

- Advanced bonding and attachment of solid-state detectors to read-out electronics
- Laboratory measurements and feasibility studies for X-ray inspection on different materials and samples (wood, ceramics, plastics, food, others)
- Design and realisation of industrial prototypes for new generation X-ray non-destructive tests and innovative measurement systems for in-line real-time quality control systems



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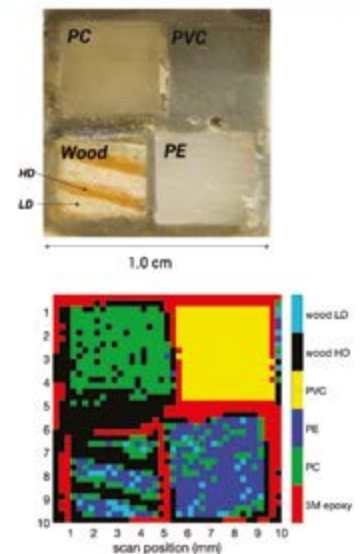
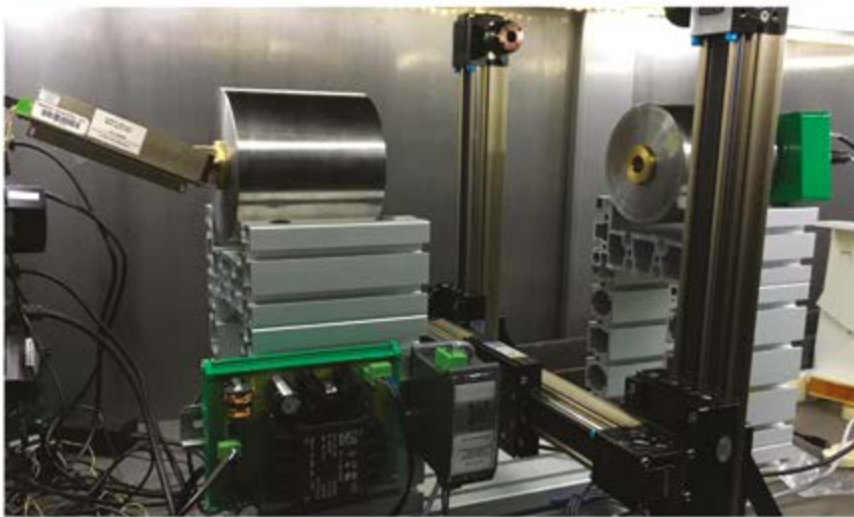
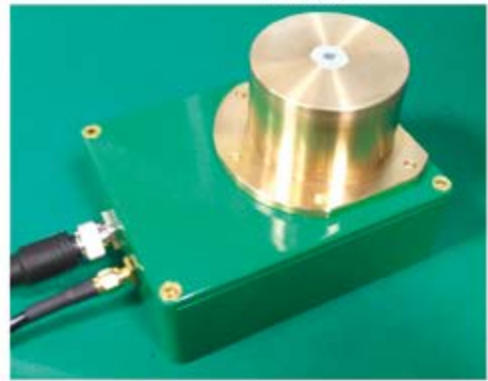
- A highly skilled team at your service for specialist consultancies on the use of radiations for different purposes
- Preferential relation with world leading CZT suppliers

#### Applications

- Space, Astrophysics, Observation of the Universe
- Medical imaging (densitometry, CT, gamma cameras, SPECT) and medical therapy (prompt gammas detection for dosimetry in Boron Neutron Capture Therapy)
- Environmental Monitoring, Nuclear Safety, Security, Decommissioning
- Material inspection, analysis and recognition (absolute density, compositional analysis, etc)
- Defectoscopy and quality control inspection, where high X-ray flux is required

#### Technologies

- Ionizing Radiation Detection, Solid-state detectors, Semiconductors.
- X-ray hyperspectral imaging, Compton imaging, high-flux X-ray applications





# DUNE

## Company profile

DUNE is a Small-Medium Enterprise (staff of 15 engineers) operating since 1980 in R&D, aerospace, defense, underwater acoustics, robotics, industrial control and communications. Over the last 40 years we have focused our activities in the fields of design, simulation and development of SW processing architectures for hard real-time systems on multi-core and multi-processor platforms (Radar, Sonar and Satellite Systems, Robotic and Industrial Control Systems, Inertial Navigation Systems), management of EU Research Projects (Wireless networks, GSM, UMTS, LTE, LTE-A, femtocells, picocells, broadband communication networks), design and development of dedicated HW solutions for real-time purposes. Application-ready or dedicated solutions based on a consolidated experience are provided as well as the capability to seek innovative solutions in system analysis. Flexible processing architectures are exploited to prevent or mitigate the risks related to the obsolescence providing the Customers with systems, easy to be migrated on innovative platforms, which minimize program risks, reduce migration costs and accelerate time to deployment and time-to-market. The company skill in leading and managing International Research Projects ensures a solid support to the Customers regarding proposal of innovative ideas, international partner contacts, proposal presentation and project management. The expertise in developing high-performances HW solutions may answer to specific Customer needs not completely met by commercial products.

## Products | Services | Applications | Technologies

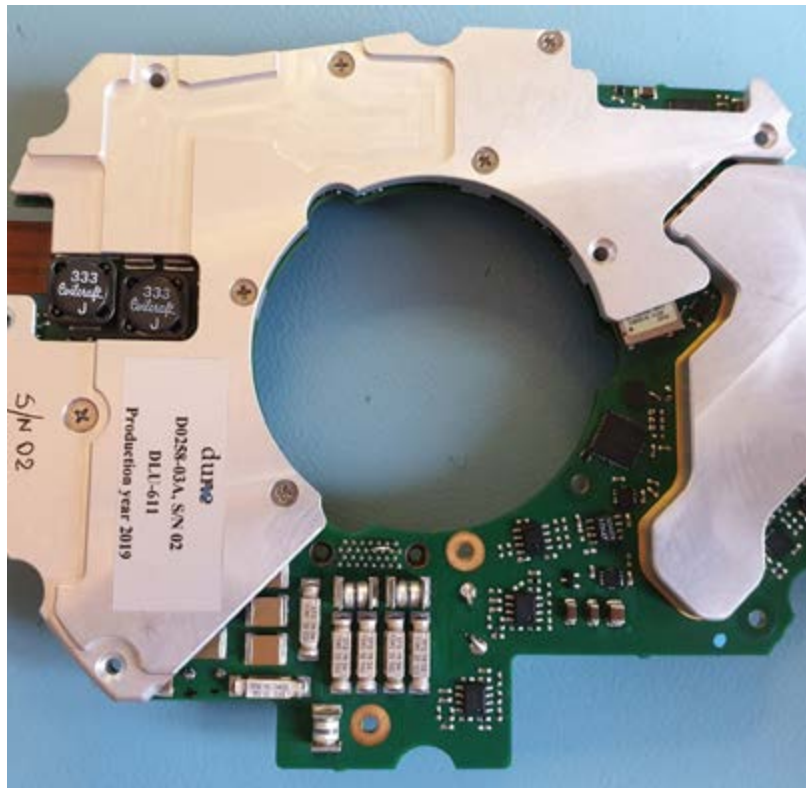
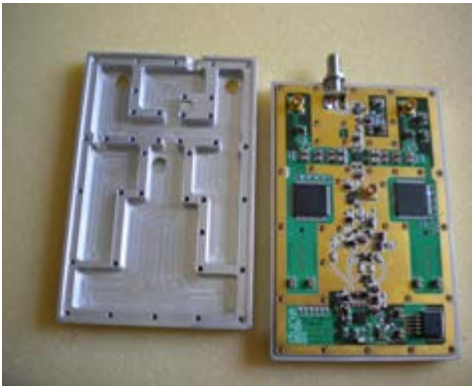
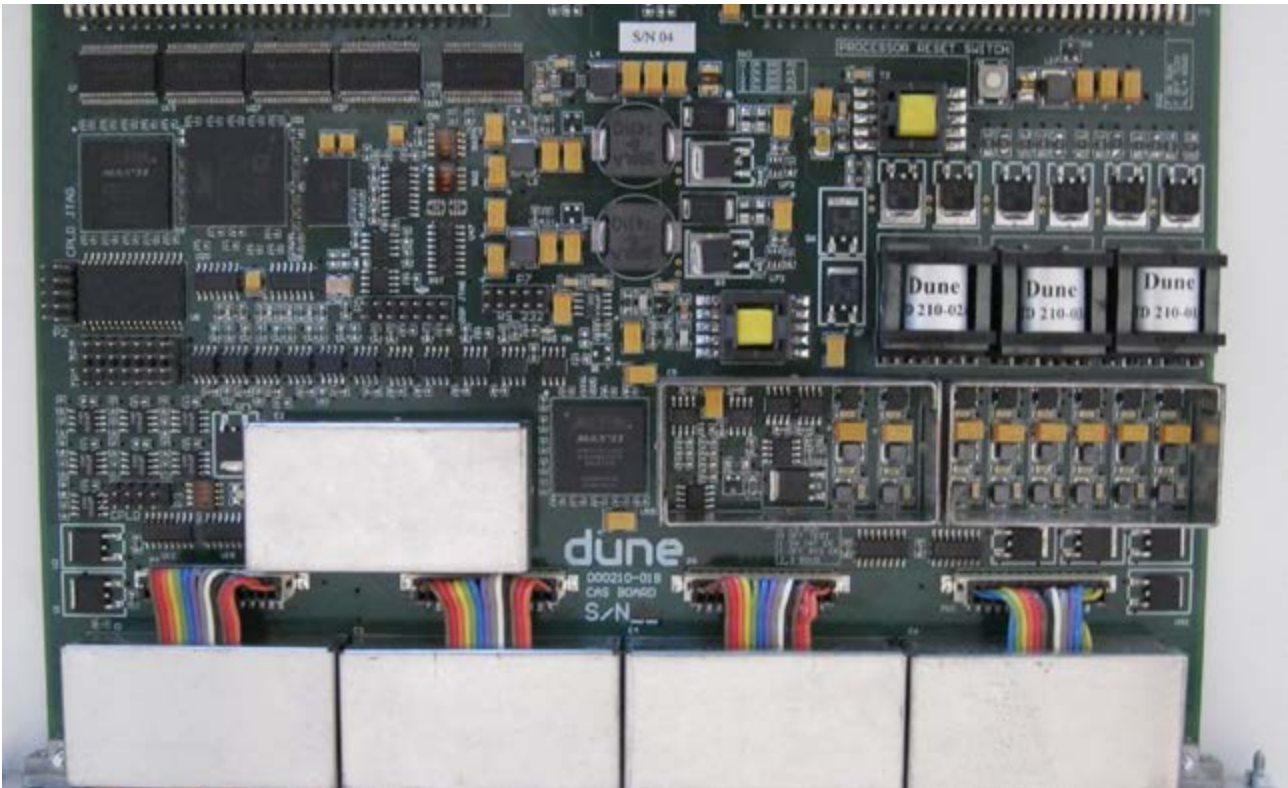
Radar and sonar signal processing. Production of localization equipments



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# Ecor International S.p.A.

## Company profile

Headquartered in Schio, Vicenza, Ecor International produces welded and brazed components in stainless steel, nickel, titanium and aluminium alloys for aircrafts, spacecrafts and orbiting satellites.

The company deals with the complete manufacturing process, starting from draft and implementation of qualification plan, to final control of the parts and the related technical documentation.

Thanks to the competences in the special processes of welding and heat treatment, the availability of qualified personnel and cutting-edge systems, Ecor International guarantees manufacturing high quality standards.

The conventional dimensional controls are integrated by:

- Non-destructive testing
- Leak/Proof/Leak - L/P/L at high pressure with helium leak detector

The production site is equipped with a Cleanroom ISO 7 operational, a clean environment where welding and system integration are performed, aiming at not compromising the cleaning level of the components. The cleaning process in compliance with cleanliness standards and related verifications are managed in-house.

Furthermore, for the Space industry, the company performs heat treatments and high-vacuum outgassing on critical items such as protective screens, components and sub-systems of orbiting satellites to streamline and improve material performance.

## Products | Services | Applications | Technologies

Ecor International has been involved in the following main programs:

- Orion MPCV (NASA)
- Solar Orbiter (ESA)
- Cygnus PCM (NASA)
- PLATINO (ASI)

Ecor International has achieved the following certifications and accreditations:

- ISO 9001, ISO 14001, OHSAS 18001
- AS/EN 9100
- NADCAP for welding processes (WLD), heat treating (HT), non-destructive testing (NDT).

The parent company, Il Sentiero International Campus, carries out research activities on Surface Engineering, Reliability Engineering, Additive Manufacturing, Joining Technologies to develop innovative components.

Ecor International has been involved in the following main programs:

- Orion MPCV (NASA)
- Solar Orbiter (ESA)
- Cygnus PCM (NASA)
- PLATINO (ASI)

Ecor International has achieved the following certifications and accreditations:

- ISO 9001, ISO 14001, OHSAS 18001
- AS/EN 9100
- NADCAP for welding processes (WLD), heat treating (HT), non-destructive testing (NDT).

The parent company, Il Sentiero International Campus, carries out research activities on Surface Engineering, Reliability Engineering, Additive Manufacturing, Joining Technologies to develop innovative components.



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# EICAS Automazione S.p.A.

## Company profile

EICAS is a small-size high-tech company established in 1984 by a group of professors and industrial researchers of the Politecnico di Torino with the aim to set up a company excelling in the complex system management and control area.

The core of EICAS scientific background concerns dynamic system modelling, simulation and control, signal theory and applied mathematics.

The main activity areas include

- Space: EICAS has been working on autonomous spacecraft attitude determination from star measurement for years, in collaboration with the major players of the industry. In the most recent years the company has finalized a new concept of multicamera system powerful and low cost, based on sophisticated in-flight auto-calibration techniques both of the camera model and of the camera attitude related to the spacecraft reference system. The first proprietary multicamera star tracking system is now under development, named ARGO. The company skills include capabilities in control design and data fusion techniques, FDIR and dependability, signals and images elaboration.
- Industrial automation: automatic digital control design, discrete manufacturing automation, handling of flexible materials, development of software tools for automatic control design and rapid control prototyping, development of sophisticated techniques for safety, human-robot collaboration.
- Automotive: vehicle precise positioning and control, proprietary software tools for vehicle dynamic, fault injection simulation, vehicle automatic control and fault tolerance algorithm testing.

EICAS has mainly worked on advanced, long term innovation projects for and/or in co-operation with industrial companies (LEs & SMEs), research institutes and Universities, having also a strong reputation as a partner and coordinator of European R&D projects.

## Products | Services | Applications | Technologies

EICAS owns a significant portfolio of innovative products and key enabling technologies:

- ARGO for Space

Highly accurate, flexible, robust and scalable multicamera system for spacecraft autonomous attitude determination through low cost cameras. The ARGO Star Trackers are tailored for the emerging market of SmallSats where the trade-off performance/cost/size is fundamental for spacecraft manufacturers.

The first version, ARGO 1.0, is currently being tested at TRL 9 in a IOD co-funded by H2020 EIC SME Instrument Programme. A second version targeting constellations market, ARGO 2.0, is currently under development.

Application domain: Space.

- EICASLAB™

The professional software suite for automatic control design and forecasting, able to support the automation of industrial processes through powerful tools for modelling plants, designing and testing embedded control system architectures.

Application domain: Space, Automotive, Industrial Automation, Robotics, Machine Tools, Economics.

- EICASLAB RCP Platform

EICASLAB Rapid Control Prototyping multi-core PC platform. Based on EICASLAB™ technology, it represents a turn-key solution for quick, smart and easy validation in field of even complex control architectures.

Application domain: Space, Automotive, Industrial Automation, Robotics, Machine Tools.



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- ARGO for Industrial automation

Plug & play, low cost and highly accurate optical multicamera measuring system for contact-less measurement of the pose of moving rigid objects, applicable in many context of Industry 4.0 for the development of intelligent robotic cells.

Application domain: Industrial Automation, Aeronautics.

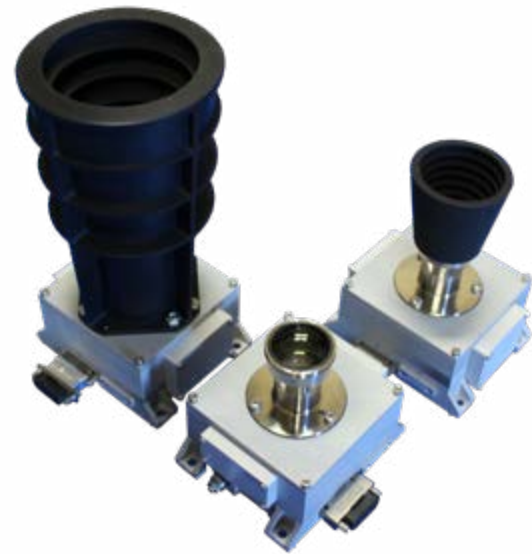
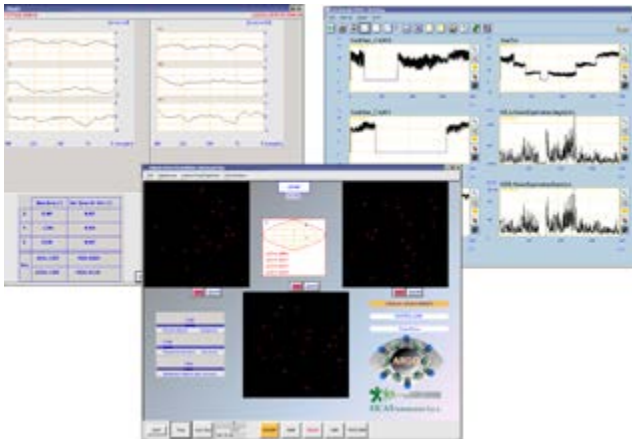
- ERSEC

Multisensory precise localisation system for safer and autonomous vehicles, applicable in automotive sector (active safety, autonomous vehicles), industrial automation (automated guided vehicles), in aerospace (unmanned aerial vehicles, AUTOTAXI functionality on the airport surface).

Application domain: Automotive, AGV, UAV..

EICAS offers the following consultancy services:

- Automatic control design: innovative and customized solutions for industrial automation, automotive and space
- Control algorithms, real-time software development, rapid control prototyping and FDIR techniques
- Transfer of know-how: Training courses on EICAS control design methodology and EICASLAB technology





# EIE GROUP SRL

## Company profile

EIE GROUP is an engineering company, an excellence in the Italian Industrial panorama, leader in Management & Contracting, Engineering & Design, Production & Services, operating in the fields of Astronomy and Astrophysics and the Big Science, besides producing machines, equipment and integrated systems for the industry and the scientific research fields.

The company, on the international scene for more than 25 years, has focused on the development of industrial and civil projects becoming a leader in the production of Telescopes, Radio-telescopes, Astronomical Observatories and scientific equipment, with focused engineering assets and solid know-how in fabrication and assembly processes, as well as in mechanisms and plants management.

EIE GROUP delivers integrated engineering and project management services, as well as bespoke products for the Industry and otherwise.

Flexibility and adaptability of the organizational structure, a multi-skilled personnel with solid engineering and technological know-how which is delivered with creativity and groundbreaking solutions to best serve the clients' demands, are at the base of EIE GROUP success. For this reason the group promotes a constant growing of its innovation culture through trainings at all levels.

EIE GROUP is supported by three main divisions: MANAGEMENT & CONTRACTING, ENGINEERING & DESIGN, PRODUCTION & SERVICES.

EIE GROUP intends to consolidate and build upon its position as an international Leader in the design and development of cutting-edge astronomical projects and scientific instrumentation with high technology impacts.

Promoting technology and scientific innovation through products and services for the Industry and Science, generating value for its clients and scientific partners.

The principles and values inspiring EIE GROUP, in the pursue of its mission, are rooted in the firm belief that correctness and transparency are essential elements to the success of every project. EIE commits itself therefore to the promotion of business activities and close relationships with its project partners, in a sustainable way, through an on-going commitment to economic and social development.

## Products | Services | Applications | Technologies

We have focused EIE's core business in the fields of Astronomy, Astrophysics and the Big Science, designing and developing the biggest Telescopes and Domes, Radio-Telescopes and Astronomical Observatories around the world.

We work with scientists, technology providers, engineers and industries whose requirements are the most diverse, complex and highly specific.

EIE faces the markets indifferently as Main Contractor or as Partner in International Consortia, according to the project and its development requirements.

EIE's niche design, technical and managerial skills equips us to provide comprehensive services to meet our customer expectations, whatever the context we are asked to find a solution for.

In the years we have realized multiple projects for international astronomical organizations like the European ESO (European Southern Observatory), or the Italian INAF - National Institute for Astrophysics, the French INSU -Institut des Sciences de l'Univers, or the American LBT Corporation and the University of Tokyo to cite a few examples.

Our expertise extends from Project Management to Engineering & Design, to Manufacturing, Pre-Assembly, Testing and Erection on site.

Whether it be Observative Instrumentation, Dome and Enclosures or Equipment, our goal is to deliver efficient and dynamic solutions, meeting the client's expectations.



EIE GROUP

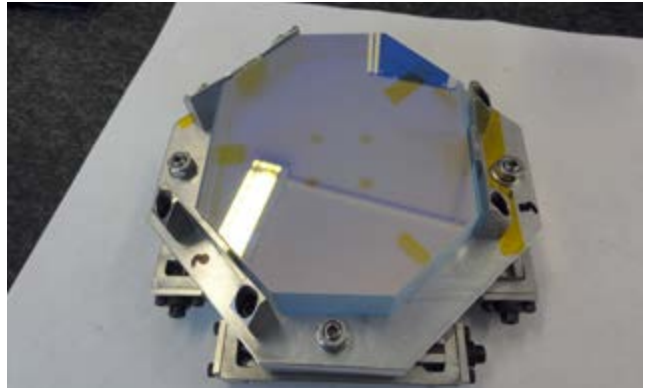
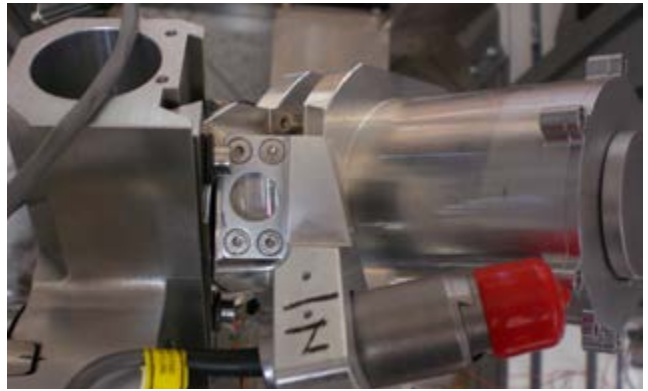
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We propose streamline operations and we deliver major projects that meet the demands, as we did for the ALMA - Atacama Large Millimeter Array project, the LBT and the 4 VLT Telescopes and as we are doing now, for the Turkish telescope DAG, for wich we are designing and fabricating Telescope and Dome, or the LSST - Large Synoptic Survey Telescope, now undergoing manufacturing and erection on site phase, or .

We provide a wide range of services and engineering solutions for the aerospace industry, including design and realization of complex optical, mechanical and thermal ground support equipment, opto-mechanical system design and prototyping for Solar System exploration and Earth observation. Currently the company is engaged in the development of NEOSTED project and VERT-X facility.



# Elital srl

## Company profile

Design and construction of electronics and mechanical systems, telecommunication systems for mobile and transportable station terrestrial and airborne, electronic and mechanical components and subsystems, shelters, transportation systems, special trailers, fixed station, field systems for space, defense and strategic applications.

Design and equipping of shelters, vans, trucks, tracked vehicles, moving platforms, trailers, vehicles in general, both civilian and military.

Mechanical Ground Support Equipment (M-GSE), Electronic Ground Support equipment (E-GSE). Design and implementation of ballistic protection on shelter and vehicles.

Design and construction of systems for high accuracy weapons.

Design and manufacturing of printed circuit boards, cabling and silkscreen for space and defense.

## Products | Services | Applications | Technologies

Products: MGSE for small and large satellites, Transport Container, Tilting Trolley, Multipurpose trolley, Mass properties measurements, Optical Instruments MGSEs.

EGSE: RF EGSE for testings in RF.

Satcom Products, Communipack family products for satellite communication. Transportable trailers and suitcase products in X, Ku and Ka band.

Military and Homeland Security - design and manufacturing of special purpose vehicles for reconnaissance, surveillance and intelligence.



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# Esri Italia

## Company profile

Esri Italia is the Italian leading company in geospatial solutions for Government and Enterprise. Esri Italia is Esri Official Distributor for the Italian market where the company operates also in networks with important Partners. The target customers are mainly in Government, Defence, Public Safety & Security, Space, Telecom & Utilities, Enterprise Companies, Universities, Research Institutions and No-Profit Associations. Esri Italia has a strong presence in the Italian market with Enterprise solutions supporting operation and decision making of any private or public organization.

The company offers high level of expertise in various application fields with solutions based on Esri technology and the integration of ArcGIS Platform with other enterprise systems. The offering integrates Geolocation and Mapping Platforms, Spatial Analysis, GIS, Geospatial Data, Training Programs and Professional Services.

## Products | Services | Applications | Technologies

ArcGIS is a geolocation platform to make better, smarter decisions and a more efficient organization.

It works about every problem and situation has a location aspect.

People in an organization can use ArcGIS in different ways i.e.:

Executives use the platform to keep on top of key performance indicators and analyze trends and spatial connections that influence every aspect of organization's operations.

GIS analysts with ArcGIS can build maps using up-to-date data, perform deep analysis, and share results within or outside their organization

Knowledge Workers use ArcGIS for manage enterprise data in decisions and business workflows. Support decision making in their organization with tools for advanced analysis and data visualization.

CIO & IT Professional with ArcGIS can integrate mapping and spatial analysis into business system dashboards and reporting systems without customization. Implement ArcGIS across your enterprise using your organization's policies and procedures for maintaining security and data integrity. You can deploy ArcGIS on-premises or in the cloud.

Many projects in Environment & Natural Resources, Defense, Public Safety & Security, Urban Design, Utilities & Communication include the ArcGIS Platform.

Esri Italia Solutions complementing the ArcGIS platform:

Normalization and Geocoding - Standardize and convert an address into a geographic location allows fully understanding the spatial relationships with other information. Esri Italia supports standardization and mass geocoding of addresses and points of interest.

Image Processing - The processing of remote sensing images provides powerful spatial analysis tools. Esri Italia offers skills and solutions for satellite images analysis, particularly in SAR (synthetic aperture radar images). The company owns a patented solution called GISAR for filtering and extracting automatically information from data. The collaboration with the European Space Agency allowed testing the solution mainly with COSMO-SkyMed and Envisat data.

Geophysical and Structural Monitoring - This topic is very important in Italy, a country with exposure landslides, subsidence, bradyseism, volcanoes and a unique historical heritage. Maintain the territory integrity requires effective control actions. The SENDAS solution is an alternative tool to traditional monitoring systems, based on GNSS sensors single frequency. It is a technologically advanced solution for monitoring landslides, volcanoes, dams or other similar elements.



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# ESSETI MECCANICA DI PRECISIONE SRL

## Company profile

ESSETI MECCANICA DI PRECISIONE Srl was founded in Mirandola, near Modena, the Italian famous area of Motor Valley, in 1988. ESSETI takes its first steps on worldwide circuits and racetracks by supplying mechanical prototypes for the motorsport industry. In few years it partner of companies in the field of: automations, packaging and automotive. In 2009 ESSETI to supply high technology mechanical components for the aeronautics as well as mechanical prototypes based on customer's drawing for the aerospace industry. Few years later, as it is a prerequisite to work in this field, ESSETI its 9100 certification. ESSETI is now closely and constantly co-operating with the biggest aircrafts producers in the world. The goal of ESSETI's team is offering a complete service to customers that are not simply looking for a supplier but for a reliable partner, which should mandatory be fast with deliveries and answers, opened minded enough to give assistance and solve problems thorough and with undeniable quality and machining precision. These elements are the key to make it good in ESSETI. Quality, precision, fastness and continuous improvement is what we are working on every day.

ESSETI MECCANICA DI PRECISIONE Srl is specialist in:

- Manufacturing prototypes, complex mechanical components and small series;
- Complete service of mechanical prototyping: from the analysis of the customer's drawing up to the finished component, including special processes (heating and surface ones) and tests;
- Turning services and complex job-orders on demand;
- Milling services and complex job-orders on demand;
- Gear Cutting, Grinding and Electron Discharge services;
- High technology mechanical machining on any kind of metal (no matter whether rod or casting, for instance: Inconel 718, 13-8 PH, 15-5 PH, Greek Ascoloy, Titanium, steels, aluminium, plastics ...);
- Complex mechanical machining on demand for the aerospace industry;
- Manufacturing and assembling complete groups.



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# Euro.Soft srl

## Company profile

Euro.Soft field of work is a result of a number of years of experience in the design, prototyping and manufacturing of hardware and software in various fields of application. The small but dynamic workgroup (15 stable resources) collects within it various skills related to SW-HW design in terrestrial and space environments.

Euro.Soft was set up in 2000 and operates in the aerospace sector, particularly:

- Space software and electronics systems
- E-GSE, M-GSE and data acquisition equipment
- NavSat & TLC applications
- Earth Observation
- Ground systems - Astrophysics (telescopes) and antennas

The Company is certificated ISO 9001 and is compliant with the ECSS ESA standards. The company worked on several space programs as:

ESA: GOCE, EUROSKEYWAY, EPDS, MIFE, SMS, TALED, STRETCH

ASI: COSMO SECOND GENERATION, COSMO SKYMED, IRENE, MIOSAT, NADIA, TELESAL, SIGRI, CIRANO, SIMDEO, SAR4Bat, OCEANSAT, MEMORIES.

OTHERS: UDRAGON (MISE), MISTRAL (DAC), PON EO (CC), MSS CPA (CIRA), EBW (AVIO), DEVILS (ROLLS ROYCE), SKA (SKAO).

## Products | Services | Applications | Technologies

The company has skills on HW/SW space & ground systems, characterized by the reliability and precision combined with the modernity and power of the terrestrial HW/SW platforms. The latter offer excellent performance in terms of processing power, low power consumption and speed of engineering. In recent years, it has also begun to use FPGA platforms for various aerospace projects.

Euro.Soft has developed and managed several orders for public and private clients, both in Italy and abroad, demonstrating the ability to integrate different technologies: within the Space field participated, as Thales Alenia Space and Telespazio's sub-contractor, to the COSMO SKYMED program and to the Euroskyway, GOCE, ISS EPDS programs, in which developed land and flight HW/SW and participated to the design, testing and integration activities.

The company operates following an ISO 9000 certified quality system and regularly applies the ECSS ESA standards. In collaboration with other companies, Euro.soft has participated in many space projects, including "CIRANO Robotic Support Systems" within the "Italian Vision for Moon Exploration", MIOSAT (Phase B design of a decomposable telescope: autofocus electronics), on board avionics (OBDH) for various programs conducted by the ALI consortium for small reentry satellites, funded by ASI (IRENE), ESA (SMS, IRENE SR and IRENE GSTP), MIUR (MISTRAL).

In the field of TLC/NAVSat/EO applications, Euro.Soft realized several systems, for municipalities and other authorities. In some cases, Euro.Soft assists and maintain those systems, including the system hosting and tele-maintenance.

In the space downstream application portfolio of the Company, we can mention the ESA and ASI projects TALED (TelecommunicAtion, Localization and real time Environment Detection), DIGICULT (fruition of "cultural heritage spread in the territory"), NADIA (Navigation for Disability Applications), OCEANSAT, MEMORIES, "Vento e Porti", AMICO (data fusion of ground data, NAVSAT, optics and radar satellite images, for maritime applications), SIMDEO, (landfill monitoring), SIGRI, (Forest Fire Management), TELESAL (TLC e-health satellite applications).

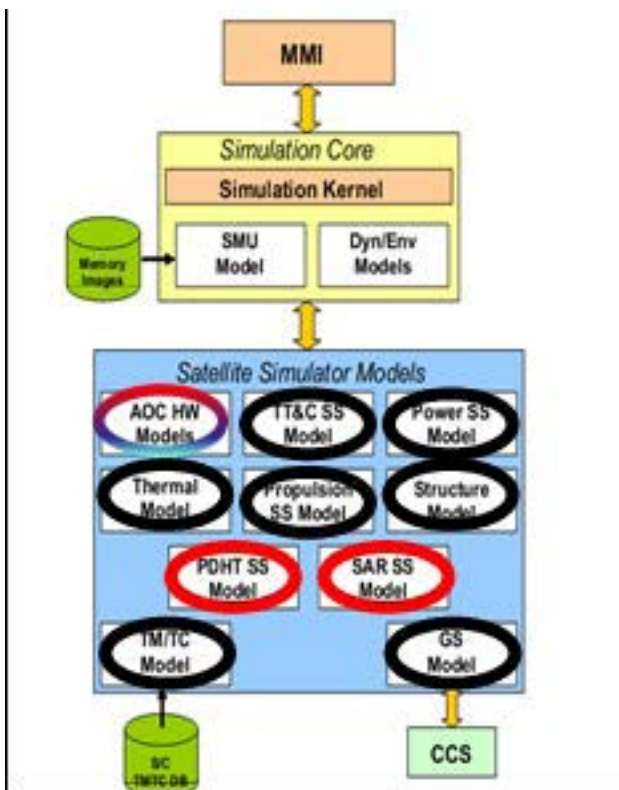
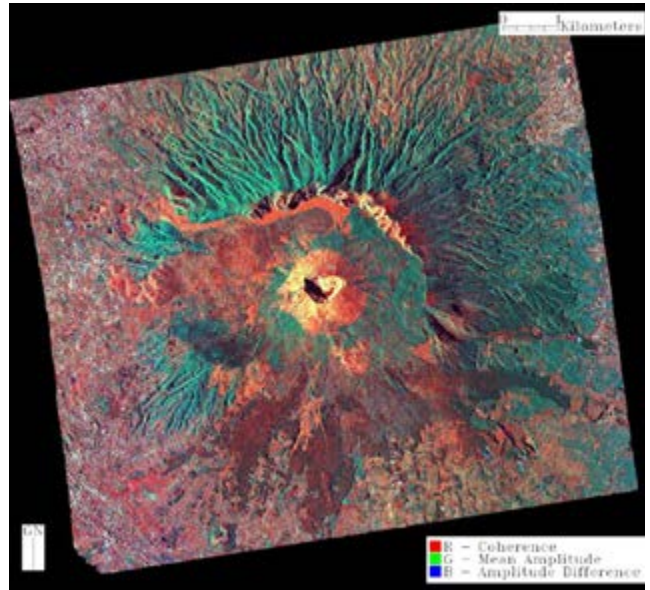
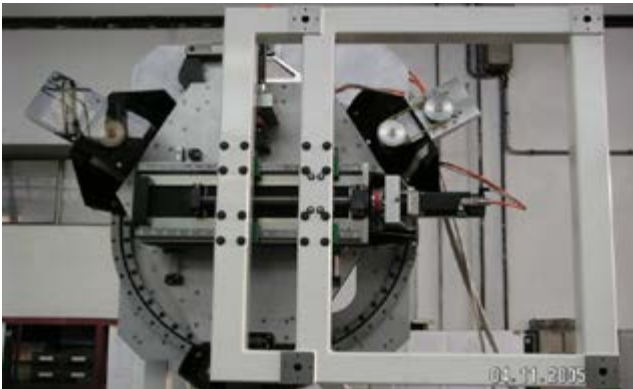


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# FlySight Srl

## Company profile

FlySight S.r.l. is the Strategic Company dedicated to Defence and Security, as a part of Flyby S.r.l. group, which is specialized in the development of DSSs (Decision Support Systems) exploiting cutting edge technologies Remote Sensing and Big Data Analytics fields. FlySight Team provides solutions including design and development of state of the art C4ISR systems (Command, Control, Computer, Communication for Intelligence Surveillance and Reconnaissance). The solutions proposed are based on AI (Artificial Intelligence) approaches exploiting the latest cognitive signal processing and adaptive data fusion algorithms. Typical applications are for avionics, naval and underwater sectors providing geospatial situational awareness both for the on-ground segment and for the on-board one. Real time PED (Processing Exploitation and Dissemination) is allowed by the integration of our products in already existing architectures thanks to the interoperability of our systems with STANAG and OGC standards.

## Products | Services | Applications | Technologies

FlySight's flagship product is OpenSIGHT, a Geospatial Solution for Processing, Exploitation and Dissemination. This product is a modular cost-effective system resulting from over 10 years of experience in the development of on-board and on-ground solutions. OpenSIGHT exploits real information in a synthetic environment for Geospatial Situational Awareness and provides a new approach in the definition of Decision Support Systems as a component of the TMC (Tactical Mission Command) or as a tool for the real-time mission analysis, enabling real-time collaboration in a COP (Common Operating Picture) of the scenarios. The adoption of OpenSIGHT allows the integration of new solutions or it brings new fundamental capabilities in a Legacy Command and Control environment:

- to process data from heterogeneous sensors in real-time (Electro-optical, Infrared, Hyperspectral, Radar, LIDAR, SONAR);
- to layer information from multiple warfighting functions on 3D map displays or on Augmented Reality views;
- to share information and commands, providing all parties with a real-time common view of the scenarios.

The built-in interoperability features (STANAG and MIL-STD) allow OpenSIGHT to directly interface NATO systems and to manage georeferenced data in already existing geodatabases (or to provide new solutions for geospatial information management).

Process heterogeneous data

Many processing functionalities are available to enhance the situational awareness and to support the decision process:

Real-time processing of EO and IR images/videos

The following functions are integrated into the real-time processing of EO (Electro-Optical) and IR (InfraRed) images/videos: Enhancing, Fog Suppression, Fusion, Electronic Stabilization, Tracking, Super Resolution, Mosaicking, Moving Target Indicator, Automatic Target Recognition, Simultaneous Localization and Mapping.

Real-time processing of hyperspectral images

The following functions are integrated into the real-time processing of hyperspectral images: Anomaly Detection, Features Segmentation, Features Classification, Features Recognition.

Manage common information layer

OpenSIGHT supplies and manages multi-layer information, either in synthetic 3D displays or adopting Augmented Reality solutions to enhance the human comprehension of operative scenarios.

The displays can be used to show a 3D rendered environment derived from merging a



## Contact

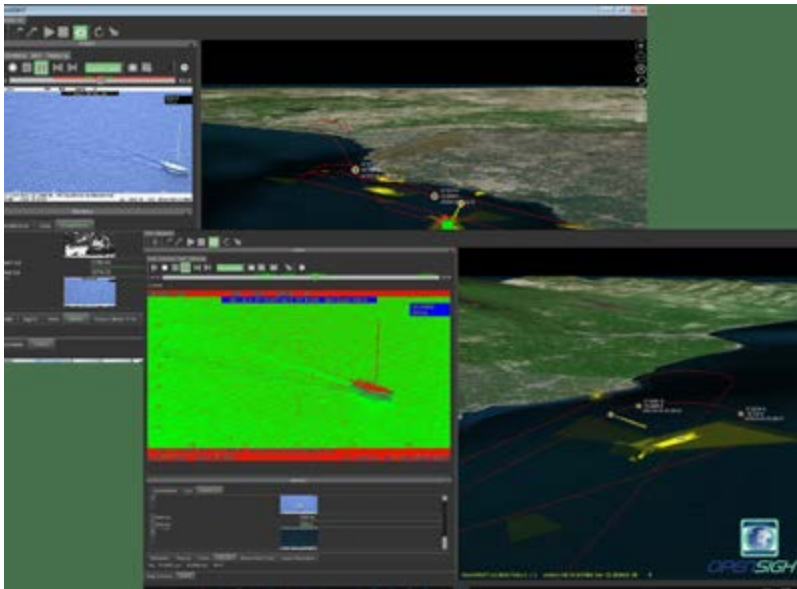
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priori knowledge with the real-time information coming both from connected actors and from on-field sensors. The same pictures can be shown in Augmented Reality views, where all the information is overlaid on the scenario sampled by the adopted sensors.

Share information:

OpenSIGHT exploits existing communication layers allowing the information sharing between the actors operating in the same mission. Tools for the dissemination of the information and commands are ready to be interfaced with legacy infrastructures





# G & A ENGINEERING SRL

## Company profile

G & A Engineering S.r.l. is a small company operating for over 45 years in military and space sector; it is located in a modern plant in Oricola (AQ) divided into different buildings and structured to meet the needs arising from research, design, engineering, experimentation, prototyping and series construction, that the company carries out in military, space, industrial sectors.

The company as the following certifications: ISO 9001:2015, ISO 14001:2015, SA 8000:2015, Innovative SME, Private Research Center for Microelectronics for Space Application, Private Research Laboratory

The company has several workshops with tools, machines and equipment of the latest generation that, together with the company know-how and qualified and multidisciplinary staff, have allowed to consolidate high-level technologies and processes that allow it to operate in sectors very challenging and that make it independent in passing from an idea to a finished product.

Over the years the company has consolidated high-level technologies, processes and know-how that allow it to operate in very challenging sectors and has a structure able to guarantee the sale of services and products at all stages of their "Life Cycle", carrying out research, design, engineering, industrialization, manufacturing and logistics activities, integrated with the continuous application of all the standards typical of space, military and industrial sectors.

Unique and peculiar characteristic of the Company is the ability to design and build "Special Equipment", custom designed devices built with criteria that make a prototype comparable, for finishes and construction features, with an industrialized product; these special equipment typically include electronic, microelectronic and electrical technologies as well as mechanical, pneumatic, hydraulic, vacuum, etc ...; beyond that, the company is known on the market for its ability to cooperate with the world of research and the ability to make experimental systems indistinguishable from industrial systems.

These capabilities, together with the particularity of having a strong expertise in R & D and design and engineering activities, with the exclusive presence of qualified personnel and the availability of cutting-edge machines and equipment, have enabled the company to successfully participate in large international experiments, like AMS02 and GLAST/Fermi.

## Products | Services | Applications | Technologies

The company competence are all those necessary for analog and digital electronic and microelectronic, mechanic and micromechanics, electro-mechanic, vacuum, hydraulic, pneumatic, else that software & firmware.

In the space sector, the company participated in the two largest physics experiments ever carried out: AMS-02 and GLAST/Fermi, building the silicon heart of the experiments, under NASA control. We made more than 1 million wire bonds without failure.

With the co-financing the Ministry of Manufacturing Activities we developed an entire micro-satellite (GEASAT) using state-of-the-art technologies and developing all the subsystems. The characteristics of such this satellite is that all subsystems are positioned on the satellite's side wall, leaving the entire bus available for payload.

Else this microsatellite we have developed and manufactured also some cubesat 1U and 3U, for universities and research activities.

The company participated with its own experiments in two space missions aboard the ISS, Eneide Mission with the EST experiment and DaMa Mission with the APE experiment, as well as having engineered and built other experiments for flight and ground space.

We successfully had direct contracts with the Italian Space Agency and with the European Space Agency, else that with national research institutes.



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The company proposes itself in the space market with the following products and services:

- Development and construction of special equipment for space experiments
- Providing custom components for mini and micro satellite buses
- Providing cubesat satellites and standard cubesat parts
- Development and construction of battery packs for satellites and launchers



# GAROFOLI S.p.A.

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## Company profile

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Garofoli S.p.A. is a company specialized in the development of satellite and payload transport, lifting and handling equipment and test equipment adapters.

Since its creation, the company has provided several MGSEs for the space sector.

Nowdays Garofoli S.p.A. has expanded its experience and its skills to be able to propose customized solutions and face new challenges.

Garofoli provides innovative solutions and concepts, from the engineering phase to final assembly and testing, as well as on-site assistance.

High capacity to manage international programs.

## Products | Services | Applications | Technologies

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During the years Garofoli has developed several custom-made systems including engineering, analysis, qualification, manufacturing and tests of:

- Storage and transport containers (different sizes: up to a lenght of 13000mm; active; ISO8; transportable by road, boath and air; sliding / lifting cover or front door solution)
- Handling and Lifting Devices
- Multipurpose Trolleys (mechanical and electro mechanical; balancing; load cells...)
- Manacle Clamp Bands
- Vibration Test adapters

Today Garofoli offers a complete range of services from discrete work packages to full turnkey solutions.



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# GAUSS SRL

## Company profile

The Group of Astrodynamics for the Use of Space Systems (GAUSS Srl) is an Italian limited liability company based in Rome, founded in 2012 as a spin-off of the Scuola di Ingegneria Aerospaziale of Sapienza University of Rome, carrying on the school's more than twenty-year tradition in the field of microsatellites. Active in the space technology field, its aims are the research, the development and the implementation of aerospace projects, plus the educational aspect and the execution of related cultural initiatives.

GAUSS has gained experience from 9 differently shaped and sized satellites' launches. The company business is mainly related to the design and the manufacturing of micro, nano, pico and femto satellites, intended as CubeSat, PocketQube and releasing platforms such as GPOD (GAUSS Picosatellites Orbital Deployer), MRFOD (Morehead Rome Femtosatellites Orbital Deployer) and TUPOD (TubeSat Picosatellites Orbital Deployer).

Since the early nineties, activities of designing, ground testing, integration, launch and ground operations have been managed by GAUSS members at the Scuola di Ingegneria Aerospaziale, where the UNISAT program started under the supervision of Professor Filippo Graziani.

In the most recent launches, UniSat was also a platform and it was able to release 4 CubeSats, thus letting GAUSS be a small satellites launch provider. GAUSS activities include also structural design, realization and integration of the main subsystems and payloads and all the ground segment operations. The scientific and educational mission of the company is also very important: several experiments are boarded on the microsatellites, ranging from space debris observation instruments to space biomedicine payloads research.

Since 2009, GAUSS has been performing bio-medical research in space and on 2011 it was able to conduct two bio-medical experiments on board the Space Shuttle.

Since 2000, GAUSS has been launching satellites with the support of "International Space Company" (ISC) Kosmotras, using the Dnepr LV. At present, GAUSS has an agreement with the Company established by ISC Kosmotras and Glavkosmos, GK Launch Services, which operates Soyuz-2 commercial launches.

Most recently, GAUSS is also performing launches from the "International Space Station" through the Japanese Experiment Module "Kibo".

## Products | Services | Applications | Technologies

### UNISAT PLATFORM

UniSat series consists of microsatellites, originally conceived for Space education, then evolved into a commercial bus system, able to host many kinds of payload: from nanosatellites to be released in orbit to onboard IOD/IOV experiments.

### CUBESAT, POCKETQUBE AND TUBESAT DEPLOYERS

Releasing systems: GAUSS designs, manufactures and launches the CubeSat deployer GPOD (Gauss Picosatellite Orbital Deployer), available for 1U, 2U, 3U and 3U+ CubeSats. Furthermore, it is customizable on request. The MRFOD (in cooperation with Morehead State University) is a deployer for PocketQube satellites. The TUPOD (in cooperation with TetonSys) is a deployer for TubeSats.

### LAUNCH SERVICES

GAUSS provides launch services for micro, nano and pico satellites with different opportunities: launches into near SSO and other LEO orbits at heights ranging from 450 to 650km with the cooperation of GK Launch Services which operates the Soyuz launch vehicle, using the UniSat platform; ISS launches through the Japanese Experiment Module "Kibo" at heights of around 400km. In fact, GAUSS is able to provide services in LEO orbits for any kind of picosatellites and nanosatellites standard.



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#### ABACUS ON BOARD COMPUTER

ABACUS is an OBC manufactured with a PC104 form factor. It is a multi-core OBC with a MSP430 microcontroller and a Spartan-3E FPGA. It includes a 9DoF IMU and FLASH memory. Software libraries include the capability to update the firmware once in orbit. It has an extensive flight heritage and more than 4,5 years of continuous operation in orbit.

#### HERCULES ON BOARD COMPUTER

HERCULES is an advanced OBC that features a dual-core 220MHz ARM Cortex R4F 32-Bit CPU, with cores working in lockstep. It integrates two 9DoF IMUs, a FRAM memory, a NOR flash and SDCard. The CPU architecture makes it able to detect and to recover from common mode faults.

#### GAUSS RADIO UHF

The GAUSS UHF transceiver is designed for nano and microsatellites and it is available in two RF power versions (2W and 5W). It includes a TNC, with speeds up to 125kbps, using RAW, AX25 and FEC protocols. Its small dimension allows to stack two radios on the same PC104 board. Test equipment and software are included. New features are planned using upgradable firmware.

#### GROUND STATION & SOFTWARE

GAUSS offers support for in orbit operations through its fully automated ground station (based in Rome) in VHF & UHF (uplink & downlink) and S-Band (downlink). GAUSS also offers customized software to automate a ground station and support for designing and building it.





# GELCO SPA

## Company profile

GELCO is a customer-oriented company operating in professional electronic sectors, both national and international. GELCO is specialized in design, engineering, manufacturing and testing services at the highest levels of experience and technology, in defence (avionic, naval, land) as well as other professional sectors (electro-medical, automotive, communications, aerospace). EN9100, ISO 14001, ISO 45001

## Products | Services | Applications | Technologies

Design and manufacturing of EGSE. Design and manufacturing of harnesses and boards according to ECSS standards (Gelco has two clean rooms ISO8). Microelectronics activities (Package welding system, Parallel GAP, Wire bonding, Ultrasonic cleaning, Pull tester, Leak tester). Design of power supplies, digital boards (FPGA, microcontrollers, DSP), RF Modules (Transmit/Receive Module for Phased Array Radar, AGC). Operators qualified according to IPCs and ECSS-Q-ST-70-38, ECSS-Q-ST-70-28, ECSS-Q-ST-70-08, ECSS-Q-ST-70-26. Firmware and software development.



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# Geo-K

## Company profile

It is the commercial vehicle through which the scientific know-how developed by the University's Earth Observation Laboratory is made available to public and private initiatives in the form of user-oriented applications.

Immediately after its foundation GEO-K was incubated within ESA-ESRIN where new technology, based on artificial neural networks for the processing of satellite data, was further developed.

In 2007, GEO-K was awarded the ISO 9001:2008 certification for "Design and development of satellite data processing components for GeoInformation production.

Over the last few years

GEO-K has been involved in contracts with national (ISPRA, ASI) and international (ESA) institutions for the exploitation of EO data. Furthermore, in the ESA Fuegosat Synthesis study, GEO-K has contributed, together with the University of Valencia, to defining a new TIR space-mission. The company has also acquired experience in providing educational sessions in EO, mainly addressing companies or technical groups.

Often GEO-K exports its technology and know-how to other fields of engineering not strictly related to EO. In the past, consultancy has been provided for Automatic Incident Detection problems, Solar Energy Devices and Electromagnetic Pollution analysis.

## Products | Services | Applications | Technologies

**EO Software development** - For more than 5 years now, GEO-K has been conducting a variety of Earth-Observation application-development projects leveraging the use of radar and optical data to generate thematic maps, hydrocarbon pollution maps and update land use classification. One such software is Neumapper, which processes remotely sensed imagery using an artificial neural network computational model.

**Change Detection** - Change detection is an automated process that generally consists of comparing images acquired on two or more different dates. A recent image can also be compared to a geospatial database to spot differences, mainly in terms of the size of mapped linear or surface features. Our change detection services are used to: Assess logging activities caused by forest fires and etc.; monitor urban sprawl and wetlands; detect cm-scale surface movements impacting critical infrastructures.

**Precision Farming** - GEO-K provides you with make use of satellite images acquired during the growing season to generate various agricultural diagnostic tools. Satellite imagery such as RadipEye are especially suited to such a need because of the possibility of acquiring images several times a week. Crop yield diagnostic tools can be used to: access plant growth stage and ground cover; produce a vegetation index to indicate crop vigour; produce economic yield maps.

**Natural Disasters:** Following natural disasters such as floods or earthquakes, GEO-K may give the authorities in charge images and map information useful for people in the field by: extracting tactical information for emergency situations; providing expertise in the use of radar images in case of heavy cloud cover, particularly for floods.

**Thematic Mapping** - The combination of satellite optical and radar acquisitions at various spatial resolutions with powerful automatic image processing techniques facilitates the frequent generation of updated worldwide cartography at different scales. During the data production process, one of our thematic specialists extracts the information directly from satellite imagery by using machine learning algorithms. Our thematic mapping services include: land use mapping; eco-forestry mapping; geomorphological mapping;

**Image Processing with artificial intelligence** - Satellite images abound in information that is sometimes hard to interpret and synthesize; they need additional processing to extract information relevant to the user. We carry out several types of image processing based on artificial intelligence to facilitate information extraction. Besides the spectral values of pixels, the object based approach defines and takes into account many of an



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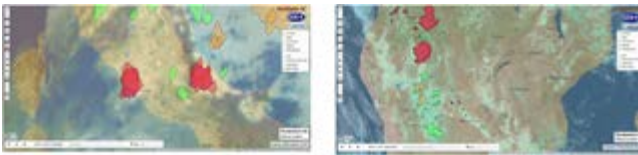




object's features. Applied to ocean monitoring, this approach can, for example, detect ships and oil spills in a radar image.

Drones - The last frontier for imaging and soil data acquisition: drones represent the new way to look down on. GEO-K achieves the ENAC (the Italian institution for civil aviation) licence to use these versatile devices.

Apps - With modern mobile devices, it is possible to use satellite data smartly thanks to the on line applications. GEO-K has already developed two apps for meteorology and geographic edutainment. Many other applications can be developed: satellite data - and more generally images - permit a territory and its institutions adaptable study



# GEOCART S.P.A.

## Company profile

Geocart is an engineering company that operates in the fields of Earth Observation, Environmental Monitoring, Engineering and Information and Communication Technology by providing technical expertise and highly innovative services. The core activity is the design, production and maintenance of geographical databases.

The company provides services related to the processing of satellite images and of geographic data acquired by means of terrestrial and aerial remote sensing with the use of traditional techniques and innovative instruments (GPS, laser scanner, photogrammetric cameras and sensors operating in different spectral bands). Moreover, Geocart designs and develops multi-sensor integrated platforms and carries out GIS and cartographic editing and offers a consolidated experience on differential SAR interferometry techniques. Regarding SAR analysis, the company has developed a software named "SLIDE" (acronym for SAR Land Interferometry Data Exploitation) that allows to measure, with very high precision, displacements of land, works and infrastructures, using the SAR data acquired by satellites.

## Products | Services | Applications | Technologies

### Products

Orthophotos and Oblique Photos, Digital Cartography, Satellite Data, Thermal Imaging, Hyperspectral Imaging, DTM, DSM, 3D Models, Software and App, Web GIS

### Services

Infrastructures Inspection and Analysis, Aerial and terrestrial remote sensing, Satellite data processing, Topography, Cartography, Environmental Impact Studies, Environmental monitoring, Soil Use Classification, Characterization of forests, Corridor mapping, Urban and territorial planning, System integration, Web GIS, Software and App.

### Applications

Urban and Terrain Mapping, Coastal and Protected Area Characterization, Environmental Assessment, Land Degradation Risk Management, Natural and Anthropogenic Risk Management, Water Bodies Monitoring, City modeling, Civil Design, Analysis of structures displacement, Precision farming, Analysis of the Vegetation, ICT Solutions

### Technologies

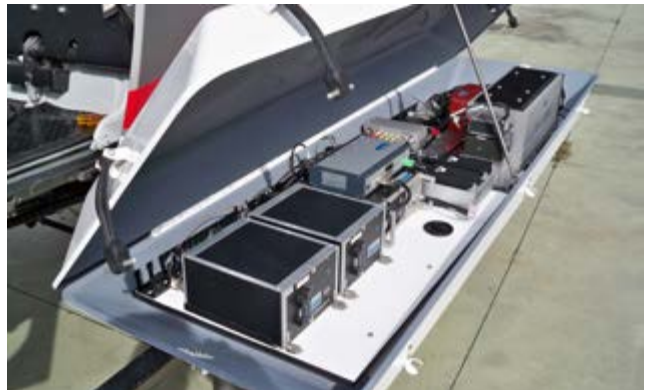
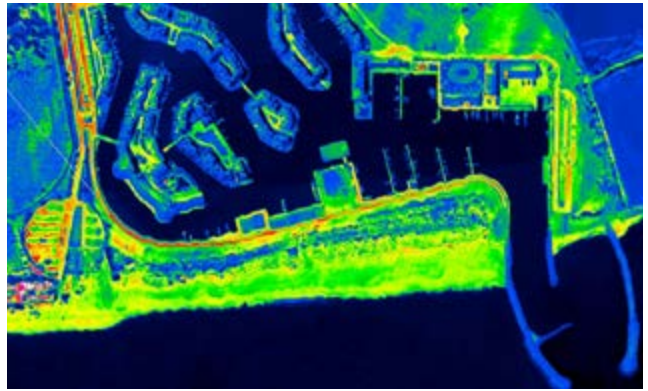
Laser Scanner, Hyperspectral Sensors, Digital Cameras, Thermal Cameras, Gps And Topographic Tools, Multi-Sensor Integrated Platforms, Own Software



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# GEOFYSICAL APPLICATION PROCESSING (GAP) SRL

## Company profile

Geophysical Applications Processing s.r.l., innovative SME, born as a spin-off company of Politecnico di Bari, Italy, on February 2006, whose mission is to develop products, processes and services with technological and scientific value in the fields of satellite remote sensing, stereo vision and biomedical research, and related software/hardware technologies. The company is also able to provide scientific and technical trainings in the same fields.

The educational and research background of the spin-off company is based on scientific results achieved, over the last twenty years, by the Remote Sensing Group of the Department of Physics of Bari, and the Institute for high studies on Intelligent Automation Systems (ISSIA) of the National Council of Research (CNR) of Bari, in the framework of research projects funded by national and international space agencies (ASI, ESA, NASA) as well as by the European Commission.

Shareholders of GAP are Polytechnic of Bari, Planetek Italia s.r.l., SITAEL s.p.a., three professors of the Polytechnic of Bari, one professor of the University of Bari and four researchers of CNR.

GAP is member of the Association of Italian Small and Medium Aerospace Enterprises (AIPAS) and the Apulian Aerospace District, an association recognized on 2009 by a regional law that operates to reinforce and consolidate the competitiveness of regional aerospace products, in both national and international markets. The policy of the district aims on the one hand at reinforcing the integration and synergies between large and small & medium enterprises, and on the other hand at increasing and promoting its competence in research and vocational training throughout the entire country.

GAP offers a wide range of products and services for environmental monitoring and mapping through remote sensing techniques as well as in situ measurements. Here below the main areas of competence.

- Radar Satellite Remote Sensing
- VIS/NIR Satellite Remote Sensing
- UAV technologies for Photogrammetry and Remote Sensing
- Meteorological services Other areas

The long-term experience in the field of digital signal processing has enabled the transfer of GAP algorithms, developed for remote sensing, in other areas where advanced techniques are required for digital processing of data. Examples of this technological transfer are:

- Stereo Vision & 3D Tracking
- Biomedical Applications

## Products Services Applications Technologies

GAP provides the following products and services characterized by high level of innovation and scientific/technological contents in the field of remote sensing and the related hardware and software technologies:

- production, marketing and customer service
- feasibility studies, designing, developing and prototyping of innovative procedures for digital signal processing (DSP) dedicated in particular to satellite remote sensed data;



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- training activities dedicated to the product users;
- activities of research and development aimed at updating the scientific knowledge in the specific fields of interest.

GAP expertise is based on Digital Signal Processing Techniques (Assembly, Fortran, C, Python, Matlab programming) applied to remote sensed data.

These techniques are used to:

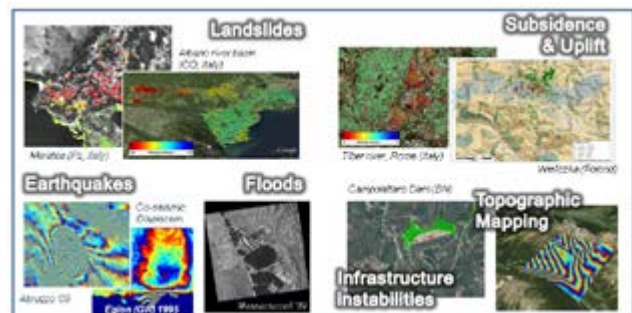
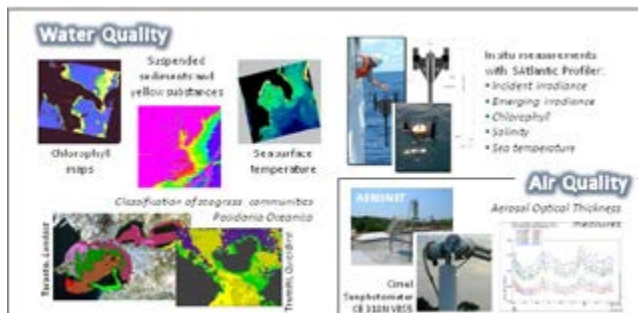
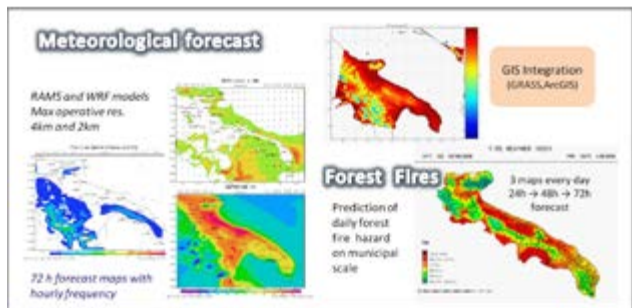
- Monitor and study of terrain displacements (earthquakes, landslides, subsidence)
- Monitor building stability
- Monitor the risk of fire in critical areas
- Produce Digital Elevation Models
- Perform water quality analysis
- Weather Forecasts
- Detection of fishing zones

For each of these products, GAP has:

- the expertise to select the right combination of sensors and data sets;
- the tools to process remote sensed data;
- the skills to devise and develop ad hoc tools for a specific problem.

Of particular importance is the GAP expertise concerning the processing of data acquired by Synthetic Aperture Radars (SAR) with particular emphasis on Differential SAR Interferometry. This technique has been successfully applied to obtain topographic maps and study ground displacements with an accuracy of 1 mm/year. One of the major interests of the group is the assessment of EO-based methodologies to produce landslide early-warning maps, which rely on the detection of temporal changes of slope-related surface factors, associated with static landslide susceptibility mapping. The use of advanced these techniques applied to multi-temporal series of acquisitions is essential in this field of applications to detect small-scale phenomena such as slope and building instabilities using the Persistent/Distributed Scatterers (PS/DS) with sufficient spatial density. GAP has implemented a Multi Temporal Interferometry software, named SPINUA and based on PS/DS techniques, able to process multi-temporal series of acquisitions for the monitoring of building and terrain instabilities (seismic displacements, landslides, subsidence phenomena) even in scarcely urbanized areas.

SPINUA software implements a proprietary version of the PS/DS techniques. It is able to process L, C and X-Band satellite data and has been successfully tested in many research activities as in the LEWIS (FP-V) and MORFEO (ASI) projects and in many case studies (Haiti, USA, China, Italy, Israel, Poland, Oman, etc.) concerning the monitoring of subsidence, landslides, earthquakes and infrastructures instabilities.



# GMSPAZIO

## Company profile

GMSPAZIO is an EU SME hi-tech company based in Rome, made mainly of brilliant young engineers operating in the fields of Aerospace, Defense and Homeland Security to help customers managing:

Complex Modeling & Simulation Scenarios,

Space Surveillance & Tracking and Space Situational Awareness Systems,

Missile Defense Network Analysis Systems,

Satellite Remote Sensing Products and Services,

UAVs Surveillance & Monitoring Solutions,

Model Based System Engineering Solutions,

Offering Products, Services, Training, and Know-how transfer, to develop Integrated and Customized Information Systems, and customers' tailored ICT applications and related services.

GMSPAZIO operates in EU Countries and overseas markets delivering integrated solutions to the main actors of the aforementioned market segments, serving International and National Space Agencies, Ministries of Defense, Prime Contractors, Subcontractors, and Research Entities with state-of-the-art products and solutions used to produce high quality results saving time, money and resources.

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## Products | Services | Applications | Technologies

GSTT (GMSPAZIO Satellite Tracking Tool-Kit) is an integrated system able to allow the cooperation of several heterogeneous SSA/SST Systems devoted to Space Surveillance & Tracking, and Space Situational Awareness operations. It offers the capability to employ its sensors and a network of commercial sensors using these measurements together to locate, track, and predict movements of space objects. Its incredible precision (around tenths of meters) is feasible due the combination of GMSPAZIO software tools and advancements in high effective commercial sensing technologies, offering unparalleled accuracy and high degree of certainty to obtain the best avoidance prediction and enable near real time maneuvers' detection.

GMDT (GMSPAZIO Missile Defence Tool-Kit) is a powerful yet simple software environment where evaluating the performance of Missile Defence System. GMDT works side by side with AGI STK (AGI Systems Tool-Kit) in order to quantify the most



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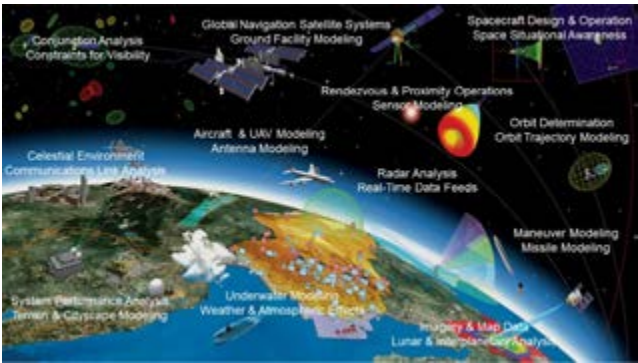
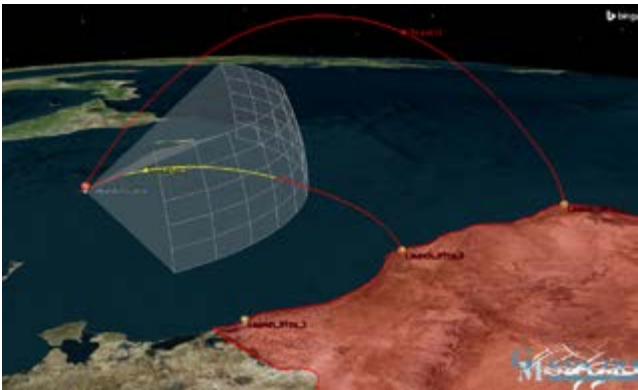
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important metrics characterizing the performance of such kind of systems against any type of incoming ballistic threat missile.

GMPS (GMSPAZIO Mission Planning & Simulation) is a software solution dedicated to Mission Planning & Mission Simulation supporting Single and Multiple (Constellation) Satellite Missions dedicated to Remote Sensing Activities (LEO Orbits with single/multiple Satellites and single/multiple Uplink and Downlink Ground Stations).



SENSING  
LAYERS

Analysis software for land, sea, air, & space

# GP Advanced Projects

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## Company profile

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GP Advanced Projects is an innovative SME active in both production and management of space projects. Thanks to its experience in project & innovation management, the company enabled different non-space companies and institutions entering the space sector; the company is also actively engaged in scientific projects for both ESA and NASA.

In addition, GP Advanced Projects has developed its proprietary pico-satellite platform, able to perform IoT/IoV activities in LEO.

All of this, has been made possible by a passionate team of young engineers and managers, based in Brescia, at the crossroad between Milan and Venice.

## Products | Services | Applications | Technologies

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GP Advanced Projects offers consultancy to help companies in entering the space field and provides support in designing and developing space components and systems. The company focuses on innovative projects about cutting edge technologies in the space field and on the terrestrial applications of space technologies.

The company also is active in the development of nanosatellites and their subsystems enabling the delivery to clients of its proprietary constellation platform for LEO missions. Applications areas are, for example, IoT, smart farming, air traffic and navigation control.

This is possible thanks to the ViVa platforms which delivers increased payload capacity and the PiCo constellation, based on a unique 1/3U technology.

The company product portfolio showcases:

- A proprietary pico-satellite platform able to perform IoT/IoV activities in LEO. The platform is ideally suited to become a constellation and the company is striving towards this goal.
- System engineering and management support on different scientific projects for both ESA and NASA;
- Development of innovative space components, such as:
  - WAMS: an monolithic silicon-only, reliable and highly scalable sun sensor with up to 170° field of view;
  - Solar panels following Cubesat standards including temperature and fine sun sensor;
  - POD: a 3U cubesat deployer, able to deliver your product in orbit with zero momentum.



## Contact

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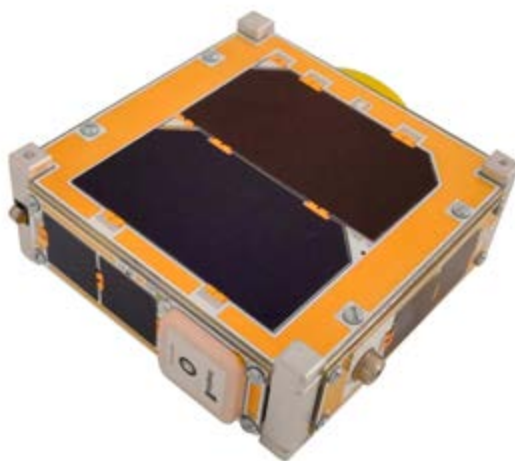
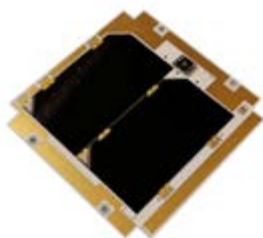
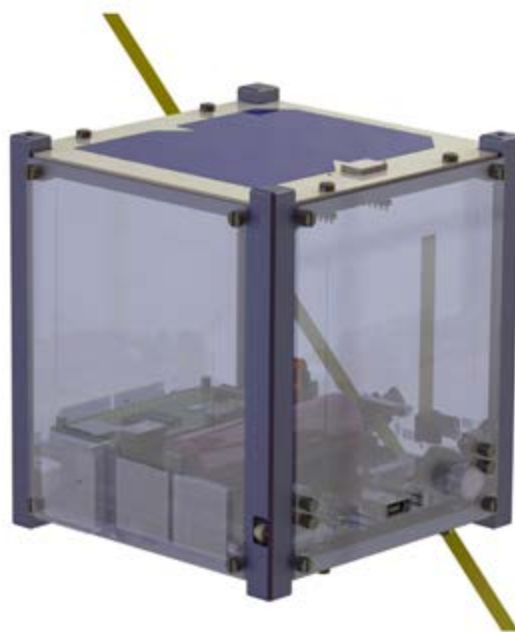
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# HTT

## Company profile

HTT is a SME focussed on design, manufacture and valued services of HiRel & VHiRel Custom MAGNETIC DEVICES and POWER ELECTRONIC EQUIPMENTS for Aerospace, Space and Defense.

With over 30 years of extensive hardware design and manufacturing experience, our team is able to offer t-key solutions and problem solving in collaboration with main research institutes and universities for the Industry players across Europe.

### Products | Services | Applications | Technologies

Custom design, manufacture and added value services of Hi-Rel and VHi-Rel products and electromagnetics devices for Aerospace and Defense.

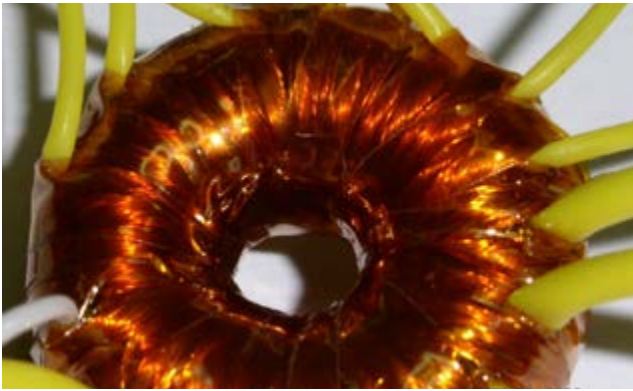
Design and Engineering, manufacture, build to print/spec, R&D, reverse engineering and fast prototype service of Transformers and Inductors, Electric Motors and Generators.



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# INFORMATION TECHNOLOGIES SERVICE SRL

## Company profile

ITS was established on 1st September 1999 and is formed by managers and entrepreneurs deriving their complementary experiences from a prolonged activity in the main aerospace Italian industries and from the mastery of the financial instruments necessary for the "start-up" of firms focusing in the high technological sectors.

Mission of ITS is to operate in the High Band of the Information Technology field and relevant Electronic Technologies.

The development of ITS, in terms of manpower and turn over, will be based through a mix of internal and external strategic path, in this latter case making use of capabilities already present in Italy and Europe in the SME, through a policy of stable partnership.

In this sense a particular attention will be devoted to the relationship between Research and Final Users, carrying out the industrial link which changes technologies into hi-tech products really usable.

ITS main fields of action

In terms of Vertical sectors the action of ITS is addressed mainly to:

Defence

Space

Commerce, deriving competences and technologies from the first two fields

In terms of Horizontal capabilities, ITS will develop the following main ones:

Data processing of digital images coming from several typologies of sensor (multispectral and hyperspectral electro-optics, radar, etc.) also implementing techniques of data fusion

System Integration extending the concept of distributed information architectures (LAN and Web) also to Complex and Robust systems (C4I2) using wireless links (Link 16, Satcom UHF, GBS)

Simulation and Modeling also of Complex Scenarios (Digital Battlefield)

Technologies and Systems based on satellite navigation (GPS and Galileo)

High End Computing also for on-board and distributed systems.

RFID Application for the Italian Air Force

TLC Satellite Space architectures

TLC Satellite Ground Architecture

Strategic and Sectorial Consultancy both to SME and to the Research and Acquisition Government Bodies

## Products | Services | Applications | Technologies

ITS main capabilities are:

On Board Supercomputing for Space and UAV applications

Anti-Spoofing Simulation and Apparatus Development

UAV jamming Apparatus

Ground Segment TLC architectures

On Board Payload for Micro and Nano Satellites

On Board Antennas for Aircrafts

Satellites Antennas

Multibeam Stearing Antennas



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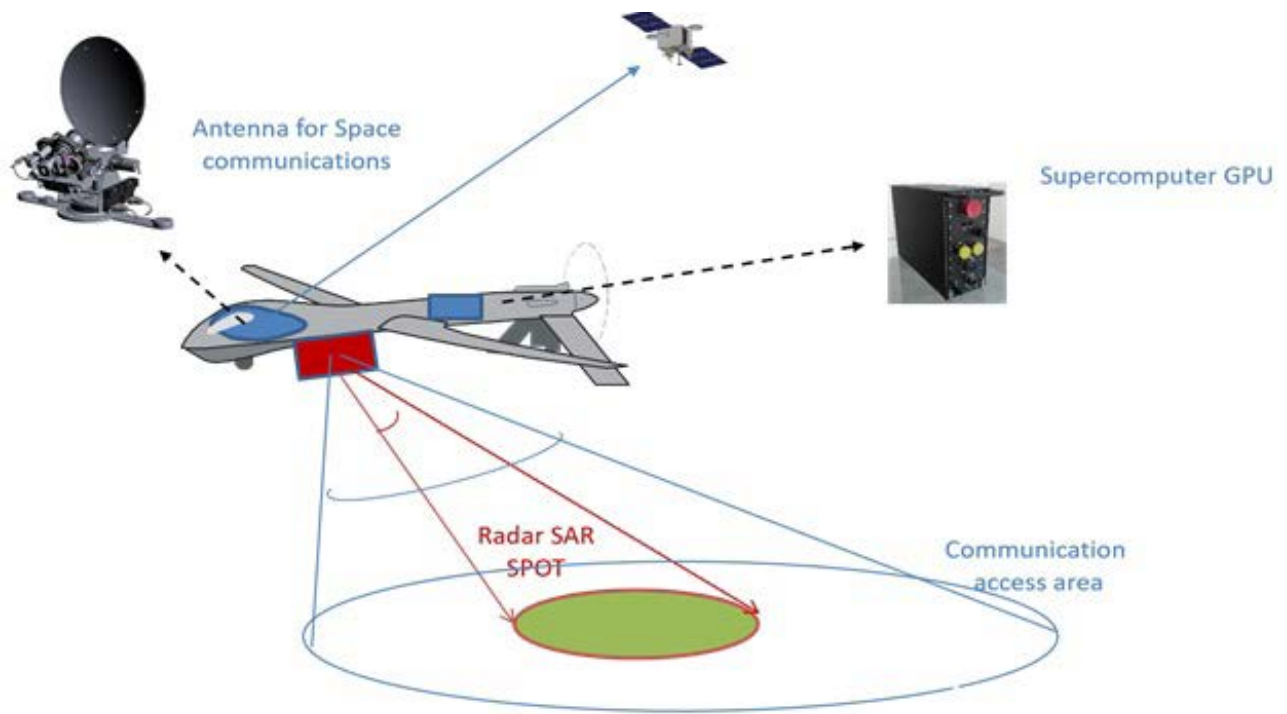
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# INNOVA Consorzio per l'Informatica e la Telematica Srl

## Company profile

INNOVA Consorzio per l'Informatica e la Telematica Srl is an Italian SME founded in 1989 by three successful local ICT companies. INNOVA is geared mainly towards the space sector, and more specifically towards the Earth Observation sector. The main remote sensing technology on which the company operates is the processing of satellite images acquired with Synthetic Aperture Radar (SAR) used in various civil and military related applications, primarily for monitoring and control of the territory.

Over the last few years the company has also invested in the infomobility sector, focusing on systems that use GPS satellite navigation and of course, ESA's future GALILEO

We count today with 17 highly qualified professionals and over 15 years as partner of Leonardo (ex Finmeccanica) within the COSMO-SkyMed programme.

## Products | Services | Applications | Technologies

INNOVA has had and continues to have a major role in the COSMO-SkyMed programme, the largest Italian investment in Space Systems for Earth Observation, commissioned and funded by the Italian Space Agency (ASI) and the Italian Ministry of Defence (MoD) and conceived as a Dual-Use (Civilian and Defence) end-to-end Earth Observation System aimed to establish a global service supplying provision of data, products and services compliant with well-established international standards and relevant to a wide range of applications, such as Risk Management, Scientific and Commercial Applications and Defence/ Intelligence Applications.

Within the programme, INNOVA has been involved in the analysis and prototyping of the focusing algorithms for the StripMap and Spotlight acquisition modes to generate Single Look Complex, Multilooked, Detected, Ground Projected and/or DEM Projected images.

Highlight of said experience is without a doubt the design and development of the processor to focus very high resolution data acquired in Spotlight acquisition mode, of great interest for civil, but mostly, military defence applications.

Currently, the Second Generation programme is underway, which will put another 2 satellites with improved, more advanced electronics in orbit from the second half of 2019.



## Contact

Recinto Il Fiorentini, 12/21

Matera MT 75100

Andrea Di Pasquale

CEO

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# Intelligentia S.r.l.

## Company profile

Intelligentia was born as the result of the collaboration between Balance Systems Srl, a company operating in the manufacturing sector since 1975 (production of balancing machines and auxiliary systems for process control), and University of Sannio, an important research center in the heart of Campania region in Southern Italy.

Intelligentia has been listed as an Innovative START-UP according to the Italian Law (art. 25, comma II, D.L. 18 October 2012, n.179) up to December 2015, and currently is officially listed as Innovative SME according to the Italian Law (D.L. 3/2015) in the Italian Business Registry.

In December 2018 Intelligentia acquired the control of Emmedidue S.r.l., now Intelligentia Electronics S.r.l., an engineering company highly specialized in electronic design. Intelligentia Electronics offers advanced consulting in engineering and innovation to meet the needs of customers with turnkey systems. Intelligentia Electronics can boast of many years of experience in design of both analog and digital electronics using the most innovative technologies such as latest DSP, FPGA and A/D conversion processors generation. The field of application of Intelligentia Electronics products and expertise vary from Aerospace to Automotive to Industrial to Green Energy.

The persistent research for innovative technologies & methodologies and the subsequent utilization in industrial and aerospace markets are our leitmotif. All mixed with the enthusiasm of a competent, motivated, and highly specialized group of professionals.

For instance, we examine the technological solutions provided by the research community for the management, processing, and storage of huge quantity of data. The latter, when properly elaborated, can be used by our customers for improving their products and increasing their business opportunities.

Intelligentia invests a significant budget in internal R&D with the aim at identifying new needs, and in developing prototype solutions. Once converted into industrial products, our customers can take advantage of them, for instance, to reduce their time-to-delivery and increase the quality parameters of their services.

## Products | Services | Applications | Technologies

Focused on our R&D activities and prototypes, our products are based on the most reliable and cutting-edge technologies available on the market.

The application contexts can vary from general purpose Information Systems to very specialized tools for specific customer needs, including hardware and firmware design for embedded systems.

Intelligentia delivers solutions and products to different Market segments, that is to say, the Aerospace, Finance, and Industrial contexts.

In particular our expertise can be grouped into the following areas:

On board software development : design & development of critical on-board SW running on space qualified on-board computers. Development of the Packet Utilization Standard C library (ESA project).

On board software testing: full-blown SW Verification and Validation, covering the entire V-model: SW Unit Testing, SW Integration Tests, SW TS Validation, SW RB Validation, and Acceptance Tests.

Satellite Configuration & Calibration Database, customizable for different satellite platforms.

Satellite Assembly, Integration, and Testing activities, especially in the context of functional chain verification.

Ground software: Design and development of fully integrated Rich Internet applications compatible with the most common cloud platforms. They are based on the REST/SOAP services layers to enable third Party integration. Most of the developed software



## Contact

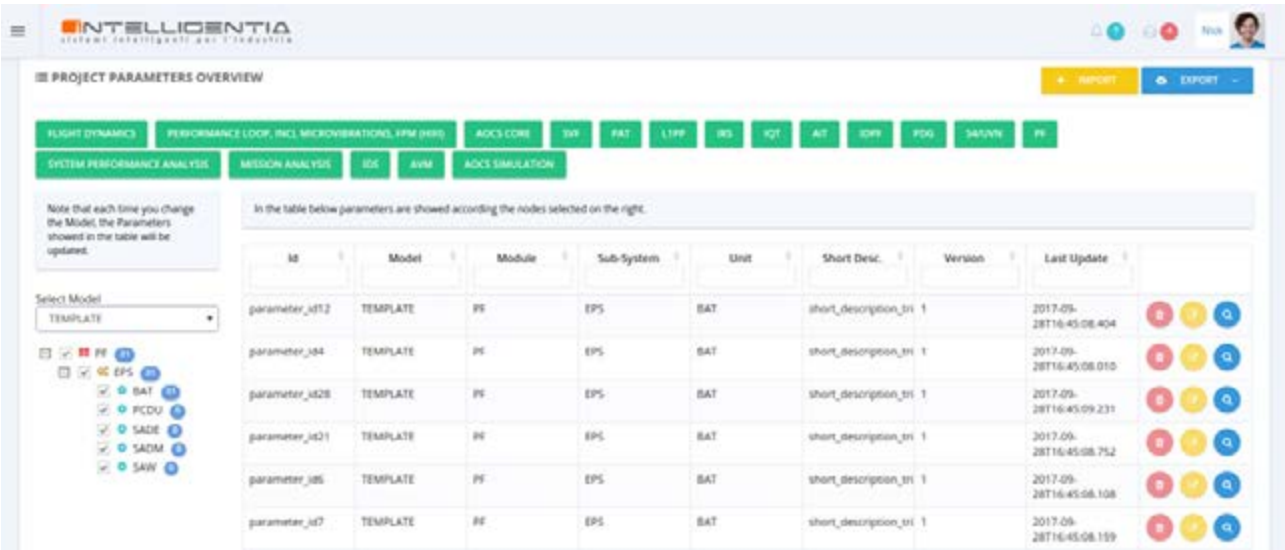
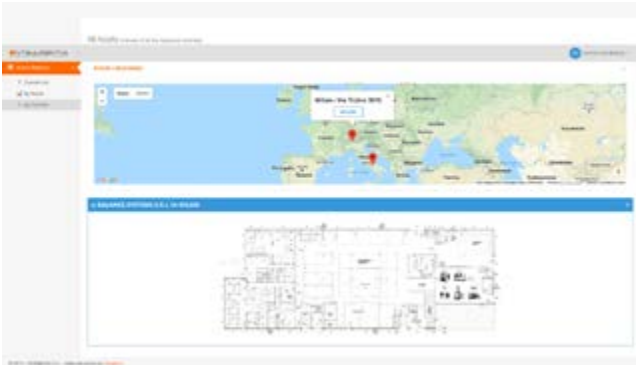
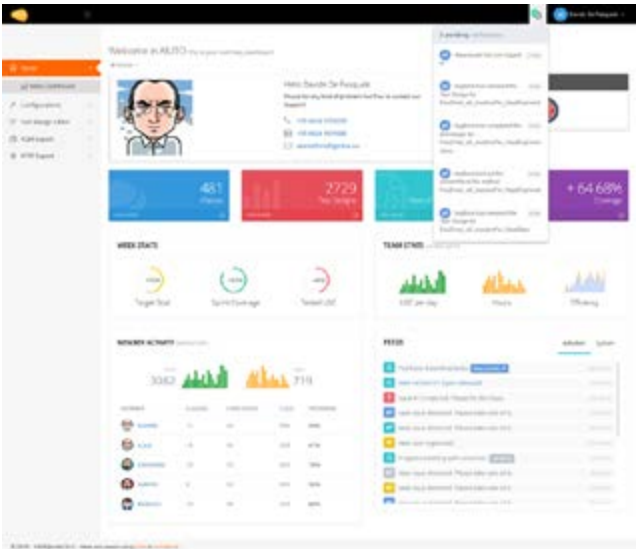
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applications have a common technological core based on our platform ELISA (Enterprise Light Information Systems Architecture), which offers the possibility to deliver very stable and long term supported applications in particular for private and hybrid cloud.

Industry 4.0 and IoT: Intelligientia develops and delivers fully integrated solutions and enabling technologies for the Industry 4.0 systems, such as Big Data, IoT, Cyber-security, Cloud Computing, and Simulation. Real-time processing of live data from Industrial plants, also integrated with satellite downstream data, are used to deliver innovative services such as assets monitoring and locating, production and quality KPIs monitoring, preventive and predictive maintenance.

Electronics, sensors, and embedded solutions: motor driver design and implementation, algorithms for motor control, power electronics, digital electronics for signal analysis and elaboration, power transmission contactless systems, radiofrequency circuits, Sensor and actuator design and customization (accelerometers, eddy current, acoustic emission, inductive, Hall effect).



## Company profile

IMT Srl is a private company, founded in 1991 and active in the Space sector on three main types of activities:

- Systems Engineering: Design and Development of Nano/Microsatellites and relevant On-board units for space commercial, scientific and defense applications.
- Parts Engineering: Characterisation and Testing of EEE (Electrical, Electronic, Electro-Mechanical) parts.
- IoT solutions: Development of IoT Solutions for Smart Cities, Environmental Monitoring and Agriculture.

## Products | Services | Applications | Technologies

### SATELLITE PLATFORMS:

- ERMES Cubesat 3u
- HORTA Cubesat 6u
- NADIR Nanosatellite
- EOSS Cubesat 6u

### SATELLITE SUBSYSTEMS:

- Nanosat X-Band Transponder
- Cubesat/Microsatellite C-Band Transceiver
- IMT uSADA (Solar Array Drive Assembly) for Cubesats 3/6/12u
- KA-Band Transmitter
- S-Band Transceiver for Small Satellites
- Cubesat OBDH (On-board data handling)

### EEE PARTS TESTING ACTIVITIES:

- DPA (Desctructive Physical Analysis)
- Failure Analysis
- Construction Analysis
- Re-Life Test
- Environmental Testing
- Upscreening
- Radiation Testing (TID, SEE, Displacement)

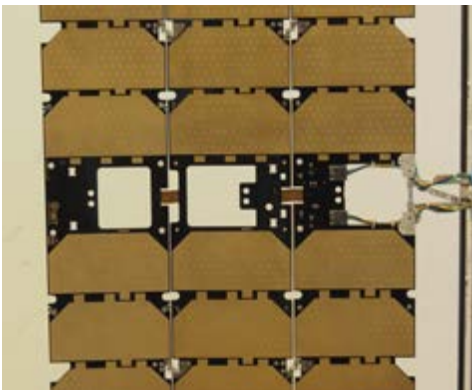
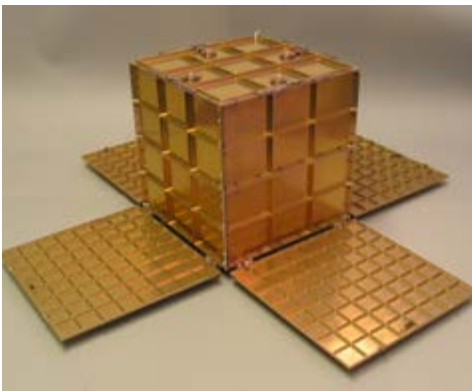


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# Interconsulting S.r.l.

## Company profile

Interconsulting S.r.l. is an Italian Systems Engineering SME, focused on aerospace and defence solutions of high technological value. Its core business lies, among others, in the development of Safety and Mission Critical turnkey solutions. Participation in both national and European R&D projects (e.g. CleanSky2 programme) gives its products a high added value.

## Products | Services | Applications | Technologies

### 1. BEP-1553 FEE

This activity was performed for TAS-I client. InterConsulting has performed porting and new development activities of TASI BEP-1553 SW to make it compliant with the new MIL-STD-1553B HW Device (AIT boards instead of AIM boards) adapting the device drivers and software interface with the drivers.

### 2. BRT-SIM FEE

This activity was performed for TAS-I. InterConsulting has been developing and providing to TASI a system (HW and SW) named BRT-SIM-1553 FEE devoted to test, simulation and analysis of data exchange with a Unit Under Test (UUT) over MIL-STD-1553B standard bus. BRT-SIM-1553 FEE SW also manages an Ethernet Interface to communicate with CCS. The overall test execution is controlled by the CCS computer that commands and synchronizes the operation of the other FEEs using the EDEN TCP/IP protocol, monitors their status and acquires the test result information.

### 3. Wizard FEE-SW

This activity was performed for TAS-I client. It consists of the development of a software component running on a test workstation with the aim of testing a mass memory support connected to the workstation via Wizard Interface. Test activities are based on both low level (Wizard) and high level (CCSDS) communication protocols verification.

### 4. IP Core

Design, Development and integration of a firmware component dedicated to the Virtual Channel Assembler / Multiplexer for FPGA Virtex5. For this component a set of different interface protocols have been implemented, based on CCSDS and SpaceWire protocols. All components are managed through a soft-core LEON2 via AMBA communication bus.

### 5. Remote Sensor Monitoring System

Software application to store and display data collected from GPS/EGNOS/GALIELO remote sensors net. The aim of the software is to demonstrate the capabilities of GNSS utilities for environmental monitoring of civil engineering and special structures (edges, buildings etc.). The central applications retrieve data from sensors storing them on internal database to make them available for post-processing and display on a 2D Raster Map. IC has developed both server-side components (GPS data collection, data pre-processing, pre-processed data archiving) and client-side components (data post-processing, data analysis, data graphical presentation, alarms management).

### 6. Web Portal for Ionospheric Prediction Services

WebClient-side application providing to the user a set of functionalities to monitor and retrieve data and statistics regarding ionospheric space weather predictions. The data are retrieved by client software through web services calls made available by Back-end application, collecting all data on database.



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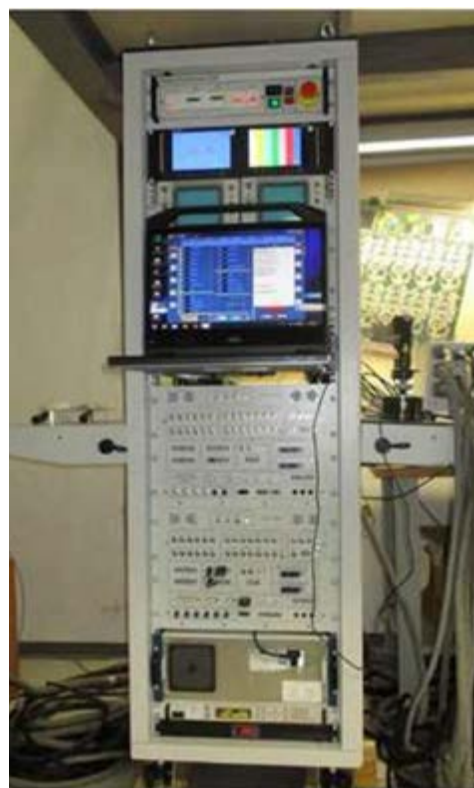
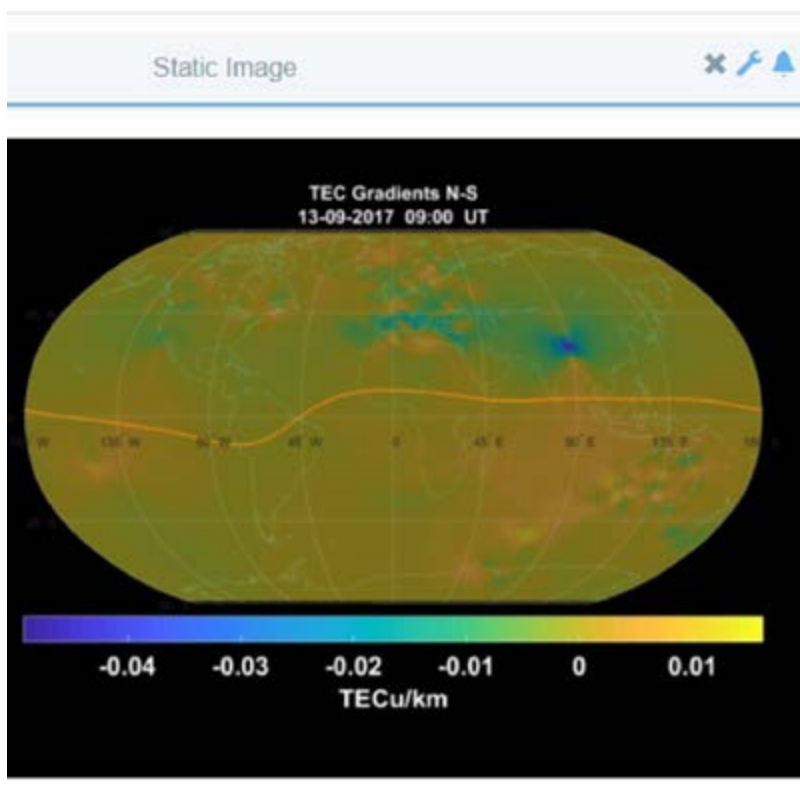
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# Iptsat srl

## Company profile

The Iptsat has long been engaged in the development of solutions for the management and monitoring of land and environment through interaction with the users community GIS (Geographic Information System) and Remote Sensing, providing high level of professionalism in all aspects relative to the use of these technologies and proposing solutions with high added value. The business sector in which Iptsat in 1987 initially concentrated its energies was that of GIS Geographic Information Systems, operating in developing applications for the management of geographic resources. Since 1996 Iptsat draws new life and economic planning from a corporate reorganization operated to meet the growing demand for remote sensing data and the need to create new GIS solutions to meet ever-changing technology. In 1999 Iptsat joined the Business Network of esri Italy, dealing with the sale, assistance and development of customized software ArcGIS. With the growth of its know-how, Iptsat pays special attention to training activities, offering training courses best suited to professions and businesses, with strong skills in computerized management of land and environment. From 2010 we are Rapideye (now Planet) partner.

## Products | Services | Applications | Technologies

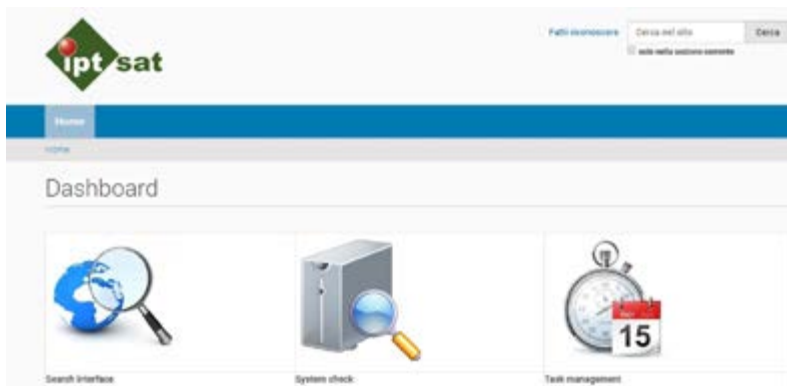
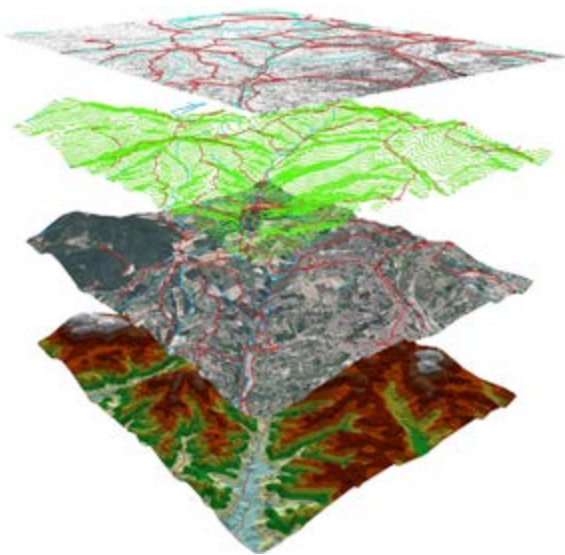
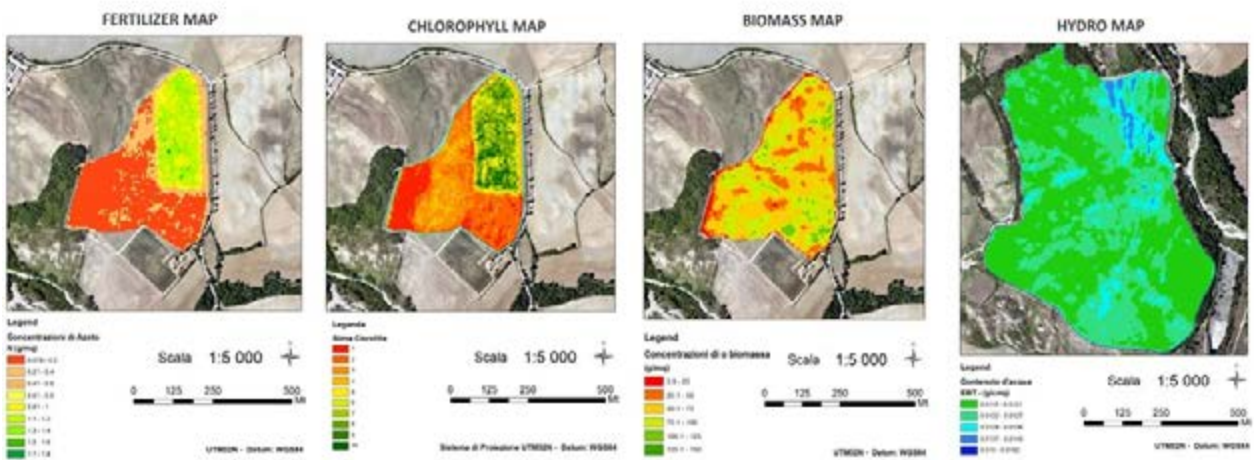
**CLOUD GIS AND CATALOGS** We offer all the commercial and open source solutions for publishing customer data through their servers either at our data center business, or through the clustering of the data, the optimization of databases and cataloging and dating of meta data according to the standards of the INSPIRE Directive. **VISTA** Web Planning tool (server side) for the download of Copernicus data with download connection rescue, ping control for new data (for long period monitoring), with easy user interface, with the possibility to make at the same time more download. **EOFARMING** main objective is to launch in the market an innovative Precision Farming service which targets small farms (average size between 5-30ha), addressing a clear user need, and to enter in the emerging market of commercial applications of EO downstream services in agriculture. The combined usage of GIS and remote sensing, for the development of a Webgis platform related to a geographic database; the use of an innovative algorithm derived from the 3 indexes NDVI, LAI and OSAVI developed by IPTSAT in collaboration with CRA for the production of 3 kind of maps simultaneously i.e. crop vigor maps, vegetation status maps, green leaf maps. The use of free data from Sentinel 2 and Landsat 8 as basic information in the realization of thematic maps, thus valorizing EU efforts in provision of open access data from satellites. **REMOTE SENSING** Iptsat has for years been engaged in the world of Remote Sensing • Distributing RapidEye satellite imagery, GeoEye, IKONOS, Aster, Landsat (7,8), Pleiades. • Carry out activities in remote sensing proximity via radio-controlled UAV drones • By providing remote sensing data processing and classification, i.e. analysis and interpretation of the images • Proposing solutions with high added value for the study and control of environmental resources, agricultural, and forest vegetation **Products:** Very High Resolution Data (RapidEye - 5mt); High Resolution Data (0,5 mt - 4mt); Medium Resolution Data (10mt - 60mt) **Value Added Services:** • Correctional services and preparation of satellite images; Change Detection and historical analysis; dem - stereoscopy; ctrn e dbt; orthophotomaps; maps of vegetation indices. **UAV Cartography:** w • Mappe No fly zones per SAPR GIS Iptsat has been for years engaged in the world of geographic information systems: • Dealing with the sale and support of the ArcGIS software, thanks to its membership in the Esri Business Network of Italy. Esri is a leading global provider of GIS software. • Land use planning, urban planning, infrastructure, public works and transport • Environmental monitoring, study and management of natural resources • Emergency and Safety • Tourism, Archaeology, Cultural Heritage and Landscape • Facility Management, Real Estate Management, Marketing • Utilities and Telecommunications • By creating and updating geographic databases based on geospatial information and technology • Esri and/or open source, both for desktop environments, and Web • Providing Geographical datasets, ready to be used in the context of systems and GIS applications



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# Issel Nord S.r.l.

## Company profile

ISSEL NORD, a Fincantieri company well-established on the market for more than 30 years, is specialized in providing a wide range of integrated logistics and product support services for civil and defence sectors.

ISSEL NORD's Engineering department is specialized in Integrated Logistics Support (ILS) analysis, which consists in collecting, analysing and processing all the information related to the life cycle of any complex system, in order to increase the predictability of the deterioration times of each individual component and optimize maintenance and replacement procedures to ensure maximum safety and efficiency.

ISSEL NORD's Information Technology department develops and produces powerful management software and multimedia solutions, using the most advanced technologies available on the market. Our flagship product, SIMPLICIO NXT, can integrate the ASD/AIA S-Series and the ADL SCORM® specifications in a single common source database, and it is already widely deployed in a number of national and international projects both in the military and civil sector.

ISSEL NORD's Translation & Interpreting Department can rely on a worldwide network of over 1,000 qualified translators, reviewers and DTP experts, as well as a suite of innovative translation management software, such as CAT tools and translation memory/terminology software.

ISSEL NORD currently has more than 180 employees. Our staff guarantees professional and high quality services.

Thanks to our fully-equipped warehouse, located close to Fincantieri's Shipyard in La Spezia, our company can handle a great number of goods, and ensure the right spare parts are delivered in the right place at the right time. Each year we manage more than 125,000 parts for a variety of naval vessels.

ISSEL NORD production processes - including software design - are certified to:

- UNI EN ISO 9001:2015
- EN 9100:2018

ISSEL NORD language services are certified to:

- EN ISO 17100:2017 (Translations)
- UNI 10574:2007 (Interpreting)

## Products | Services | Applications | Technologies

Technical Publications for the Defence Industry, as per ASD S1000D, ATA, MIL standards

- Aeronautical systems and equipment for military aircrafts and helicopters
- Naval systems and equipment for warships and submarines
- Naval and land-based weapon systems: small, medium and large calibre naval gun mounts, missile systems, battle tanks

Technical Publications for the Civil Sector

- Industrial plant systems
- Naval systems
- Rail systems
- Electronic and TLC systems

Logistics Studies

- Logistics Support Analysis (LSA) and LSA Record as per ASD S3000L and MIL-STD-1388-2B standards
- Reliability, Availability, Maintainability and Testability Analysis (RAM-T)
- Hazard and Safety Analysis
- Failure Modes Analysis (FMEA, FMECA)
- Life Cycle Cost Analysis Models (LCC)
- Level of Repair Analysis (LORA)



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- Reliability Centered Maintenance (RCM)
- Logistics calculation of spare parts, support tools and test equipment
- Initial Provisioning Lists (IPL) as per ASD S2000M standard
- Illustrated Parts Catalogues (IPC/IPD)
- NATO codification both for Italian and foreign material production
- Training Needs Analysis (TNA) and Training Plans

#### Simplicio NXT Integrated Authoring System

- ASD S1000D XML Interactive Electronic Technical Publications (IETP)
- SCORM Computer Based and Web Based Training Content (CBT/WBT)
- ASD S2000M Initial Provisioning Lists (IPL)
- ASD S3000L and MIL-STD-1388-2B Logistics Support Analysis Record (LSA-R)

#### IETP Visualization Systems

- Web based and stand-alone IETP Browsers
- Custom Services for IETP and LSA-R Production

- S1000D Guidance Documents
- Business Rules Exchange Data Modules (BREX)
- Applicability Data Modules (ACT, CCT, PCT)
- HTML and PDF Style Sheets
- LSA-R Import & Export Tools

#### MRO Software

- Logistics configuration breakdown management
- Parts list management
- Maintenance procedures management
- Spare parts, tools, consumables and skills management
- Preventive (periodical and on condition) maintenance scheduling
- Store keeping management
- Technical documents integration
- Graphics, reporting and accounting

#### Multimedia Applications

- 2D and 3D animations on assembly and disassembly procedures, graphic illustrations, flow animations
- Virtual Reality and Augmented Reality applications
- Commercial and promotional presentations and video contents

#### CAD & Desktop Publishing

- 2D and 3D models
- Exploded views
- Functional and wiring diagrams
- Composition of publications according to specific formats and applicable standards

#### Spare Parts Management

- Definition and sizing of the required spare part sets
- Goods purchasing
- Packaging, Handling, Storage and Transportation (PHS&T)
- Test and validation
- Delivery

#### Training Services

- Familiarisation systems
- Computer & Web Based Training (CBT/WBT)
- Training Courses for operators and maintainers

#### Language Services

- Translation of technical manuals, spare parts catalogues, contracts, marketing and advertising documentation, legal translations, authenticated expert reports, websites
- Localisation of documents, websites and publications
- Translation Memory with company-specific terminology
- Controlled Natural Languages
- Transcription
- Interpreting services



# Italconsul S.r.l.

## Company profile

ItalConsul is an engineering services enterprise. Its Core Business is Logistics Engineering, in particular the R.A.M.S. (Reliability, Availability, Maintainability, Safety), as support for the Design of Systems and Equipments.

ItalConsul offers Logistics Engineering services providing its customers with continuous support in the various phases of the product life cycle: definition of requirements, design, implementation and technical assistance.

Decades of experience gained in RAMS Analysis led ItalConsul to develop its ability to Design in the fields of Mechanical, Electrical, Electronics Engineering (Machinery and Equipment), Software and Assessments.

Moreover, ItalConsul extended over time its skills to simulations by software, such as Finite Element Analysis, Multi-domain and circuit simulations, too. The work-areas of ItalConsul concern Aerospace, Naval, Railway, Defence, Power Plants and manufacturing. ItalConsul employs Human Resources with long experience, gained over decades. They work in symbiosis with young talents, supported and trained constantly to highly advanced projects.

Then ItalConsul is engaged in Research & Development activities. Among its results it includes three patents, seventy scientific publications (also in prestigious journals) and the realization of RelySoft®.

RelySoft® is a software that automates a methodology conceived to calculate the probability involved in the Physics of Failure (PoF) approach. It can be used for Reliability Prediction in order to overcome the limitations of the traditional reliability prediction methods (like MIL-217 or NPRD approach) but not only for this. Italconsul has been using Relysoft® for more than 20 years for railway and aerospace applications.

## Products | Services | Applications | Technologies

The following are some analyses that Italconsul provides for its ILS services.

Reliability  
FMEA/FMECA  
FTA/Event Tree/HAZOP  
Maintainability  
Availability  
LCC and LORA  
Safety  
Hazard Analysis, Hazard Log  
SIL Demonstration  
RCM  
Manuals  
Logistic Support Analysis Report LSAR  
FRACAS  
Testability  
Databases  
Training

Italconsul can also integrate the above traditional logistics analyses by means of Relysoft tool in order to deal with reliability problems that otherwise would not be tractable with traditional reliability methods. RelySoft® automates a methodology based on the failure-oriented approach, developed and applied for many years by Italconsul, mainly in the aerospace and railway sectors. Relysoft® does not need a considerable number



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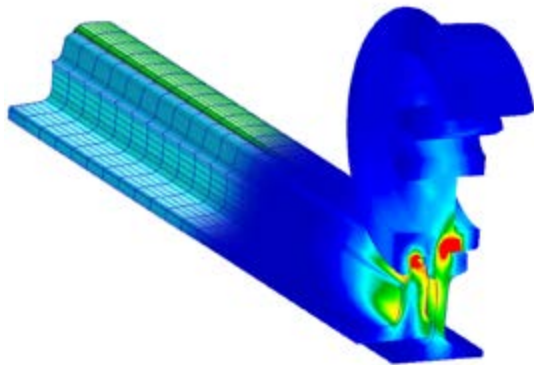
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of tests on physical samples in order to quantify the generic failure of the component in time, but analyzes the process underlying the fault and the value and the uncertainties of the quantities involved in the process itself. It is able to assess the probability that this component will fail.

Relysoft is suitable to be used not only for the reliability prediction, but also to perform a Probabilistic Design, in order to:

- Calculate probability of success of a physical process
- Assess the importance of the uncertainties in a process
- Reduce the over-sizing
- Fit design changes (prototype)
- Evaluate the reliability of a process/component over the time
- Determinate the end of life of a component/system
- Establish the time to perform preventive maintenance, reducing the necessity of predictive maintenance
- Estimate the cost of warranty

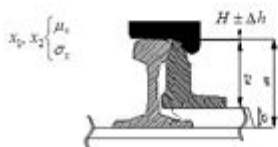


$$y = \Psi(x) = \frac{x_1^{a_1} \cdot x_2^{a_2} \cdot \dots \cdot x_n^{a_n}}{x_1^{b_1} \cdot x_2^{b_2} \cdot \dots \cdot x_n^{b_n}}$$



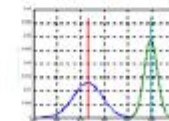
- Model:
- Closed-Form Analytical Solution
  - Finite Element Simulation
  - Circuit Simulation
  - ....

- Input:
- Component / System / Process Data
- rated value
  - uncertainties about rated values (Tolerances)



- Output:
- Reliability of the Component / System / Process

Reliability = 99.99 . . %



- Degradation Material Laws





# Italspazio Srl

## Company profile

Italspazio is a telecommunications company, established in 2005, specialized in design, development and support of systems, products, solutions and hi-tech services. The company's services are aimed to customers in the purview of software and automation, defence, professional communication and ICT. The company provides satellite capabilities to enable the customers to use Internet in areas with no terrestrial connectivity, to broadcast events and to bring GSM coverage to areas affected by natural disasters such as earthquakes, floods, etc. Moreover, the company provides solutions that can detect via satellite the positions of mobile vehicles located in areas with no GSM/UMTS coverage. Italspazio is a perfect blend of experience and innovation: his staff is formed by a team of engineers with ten-year experience and a group of young engineers who are constantly engaged in the research and development of innovative solutions and innovative projects, such as those based on satellite remote sensing. Using Earth Receiving Stations, designed and manufactured by Italspazio, and specifically launched satellites for tracking our planet, Italspazio works on research and development projects that allow to continuously detecting and monitoring the most important phenomena characterizing planet Earth such as pollution, deforestation and so on.

## Products | Services | Applications | Technologies

Aramis project is relative to planning and development of a fleet of Cubesat, a kind of microsatellite whose fulfillment cost is inexpensive. The satellite constellation main purpose will be planet earth observation in Mediterranean and North African basin. The gained data will be transmitted to a geostationary satellite, which in turn will transmit to a gateway. The satellites will be able to communicate with each other, to gain the largest number of information. Moreover the satellite will be multi-application, such as TLC, navigation, SAR RF, SAR Optic and so on. Satmonitor is a user-friendly web platform developed by Italspazio, that provides real-time VSAT Monitoring that grants the end user a comprehensive overview over connected assets. The platform is optimized for cross-platform and can be accessed from tablet, smartphone and desktop. The scope of the platform is to provide live tracking solutions for either fixed or mobile stations. The tracking is visually represented by color-coded markers displayed on geographical mapping software powered by Google. Additionally, the platform has also been designed to integrate essential services such as real-time remote sensing (Weather reports) and technical satellite data (Coverage, Latency & IP Traffic data) for control and security purposes.

Same as Satmonitor is Sat-tracking, which as been developed for mobile stations.

Italspazio provides Satellite Internet Connectivity Services, collaborating with different satellite operators and teleports, provides bundle VSAT services on different platform and on different satellite. The VSAT allows a wide coverage and the ability to reach those countries whose infrastructures are underdeveloped, and also provides satellite coverage in rural areas where there is the need to constantly monitoring solar parks and the operation of the plant, and to make video surveillance. Italspazio offers a wide range of maritime services. The coverage is obtained using capacity of a selected fleet of satellites, allowing an extended coverage throughout Europe and Caribbean. The maritime services are operated from satellite fixed antennas devoted to track the relevant satellites, using dedicated bandwidth. The Italspazio NOC is operative 24/7. The correct functioning of all services, infrastructure and systems is guaranteed by a monitoring system that allows timely action against any problem. The operational structure is composed of technical experts for monitoring of major hardware / software platforms, applications and network services, and a team of certified engineers on systems that operate at the application infrastructure level. The highest level of technological equipment with backups needed for continuity of service are available. The NOC then responds effectively to the needs of organizations that rely heavily on their own internal procedures and on computer applications and that want to make use of assistance from specialized personnel, constantly updated, without having to

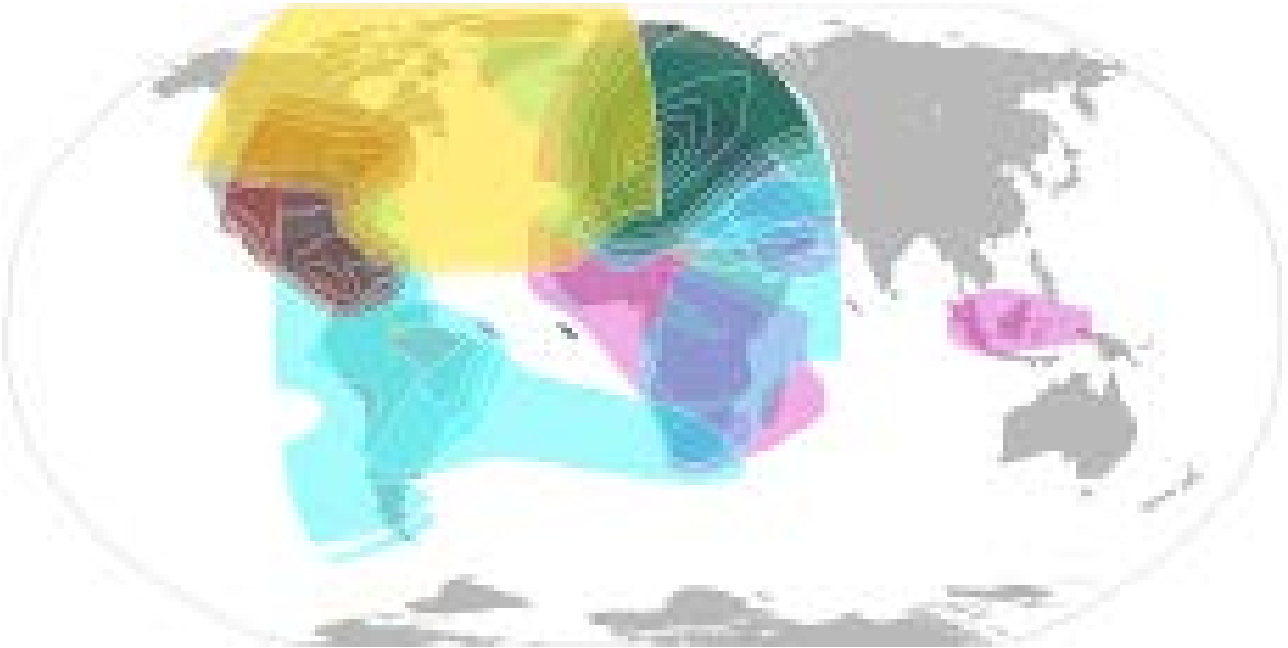
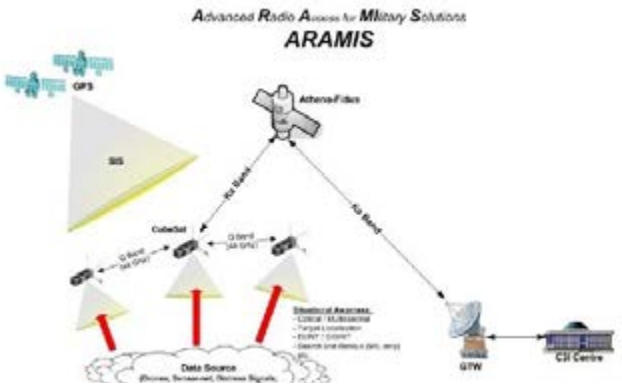


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commit internal resources. Through the constant monitoring and support activities of specialists, the constant control of the proper functioning of the systems and the full usability of applications is in fact guaranteed. This allows to minimize any kind of “failure” and minimizes the out-of-service time. Every customers request in fact is handled in real time, allowing to guarantee the shortest solving time.



# Kayser Italia Srl

## Company profile

Kayser Italia is a Small Medium Enterprise (SME), a private independent aerospace system engineering company, owned by Dr. Valfredo Zolesi's family. It has been incorporated in 1986, and since 1995 it is 100% Italian property. The company is located in the countryside of Livorno, in the region of Tuscany, 20 Km south of the international airport of Pisa and 90 Km from Florence. In a modern building, the company has 5,000 sq. meters of property, organized into offices, meeting rooms, conference room, laboratories, clean room, manufacturing, inspection and integration area, and an User Support Operation center (USOC) for the support to the execution of experiments with astronauts on board the ISS. Since the beginning up to now, Kayser Italia has participated to over 70 space missions with more than 110 payloads, all of them completed with full scientific, technical, economic and programmatic success. The staff consists of over 60 high-specialized engineers, with expertise in electronics, aeronautics, mechanics, thermodynamics, physics, computer science, optics and molecular biology. Their design and manufacturing capabilities, joined with a deep engineering background, have allowed the participation of the company as both prime-contractor as well as sub-contractor to many European Space Agency (ESA) and Italian Space Agency (ASI) programmes, especially in the area of life science (biology and human physiology). The payloads developed by Kayser Italia have flown on sounding rockets, on the Russian capsules Bion, Foton, Progress, Soyuz, on the Shuttle Transportation System (STS), on SpaceX, on the Japanese HTV module, on the European ATV module, on the Chinese Shenzhou spaceship and on the International Space Station (ISS). Kayser Italia supports grants and partnership programs with universities and research institutes and is actively involved in the promotion of the integration process between large and Small Medium Enterprises working in space.

## Products | Services | Applications | Technologies

### PRODUCTS:

- Bioreactors, Experiment Containers, Incubators, etc. for biology experiments
- Bio analysers
- Instruments, devices and consumables for human research experiments
- Experiment hardware for physical and material science research
- Payloads and associated control electronics and software
- Electronic equipment (power conversion and distribution, control, data acquisition, etc.)
- Structures and deployable systems

### SERVICES:

- Project Management
- Space system engineering
- Electrical and electronics design
- Manufacturing of electronic circuits and harness
- Structural, mechanical and thermal design and analysis
- Software design and implementation
- System Assembly, Integration and Verification (AIV)
- Product and Quality Assurance, Safety
- Support to ISS on-board astronaut operations by means of dedicated User Support Operation Centre (USOC) and certified personnel

### TECHNOLOGIES:

- Deployable space structures based on tensegrity technology
- Miniaturised deployable boom (Cubesat standard)
- Wired and wireless on-board sensors and actuators network

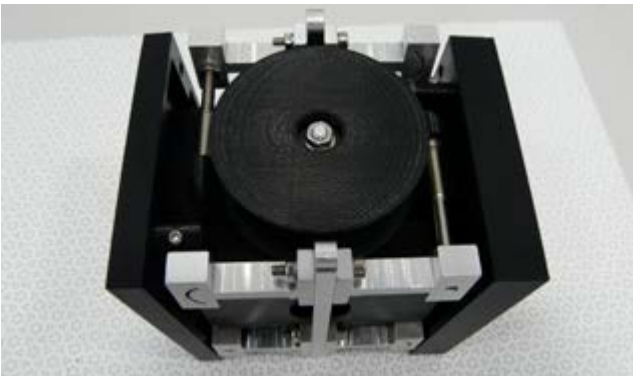
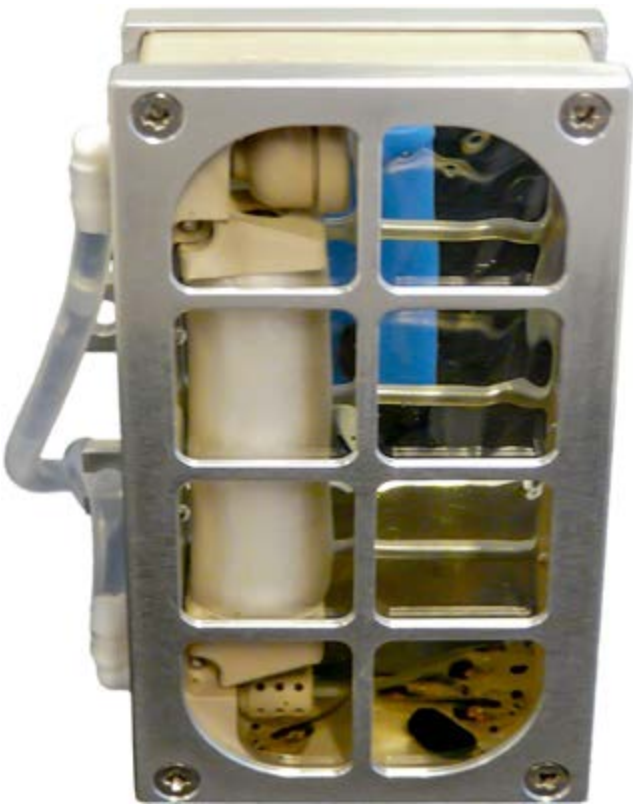
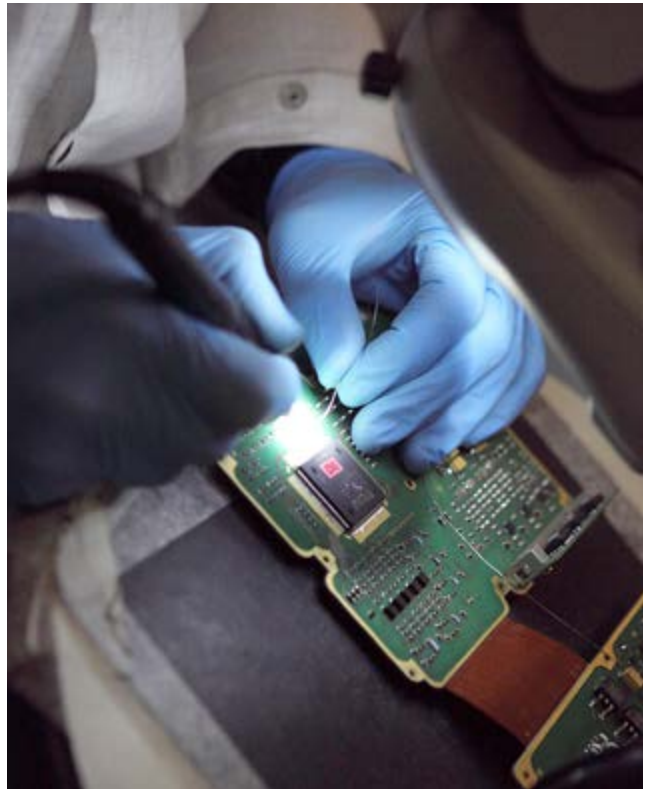


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# Kell s.r.l.

## Company profile

Kell srl is an innovative Italian ICT SME located in Rome, Arezzo and in Gualdo Tadino, near Perugia (operative sites), Italy. It is fully owned by private shareholders.

Kell has over 20 years of experience in space sector developing SW and HW integrated platforms in the field of e-health, telemedicine, e-government, Earth Observation, GIS and navigation systems.

Kell constantly invests in R&D to pursue its vision: "facilitate the day-by-day life through ICT, make it easy, usable". This is pursued by means a continuous innovation process, a strong investment in human resources and collaborations with Scientific organisations as Universities, public and private Research centres.

The team is formed by young researchers and technicians, with strong and focused skills on ICT solutions, informatics, software engineers, electronic engineers, physicists, engineers, electronic, oceanographers, economist who form dynamic and multidisciplinary group engaged in R&D and services activities performed for international and national Public Bodies and private organizations. The team is formed by a fixed group of managers, researchers and technicians and a broader network of professionals with multidisciplinary skills.

Kell has been involved in EU / national funded trans-national programs as prime contractor, lead partner and partner. Kell has also been prime contractor of the European Space Agency (ARTES Programme) and Italian Space Agency projects to develop new SatCom services for e-Health (KosmoMed, TeleSal, NESA, etc.).

Kell internal organization aims to satisfy its customers in respect of its quality system and certified procedure (ACCREDIA and KIWA).

- UNI EN ISO 9001:2015 for the sector EA 33: "Design, development, implementation, technical installation of SW platforms and systems for tele-medicine, Earth Observation and navigation for telecommunications";
- UNI EN ISO 13485:2016 for the "design and development, implementation, technical installation and assistance of SW medical platforms and systems for the tele-medicine".

Main technologies and skills are:

- Information Technology: web platform and mobile solutions for e-Health applications;
- Earth Observation: Kell designs and develops software systems for telemetry processing and production and processing of remote sensing images, optical and SAR, archiving and distribution of data and quality control fusion and geo-location for smart agriculture, water and land management;
- Navigation

## Products | Services | Applications | Technologies

Satellite Telecom supports ICT / SW open source web platform, tested in healthcare organizations, to provide and manage the classical e-health services as tele-counselling, tele-consultation, tele-diagnosis, tele-emergency, screening campaigns services, electronic medical records, plus the tele-validation service, that is especially delivered to CRO and pharma companies to raise the performance of management of clinical trials.

During last years, Kell has established a leadership position in the development of telemedicine systems; enhancing technological innovations in the ICT field that can be used in the health sector to improve the efficiency and increase the quality of health processes, in all the different contexts of their "value chain" such as prevention, emergency care, maintenance of own well-being - wellness, family support, clinical and epidemiological studies. Along with some of the major Italian companies, it has developed the largest telemedicine programs especially some of them based on satellite communications for mobile telemedicine.



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Some examples of applications and tools deployed are:

- KosmoMed: SW/HW integrated system for satellite tele-medicine to support high quality video-conference and medical data exchange in all kind of medical branch;
- Mobile Ambulatories (by land and sea): with advanced diagnostic equipment and satellite solutions for screening campaign, clinical investigations, etc.

Kell operates in the Earth Observation since 1997, as service provider for Public and Private organisations, developing and implementing. The use of Satellite technologies, the integration with other sources to collect data (aero-UAV, ground sensors), the use of open standards to design and perform ICT applications and solutions, are at the core of the innovation strategy of Kell. Some examples of applications and tools deployed are:

- WAGRIT: a SW tool for the land and agriculture monitoring that able the classification of vegetation
- AIRFIRE: Satellite and Hyperspectral images monitoring campaign to assess and alert in case of fire
- MIA-VITA "Mitigating and Assessing Volcanic Impacts on Terrain and human Activities", an integrated tool to assess and manage the volcanic risk for human
- ITACA (Innovation Technologies and Applications for Coastal Archaeological sites), a tool using satellite techniques, remote sensing, special algorithms from marine movements, to identify sub-marines archeological sites and support the management decisions of public authorities.
- MEMORIES (marine MEteo MOdelling for weather Routing Enhanced by Satellite navigation and wave radars), The project developed a prototype of a meteo-navigation on-board terminal and the related service center, to support weather route planning processes (i.e. route planning based on weather conditions to improve efficiency, comfort and safety of navigation).





# Labormet Due

## Company profile

Labormet Due is one of the most solid commercial structures in Northern Italy in the field of scientific instrumentation for the laboratory and quality control.

The company supplies tools and related consumer products for the control and characterization of related materials, from the stereo-microscope to the 200-ton traction machine.

The real added value of the service offered lies in decades of experience and in the acquired professionalism that allows us to offer customized technology solutions based on customer needs and turnkey laboratories for the solution of any problem relating to the control of materials in the entry, to control production and generally improve quality.

Labormet Due guarantees for all the equipment supplied: installation and training of personnel, after-sales assistance, requalification, and certification.

At the same time, Labormet Due has its metrology and industrial computed tomography laboratory.

Reverse engineering, evaluation of the porosity, internal control of the defects are just some examples of what the tomographic technique can offer.

Typically the purchase of this instrument scares users for its costs and the management and logistical costs that it entails, the offer of the service quantifiable in "projects" or overtime represents an ideal solution both for customers who have continuous requests for analysis and sporadic customers.

In this field, the company has been able to work for various leading companies in the space sector, which more and more often require advanced control techniques to guarantee the highest quality in products of high technology, innovation, and economic value, for example, components additively manufactured.

## Products | Services | Applications | Technologies

Quality Control and material characterization products:

- scanning electron microscopes SEM, Micro-analysis EDX, WDX, EBSD, atomic force microscopes AFM, scanning acoustic microscopes SAM, x-ray diffractometer XRD, x-ray fluorescence spectrometer XRF
- systems for industrial x-ray computed tomography
- machines for test traction, compression, and resilience testing and other static mechanical tests
- specific instruments for the control of physical and mechanical characteristics of the rubber
- bench hardness testers HV HR HB, universal, portable hardness tester
- chemo-mechanical durability, fingertip & hand abrasion testers, multi-functional and high dynamic scratch/punch/abrasion testers, universal surface testers, 3D optical measurement systems, micro-cal tests for wear and coating thickness testing
- stereoscopic microscopes, optical and confocal, digital cameras, image analysis systems for metallography and cleaning control details
- furnaces and heat treatment plants
- optical 3D measurement machines (non-contact), roughness, profilers, roundness
- machines and consumables for the preparation of metallographic samples
- resonant testing systems and machines for dynamic materials testing
- development of leading software for the analysis and visualization of industrial computed tomography data
- climatic chambers, rooms for corrosion tests in salt spray, heat treatment furnaces for environmental simulation equipment in general



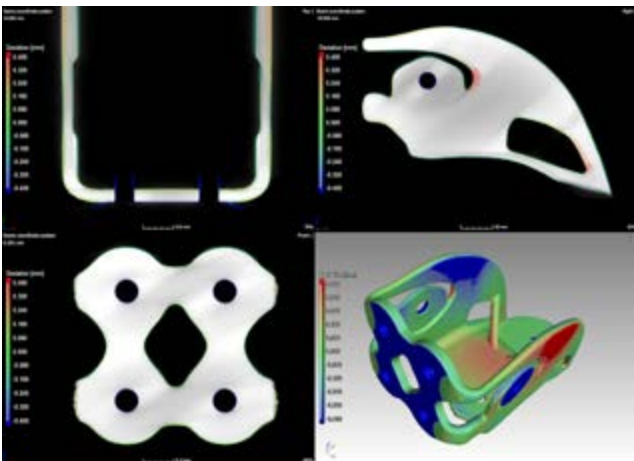
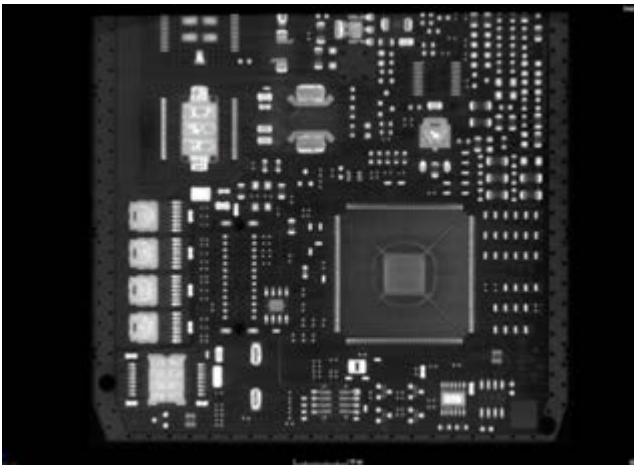
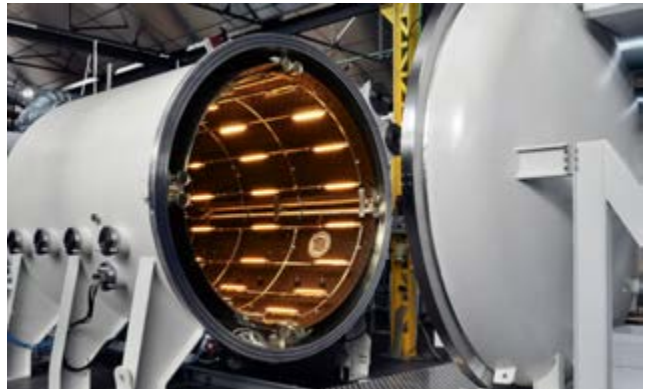
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Industrial X-Ray Computed Tomography Services:

- Failure analysis
- 3D metrology
- Reverse Engineering
- Defect Analysis
- Product Contamination
- Electronics inspection
- Assembly verification
- Weld quality analysis



# Leaf Space S.r.l.

## Company profile

Leaf Space S.r.l. is a high-tech company that offers dedicated services for microsatellites operators. Born as a natural evolution of a close-knit relationship between its founders and the fruitful cooperation with both research and commercial partners, Leaf Space develops products and services to simplify the access to space for commercial, scientific and exploratory purposes, by tackling the unmet needs of the microsatellites sector. Leaf Space offers turnkey solutions for microsatellites' operators tailored to their specific requirements. Leaf Space wants to streamline the accessibility to space by designing and developing dedicated products and services to enhance the process of using space in commercial terms over the scientific and exploratory ones already gained. Leaf Space delivers a set of services for micro and nanosatellites, including telecommunication services and custom telecommunication products.

## Products | Services | Applications | Technologies

Leaf Space provides complete Ground Segment services for the New Space market. Leaf Line is a unique multi-mission ground segment as-a-service solution, completely owned and operated by Leaf Space. A network of 12 ground station sites (at regime, in Q4 2020) and a strong software infrastructure are the base of the service, which can manage and optimize requests from different users. The GSs time is shared between different customers and missions using a high efficiency scheduling algorithm, optimizing the GSs use while satisfying the customer's constraints. From the operations point of view, Leaf Space will carry out all the activities and management of the ground segment, therefore the customer will have the important advantage of focusing more on his own core business. To interact with the Leaf Line network, our customer can use a dedicated API and a real-time data transfer interface through which a proprietary control centre or ground segment manager software can be integrated. Leaf Key is an exclusive Ground Segment as a Service solution created for satellite operators and space service providers who need a custom and dedicated way to operate their space assets.

Based on a similar technology and infrastructure as Leaf Line, Leaf Key is tailored on the mission needs both from the performance and operations point of view. The deployment of the network backbone follows the development plan of the customer constellation, guaranteeing the right performance at the right time.

In addition, Leaf Key can be paired with Leaf Line to balance peak loads or to increase the support to the customer's mission.

From the operations point of view, Leaf Space carries out all the activities and management of the ground segment, therefore the customer will have the important advantage of focusing more on his own core business.

To interact with the dedicated network, customers can use an API and a real-time data transfer interface through which a proprietary control centre or ground segment manager software can be integrated. Leaf Space also provides LEOP (launch and early operations phase), anomaly resolution, back-up, capacity boost, consultancy services and ground station provision for New Space market players.



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# L.M.A. s.r.l.

## Company profile

Over 50 years of experience in the Aerospace Market, LMA is today a leading global supplier of complex assembled components to the most important Space Customers. A whole set of in-house capabilities and a strong Research & Development enable LMA to offer cutting edge processes (from the detailed-design up to the delivery of the final product) and provide ground-breaking innovation solutions to its customers.

The Company excels at being a Tier 1 Integrator filling the gap between the main Customers and the traditional Subcontractors by integrating the supply base.

By investing in a significant R&D budget, the Company is building its future competitiveness by focusing efforts in the development of the innovative additive manufacturing technologies.

4 fields of excellence:

- Machining (Aluminum, Titanium, Steel, Inconel, etc..)
- Sheet Metal Forming (Aluminum, Titanium, Steel, Inconel, etc..)
- Additive manufacturing (plastic and metal)
- Expertise (NCM, Mechanical, Metallurgical, etc..)

## Products | Services | Applications | Technologies

INTERNATIONAL SPACE STATION

MULTI PURPOSE LOGISTIC MODULE (MPLM)

Liquid Nitrogen distributor to refuel the space station.

Manufacturing of key components, assembly and final control.

INTERNATIONAL SPACE STATION

MULTI PURPOSE LOGISTIC MODULE (MPLM)

REAR CLOSING DOOR (Aluminum).

Machining (5 Axis) and final control.

ARIANE IV

SPACE LAUNCHER BOOSTER COMPONENT (Uranus)

Machining (5 Axis) and final control.

INTERNATIONAL SPACE STATION

MULTI PURPOSE LOGISTIC MODULE (MPLM)

Front Door (Aluminum)

Front Door

INTERNATIONAL SPACE STATION

MULTI PURPOSE LOGISTIC MODULE (MPLM)

Liquid Nitrogen distributor to refuel the space station.

Manufacturing of key components, assembly and final control.

INTERNATIONAL SPACE STATION

MULTI PURPOSE LOGISTIC MODULE (MPLM)

REAR CLOSING DOOR (Aluminum).

Machining (5 Axis) and final control.

ARIANE IV

SPACE LAUNCHER BOOSTER COMPONENT (Uranus)

Machining (5 Axis) and final control.

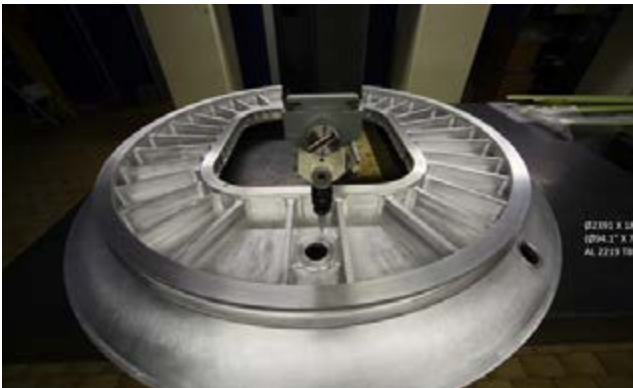


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INTERNATIONAL SPACE STATION  
MULTI PURPOSE LOGISTIC MODULE (MPLM)  
Front Door (Aluminum)  
Front Door



# Mapsat srl

## Company profile

MapSAT is an Italian newCo, based in Milan (Italy) and established in March 2015.

The principal place of operations is located in Benevento (Campania Region - Italy) in order to meet a specific sector of the market, related to the growing demand for products and services of remote sensing for continuous monitoring of the Earth's soil and sea. These activities are aimed at protecting environment and climate, citizens security, urban planning, development of energetic and electrical infrastructure, prevention of human and natural risks and, more generally, updating and control of the elements of main interest to constantly increase the knowledge of territorial changes.

MapSAT targets both public and private clients, with the aim of creating technology platforms dynamic and flexible, able to satisfy both of these stakeholders, working on customizing the hardware and software solutions based on the same technology.

MapSAT is developing a solid platform of business based on MARSec (Mediterranean Agency for Remote Sensing and Environmental Control) previous existing know how and technologies, along with a new push to develop new Earth Observation products and services for civilian and military market. Moreover, MapSAT will spend many energies to start and strengthening its relationships with the European Space Agency, United Nations, European Agencies (Frontex, JRC, EMSA, UNOSAT, ...) governmental bodies of competence of the Mediterranean countries (North Africa and Eastern Europe) interested in services of remote sensing for their territory.

Company location in Campania Region provides the strategic coverage of an important geopolitics area: Europe, Mediterranean Sea and North Africa.

The GS is equipped with two antennas that have been provided from Sea Space Corporation (USA). The largest antenna (X band) is based on a structure of several meters in height.

Since 2004, the MARSec Ground Station has been acquiring data from Aqua and Terra NASA satellites equipped with MODIS sensor. This experience has given the opportunity of configure and adapt the systems to acquire EROS-A starting from August 2005, RadarSat-1 from 2006 and EROS-B since 2009.

The X-band Antenna System is SeaSpace TeraScan 4.4m, three axes X-Band Polar Satellite Tracking Antenna. The Antenna is connected to the Equipment Racks located in Equipment Room.

The distance is about 146 meters therefore the tracking/carrier frequency is down-converted to 720 MHz. The antenna is configured to acquire EROS-B, EROS-A, Terra and Aqua missions.

## Products | Services | Applications | Technologies

MapSAT can provide a wide range of products and value-added services from EO satellite data acquired at the center in Benevento.

Earth Observation Midstream: Near Real Time Services

MapSAT manages a Ground Receiving Station (GRS) certified by ImageSat INTL as EPOD Station since 2009. The Exclusive Pass on Demand (EPOD) Program enables our Ground Station to autonomously task the EROS B satellite and directly receive all the acquired imagery on a selected set passes every year into MapSAT commercial footprint (EPOD footprint) established in the business agreement.

MapSAT can choose in advance and notify ImageSat of the relevant orbits for which it would like to have full control. In the selected passes, the MARSec GRS will create and transmit to the satellite the acquisition command file generated by Mission Planning System (MPS).

The satellite will acquire the images as planned and will downlink them to MapSAT



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Ground Station in real-time.

Thus MapSAT is able to process and transfer a set of Products to the Customer in NEAR REAL TIME (24h/36h).

Earth Observation Downstream: Value Added Product&Services

AGRICULTURE: Agriculture Land Use Map (using VHR and HR Optical satellite), Crop Monitoring, Frauds Detection...

FORESTRY: Forest Inventory (using VHR and HR Optical satellite), Estimate of the damage after a forest fire, Illegal use of soil...

ENERGY & INFRASTRUCTURE: Map of electrical networks, Oil Spill Detection, Offshore Drilling Installations, Oil Drilling, Oil & Gas Infrastructure Planning and Management....

SECURITY: Ship Tracking, Route Detection, Target Recognition, Illegal immigration Control, Illegal Traffic Control, Piracy Sea Monitoring, Borders Control, Terrorist Attacks...

GOVERNMENT: Analysis for Disaster and Crisis-Management Support (Civil Protection), Port Development, Municipal Planning, Illegal Buildings Monitoring, Cartography update...

ENVIRONMENT: Recognizing trends in resource depletion, Climate Changes, Efficient disaster assessment of natural disasters...

RESEARCH&DEVELOPMENT: GSTP ESA Program, Italian Defense PNRM, EDA, CIRA, ASI ...





# MEC srl

## Company profile

MEC was founded in 2004, as spin-off of Bologna's and Ferrara's Universities, in order to offer to the Italian and European enterprises, the know-how coming from the university R&D department in the field of microwave electronic components, with a main focus on MMIC and TR Modules. The Company's expertise and core business, are based on the executive design, lay-out generation, on wafer probe test, on jig electrical & thermal characterization of MMICs and discrete active components. The leading technologies based on GaAs and GaN semiconductors are used in our projects. A manpower of fifteen PhD Engineers, with solid background and expertise in MMIC design, make the strength of our Company. Further, the most advanced software tools, based on ADS, Microwave Office Sonnet EM and Ansys TAS, are always available to this design team. On the base of the excellent results achieved in strategic European projects for Space, MEC was appointed by UMS ( which is first European GaAs / GaN foundry ) its official Design House. Since then, a very tight cooperation is in progress with this foundry, which allows MEC to get early access to each new technology. From its inception, MEC had the opportunity to develop, for enterprises which are leaders in satellite systems, as Thales Alenia Space, Selex, and Space Agencies as ESA, CONAE and ASI, very innovative microwave integrated modules and advanced MMICs, which allowed us to become one of the preferred European Design Centre for spatial microwave components. The most known European satellite programmes, to name some: Iridium, Galileo, CosmoSkymed, SIASGE, Sentinel...etc, board MMICs and microwave hybrids in their most critical line-ups, developed by MEC.

## Products | Services | Applications | Technologies

X-Band GaN Single Chip TR-Module

27W X-band GaN HEMT HPA

50W L-band, 45% PAE

High Power Micro-Modules L, C, X band

Over the twelve years since our inception, we had the opportunity to cover a large spectrum of designs, from L band thru W band, both for small signal and very high power amplifiers. The above pictures give an idea of some significant items which address the new generation of SAR Antenna for Earth Observation 1), 2), 4) and mobile Communications ( Iridium ) 3).

More in general, the following products, based on GaAs and GaN technologies, represent a short catalog of what a Satellite System Integrators can find as MEC's off-the shelf

HPA at X, Ku and Ka band for satellite and terrestrial telecommunication systems.

HPA at L and X band for Earth observation satellite.

Down converter at V band for Telecommunication Satellite.

VCO at C, X and Ku band.

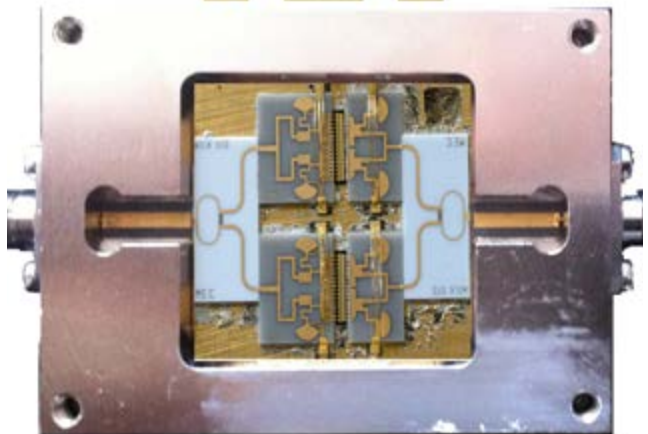
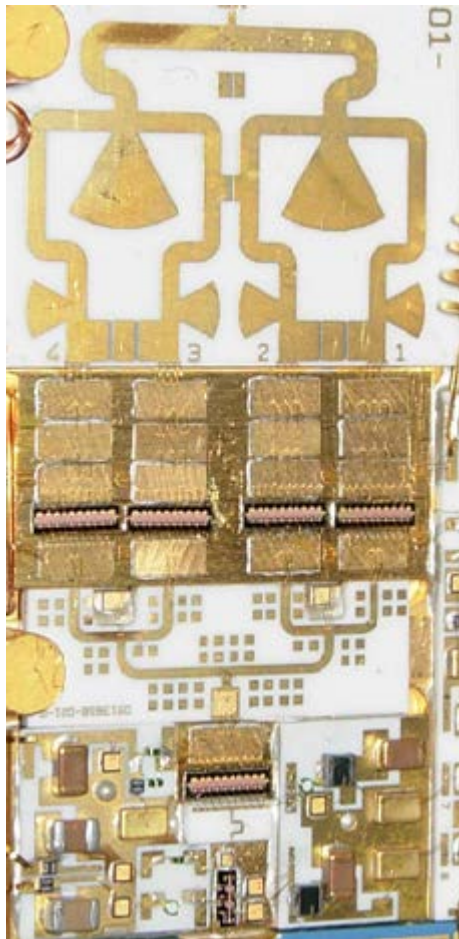
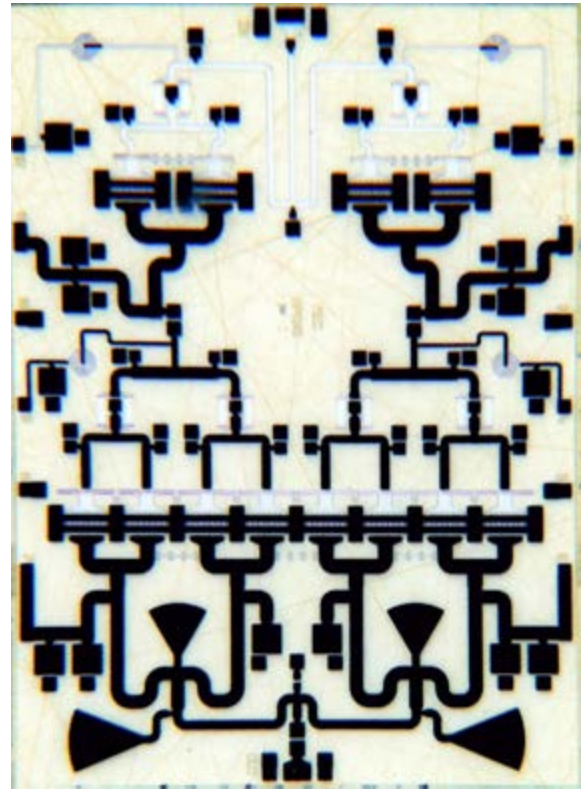
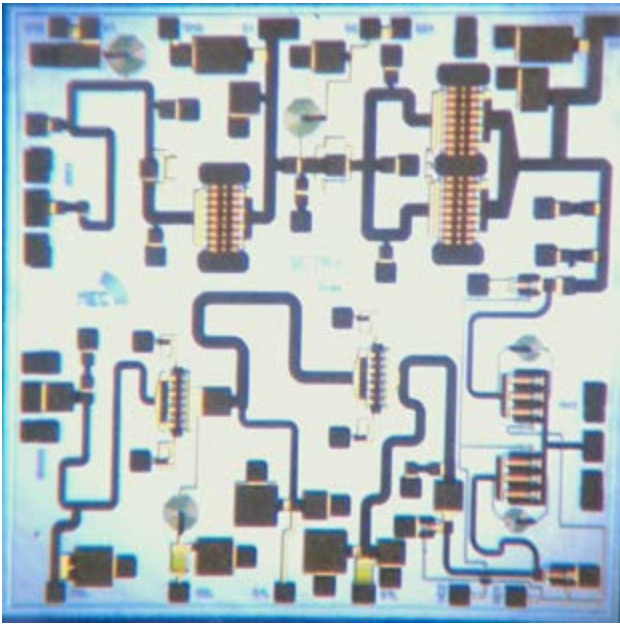
LNAs from 2 to 20 GHz.



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# Media Lario S.r.l.

## Company profile

Media Lario is a dynamic and innovative technology-driven company supplying high specification optical components and optical systems including the patented Replifformed Optics™ process suitable for high volume applications.

We work with leading industrial and Agency partners including Agenzia Spaziale Italiana (ASI), the European Space Agency (ESA) and NASA.

### OVER 25-YEAR EXPERIENCE OF HIGH PRECISION OPTICS IN SPACE

For more than a quarter century, Media Lario has been providing the technology to take some of the most significant and beautiful Images of the Universe ever seen. This work has contributed greatly to scientific research and understanding of the world in which we live.

Media Lario optics have been utilized in space borne programs since company founding for large scale missions like Beppo-SAX, XMM-Newton, SWIFT, eROSITA, CHEOPS, METOP.

Ongoing programs include ATHENA, Einstein Probe, ASTHROS, FLEX, PLATO, ARIEL.

## Products | Services | Applications | Technologies

### REPLI-FORMED OPTICS™

- Suitable for high volume – 1-day manufacturing time for optics
- Scalable production – Production capacity for 100's telescopes / month
- High replicability – Process uses a mould, no grinding or polishing

### HIGH PRECISION GLASS MIRRORS, LENSES AND METALLIC MIRRORS

- Shape accuracy  $\leq 20$  nm – Aspheric, off-axis, freeform designs for UV, VIS, IR
- Size up to 1.2 m or larger – Including Glass, Quartz, Zerodur, Alum substrates

### LASER OPTICAL COMMUNICATIONS TERMINALS OPTICS

- Optical assemblies for inter-satellite and ground communication
- Suitable for small satellite constellations.
- Utilizing patented high-volume, low-cost manufacturing processes

### SATELLITE OPTICAL SYSTEMS

- Hyperspectral EO Payload for Small Satellite – 9+ bands, 2.7 m res PAN, 5 m res RGB
- Custom high-performance optical systems with  $<1$  m GSD for small satellites constellations.

### X-RAY OPTICS

- Optical assemblies utilizing patented electroforming technology
- Large range of coating materials and complex shapes

### HIGH PRECISION CURVED MIRRORED PANELS

- Laminated structures made of Ni or glass skins glued to Alum honeycomb ( $\leq 15$  kg/m<sup>2</sup>)
- Shape accuracy  $\leq 10$   $\mu$ m – Spherical, aspheric, off-axis designs. Life tested to 20 years

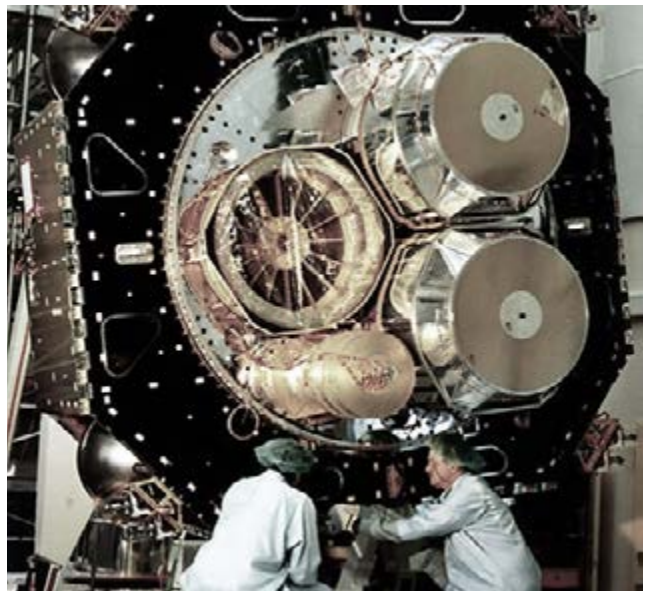


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# Meteorological Environmental Earth Observation -MEEEO SRL

## Company profile

It all has begun with the weather. Weather monitoring from space and from local weather stations has always been the fil rouge of the history and the present of MEEEO. Since the beginning, the MEEEO's staff has been spending all its resources and energy to facilitate the access and the exploitation of any kind of geospatial data with a clear focus on remote sensing and climate data. Founded in 2004 in Ferrara, Italy, MEEEO started its activity providing products and services for climate monitoring and atmospheric pollution monitoring, extending successively its application domain to the Earth surface mapping.

In 2006, the European Space Agency - ESA awarded MEEEO with an industrial contract for the implementation and development of products and services based on remote sensing and since that time, the company has been continuously working in the space sector by providing innovative solutions to cope with the never-ending challenge of Earth Observation data exploitation.

MEEEO has always been looking for new ways to evolve and, in 2009, a branch company, SISTEMA GmbH, was founded in Vienna as R&D laboratory. SISTEMA is focused on development of new data processing tools, working mainly on ESA and on Austrian National projects. In 2011 MEEEO became an affiliated partner of the Climate-KIC European initiative, investing in innovative projects to create new services for the climate mitigation and adaptation market.

In 2014 MEEEO opted to improve the quality of its offer establishing a owned data infrastructure that provides on line processing and storage capability. The MEEEO Data Facility (MEEEO-DAF) is a high performance infrastructure created to support the high computing demand of geospatial data and services and to develop and test new cloud computing solutions for big geospatial data exploitation.

In 2018 MEEEO entered formally in the Copernicus world becoming a partner of the Copernicus Academy network to empower the next generation of researchers, scientists, and entrepreneurs with suitable skill sets to exploit Copernicus data and information services at their full potential.

By going through the brief company history, the offer of MEEEO is quite clear. MEEEO boasts a team made by people with a decadal experience and passion for innovative solutions in the use of Climate and Earth Observation data and tools and with a deep knowledge of the whole value chain of the space data management and processing.

## Products | Services | Applications | Technologies

MEEEO started developing thematic applications in the domain of meteorological and climate data and since the beginning, it was quite clear that the main barrier to provide effective EO data services was the complexity of the data preparation phase. For this reason, in 2008, MEEEO decided to extend its internal R&D working programme to the data accessing part of the Remote Sensing Processing value chain. Bridging the gap on data accessibility has become the core mission of the company and the steady effort dedicated to pursuing this scope has produced a game changer product called ADAM, the Advanced geospatial DATA Management platform. ADAM implements the Digital Earth concept allowing the access to large variety of multi-year global environmental data (e.g. temperature, precipitation, vegetation status, etc) enabling visualization, combination, processing and download (<https://adamplatform.eu/>). ADAM makes global environmental geospatial data Findable, Accessible, Interoperable and Reusable (FAIR). ADAM exposes heterogeneous geospatial data as datacubes allowing effective



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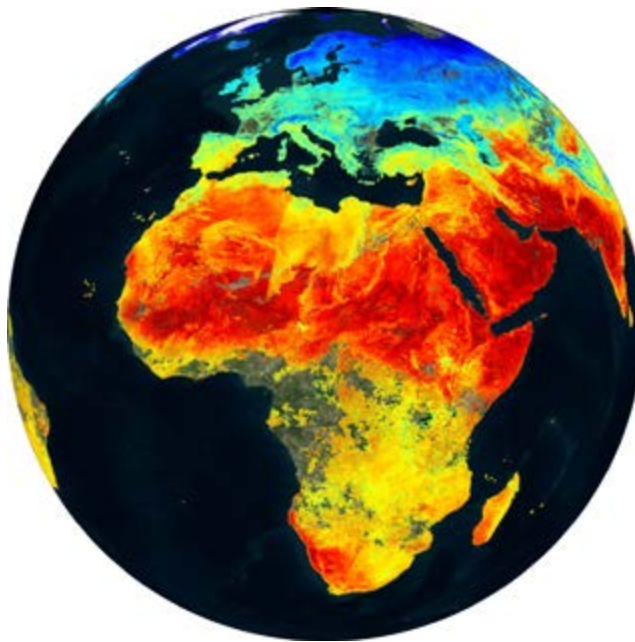
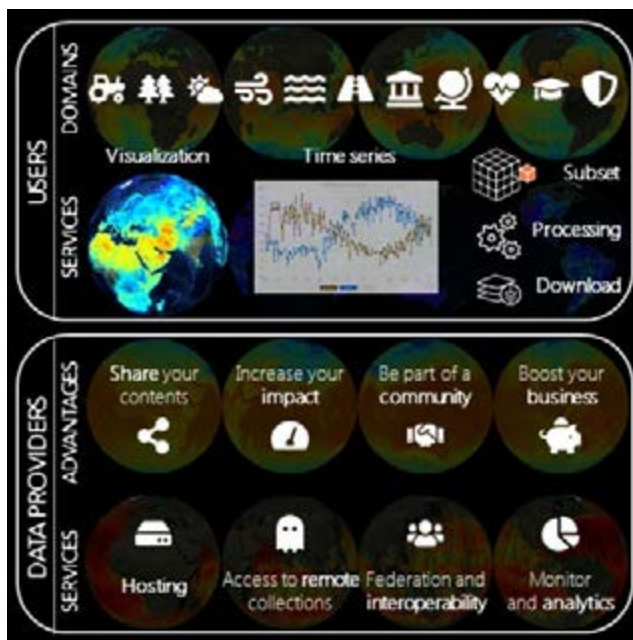
subsetting functionalities. ADAM provides the user with only the portion of data in space and time which is really needed.

The application domains.

ADAM is an enabling technology for geospatial data processing centres. By means of its unlimited customizations, it allows to implement the “data as a service” paradigm to enhance the processing performance, to extend the processing capability and to improve the level of automation and flexibility of the cloud-based data processors. ADAM can be linked to existing user environments by exposing backend data access services or it can be provided with user interfaces like a web data portal and jupyter notebooks.

Sustainable Development Goals (SDGs). The major part of SDGs can take benefit from the implementation of the ADAM technology. In the Earth Observation for Sustainable development initiative, ADAM is supporting climate-resilient decision making by providing a quick, easy assessment of climate anomalies (hot spots detection) and rapid calculation of climate risk indicators and associated extreme events. The climate indicators and the EO data analytical tools implemented in ADAM are used to support the insurance sector and European farmers community in the agricultural sector, the monitoring of Climate change effects on Cultural Heritage and the assessment of Climate-related Health risk.

Professional level education and training. Geospatial Big data is currently one of the hottest topics for data researchers and industry in the space economy and ADAM provides a unique data laboratory and learning environment to grow the new generation of geospatial data experts.



# N.C.M. TECHNOLOGY SRL

## Company profile

We are advanced mechanical parts manufacturers specialized in the aerospace field. We supply aero structures, complex components, assemblies, subassemblies, and parts for the global aerospace industry as subcontractors or as direct suppliers. We can execute the design, manufacturing, testing and certification of all the components that we produce. We are partners of leading companies and we are involved in major projects for the civil aviation, the military aviation and the aerospace industry.

We have capabilities for 3,4 and 5 axes machining of mechanical parts with dimensions up to 4 meters. With our presence and activity in this sector since 2008, we have now acquired a long experience for manufacturing small, medium and large mechanical parts and we highlight our components and tooling production for all kind of materials.

We are specialized in the manufacture of any kind of aeronautics tooling and we can provide a system of supply vertically organized including materials, machining and special processes. We extended our traditional machines to develop high technology tools that meet all irregular shape parts working especially for the aerospace sector. We produce a wide range of components for SAR satellites and many other aerospace mechanical parts and assemblies.

We have a wide capacity of working hours per year, with great resources and a technical staff with long experience.

The traceability of all the parts realized is ensured thanks to production cycles specifically created for each order. The conformity of the components and the repeatability of all details are ensured through our cutting-edge CMM machines. We stand in a leading position thanks to the high-level technologies used, the accurate realization of the projects and the strict quality tests procedures.

Our quality system is recognized and certified by RINA institution according to the strictest standard rules in place: AS/EN9100 and ISO 9001.

## Products | Services | Applications | Technologies

- Complex precision machines
- SAR satellites mechanical parts
- Components for civil and military aviation industry.
- Complex mechanical assemblies for the aerospace sector
- Subassemblies and precision machining in aluminum alloys and any kind of special steel, meant for the global aerospace industry.
- Molds for Injection
- Thermoforming plastic



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# NADIR SRL

## Company profile

Nadir S.r.l. is a small enterprise headed by some experienced researchers that focus their activities in the application of a novel and proprietary atmospheric plasma technology and in the development of innovative nanocomposites polymers materials with active and smart functionalities.

The Company holds an international patent (US9693441B2, JP6569954B2 AU2014349815B2 CN105900532B), related to the new plasma jet device that is now emerging in several fields ranging from advance manufacturing to biomedical, for surface cleaning, adhesion promotion and functional coating depositions.

## Products | Services | Applications | Technologies

The Nadir Plasma device is a jet type that works in atmospheric conditions and thus does not require vacuum systems for the plasma generation.

Thanks to the innovative own design the Nadir device is able to generate efficient and cold plasma, (even less than 40 °C on the substrate) particularly suitable for surface treatment of heat sensitive materials.

Surface treatments for Printed Circuit Boards, Optical Lenses, others...

Cleaning, Activation, Etching, Bonding, Adhesion, Polymerisation, thin films deposition of functional layers.

The Nadir Plasma device is also a mounted as module in additive manufacturing 3D printing application for surface modification of materials during the printing process.

Nadir is a supplier of custom compounds for end users looking for innovative polymer materials, blending a specific polymer with performance additives or other polymers to achieve properties specific to each application. The technology used by Nadir is Melt compounding assisted by the use of a Lab Scale Corotating Twin Screw Extruder.

Consolidated experience in the realization of polymer compound with:

- ☐ Enhanced mechanical, thermal, gas barrier properties
- ☐ Antimicrobial/antioxidant/antibiotic and other biologically activity
- ☐ Graphene based filler for conductivity improvement
- ☐ Metallic nanoparticles for metaldetect-ability
- ☐ Phluorofors for optical recognition
- ☐ Innovative lightweight material (nanostructured bulk or foam polymers)

The custom compounds can be obtained as a pellet or as calibrated filament for 3D printing applications in order to obtain 3D article with specific functionality with a tailor made approach on the base of customer request.

- On demand atmospheric plasma surface treatments and functionalistion
- Customised atmospheric Plasma equipment realization
- On demand specialty masterbatches with tailor made properties
- Melt compounding service
- Technological Scouting of Innovative high performance materials
- Plasma & Polymers scientific consultan

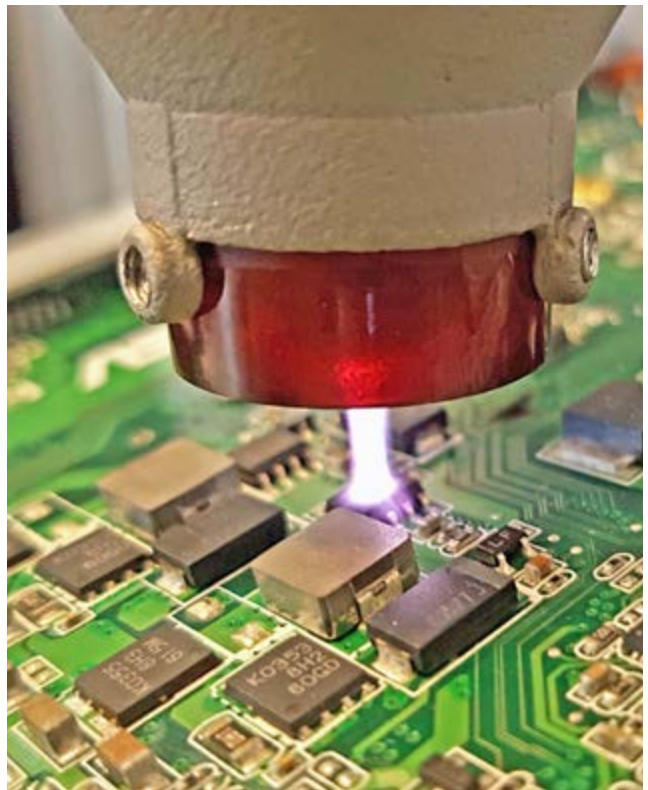
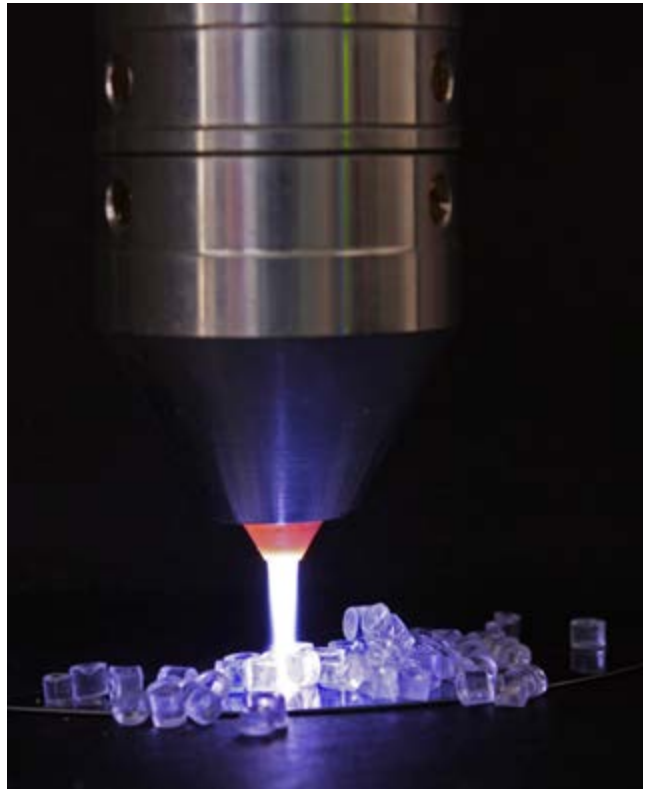


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# NAIS Srl

## Company profile

NEXTANT Applications & Innovative Solutions – NAIS was established at the end of 2005, as Italian private owned; It's an ICT System House based in Rome, classified as SME according to the European Commission classification (2003/361/EC). Company's mission aims to design and propose to the proper market sectors, innovative applications and services based on ICT technologies and Satellite Navigation, EO & Communication assets. NAIS core competencies on Space & Defence market's domain plays a strategic role in the development of innovative application by enabling technologies. Passing through R&D Projects, product industrialization and commercialization, NAIS completing in this way the whole Technology Transfer Process.

Over time several innovative applications and services have been developed and now available in the field of Smart-mobility (solution for both citizens and tourists transportation support and information), Emergency (mission management and resource planning), Cultural Heritage (safeguard, fruition and prevention), Maritime (search & rescue, mission management and access to harbour and docks), Defence (air defence systems radar), and Aeronautics (Air Traffic Management system 2D & 3D and flight information systems of General Aviation aircraft). Based on the following ICT knowledge:

- Satellite technologies (Navigation (EGNOS/GALILEO), Communication, and Earth Observation);
- Innovative HMI techniques based on Virtual and Augmented Reality techniques (e.g. applied to the development of non-conventional radar displays for the future Air Traffic Control);
- Engineering and architectural aspects (e.g. Enterprise Architecture, Model Driven Engineering, SOA, RAMs analysis) applied to the development of complex safety critical systems (e.g. next generation ATM systems).

NAIS was involved and in someone still running, in National & European R&D project and programs, such as in the ATM sector: SESAR (Single European Sky ATM Research), eATMS (new ATM Italian program) S2BAS (Small airport & small aircraft flight information services) and RAID (RPAS & ATM Integration Demonstration). In ESA-ARTES20 IAP program; IRIS ANTARES on the SATCOMM domain, SIMONA on Maritime situation awareness and in ASI co-financed project such as: WHERE in the Earth Observation/ GMES technologies on Cultural Heritage domain and AIRONE on Aeronautic Meteo services. Some others on Transport, Maritime and Cultural Heritage areas of European Frame Programme, such as: Meduse (FP7), Enhanced Wisetrip (FP7), ITACA (FP7).

## Products | Services | Applications | Technologies

The skills in satellite navigation technologies (EGNOS / GALILEO), Telecommunications and Earth Observation (GMES, now COPERNICUS) in synergy with ICT technologies allow NAIS to develop solutions in the following application domains: Mobility (smart-mobility and info-mobility); Cultural Heritage (transport, monitoring and safeguarding, use); Emergencies and Civil Protection (command and control systems operations and decision support); Defense (weapon simulation systems for staff training); Aeronautical transport (ATM and in-flight services for General Aviation); Marine transport (access management of protected areas); Health (e-Health systems for mobile health).

In the field of technologies applied to Cultural Heritage, NAIS has expertise in techniques and technologies of human-machine interaction based on virtual and augmented reality; GIS and WebGIS systems; standards for the interoperability of geo-spatial systems (INSPIRE directive, metadata standards, OGC standards); Earth observation data analysis techniques (classification, change detection, interferometry); systems based on GNSS positioning; wireless communication systems; satellite and terrestrial data communication.

In the application domain of Cultural Heritage, NAIS offers:



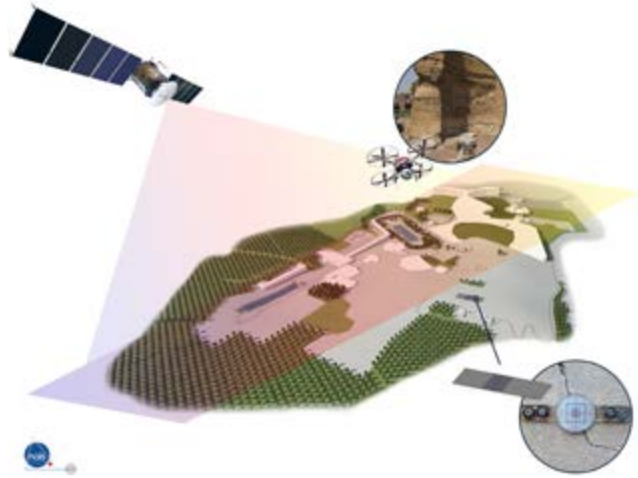
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- Solutions for monitoring and safeguarding the immovable cultural heritage and the natural heritage threatened by the impact: anthropic (human impact on the environment); meteoclimatic (impact on the vulnerability of monuments); geotechnical-structural (deformations of land and structures).
- Solutions for the protection and use of theme parks, historic buildings and museums with IT systems able to: manage multimedia contents for tourist use with 3D reconstructions; digital signature of the works (digital watermarking); manage access to sites with ancillary services to support visitors, such as location tracking, assistance requests and emergencies.
- Solutions to monitor the integrity of mobile cultural assets (eg artwork, paintings ect.) During transport - VECTOR service. The proposed solution is able to check in real time both the geographical position of the asset and the physical parameters such as: temperature, brightness, brightness and vibrations, detected in the transport case and in the cargo compartment.

NAIS is promoting its services to public territorial bodies (eg Superintendencies, Museums and Municipalities) and to associations that manage buildings and private properties of high historical and cultural interest, services deriving from the technological transfer of the results obtained from research and development projects carried out in collaboration with ASI (Italian Space Agency), the MiBACT (Ministry of Cultural Heritage and Activities and Tourism) and the ISCR (Italian Institute for Conservation and Restoration).





# Nanoracks Space Outpost Europe srl

## Company profile

Nanoracks Space Outpost Europe srl is an Italian-based company belonging to XO Markets company. XO Markets, the world's first commercial space holding company, includes Nanoracks LLC, DreamUp, Nanoracks Space Outpost Europe (Nanoracks-Italy), and Nanoracks UAE. NanoRacks is internationally known as the largest commercial user of the International Space Station, successfully launching over 1000 payloads in key markets for customers in over 30 countries and generating over \$50 million US in revenues since its establishment. Nanoracks is poised for a period of rapid growth due to several factors: 1) the continuation of the ISS for at least another decade allowing further investment and increase in revenues; 2) our international reputation has allowed us to open this year a subsidiary in Italy, an office in Hub71 and by year's end a company in China. In total, Nanoracks is poised perfectly to take advantage of the explosive growth in the commercial exploration and utilization of the international space effort.

Nanoracks has the most access to space of any company in the world. Nanoracks has agreements for utilizations of the ISS, Blue Origin's New Shepard, Virgin Galactic, Chinese recoverable satellites, Indian vehicles, partnerships with US efforts to the Moon, as well as our own non-ISS commercial platforms.

Nanoracks is also market leader in creating space research hardware at efficient price points, having about \$40 million US invested in the ISS today.

Looking forward, Nanoracks using our proven experience and leadership to become the market leader in utilizing the microgravity of space for advances in the fields of life sciences, biopharma and agriculture. For the past several decades there has been glimpses of how powerful taking gravity out of the equation is on new biopharma and agricultural products. Today, with greater access to space and with miniaturization of off-the-shelf research hardware, these critical and mature industries are ready to utilize microgravity as a cutting edge research and manufacturing tool. Nanoracks positioned to be the key partner for companies world-wide focused on three hubs: Italy, the States and UAE.

Nanoracks deploys 250 satellites (from 1U to Microsat) and brought to Space over 1000 payloads. All these are commercially driven and procured by customers as services provision request.

## Products | Services | Applications | Technologies

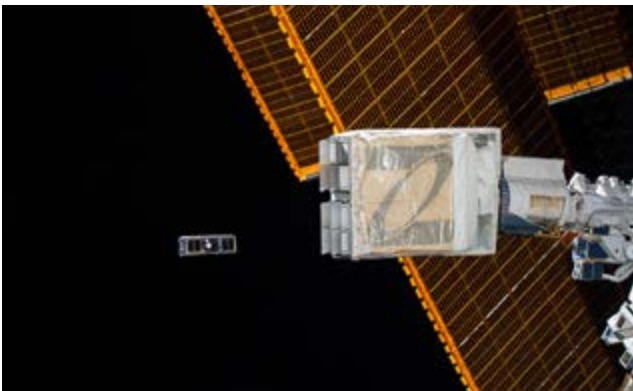
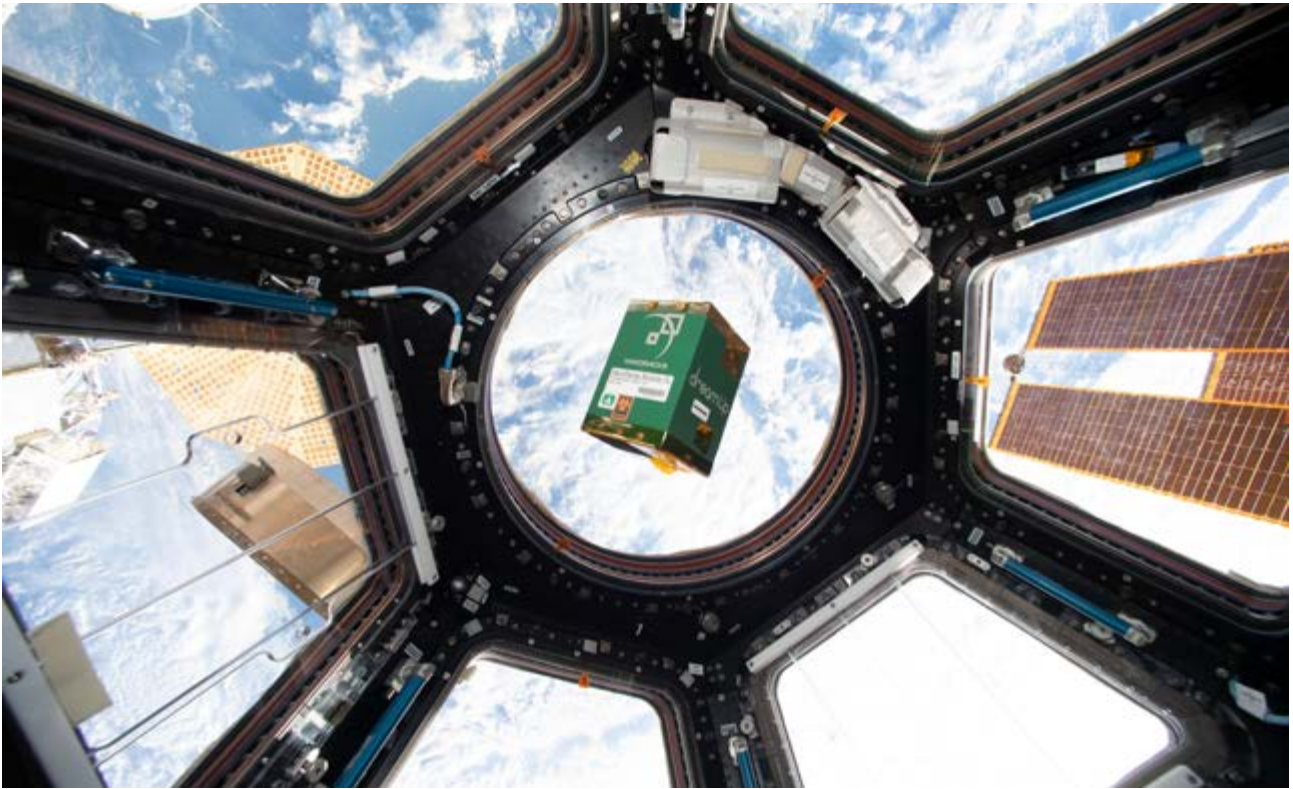
Nanoracks can offer affordable and prompt services to access Space to everyone. Its target market customers are Education entities (e. g. school, universities, etc.), Science Community and, Space and non-Space technology developers. The main services to access Space are: 1. Satellite deployment from 1U CubeSat to MicroSat up to LEO, 2. Science & Technology Payloads embarkable on internal and external platforms, e. g. sub-orbital crafts, ISS, LEO and beyond, 3. Education curricula about Space matters and field of knowledge. The Nanoracks facilities in Space are: LEO ISS - Internal Payloads: NanoLabs, NanoRacks Frame-3, NanoRacks Plate Reader, NanoRacks Microscope, NanoRacks MixStix; LEO Satellite Deployment: ISS CubeSat Deployment, ISS MicroSat Deployment, External Cygnus Deployment, Other space vehicles (Indian PSLV, SpaceX Falcon 9, etc.); LEO ISS External Platform: NanoRacks External Platform, Bishop Airlock. Nanoracks is continuously enlarging the list of opportunity to host payload in Space in LEO and beyond, e. g. LEO Free-flyer, Moon and Mars.



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# Neohm Componenti s.r.l.

## Company profile

Neohm Componenti S.r.l. is an Italian electronic engineering company located in the industrial area of Turin, in the Piedmont region, just 15 km from the International Airport of the city. The company has a 3,000 sq. meters building, organized into offices, meeting rooms, conference rooms, laboratories, clean room and manufacturing area. Neohm Componenti was established in 1990 and it absorbed the know-how, trademark and experience of Neohm Elettronica S.p.A., which was a company active in the market of electronic components for nearly thirty years.

Since then, the company has been technologically updating with an improvement of the production lines so to guarantee a perfect compliance to the market needs.

To date, Neohm Componenti area of business is the study, design, development, industrialization, production and sales of electronic components, boards and systems.

In particular, the company works in five different fields of electronic manufacturing:

- Hybrid circuits and resistive networks
- Avionic, military and space PSUs
- Custom power resistors
- Avionic, military and space microelectronics
- Electronic systems for railroad communication

Neohm Componenti is able to assist the customers from the design of the electronic component with a team of highly qualified technicians, to the product manufacturing using state of the art technologies and the product screening according to military standards.

The technologies available at the site include, but are not limited to, the thick film substrate preparation, surface mounted technology, chip on board assembly and wiring, hermetic encapsulation, PCB assembly with both SMT and PTH.

The microelectronics products are assembled inside a 400 m2 ISO7 clean room.

In March 2018, the company was acquired by a consortium of enterprises lead by TKM and Tekfer, consolidating the company's presence in the market. In 2020 a new joint venture with the swiss company Arc Power was established,

The company has a Quality Management System certified by KIWA UNAVIA CERT which complies with the UNI EN 9100:2018 and ISO 9001:2015 standards, which establishes the basic criteria, pursuing the goal of continuous improvement.

## Products | Services | Applications | Technologies

Neohm Componenti core business is the development and manufacturing of high-end CUSTOM electronic services. The company goal is to be an electronic PARTNER to the customer, supplying a complete OUTSOURCING service:

- Electronic support during development
- Industrialization
- Technological support
- Materials purchasing
- Manufacturing
- Electrical test

The products that can be manufactured can cover a wide range of technologies and applications. The product portfolio includes:

- Mechanical assembly of boards for railways communication systems
- Surface Mounted Technology (SMT) and Through Hole Technology (THT) assembly of boards on Insulated Metal Substrates (IMs), rigid or flex Printed Circuit Boards (PCBs)



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- Custom thick film resistors
- Industrial thick film based hybrid circuits
- Avionic, military and space grade Power Supply Units (PSUs)
- Avionic, military and space hermetic circuits

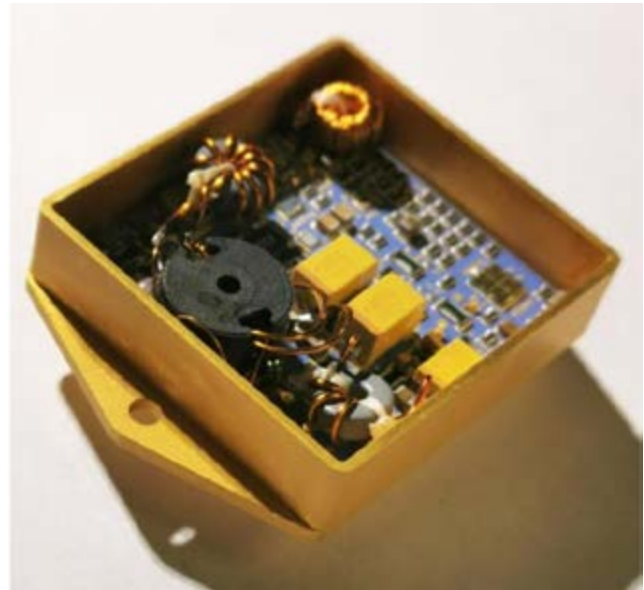
Neohm has a strong heritage in power electronics design both on PCBs and hybrid circuits. We are currently providing five different power supply products for the railways market. We participated to nine avionics and military programs, and we are currently providing twelve hybrids for the European Fighting Aircraft (EFA) program.

The company participated as sub-con to five space programs, including Cosmo Skymed and SAOCOM. For the last program (SIASGE-SAOCOM L-band SAR for remote sensing) we designed and manufactured 300 Flight Model units of the H5 hybrid. The hybrid is a DC/DC converter with 5 regulated secondary voltages, mounted on the PSU boards of the satellite. The H5 hybrid consists of capacitors, thick-film resistors, active components in chip form and magnetics and was intended for use in high reliability space applications; it is able to withstand a total radiation dose of 50 Krads (Si).

In 2019 we started a collaboration with Arc Power for the design and manufacturing of a family of standard European DC/DC converters for space, and we built the first prototypes of the 15W DC/DC converter under the ESA/EPFL COO18 contract.

The hybrids intended for space applications are designed and manufactured according to the ECSS-Q-ST-60-05C "Generic Procurement Requirements For Hybrids".

The company is going to start the activities to obtain the Process Capability Approval from ESA according to the ESCC Basic Specification No. 2566000.





# NEXT S.p.A.

## Company profile

NEXT Ingegneria dei Sistemi Spa is an entirely private Italian company, founded in 1999 as a software company for the Defense and Space markets. Over the years it has developed offering solutions and specialized personnel for other markets, while expanding the offer in the Defense and Space markets.

In mid 2018 a Merge & Acquisition operation made NEXT Ingegneria dei Sistemi S.p.A. to become part of the Italian "DEFENCE TECH HOLDING".

NEXT S.p.A.'s main activities are performed in the following domains and contexts:

SPACE - Ground Segment: Engineering, Mission Control, Mission Planning, Satellite Control, Flight Dynamic for big and nanosatellite missions

SPACE - Space Segment: In Orbit Validation, Payloads Calibration and Validation

SPACE -Big Programmes participation : GALILEO, COSMO SKYMED and COSMO SECOND GENERATION, GOKTURK, OPTSAT including activities of system engineering, GS and Subsystems AIV, System and Subsystem developments

DEFENCE -Naval: Design, development, Integration and Maintenance of Command & Control Systems, Combat Systems, Radar Data Processing.

DEFENCE - Avionic: Design, development and Integration of Advanced Simulator, Scenario Generator, Mission Planner, Test/ Verification/Validation

DEFENCE -Missile: Design, Development, Integration and Maintenance of Launchers' components, Command and Control System, Radar Data Processing, Flight Planning.

DEFENCE -Radar: Requirements Analysis, Systems Design, Systems implementation, Hardware and Software Components Integration, Test, Verification And Validation.

TRANSPORT: Design, development, integration and Test of ATC/ATM Tower Systems, Rails On Board System

e-GOVERNMENT: Design and Operational Support for ICT Infrastructure, Clouds, Data Mining, Big Data Processing and Management, Back Office, WEB Services and Applications

In the Space sector, which belongs to the Space Engineering Unit and with particular reference to the Ground Segment, NEXT has developed competences for activities related to satellite missions: design, integration and verification in Ground Segment Engineering (at system and subsystem level), design, integration and verification, preparation, production, execution and management of tests, SW design and development of Flight Dynamics subsystems, calibration / validation, data acquisition, satellite control centers, big data systems for satellite telemetry analysis

NEXT, as regards its solutions and services offered in the SPACE sector, is able to cover all the phases of a space project, from the definition of the project requirements to the operations and maintenance of the system, working in the previous study phases, design, development, integration, test and validation by mean of its staff and its highly qualified solutions.

## Products | Services | Applications | Technologies

"AR-TowerR" ARTower (i.e. Augmented Reality Tower for ATM/ATC) is an ICT system based on Augmented reality and advanced Computer Vision technology strongly integrated with ATC/ATM Primary Radars, Weather Stations, On Board Transponders ADS-B, also capable to manage "NON Collaborative Targets"

"SuSyARR" SuSyAR (Surveillance System based on Augmented Reality) is a Situational Awareness ICT system and solution, mainly focused on the protection of Sensitive Sites and/or Areas, such as Airports, Military Sites, Power Stations, Power and/or Communication Infrastructures Nodes, Country Borders, Coastal Surveillance. SuSyAR is specifically well designed to detect, respond and manage, in a very fast way, to



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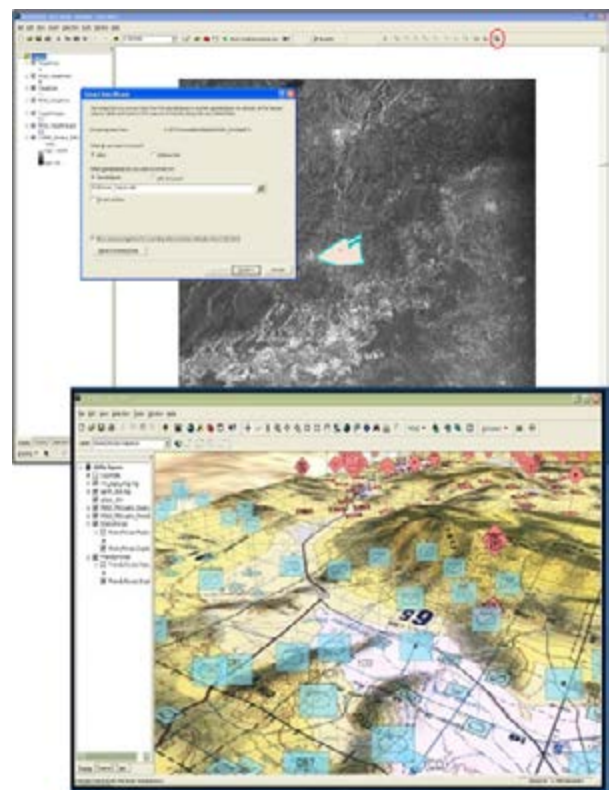
many kind of threat. Its Capability to collect and process in real time a huge amount of data/information coming from heterogeneous and distributed environmental sensors as well as from multi purpose 2 axis orientation day/night/infrared cameras, make it an advanced and complete answer to the Urban and extra urban Security needs, and more in general to smart Cities development, allowing easy integration with IoT (Internet of Thing) methodology and technology. "MIDAS" This is a co-owned product (with COBAM-CTS UK) , focused on Military, Commercial as well as Humanitarian Demining. NEXT developed and own three of the main components: a Control Centre called "Command Management Tool" (CMT), a Mobile Control Centre called "Mobile Command Management Tools" (MCMT) and the Operational WEB site to follow the Demining activities from any remote location.

"ANDROMEDA" This is an advanced BIG DATA Management and Analysis Tool. ANDROMEDA System is capable to ingest, organise, analyse and through an advanced GUI, allows a very easy retrieval, access and relations creation, to heterogeneous Data, no matter their format and organisation structure. Moreover ANDROMEDA, through an advanced Graphic GUI, allows the definition of Data Ontology, while the capability to distribute the Analysis Work Load, allows an easy scalability, depending on the amount of Data and Analysis requirements.

"NCS - Nanosatellite Control Segment"

NCS system is aimed to provide control and flight dynamics services to commercial and scientific nanosatellite constellations by mean of an innovative ground control segment characterized by the following key characteristics: multi-constellation simultaneous management, compatibility with Mission Operation and Information Management Services, autonomous routine operation management and remote manned mission monitoring & control, multimission automatic orbital control management.

NCS is provided with enhanced features to support the most advanced nanosatellite generation as well as standard features to be implemented for basic constellations.



# NOVOTECH SRL AEROSPACE ADVANCED TECHNOLOGY

## Company profile

NOVOTECH is a key partner for many industries working in the aerospace field and other advanced technology sectors. The Company was founded in 1992 as spin-off engineering consulting company from Department of Aerospace Engineering of the University of Naples "Federico II". In order to keep high competitiveness on the market, NOVOTECH has developed well consolidated know-how on aircraft and aircraft components: design/certification; automated composite manufacturing processes; advanced FEA; static/dynamic experimental tests.

NOVOTECH has proven capability in design and manufacturing of composite structures, based on low cost and out-of-autoclave automated production processes (as AFP, PCM, RTM and LRI).

## Products | Services | Applications | Technologies

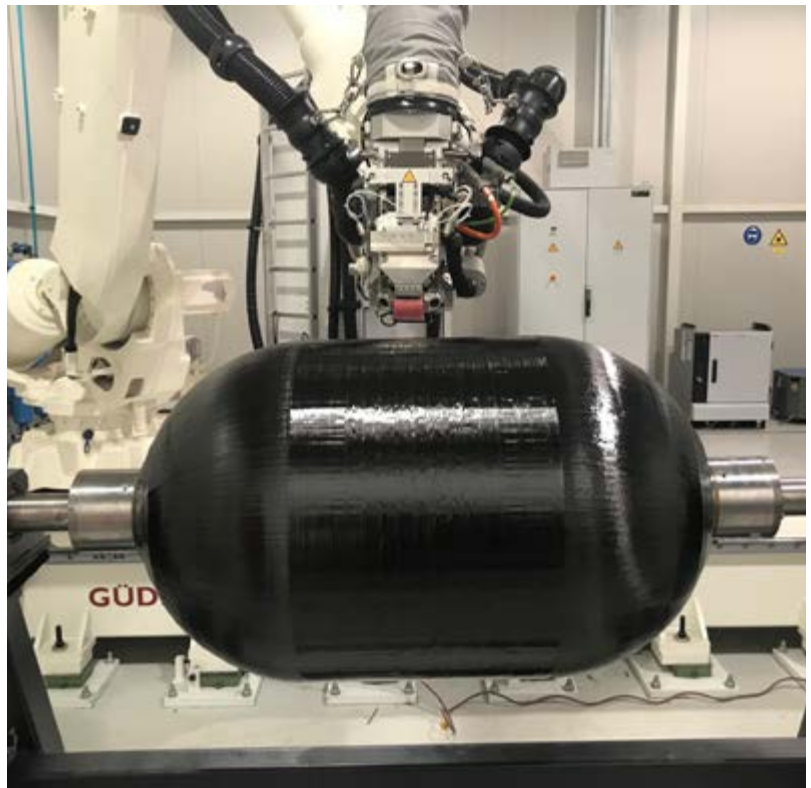
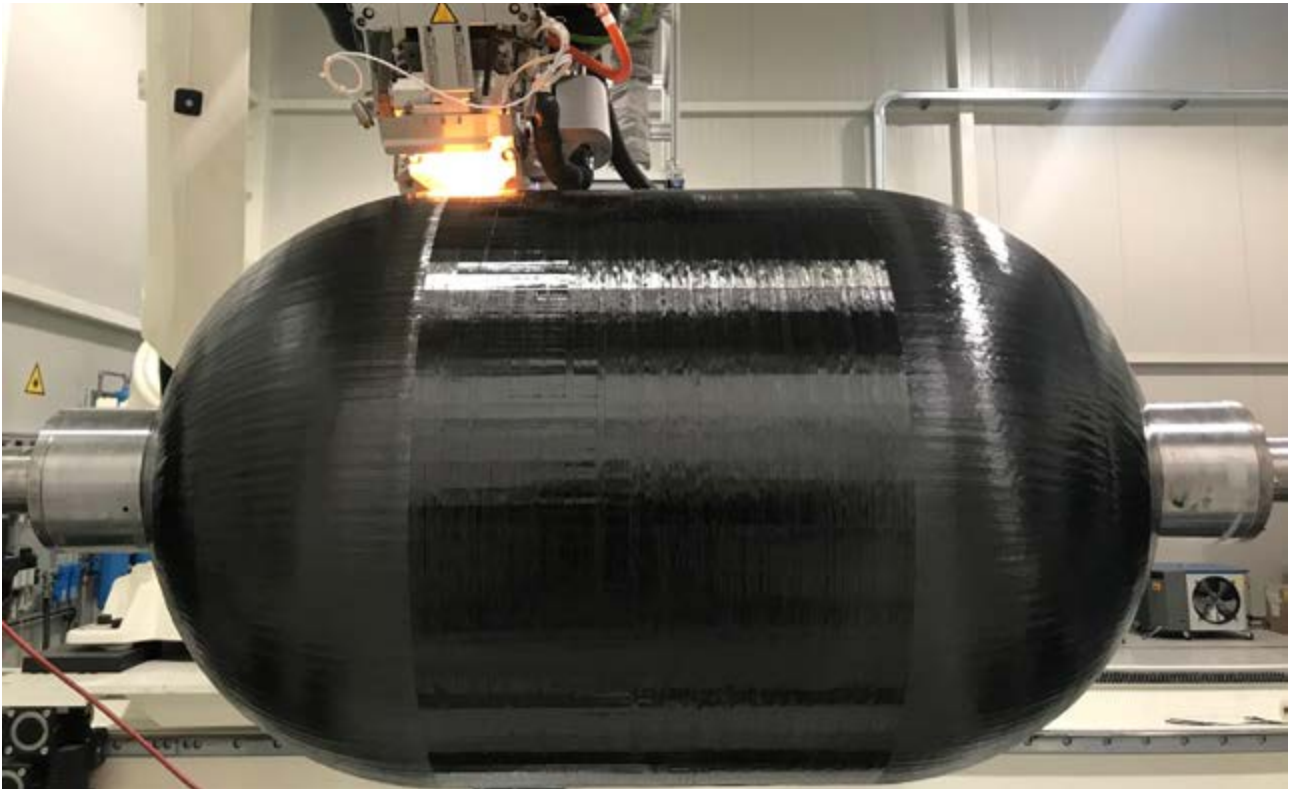
Novotech because of the long period of activity, most of 25 years, has gained over time the specific expertise in various engineering aerospace and other high-tech fields. Starting from the initial activity in the field of GVT and Aeroelasticity, it has gradually expanded its expertise in the fields of various kinds of simulations, analysis and design of aerospace and non-aerospace structures, adding in recent years a competence and significant capacity in the field of advanced manufacturing of composite structures (AFP, RTM, RFI, etc.).



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# NURJANA TECHNOLOGIES

## Company profile

Nurjana Technologies provides Systems and Software Solutions for Real-Time Sensor Integration, Multi Sensor Data Fusion and Automatic Target Tracking.

The long-standing expertise in the field of sensor data fusion and in the development of algorithms for sensor fusion allows NT to develop modular and customized solutions in a very short time with an agile process.

Thanks to the solid technical background NT team is able to fulfill all the customer's requirement specifications in a wide variety of projects worldwide and ensures the early adoption of the latest methods, concepts, and technologies.

## Products | Services | Applications | Technologies

### NT Application Domains

#### Aerospace

- Specialized engineering support
- SST/SSA and Orbit Propagation
- Mission Data Analysis, Test & Evaluation
- Autonomous navigation of Swarm of Drones
- Remote Sensing Data Exploitation

#### Instrumented Test Range

- Specialized engineering support
- Real-Time Command & Control
- Electro-Optical Tracking Systems
- Automatic Target Identification and Tracking

#### NT brand new products

NAIS, Nurjana Artificial Intelligence for Swarm of Drones: a machine learning environment for a swarm of drones designed for training algorithms.

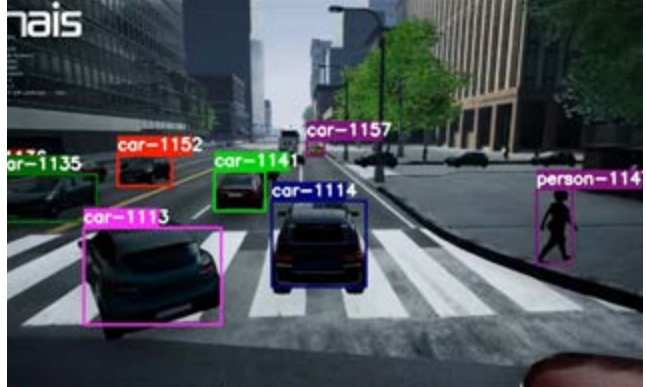
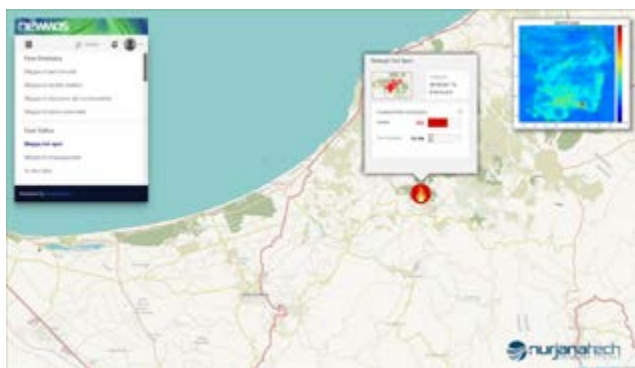
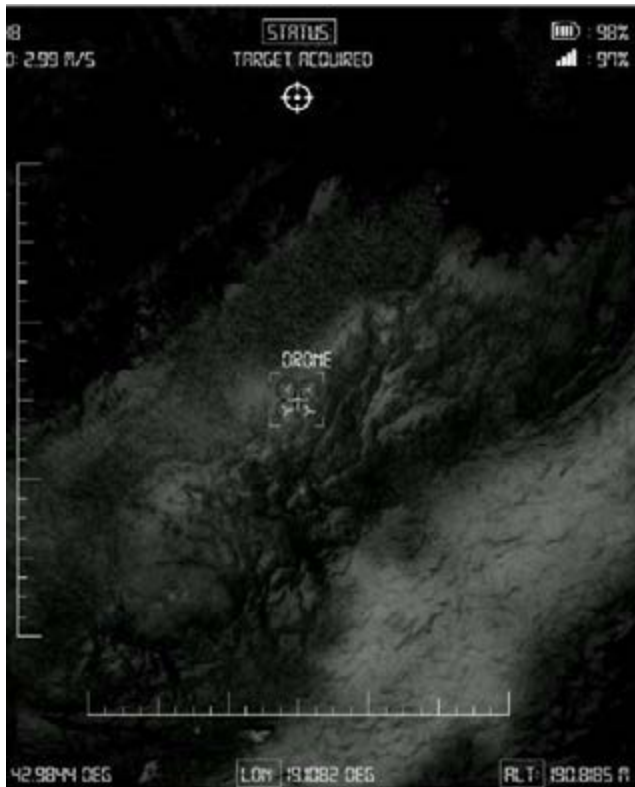
NEWMOS, Nurjana Earth Wildfire Monitoring and Observation System: a software system for planning tactical strategic interventions aimed at both the prevention and management of forest fires as well as the post-fire recovery activities.



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# OFFICINA STELLARE SPA

## Company profile

Officina Stellare (OS) is an innovative SME based in Sarcedo (VI), Italy, active in the design and production of telescopes, opto-mechanical and aerospace instrumentation for Ground and Space based applications.

Its unique position in the reference market is due to its specialistic in-house expertise and advanced skillset for the development, implementation and commissioning of complex opto-mechanical engineering projects in the aerospace field for scientific, research or defense-related purposes.

From specifications drafting to final acceptance tests, OS guarantees maximum efficiency of the supply chain and high risk management facilities.

## Products | Services | Applications | Technologies

New Space economy (Earth Observation, Laser Communications, Space Situational Awareness), Scientific Research, Defense are OS main fields of application.

Officina Stellare products are known for their highly advanced technology and competitiveness. Time-to-market, versatility, results achieved, and the in-house control over most of the value chain make OS uniquely positioned within the reference market..

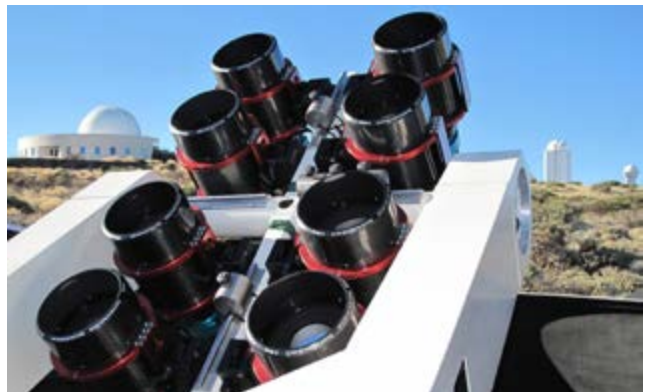
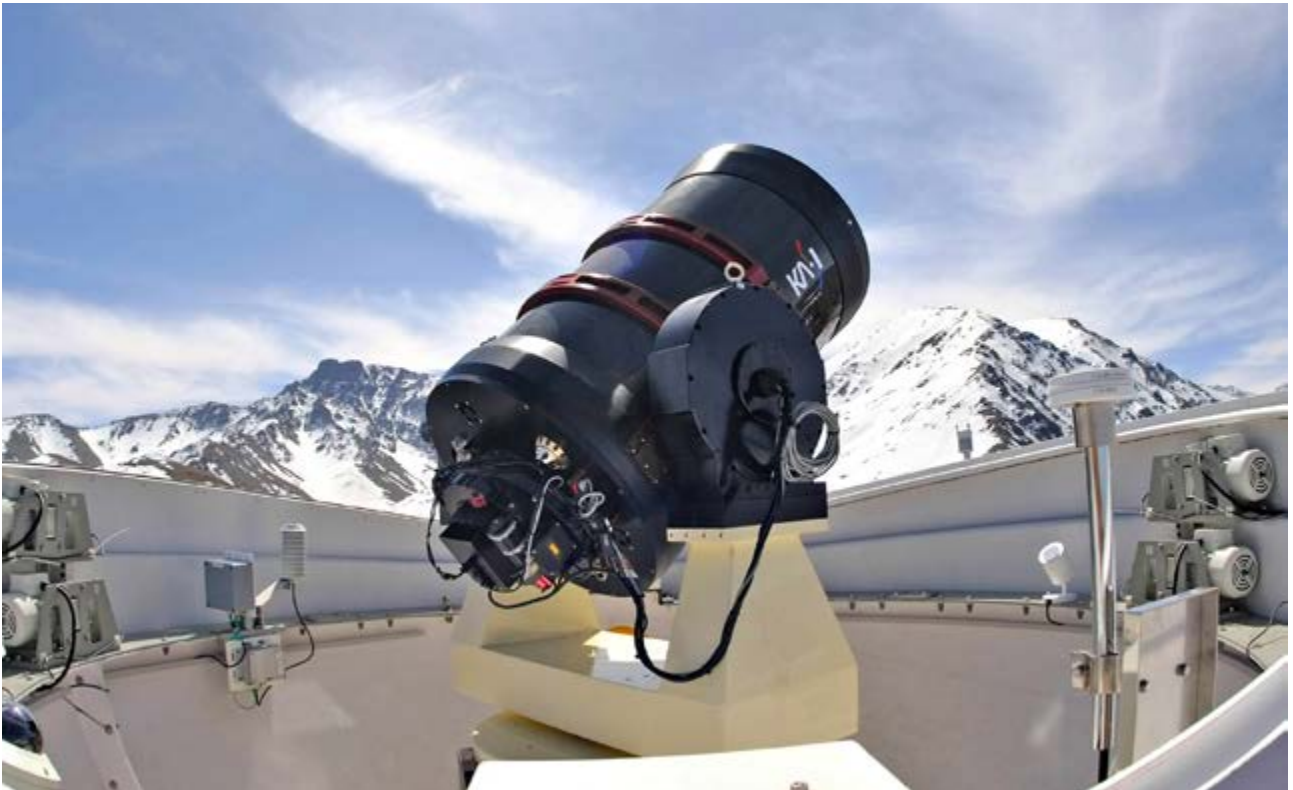


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# Optec S.p.A.

## Company profile

Founded in 1985, OPTEC SpA is the Italian firm reference leader in optical, optoelectronic and optomechanical sector, in Europe and in the World.

OPTEC customized development for many Industry sectors, represents the engine of our high standards solutions, and represents for our Customers the correct answer for each problem who tumble in Optec's action area.

Studies carried out inside Optec, are present in several technical publications; inside "Collana di Ottica e Fotonica", a technical Italian publication which contains different and interesting articles, Optec has given a contribute with the 4th volume "Elements of Optical design", written by our professionals engaging in private Industry and in research area.

Since its start up in 1985, Optec is more than a manufacturer. It is a service organization with a proven record of successful performance.

Optec is always driven by its dedication to serving Customer needs and by its commitment to producing quality products with high performance, with reference to optical sector. Optec's standard and custom products are a result of experience in imaging applications.

In the beginning, Optec provided only lenses, now we offer complete integrated systems. By providing the complete system, Optec is able to optimize system performance rather than just individual component performance. Optec has a great attention to research field, which has conducted us to collaborate with a lot of important partners in Aerospace and Imaging sectors Industry.

Optec has obtained the quality certificate ISO 9001:2015 by TÜV Italy certification

## Products | Services | Applications | Technologies

Optec designs starting from scratch, manufacture and certify diffraction limited optical payloads, multichannel camera systems for Space, focus mechanism with remote control and every kind of optical system starting from UV, passing through Visible and coming to InfraRed range.

As leading Company of Optica Group, Optec can offer not only long term heritage in designing but also glass polishing capability, mechanical components manufacturing and moreover a new optical coating facility inside of the Group.

Our core business is to follow and guide customers from the very beginning to the final system, offering continuous and tailored support in the niche world of optical and optoelectronic systems.

Optec is directly involved in design and engineering of optical systems for satellites or space stations for various companies around the world.

Through the years Optec has been protagonist of numerous successes in the Space field.

In 2001, in collaboration with CGS, Optec designed and implemented various optical systems still in use in BIOLAB of the ISS.

In 2003, in collaboration with Turin Astrophysics Observatory (OATO) Optec has been involved in SCORE experiment and the optical unit for the solar corona analyzer was realized.

In collaboration with TDS in 2010 the optical unit for the PRISMA mission was implemented. PRISMA is operational and functioning in geostationary orbit.

Under an ASI (Italian Space Agency) contract, in collaboration with TSD and Optec partner Tecnottica, 4 new advanced system were presented as navigation tools for interplanetary exploration.

Together with Space Flight Laboratory (SFL) and University of Toronto Institute for



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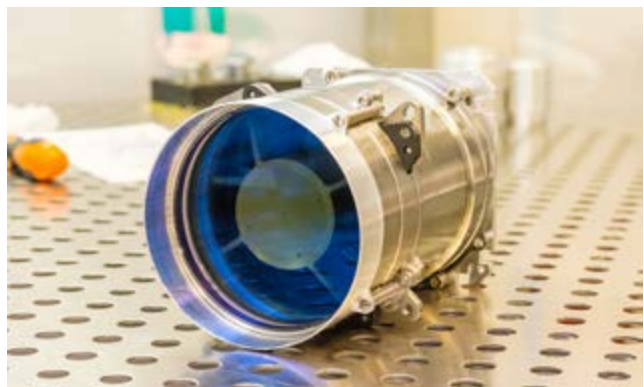
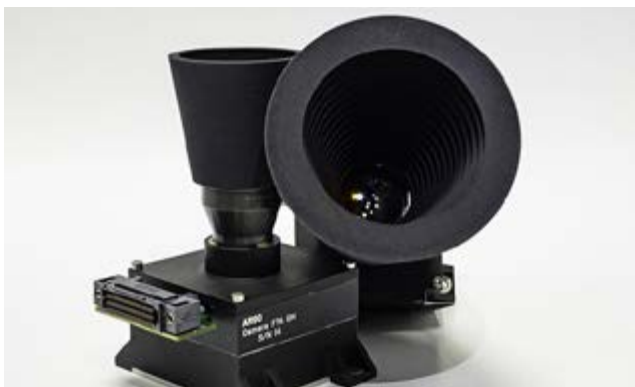
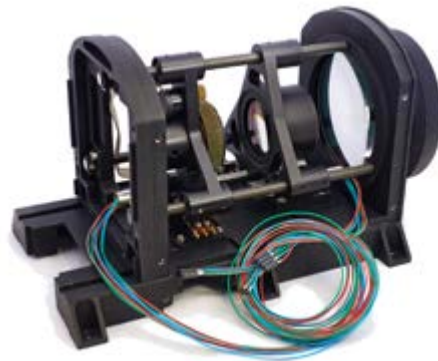


Aerospace Studies (UTIAS) the first extremely high resolution dioptric satellite, limited in resolution only by diffraction, has been designed, manufactured and qualified for launch.

OPTEC has delivered, after having successfully performed the qualification campaign, the polarimeter for the ESA Solar Orbiter METIS project which was first flight unit of the METIS Solar Orbited mission to be delivered for integration.

Finally, OPTEC is manufacturing ARGOMOON flight optical payloads. ArgoMoon is a nanosatellite that will fly on board the new American launcher, Space Launch System (SLS), during its first mission (Exploration Mission 1) scheduled for 2019.

The objective of the ArgoMoon mission is to provide NASA information about the correct launch vehicle operations through photography. At the time the second stage will release the CubeSats, it will not be able to communicate with the ground anymore. ARGOMOON will be the first nanosatellite (6U) to be released in moon orbit.



# PICOSATS S.R.L.

## Company profile

PICOSATS is an Innovative SME founded in 2014 as a spin-off of the University of Trieste. PICOSATS is incubated in Area Science Park, the largest science and technology park in Italy. PICOSATS commercial scope relates to the development, production and marketing of innovative products, processes and services with high technological value, in particular with regards to the development of small satellites and the associated instrumentation. Currently, PICOSATS main business consists of a new generation of telecommunication systems for small satellites, RADIOSAT. RADIOSAT is a miniaturized Ka-band transceiver, capable of providing a data transmission speed five times higher than the current technologies available in the market. In order to diversify the company's portfolio of solutions, PICOSATS developed its own full small satellite structural bus, BRICSAT, a new solution for building small satellites by using a promising plastic polymer and 3-D manufacturing technique, with a modularity design. Together, RADIOSAT and BRICSAT create a bundle between the hardware's side, the satellite bus, and the software's side, the communication system, addressed to the same potential user and customer segments. Additional services are being proposed for payload design and integration.

## Products | Services | Applications | Technologies

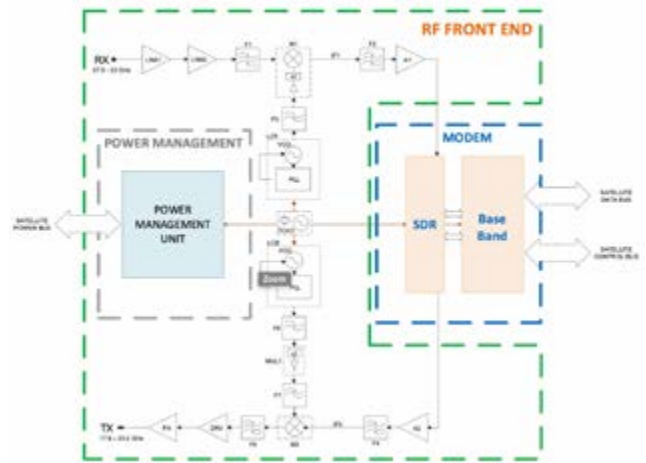
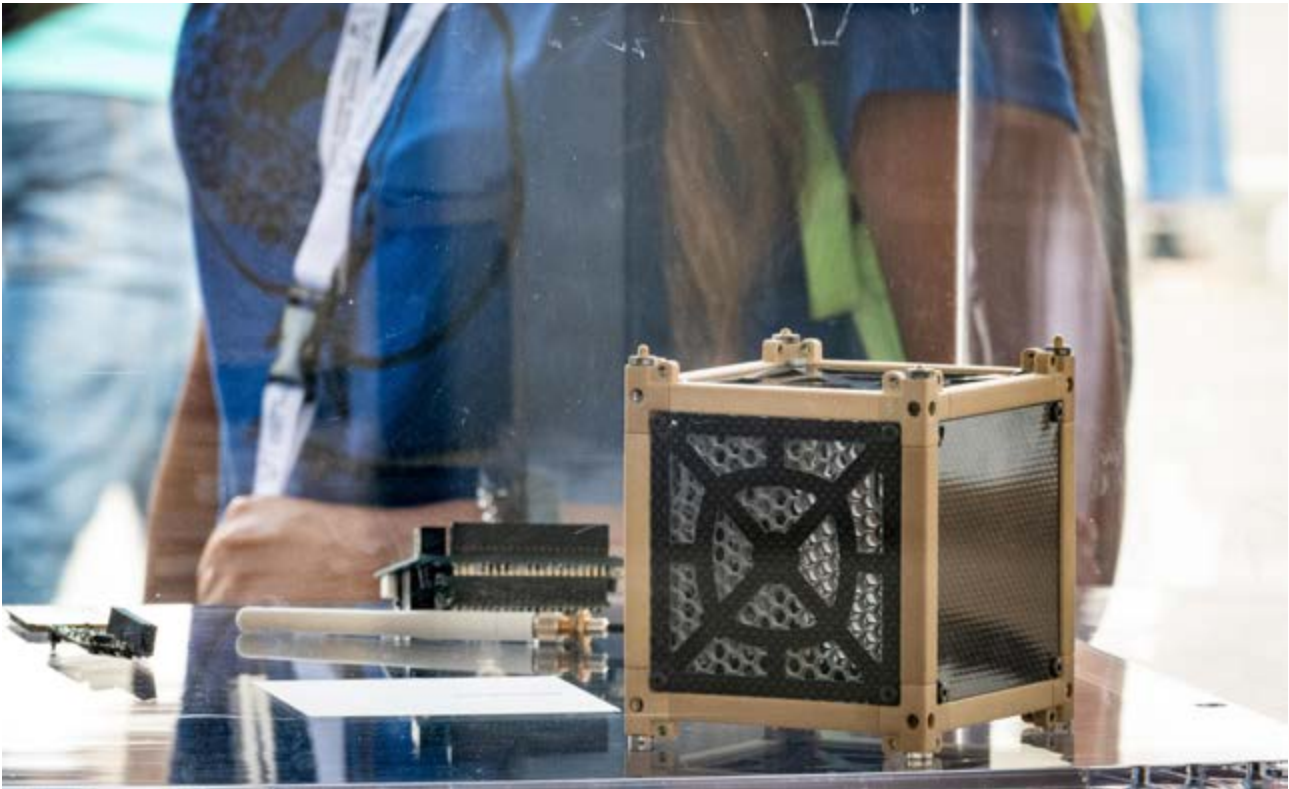
1. **RADIOSAT - Telecommunication.** A new generation of telecommunication systems for space applications dedicated to small satellites. The key technologies at the core of this system are a software defined radio and a highly directive and configurable antenna, operating at high frequencies (Ka band), and providing very high data rates. The hardware system will be associated with ad-hoc telecommunication services.
2. **BRICSAT - Mechanics.** PICOSATS is carrying on an R&D program towards the hardware development of the structural bus of the satellite that will allow exploiting cross-selling opportunities (hardware & software). BRICSAT represents a new solution for building small satellites by using an ad-hoc polymer and 3-D manufacturing techniques. BRICSAT aims at providing the means to get independency in satellite bus manufacturing and to grant accessibility and adaptability of space industry, in the light of a remarkable interest in small space programs, both in the scientific and industrial field. The hardware system will be associated with customization services.
3. **Services.** Beyond services associated to the hardware products, PICOSATS is proposing engineering services and consultant services for End to End Scientific Mission simulations.



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# Planetek Italia s.r.l.

## Company profile

Planetek Italia is an Italian SME (Small and Medium Enterprise), established in 1994, which employs 50 men and women, passionate and skilled in Geoinformatics, Space solutions, and Earth science.

The Company designs new processes and solutions that simplify the use of geo-localized information.

We cover all phases of the geo-localized data life cycle, from the acquisition, storage, management, analysis and sharing of information in order to produce and generate knowledge.

We adopt the principles of Strategic Design to satisfy users' needs with full respect for economic, social and environmental sustainability and technological feasibility.

Our many application areas range from environmental and land monitoring to open-government and smart cities, including defence and security, as well as scientific missions and planetary exploration. The main activity areas are:

- Satellite, aerial and drone data processing for cartography and geo-information production;
- EO based solutions in the field of urban planning, civil protection and emergency response, tourism, renewable energy, fleet monitoring, coastal monitoring and protection, defence, as well as in the markets of energy, transport and infrastructures;
- Design and development of Spatial Data Infrastructures (SDI) INSPIRE compliant for geospatial data archive, management and sharing;
- Design and development of real-time geo-location based solutions, through positioning systems such as GPS/Gallileo/GNSS and indoor location systems;
- Development of software for on-board payload data processing and for ground segment infrastructures for both EO and planetary missions
- Space Mission Analysis and Design (SMAD)
- Software for Electrical Ground Support Equipment (EGSE) and Satellite Telemetry Monitoring

Planetek Italia is Hexagon Geospatial Platinum Partner in Italy providing software solution for Earth Observation and Geospatial Data management. The Company is one of the main Italian satellite data reseller and value added provider.

The Company responds to markets needs through its three Strategic Business Units:

- SBU SpaceStream designs and develops solutions to support the European Institutions (EUMETSAT, ECMWF) and Space Agencies (ESA, ASI).
- SBU Government & Security offers solutions and services in the Public Administration market at national and international levels and for the Defence, Educational and scientific research markets in Italy. It provides geospatially powered solutions to the agencies and European institutions such as EEA, EDA, EC, REA and JRC.
- SBU Business to Business offers solutions to companies operating in Oil & Gas, Water, Renewable Energy, Transports and Infrastructures sectors. Its products range from systems for business intelligence on geographic data to the creation of geo-informative products and value-added data from Earth Observation.

## Products | Services | Applications | Technologies

1. Rheticus®: is an automatic cloud-based geo-information service platform designed to deliver fresh and accurate data and information for territorial monitoring. It is designed to deliver up-to-date, accurate maps and historical graphical data via a user friendly dashboard. <https://www.rheticus.eu/>
2. Preciso®: Geo-information products, derived from satellite and remote sensing

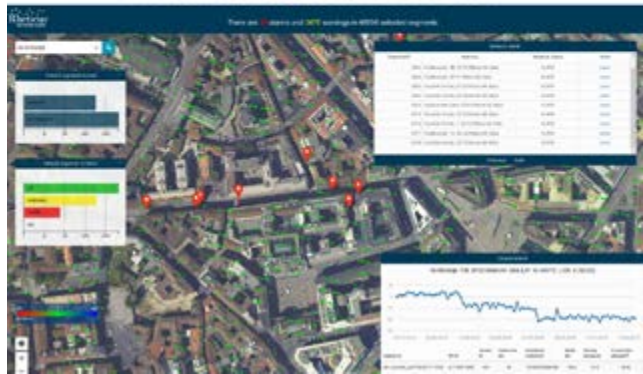


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3. **Cart@net®** : it is the WebGIS solution for the management and consultation of large raster and vector datasets, ideal to distribute on-line catalogues of cartographic data. [www.planetek.it/eng/cartanet](http://www.planetek.it/eng/cartanet)
4. **LOD4SDI**: it is an open and reusable solution for publishing geographic data on the Web as Linked Open Data, according to the standard RDF / XML. [www.planetek.it/eng/getlod](http://www.planetek.it/eng/getlod)
5. **Blockchain4EO**: By means of Blockchain technology, the EO value chain is improved in its aspects related to security, integrity, encryption and distribution of EO very large datasets to a group of peers (in the ground segment and on-board) enabling tradeable distributed processing.
6. **Information-as-a-Service**: new remote sensing applications in precision farming and sustainable development areas by making use of artificial intelligence, machine learning, and cloud computing technologies.
7. **Satellite Ground Segment**: Software infrastructures development for managing, acquiring, processing, archiving and disseminating satellite data (radar, optical, hyperspectral)
8. **Satellite Health Monitoring**: technology that detects anomalies and prevents potential failures of the spacecraft or its subsystem. It includes automatic checking tools and visualization tools.
9. **Earthbit**: it is a tool that manipulates very big SAR and hyperspectral images together with image streams (live videos from e.g. drones) in real-time. <http://www.planetek.it/eng/spaceBIT>
10. **SpacePDP**: it is an open and modular Payload Data Processing framework aimed to transfer satellite data processing from the Ground to Space Segment. It is composed of independent hardware and software modules. <http://www.planetek.it/eng/spacePDP>
11. **SpaceADM**: it is a real time algorithm to evaluate satellite attitude based on Kalman Filter theory. It is able to integrate data from different devices for providing highly precision estimates of satellite attitude. <http://www.planetek.it/eng/spaceADM>
12. **SpaceOP3C**: it is a FPGA or SW solution for on-board hi-performance hyperspectral data compression and cloud classification. OP3C compressed data can be processed in their compressed form. <http://www.planetek.it/eng/OP3C>
13. **SpacePTS**: it is an EGSE SW Front-End for Integration, Verification & Validation activities of a satellite payload. It provides full front-end functionalities (TM/TC, power and custom analogical links) on top of a commercial HW platform. <http://www.planetek.it/eng/spacePTS>
14. **ERMES**: it is a modular, flexible and interoperable SW, developed by Planetek, to accomplish AIT, Check-Out and Operations activities for Satellites, Payloads, SCOE and equipment in general.
15. **CASTeC (Context Aware Spacecraft Telemetry Checking)**: it is a software tool intended to ease the labour-intensive task of spacecraft telemetry checking, by automating the telemetry signals trend analysis and the detection of anomalous behaviours and novelties. [https://www.planetek.it/eng/projects/castec\\_context\\_aware\\_spacecraft\\_telemetry\\_checking](https://www.planetek.it/eng/projects/castec_context_aware_spacecraft_telemetry_checking)



# PROGEM Srl

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## Company profile

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Progem is involved in the industrialization, manufacture and control of precision mechanical parts for aerospace, space and defense for both civil and military purposes. Progem operates not only in general mechanical environment but also conception, design, processing and construction in other sectors like industrial automation, automotive, agricultural, textile, nautical. Progem manages prototypes and individual pieces, even at a low production rate, and full-bodied bundles of work with a high production rate. Progem designs and manages special processes related to the activity and mechanical assembly and provides complete processing including various materials' testing and finishing. Progem is involved in several R&d projects related to the Aerospace sector, with the support of the Polytechnic of Turin and some large companies in the Piemonte area (North-West of Italy).

## Products | Services | Applications | Technologies

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Progem is a Tier1 supplier that design, produce, assemble and test aerospace and defence structures and components. Progem has also successfully developed a carbon fiber strain gauge that should fly in space in 2022. It is a new technology that allows the structural health monitoring of every critical component spending ten time less than the actual solution available. Furthermore Progem can provide technological industrial washing machines created to meet the various needs of degreasing and cleaning of mechanical parts present in the field of industrial mechanical production. Its high versatility makes it suitable for both interoperational cleaning and finishing cleaning. The large number of available options allows the machine to be configured to make it more suitable for different production needs.

**PROGEM**

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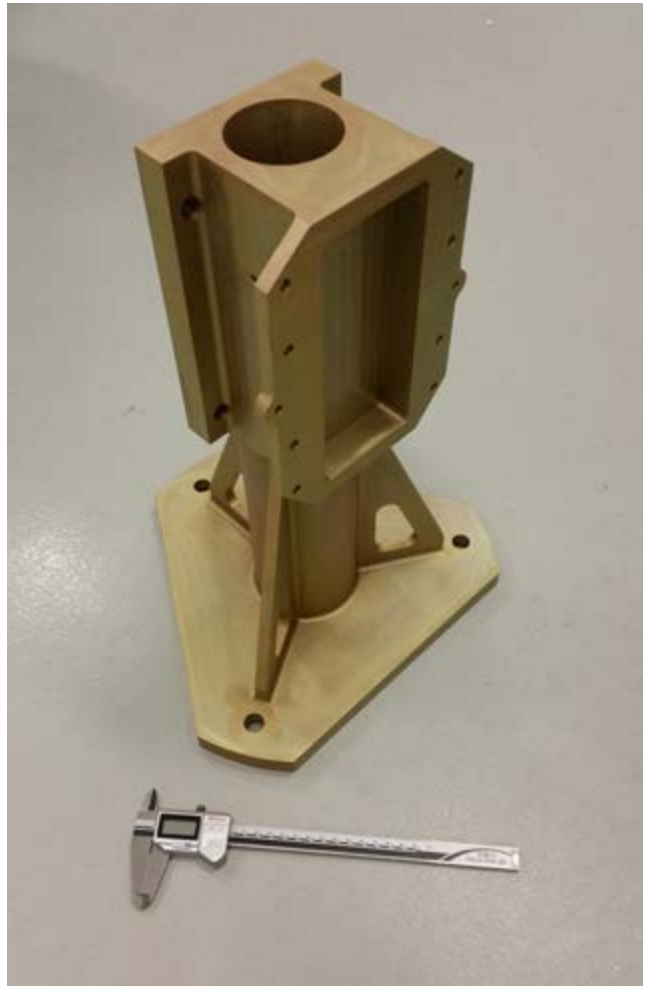
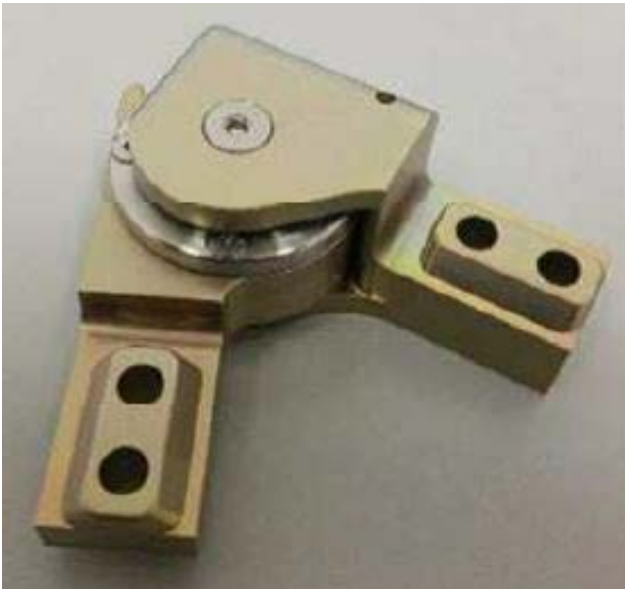
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# Progressive Systems Srl

## Company profile

Progressive Systems Srl is an Italian company with more than a decade of experience in simplifying the access to Earth Observation data and turning this information into valuable insights for EO and non-EO experts needing to solve diverse environmental and societal challenges. The offer of the company is based on the cross-sectoral competences of a highly qualified team which operates on the following areas:

- earth observation data quality and exploitation;
- algorithms development and integration into processing environment to interpret satellite data for the most accurate results;
- independent test and validation to ensure software quality and usability;
- IT solutions and cloud computing to enable customers to access, download and manage a massive amount of data by reducing time and saving storage;
- education and outreach activities to raise awareness on the benefits and opportunities offered by the Earth Observation sector.

Progressive Systems also focuses on research activities including environmental monitoring (e.g. land classification, agriculture and precision farming) and early warning and risk management support (e.g. fire detection, flood detection, ground deformation). The company is also active in training initiatives to support universities, start-ups and SMEs interested in using Big Data.

The experience of Progressive Systems is based on a long-lasting collaboration with the European Space Agency and on-site presence at ESRIN. Progressive Systems' customers can therefore benefit from:

- A sound knowledge and understanding of ESRIN and its infrastructure, stakeholders and processes;
- Deep involvement in technology and research related projects;
- Strong experience in EO data processing for scientific exploitation and data users (researchers and service industry) support;

Competence to effectively manage verification, validation and change management processes, and to support operations, maintenance and R&D projects.

## Products | Services | Applications | Technologies

Progressive Systems' activity lines are:

1. Operational services
2. Testing, Verification and Validation
3. Research Projects and Services

1. Operational services

ESA Research and Service Support

Since 2006 Progressive Systems operates the ESA Research and Service Support whose mission is to support scientists, service developers such as SMEs, start-ups and businesses in the space industry, and institutions in exploiting Earth Observation data during the R&D phase. RSS supports its customers in developing and integrating new algorithms, elaborating on-demand processing campaigns and generating and delivering value-added information. RSS customers are enabled to 1) have more resources 2) scale-up and process massive data preventing them from buying storage 3) benefit from wide service exposure.

EOsuite

EOsuite is a set of services aiming at bridging Earth Observation with non-EO research and business domains. Four are the main services offered: 1) Expert Support (feasibility



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studies, validation, consulting); 2) EO services (ad-hoc developments; turn-key solutions; platform independence) 3) Partnership (R&D projects, participation to call for bids) 4) Training (basic, advanced, customized). All the services are customizable and focused on customers' requirements.

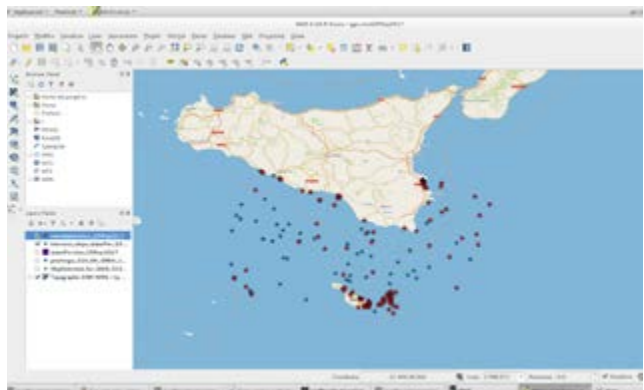
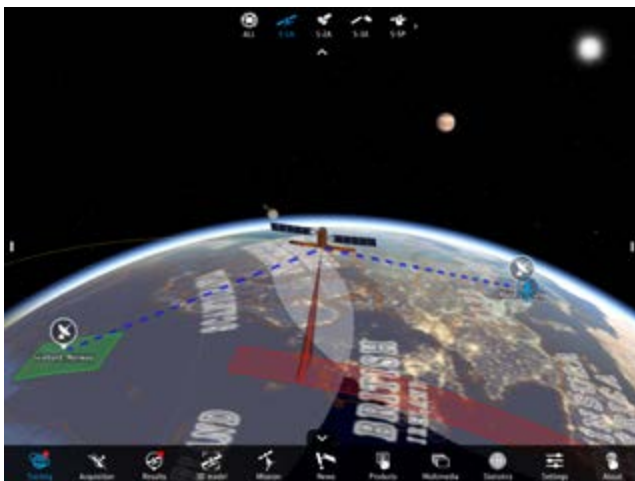
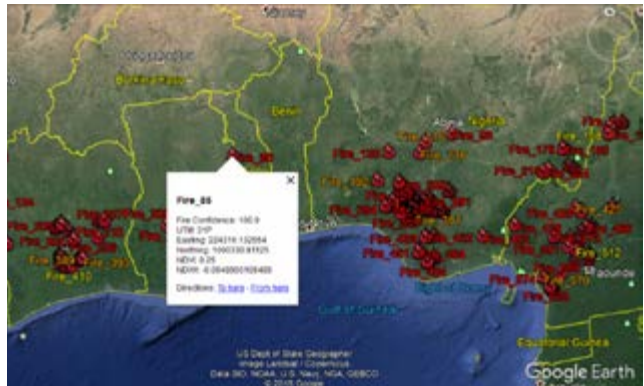
## 2. Testing, Verification and Validation

### ESA Fast Prototyping

From 2014 to 2019 Progressive Systems was involved in the frame contract for social media and mobile applications development for Earth Observation ground segment and mission operations (Fast Prototyping). It aimed at filling the gap between the general public and ESA by promoting its EO missions and emergency and monitoring services, and by highlighting the importance of EO data for the scientific community. Among the activities, the Sentinel and the Copernicus Eye Apps are still ongoing. The main role of Progressive is to gather the requirements and perform independent testing of the software deliveries released by the industrial consortium.

## 3. Research Projects and Services

- Fire and Burnt Areas Detection: Progressive Systems developed a fire detection service to detect fires in near- real time and assess derived burned areas mainly based on Meteosat Second Generation data. It allows local authorities to warn citizens and monitor the identified fires in sensitive locations.
- Flooded Areas Detection: Progressive Systems is in the position to develop maps based on Synthetic Aperture Radar acquisitions, which indicate the areas affected by the floods to support decision making and disaster response.
- Ship Detection: Progressive Systems set-up a prototype ship detection chain based on SAR observations to support the Italian Coast Guard in increasing the efficiency of its surveillance activities.



# PROGETTI SPECIALI ITALIANI SRL

## Company profile

The idea behind the Progetti Speciali Italiani Srl foundation consists in the fact that multidisciplinary activities, having important economic value exit, are characterized by short time activity concentration.

These activities typically require bursts of intense engineering, development and production works periods, however followed by long times of lack of further similar commitments.

Therefore, the solution was found by an agreement among some few SMEs to support the creation of a company, dedicated to such special projects, having a flexible amount of resources to be deployed according to the actual workload.

Each SME part of the Group provides specific technologies and industrial capabilities contributing to special multidisciplinary projects through a mix of PSI Senior and Young specialist.

The cooperation within PSI is open, so that other companies might enter within the PSI cooperation agreement.

This approach provides PSI to operate as the core of a Virtual Company of 20 Million-euro turnover with more than 200 employees, still maintaining the size of a small fraction of such a size.

In fact, the average number of PSI employees consists of less than 20 persons generating a financial turnover of 3 Million Euros.

The company organization is based on four Directorates (Programs, Technical, Commercial and Administrative) working under control of the company President.

A group of senior advisors provides support to the company activities, according to the flexible assignment of resources planning together with strategic policies consultancy in accordance with the multi-company agreement.

The combination of High Tech and Multidisciplinary approach demonstrated to be successfully in the competitive environments participated by PSI with Italian and Foreign Final Client with the following activities are undergoing:

TOMS - High Resolution Telescope for Microsatellites (Italian MoD program)

ESA Artes 5.1 ITT AO/1-8556/16/NL/CLP - Deployable Antenna Structures for Small Satellites (ESA program)

ESA Artes 5.1 ITT AO/1-8218/16/NL/WE - Aeronautical antennas for dual-band including L-band AMS(R)S and other existing aircraft applications (ESA program)

ESA AO/1-8433/15/NL/CBi - Participation of Poland in the ESA Small Launcher Initiative (PPSLI) as PGZ subcontractor (ESA Program)

ESA Artes 5.1 ITT AO/1-8692/16/NL/CLP - Prototype for a Command and Control Data Link for UAVs in the 5GHz Band (ESA Program)

ESA Artes 5.1 ITT ESA AO/1-8999/17/NL/WE - SMA Fast Locking Connector (ESA Program)

## Products | Services | Applications | Technologies

Progetti Speciali Italiani Srl is able with his organization to deliver a large set of product and technologies applied to the Space Sector but seamless to other applicative sector in the new philosophy of COTS into Space and Spin In.

The Major Product capabilities consist on:

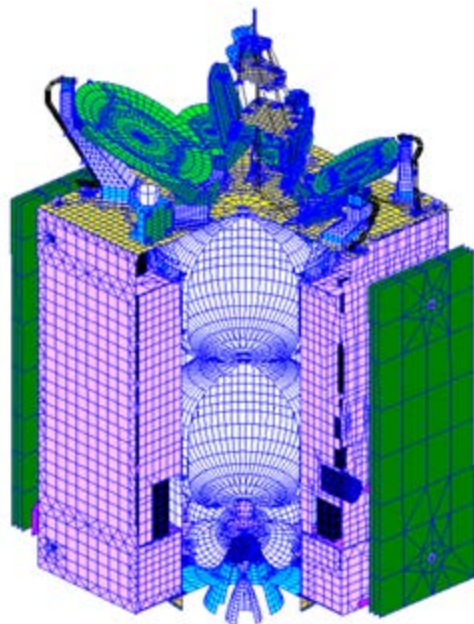
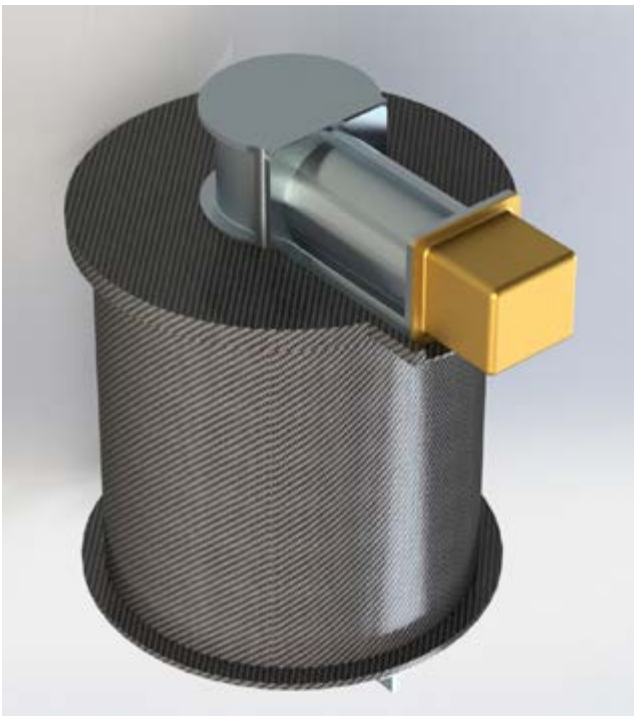
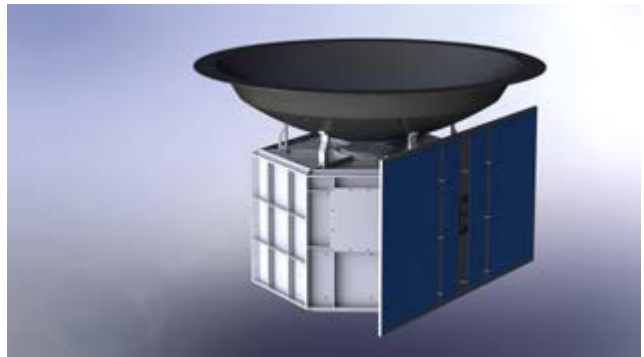
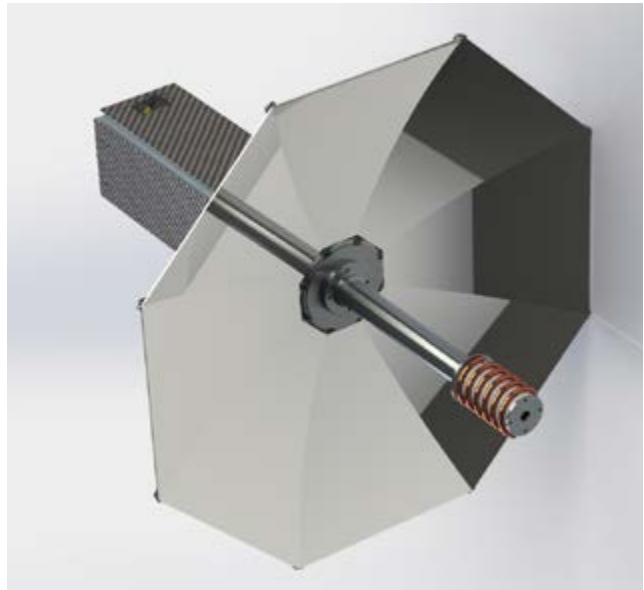


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Nano an Microsatellite for Dual Use Application  
 Elint and Optical Payload for Microsatellites  
 Sensor Suite for UAV  
 Ground TLC Satellite Stations  
 Large Thermal Vacuum Simulators  
 The Major Technological capabilities consist in:  
 Mission System Studies  
 System Definition  
 Thermo-Mechanical Analysis  
 RF Analysis  
 Deploying Mechanism  
 Metal and Composite Structure design and fabrication  
 Power Condition Unit design and fabrication  
 Feed and Antenna design and fabrication  
 Algorithm design and relevant SW development  
 AOCS Analysis and relevant SW development  
 AIT





# Radio Analog Micro Electronics srl

## Company profile

Radio Analog Micro Electronics srl, RAME in short, was established in September 2014 as High-Technology Content Innovative start-up company in the framework of Italian law 221/2012 based in Rome, Italy.

The current legal status is: limited liability research & development organization. RAME has applied for Italian Anagrafe Nazionale delle Ricerche (CAR code: 62214MIO) obtaining 100% rank from Ministero dell'Istruzione dell'Università e della Ricerca.

RAME has been approved for french Tax Credit (CIR) Accreditation from the French Research Ministry.

## Products | Services | Applications | Technologies

RAME provides services and disposes of technologies in ASIC, MW & RF circuits, FPGAs and EM-based sensor development application fields.

ASIC: RAME owns a portfolio of patented IPs in the following fields of application: • VCOs and PLLs • ADCs and DACs • RF receiver frontends (Attenuators, LNAs, Mixers) • RF transceiver frontends (Variable Gain Amplifiers, Poly-phase Filters) • Linear regulators (LDOs, Bandgaps) • Switching regulators (Buck and Buck-Boost converters) • Digital controllers for Power Management Ics.

MW & RF: Ku and Ka frontends for RF radar signal conditioning.

FPGA: mixed-signal controller Ips, cross and auto correlations IP for realtime radar signal conditioning, frame rate converters for realtime video applications (ARINC818 and other SerDes).

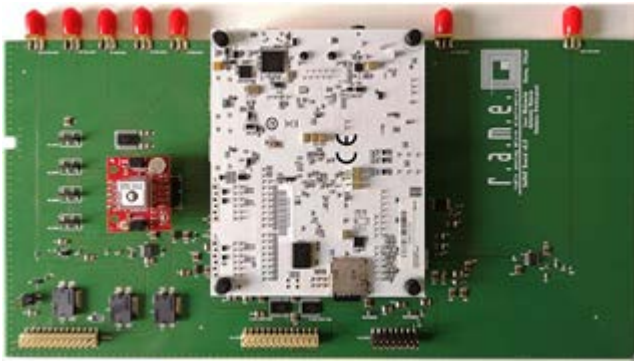
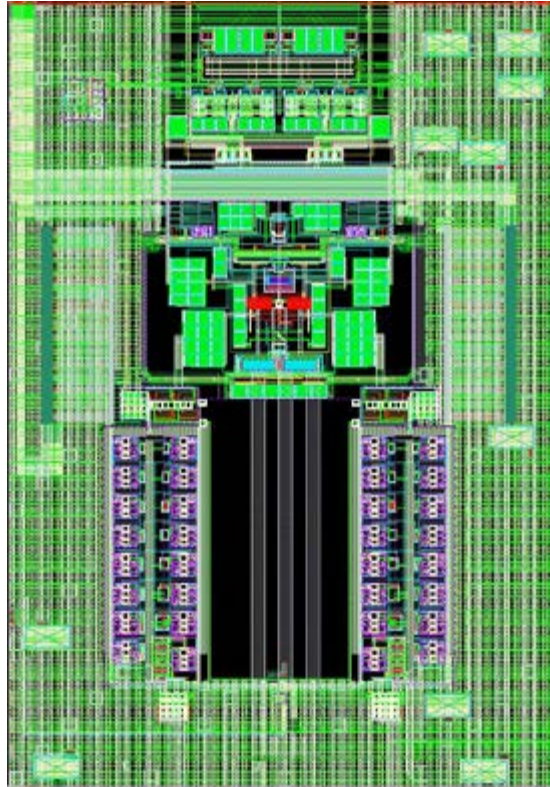
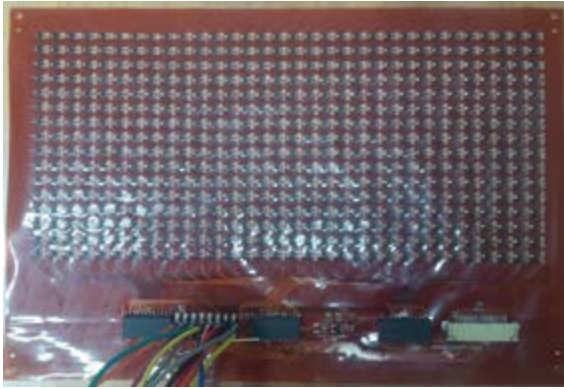
EM-Based sensors: RAME owns patented technologies for sensing of gauging in liquid with very low dielectric constant or determination of dielectric constant in finite volumes, for sensing conductivity in nanostructured surfaces (e.g. photo-voltaic cells). RAME is further developing proprietary technologies for sensing of the vascularization of human skin.



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# Radiolabs

## Company profile

Radiolabs Consortium, is a not-profit Research Organization established its headquarters in Rome in 2001 and currently includes three academic partners - University of Rome "Tor Vergata", "University of Roma Tre", "University of L'Aquila" - and two industrial partners - Ansaldo STS S.p.A. a Hitachi Group Company and WESTPOLE S.p.A. Radiolabs mission is to contribute on Applied Research, Innovation, and Knowledge Transfer in the emerging fields of ICT and relevant applications. More specifically, its main skills are in the areas of telecommunications, including wireless, satellites, railways communications and navigations, Internet systems and services, and new media technologies. Main areas of interest include: new wireless technologies, ambient intelligence, infomobility and context based services. Thanks to the close relationship between University and Industry partners strongly committed to research and innovation, Radiolabs represents one rare experience of a joint team able to gather a wide range of high level and complementary research expertise that produce studies design development of prototypes and patents. Thanks to the close relationship between University and Industry partners strongly committed to research and innovation, Radiolabs represents one rare experience of a joint team able to gather a wide range of high level and complementary research expertise that produce studies design development of prototypes and patents. Just to mention a few of the latest research activities on wireless systems, Radiolabs is involved on channel modeling, on theoretical analysis and performance improvement of modulation schemes (e.g., OFDM), and on the coexistence and interference of wireless access systems (e.g. UWB with WiMAX/IEEE802.16-based systems, Point-to-Point and UMTS). Regarding industrial developments, Radiolabs designed new protocols for mobile ad hoc WiMAX-based networks (WiMAX Mesh Networks project, 2007-2008) and now is involved in developing of Software Defined Radio platforms for the integration of wireless systems based on different standards (Stanag 4285, MIL-STD 188-110/B). Radiolabs is also involved in development, implementation and test of Waveforms according to SCA (Software Communication Architecture) methodologies for radio programmable platform in HF, VHF e UHF bands. The Consortium participated to the development of a mobile terminal to guarantee cross heterogeneous wireless network (Wi-Fi - UMTS) and in co-operation with RFI (Rete Ferroviaria Italiana), worked on the possibility to extend GPS and GALILEO coverage in tunnels for the European Railway Traffic Management System (ERTMS). The Consortium also studied the service architecture to provide time information from GALILEO satellites. Radiolabs best-practice approach is based on continuously gaining experience through participation in a number of innovative National, ESA and European projects.

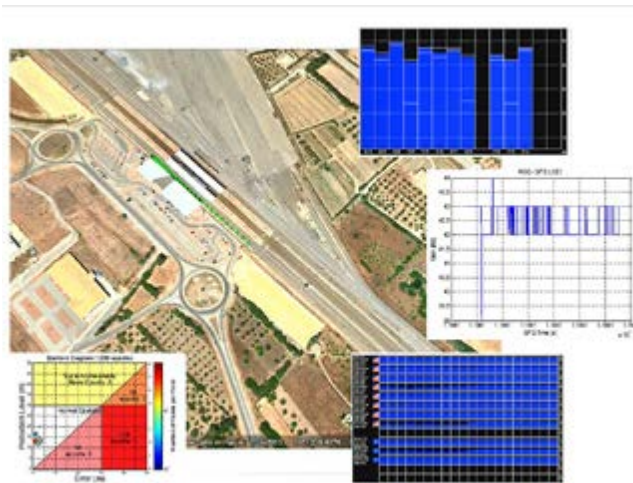
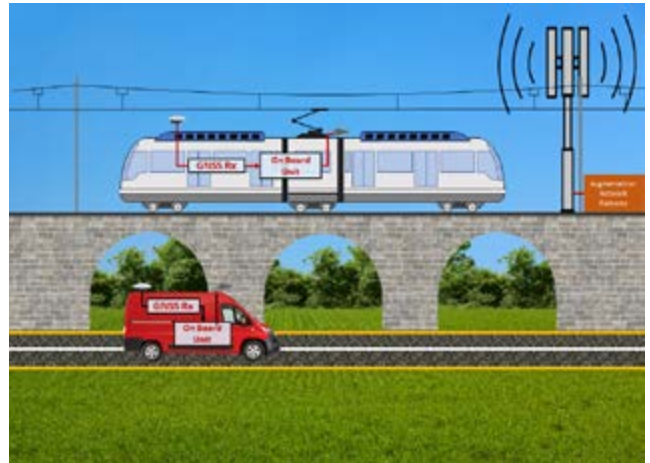


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# RedCat Devices srl

## Company profile

RedCat Devices (RCD), born as a start-up company in 2006, is a fabless semiconductor company devoted to design semiconductor memories and analog devices for aerospace and nuclear science taking the best from standard and well consolidated CMOS technologies and using Radiation Hardening By Design (RHBD) proprietary methodologies to enhance resistance both to total ionizing dose (TID) and single event effects (SEE).

RedCat Devices volatile and non volatile memories are designed specifically to be used in very aggressive environmental conditions. RedCat Devices can count on seven people permanent staff team including founders and consultants. Its capability spreads from project management to physical simulation and layout design of complete silicon devices for customers who can also be helped on silicon process evaluation.

Commercial Partnership

In november 2018, RedCat Devices signed an agreement for joint development and marketing of rad-hard processors for space applications with ARSULTRA (Argentina). The agreement aims to trigger common business opportunities in the space market and realize research activities for the development of new processors to be implemented firstly on ARSULTRA on-board computers.

Technological partners (Foundries)

X-FAB (Erfurt, Germany), TowerJazz (Israel), IHP (Frankfurt, Germany), LFoundry (Avezzano, Italy), TSMC (Taiwan), UMC (Taiwan).

Other partners

University of Jyväskylä (Jyväskylä, Finland), in particular with the RADiation Effects Facility, RADEF, an ESA-supported radiation effects test site.

University of Palermo (Italy), Dept. of Engineering for testing under irradiation (Cobalt 60) and development of rad-hard test-beds

Resellers:

Tecnode Solutions Pvt. Ltd. (India).

Research and Industrial projects

Running project:

Title: MORAL - Export-free Rad-hard Microcontroller for Space Applications

Funded under the Horizon 2020 Programme - SPACE-10-TEC-2018-2020, N52 action "JTF-2018/20-11

Period: 01/01/2020 - 30/04/2023

Title: Development of rad-hard PROMs for Space Applications (RAD-PROM)

Funded under the Italian Space Agency's Industrial

Period: 04/06/2018 - 04/06/2020

Title: Monitoraggio del Territorio e Agricoltura di precisione mediante sistemi a pilotaggio remoto (PIGNOLETTO)

Funded under Regione Lombardia (Call HUB) - POR 2014/2020 - INNOVAZIONE E COMPETITIVITA'

Period: 01/02/2020 - 01/08/2022

Title: ESA-NAVISP Anti Jammer SoC (AJS)

ESA Contract EL2-004

Period: 18/09/2019 - 18/03/2022

Former projects:

Title: Radiation Hard 16Mbit MCM SRAM for Space Applications (EuroSRAM4Space)

Funded under the European Union's Eureka Eurostars2 Programme.

Concluded

Title: Radiation Hard Resistive Random-Access Memory (R2RAM )

Funded under the European Union's Horizon2020 Programme.

Concluded

Books

• C. Calligaro and U. Gatti, (2018). "Rad-Hard Mixed-Signal IC Design, Theory and Implementation" in A. Baschiroto, P. Harpe, K. Makinwa, "Next-Generation ADCs, High-Performance Power Management, and Technology Considerations for Advanced Integrated Circuits", pp. 273-297, Springer, ISBN 978-3-030-25267-0, ISBN 978-3-030-



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25267-0 (eBook), <https://doi.org/10.1007/978-3-030-25267-0>

• Calligaro, C., and Gatti, U. (Eds.). (2019). Rad-hard semiconductor memories. River Publishers, Series in Electronic Materials and Devices. ISBN: 9788770220200.”

## Products | Services | Applications | Technologies

“RedCat Devices proprietary methodology for rad-hard components has been proven both for space applications (TID up to 300 krad (Si) and SEL over 80 MeV\*mg/cm<sup>2</sup> (Si)) and high energy physics experiments (TID over 25 Mrad (Si)) pushing standard Bulk CMOS to the same level of reliability of SOI/SOS and Triple Well CMOS. RedCat Devices also manages irradiation testing campaigns by using proprietary methodologies and FPGA-based custom board implementing ATE-equivalent functions for in-situ (under irradiation) testing.

### Products

#### RAD-HARD components:

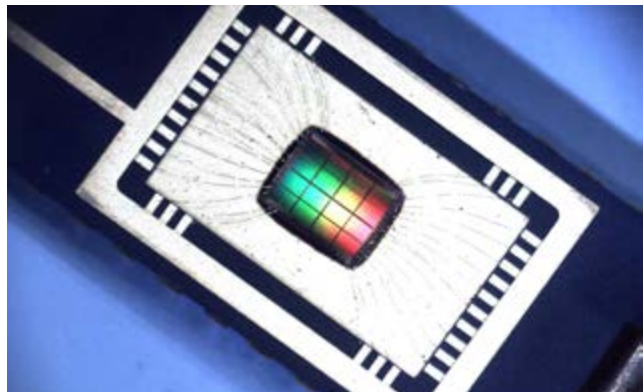
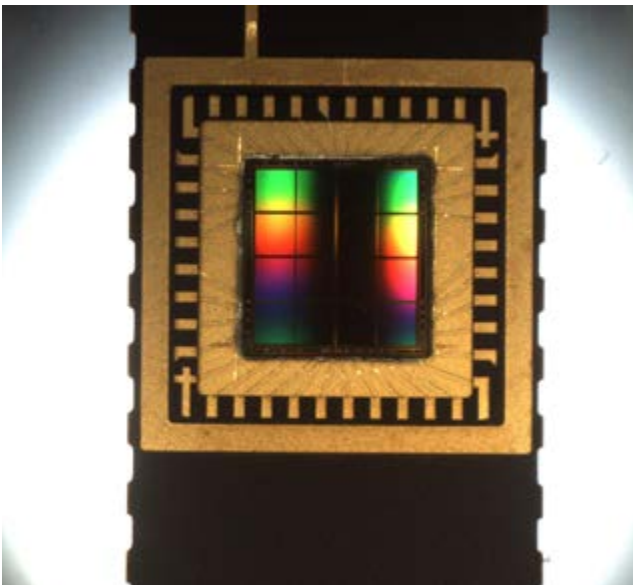
1. RC7C1024RHS: a 1Mbit (128Kbit x8) SRAM for standard space applications (LEO, MEO, HEO, GEO). Foundry: TowerJazz.
2. RC7C2048RHM: a 2Mbit (256kbit x8) SRAM device for low orbit (LEO) space applications. Foundry: TowerJazz.
3. RC7C4096MCT is a 4Mbit (128kbit x8 x4) MCM SRAM device for low orbit (LEO) space applications. Foundry: TowerJazz.
4. RC7C4096RHM: a 4Mbit (512kbit x8) SRAM device for low orbit (LEO) space applications. Foundry: TowerJazz.
5. RC7C512RHH: a 512Kbit (64Kbit x8) SRAM for Deep Space and High Energy Physics Experiments. Foundry: TowerJazz.
6. RC7C512RHM: a 512Kbit (64Kbit x8) SRAM device for low orbit (LEO) space applications. Foundry: TowerJazz.
7. RC7C512RHS: a 512Kbit (64kbit x8) SRAM device for standard space applications (LEO, MEO, HEO, GEO). Foundry: TowerJazz.
8. RC7C81092MCX: a 8Mbit (256kbit x8 x4) MCM SRAM device for low orbit (LEO) space applications. Foundry: X-FAB.

#### Rad-hard Libraries:

RedCat Devices rad-hard libraries are designed to be used in digital ASICs for space applications. All cells can be placed by using standard tools such as Cadence or Tanner.

#### Standard Cells:

- RadLib18T. Rad-hard standard cell library (1.8V) for TowerJazz ts18sl CMOS process (RadLib18T\_v3).  
RadLib18XF. Rad-hard standard cell library (1.8V) for X-FAB xh018 CMOS process (RadLib18XF\_v2).  
RadLib12I. Rad-hard standard cell library (1.2V) for IHP sg13s CMOS process.  
RadLib18LF. Rad-hard standard cell library (1.8V) for LFoundry lf15a CMOS process.  
RadLib18TC. Rad-hard standard cell library (1.8V) for TSMC cm018 CMOS process.  
RadLib33T. Rad-hard standard cell library (3.3V) for TowerJazz ts18sl CMOS process.  
RadLib33XF. Rad-hard standard cell library (3.3V) for X-FAB xh018 CMOS process (RadLib33XF\_v1).”



# RF Microtech s.r.l.

## Company profile

RF Microtech is a service company developing custom products and smart solutions for industries and system integrators operating in the field of Telecommunications, SatCom, Aerospace, Localization and Manufacturing Industry. RF Microtech offers innovative solutions in the area of antennas, beam forming networks, microwave filters and passive components, tunable devices, RF systems for satellite and terrestrial communications, radars for civil and military applications, sensors for real-time industrial processes control.

Founded into 2007 as a spin-off of the University of Perugia, RF Microtech can now rely on a high-qualified and creative team of 23 employees and 4 external collaborators, most of them engineers with PhD. The company is involved in different H2020 programs and is prime contractor in several European Space Agency projects. It is partner of international players such as Thales Alenia Space, SIAE Microelettronica, Elettronica and others. In 2017, the company moved into a larger premises, where a new and well-equipped laboratory for the manufacturing, assembly and test of antennas and microwave circuits has been set up, along with measurement facilities up to 67GHz.

## Products | Services | Applications | Technologies

The core business of the company consists of custom design and development of RF components and systems for industries, operating in the telecommunication field. Specifically, the main areas are:

- Antennas and phased arrays
- Microwave filters and passive devices
- Microwave Sensors and Systems

RF Microtech supports projects at different levels. In fact, the company provides Simulation and Technical Consultancy, System and Sub-system Design, Prototyping and Low-volume Manufacturing, RF Testing and Characterization, starting from a deep analysis of the customer requirements. The most advanced simulation tools are used: Ansys HFSS, AWR, CST microwave Studio and other in-house computational platforms for Antenna or Filter design. A well-equipped laboratory for the assembly of phased array antennas has been arranged, along with measurement facilities up to 67GHz for antenna and microwave equipment.

The enabling technologies provided by RF Microtech can be transversally applied in different markets, such as:

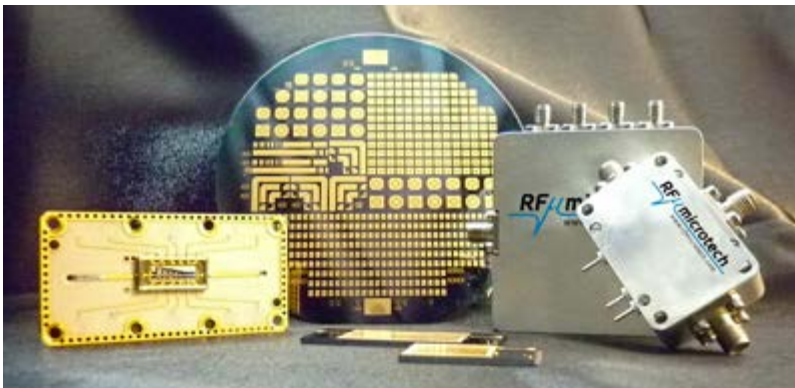
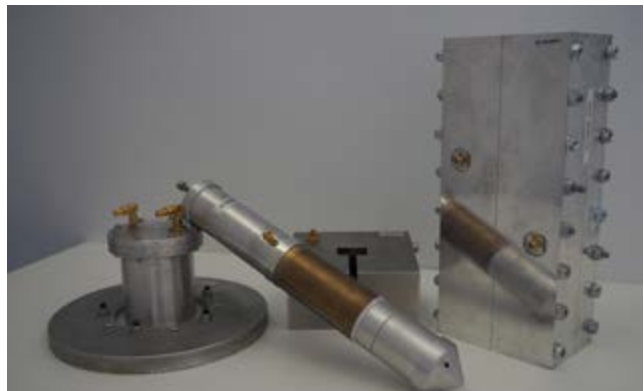
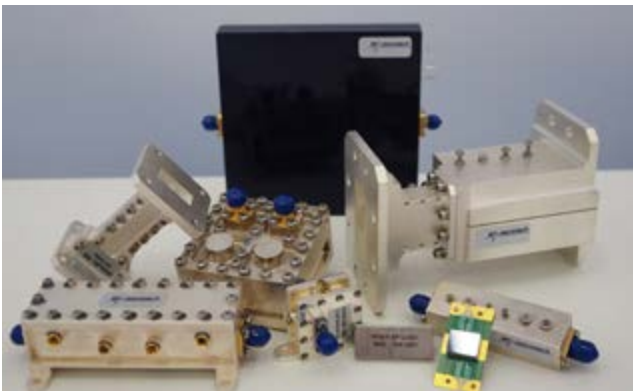
- Telecommunications and SatCom
- Space and Avionics
- Radio Link
- Real Time Control of Industrial Processes
- Localization and Sensing



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# RGM S.p.A.

## Company profile

### **rgmspace@rgm.it**

RGM is an Italian company founded in 1986 by a small group of people dedicated to production of power supplies. During the years, RGM expanded its portfolio of products, specializing in the creation of complex custom systems for power conversion for a wide range of applications in transportation, hybrid systems and energy storage, industrial and medical markets.

RGM has an important Business Unit RGM SPACE based in Rome, focused on EEE parts procurement and testing of Hi-Rel components and completely dedicated to the Space market.

RGM SPACE is a Procurement Agency formed by Managers with large experience in Space Projects, Component Engineers in the field of Hi-Rel components and Technical Experts in Space components and related activities management.

RGM SPACE participated to the main European Space Agency (ESA) and Italian Space Agency (ASI) Programmes through their Customers based in Italy, Europe and Worldwide.

Our activities start from the analysis of part list and customer requirements to achieve the best qualitative, technical and economical definition of part numbers and related test activities, in order to provide turn-key solutions in terms of parts and documentation.

Our Division has special and direct agreements with a wide range of Manufacturers and Suppliers in order to provide to our Customers the best solution, supporting them also in Parts Reductions, Standardisation and Cost Evaluation.

RGM SPACE also manage all the tests requested in a Space Program and all the procurement related documentation (Certificate of Conformity, PAD, DPA, NCR, RVT, Up-screening, Precap, Buy-off, Datapackage, EDAX, Relife, Humidity Test, etc.), available also online in a reserved area on our Web Procurement Documentation Management site.

All the processes in the Company are managed according to :

ISO 9001:2015 (Quality) for RGM Space

EN 9120:2010 requirements for Aviation, Space and Defense distributor

EN ISO IEC 80079-34 (ATEX) for products to be used in explosive atmosphere

For the more demanding Military and Space projects we apply the rules and the quality requirements set down respectively by the ECSS standards.

## Products | Services | Applications | Technologies

The activities covered by RGM SPACE can be divided into three areas:

Parts Engineering

Parts Reduction and Standardization and Preparation of Consolidated Component List (CCL)

Preparation of Detailed Specification

Technical Negotiation of Specification

PAD Preparation

Evaluation / Qualification Plan and Test Plan Preparation

Technical Interface with Manufacturer / Users

Technical and Radiation Data Base Management

Procurement

Request for Quotation and Negotiation with Vendors



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Procurement Schedule and Planning Definition  
 Purchase order Placement /Monitoring  
 Parts Procurement Status and Schedule Monitoring  
 Custom Operation / Ex -Import / Export License management  
 Parts in Stock Management  
 Incoming, Logistics & Testing  
 Visual Inspections, EDX Analysis,  
 Documentation and data review  
 Store management,  
 PRE-CAP & BUY-OFF,  
 Management of NCRs.

RGM SPACE manage also complex testing activities such as Destructive physical analysis (DPA), failure and construction analysis, Up-screening & QCI, Relife, Humidity Test, Burn-in, Life test, Electrical Test characterization, Hermeticity test, Radiation test -TID-DD-SEE, Xrays, CSAM, Radiation Tests (Total Ionizing Dose HRD/LDR/ELDRS).



# S.A.T.E. - Systems and Advanced Technologies Engineering S.r.l.

## Company profile

S.A.T.E. is an R&D and engineering company, founded in 1998 that performs services of advanced technology engineering in many different industrial fields, in particular in the offshore industry, in the gas compression and processing industry, in the automotive industry, in the space and marine industries.

S.A.T.E. specialises in the study and analysis of innovative systems, modelling, simulation, diagnostics and knowledge extraction from data, applied to power and operating machines, plants, vehicles, space systems and special machines.

In particular, S.A.T.E. operates in the following areas of activity:

- **SYSTEMS ENGINEERING**, which consists in the activities of consultancy, study and design with regard to mechanical, underwater, marine and space systems for which design with a strongly interdisciplinary and inter-functional ("systems-engineering") approach is normally necessary.
- **SIMULATION AND MODELLING**, consisting of dynamic simulation services of systems operation and control, which is necessary to verify their design. To provide these services, S.A.T.E. uses its own proprietary advanced software products, developed in the MATLAB/SIMULINK environment, for both off-line and real-time simulation. S.A.T.E. simulation tools for compressors and gas turbines thermo-dynamics and control, energy generation cycles, internal acoustics propagation and flow induced vibrations phenomena are key qualifying company products in this area.
- **SOFTWARE ENGINEERING**, which services are provided for applications requiring customised software products, either for simulation activities or for other purposes.
- **DATA ANALYSIS AND DIAGNOSTICS**, which consists in services oriented to the interpretation of data acquired from any type of physical system, such as a car or a satellite, with the purpose of characterising the system behavioural patterns and exploiting the knowledge extracted from data to improve system or process performance, identify anomalies, detect incipient faults and identify possible causes, automatically. Both physical-mathematical models and data-based models are designed and developed by S.A.T.E. with the purpose of system diagnosis.

SATE is a qualified supplier of international OEM, IPC contractors and oil companies in the power and oil&gas sector.

SATE is a qualified consultant and supplier of OEM and engineering companies in the automotive and motorcycle sectors and of CERN, ESA and Large System Integrators in the research and space sector.

SATE quality system is certified according to ISO 9001-2015 standards.

## Products | Services | Applications | Technologies

### MODEL BASED DYNAMIC SIMULATION SERVICES AND PRODUCTS

Dynamic simulation and real time simulators of processes and machines operation and control, such as for the gas compression facilities, gas turbine power plants, refrigeration cycle compressors during design, commissioning and start up phases.

Simulation of telescopes dynamics, to evaluate the dynamic oscillations of the mounting structure and optical parts and verify compliance with system specifications, considering wind disturbance, gravity, bearing friction, motors model and controls.

### DATA ANALYSIS AND DIAGNOSTICS SERVICES AND PRODUCTS

Systems diagnostics in a variety of solutions, including both model-based and data-



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based approaches. In the space field, S.A.T.E. performed six projects for ESA for the study and implementation of innovative data mining solutions for the extraction of relevant knowledge from large datasets and the automatic detection of novelties or correlations. The technologies developed were applied to:

- spacecraft telemetry or test data, to support the evaluation of test results, monitor the spacecraft health state and learn from data on its behaviour. The software solutions developed are KETTY (Knowledge ExtracTion from Telemetry) and CASTeC (Context Aware Spacecraft Telemetry Checking).
- medical data, to define solutions that may enable astronauts' medical autonomy in future missions. The software solution developed is CLUE (Tool for Clinical Laboratory data Understanding and Knowledge Extraction).
- GNSS data, to extract recommended ships routes from historical GNSS datasets, with space-time tolerances, based on ships characteristics and weather conditions, to enhance vessels traffic monitoring. The software solution developed is TRA-Miner (TRAjectory Miner).

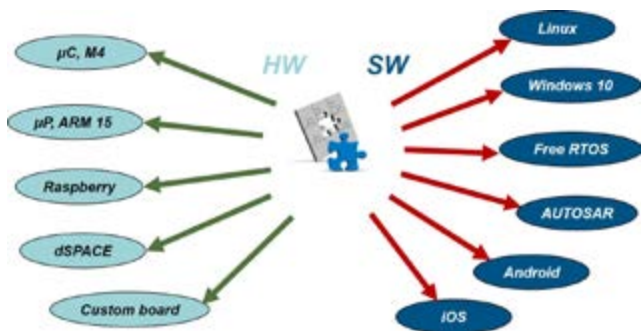
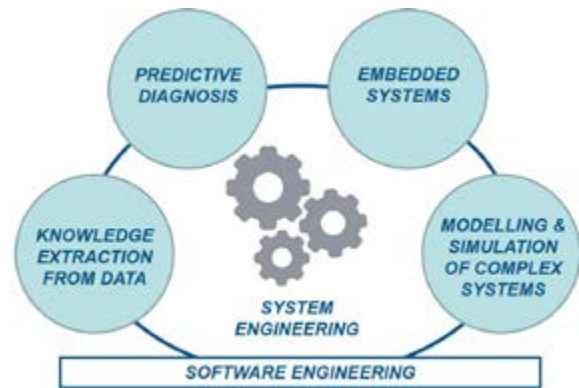
Technology transfer to other application domains, such as the automotive and the energy distribution fields, is continuously applied by S.A.T.E.

#### SOFTWARE PRODUCTS

Software products for the simulation or diagnostics of different types of systems.

S.A.T.E. is included in the network "Third party products & services", qualified by The Mathworks Inc., having produced, sold and used for commercial services, advanced simulation products for compressors, gas turbines, power-train dynamics, tyre-road interaction, mechanical suspensions, automotive HVAC, pneumatic systems, CAN signals acquisition and on-board diagnostics, fuel consumption monitoring for vehicle fleets and data analysis.

For example, in the automotive filed, for the vehicle transmission dynamics, the tyre threads performance, the vehicle air conditioning system, the heat transmission and the automatic correction of the temperature set point according to the driver effort and physiological status. The experience gained in software engineering allows S.A.T.E. deploying software satisfying the customer requirements and tailoring it to the specific programming languages and framework selected.





# SAB Aerospace S.r.l.

## Company profile

S.A.B. Aerospace S.r.l. (SAB-IT) is a company part of SAB group, in the space business since 2004. The company's core business is focused on the development of mechanical systems and subsystems for Launchers and Satellites. The internal facilities such as Manufacturing, Assembly, Integration and Testing, together with the heritage in ESA programs as responsible for small systems, put SAB-IT in the position of being a valuable alternative to large companies in different fields of activities.

Nowadays SAB-IT is recognized as one of the Italian player in the Launchers field, thanks to the collaboration with ESA and AVIO on the Small Spacecraft Mission Service project (SSMS).

The other main activities carried out by SAB-IT are related to Satellites, mainly focused on the development of mechanical subsystems of satellites platforms as well as optical payloads and equipment.

In the frame of the internationalization process, a new company has been started in Czech Republic (S.A.B. Aerospace Sro), Poland (SAB Aerospace Spzoo) and for 2020 new operational headquarters are planned to start in Romania. The company is nowadays recognized as a small system company, with competences related to electronics, mechanical, thermal, software and system integration.

## Products | Services | Applications | Technologies

### PRODUCTS:

SPACEBATTERY: development of next generation battery packs, using lithium ion cells and an evolved Battery Management System with the possibility of telemetry and remote control;

Launchers, Adapters, Dispensers and Interface Rings;

UAV: unmanned Aerial Vehicle (UAV).

### SERVICES:

#### MANUFACTURING

- Machined of Machined Parts (internal facility);
- Manufacturing of Composite Parts (outsourced)
- MWI Baseplate

ASSEMBLY/INTEGRATION: AIT activities performed by certified operators:

- Internally in clean room 100000 Class (e.g. Assembly Integration and test of Flight HW internally manufactured);
- By the customer ( e.g. EDRS-C panel integration and alignment at OHB System premises);
- In Centre Spatial Guyanais (e.g. SSIS integration on VEGA for PROBA-V launch at CSG in Kourou);

#### TESTING

- VESTA (Vega Shock Test Apparatus): Shock Qualification Test for the Satellite embarked on VEGA launcher;
- Vibration and Shock Testing (internal facility);
- TVAC Testing (outsourced);
- SSMS Dispenser First Tower;
- VIS SDPU PFM Physical and Mechanical test;
- SA-4S PDR opening and drop test.

#### APPLICATIONS:



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Conero-UAV: environmental monitoring services to the local communities and public Institutions through the Unmanned Aerial Vehicle (e.g. coast erosion, environmental pollution);

ARIANNA: platform that optimizes the tracking and management of goods within the intermodal logistics (vehicles tracking, traffic status monitoring, tracking of goods, Personal Protective Equipment RFID identification, Driver Rfid Identification, Communication interfaces towards National Telematic System);

#### TECHNOLOGIES:

##### Development of Material Technologies

- Advanced Ceramics: development of novel materials for TPS for re-entry vehicles and equipped with SHMS (in collaboration with CGS and CNR-ISTEC);
- Light Alloys: innovative application of magnesium alloys for aerospace systems.

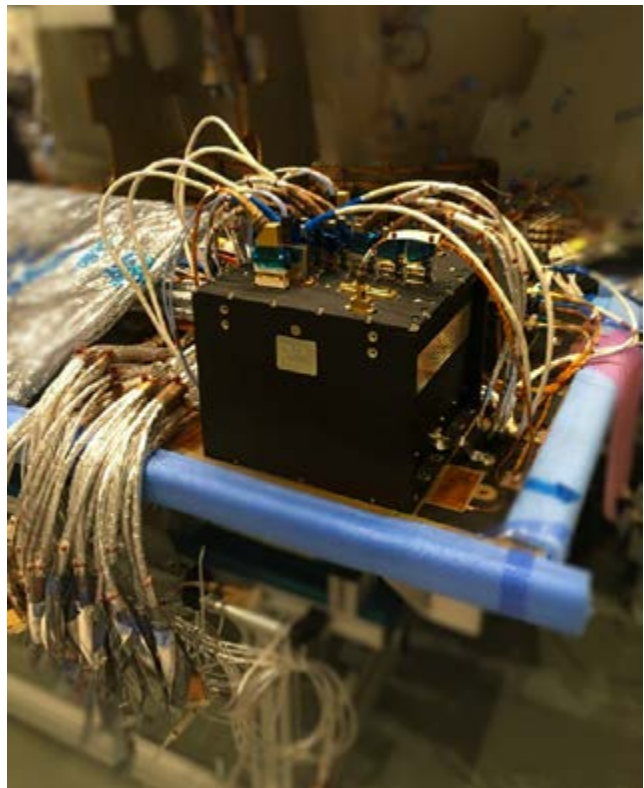
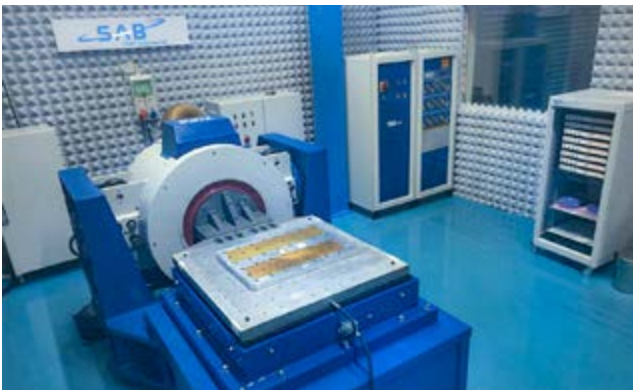
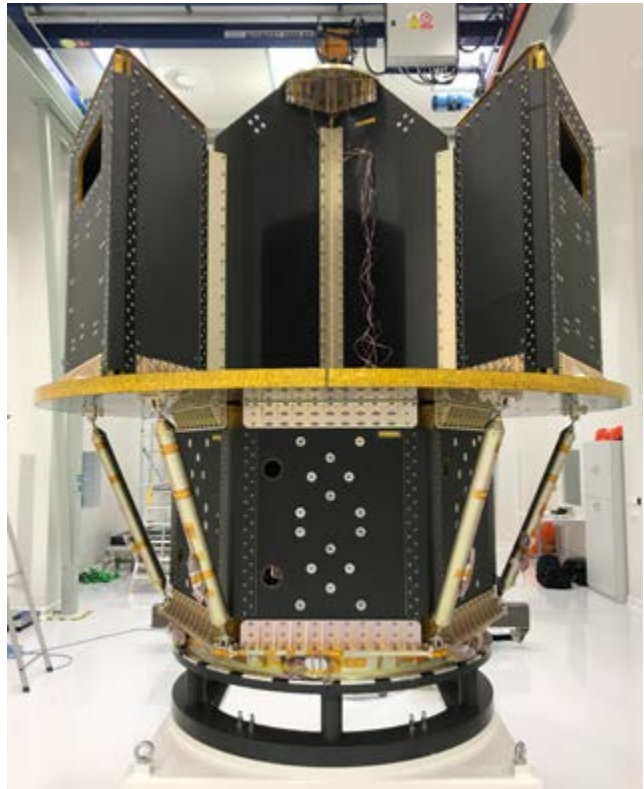
##### Development of Processes Technologies:

- Friction Stir Welding/Laser Welding;
- Carbon Fiber Lamination;
- Honeycomb Sandwich Panel with CFRP skins Manufacturing.

##### Development of Technologies for Separation Systems

##### Development of Aeronautical System:

- UAV (unmanned air-vehicle);
- Flight Management System.



# SAB Launch Services S.r.l.

## Company profile

SAB Launch Services S.r.l. (SAB-LS) is a company part of SAB group offering launch services for Nano and Micro-satellites on European Rideshare and Piggy Back missions. SAB-LS offers “end to end” services including launch procurement, support to the customer during development and qualification phase, integration activities of the satellite on the launch vehicle structure, pre and post launch support and full insurance at very competitive prices. SAB-LS focuses its activities on the VEGA and VEGA-C missions belonging to the Small Spacecraft Mission Service (SSMS) family. In the frame of the SSMS project a modular dispenser has been developed to enable the provision of a dedicated service to small satellites. Such modular structure can be flexibly configured in order to be adapted to the specific satellite aggregate.

The SSMS dispenser coupled with the VEGA AVUM (Attitude Vernier Upper Module) provides maximum flexibility for rideshare missions, allowing multiple satellite releases in different orbits with different altitudes and/or some inclination change.

The company operates from its headquarters of Benevento (Italy), while payload integration activities in Europe are carried out in the SAB Aerospace facility in Brno (The Czech Republic). Final Integration and Pre-Flight Operations are performed in the European Space Port in French Guiana.

## Products | Services | Applications | Technologies

Brokering of launch services including pre and post-launch activities;

Deployment Hardware Procurement;

Fit Check at Customer Premises;

Satellite integration on launch vehicle in European Premises;

Packaging and shipment to launch site;

Launch Insurance.



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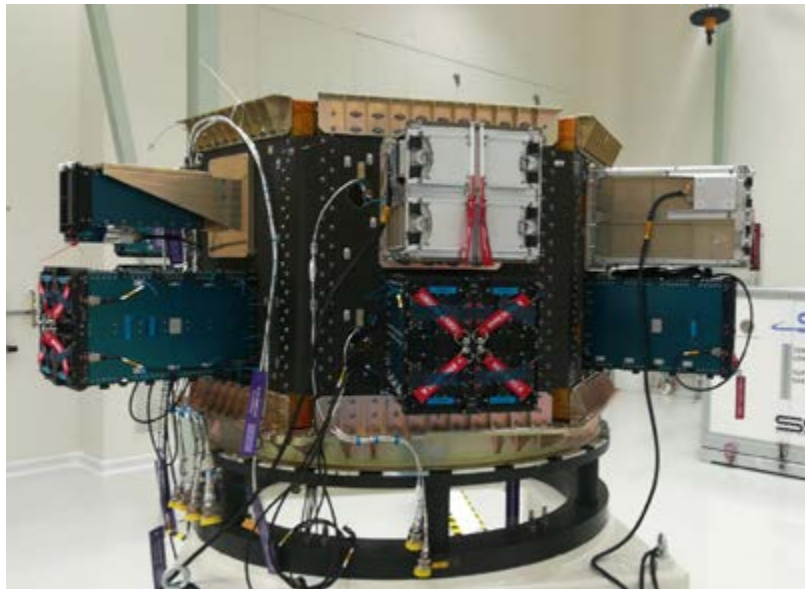
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# Serco S.p.A.

## Company profile

Serco Italia is an Italian company belonging to Serco Group, the public services expert specialising in the delivery of essential public services and managing over 500 contracts worldwide.

In Italy, our core business sector is Space, and in particular the Earth observation (EO) domain: we have been providing a wide range of services to the European Space Agency (ESA), national space agencies, institutional governments and the European Commission (EC) for the past 30 years.

Serco's teams of engineers, technicians and operations specialists support a wide range of space and ground activities: from data archiving and exploitation, data processing; to systems design, operation and maintenance; data production quality control; and the scientific and technical support for EO satellite data exploitation projects.

In addition, as part of our user-facing functions, we provide specialised EO Helpdesk and Service desk as well as 24/7 operations for critical services (e.g.: to manage incoming requests for the International Charter for Disasters).

Our employees also play an important role in supporting prestigious European programmes, such as the EU Copernicus programme, where Serco Italia provides key services for the Sentinels Core Ground Segment and Data Access and for the data dissemination operations to final users.

Serco is also participating in a number of EC H2020 Calls, such as EOPEN (open interOperable Platform for unified access and analysis of Earth observation data), which aims to fuse Copernicus Sentinel data with heterogeneous big data sources, and MOSES (Managing crop water Saving with Enterprise Services), which proposes an integrated and innovative water management solution.

## Products | Services | Applications | Technologies

### Space

- ☐ Systems Engineering
- ☐ Service Operations
- ☐ Scientific Support for data exploitation
- ☐ Satellite Data processing
- ☐ Satellite Data Archiving
- ☐ Quality Control Services
- ☐ CAL/VAL
- ☐ Satellite Data Dissemination
- ☐ Ground Segment Operations
- ☐ Earth Observation Help Desk
- ☐ Front-end User Services
- ☐ Project Management
- ☐ Training Services

### Information Technology

- ☐ IT Infrastructure Maintenance and Operations
- ☐ System and Database Administration
- ☐ Web design and operations
- ☐ Cloud Solutions

### Defence

- ☐ Programme/Project management support services



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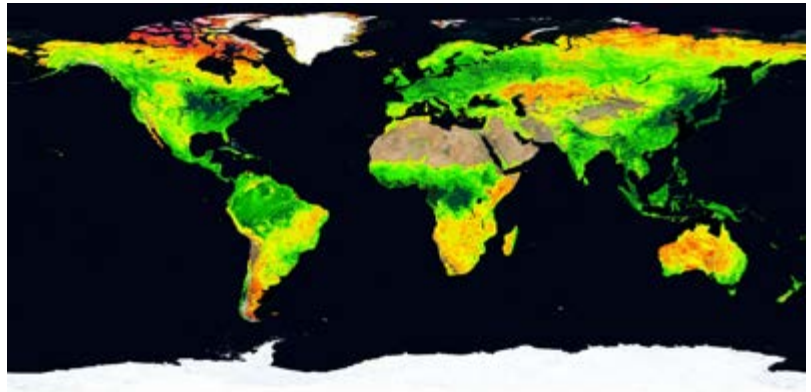
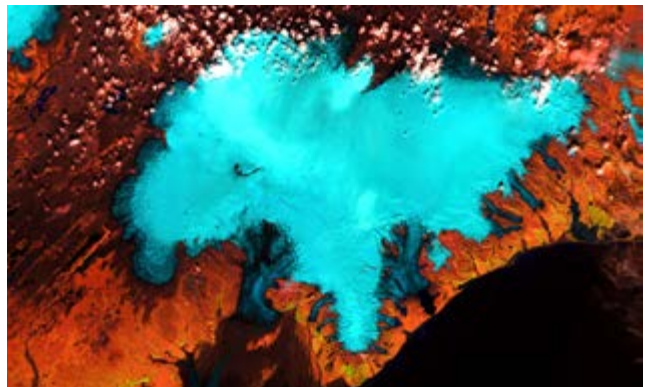
## ONDA DIAS

Serco Italia leads one of the Copernicus Data and Information Access Service (DIAS) foreseen by the European Commission and operated by ESA.

ONDA is a cloud-based platform providing direct access to one of the largest archives ever built for geospatial data (including full availability of all Copernicus Sentinel Missions data, information products from the Copernicus Services, and data from additional missions like Landsat-8 and Envisat).

ONDA's aim is to support the development of Copernicus-based user applications and also to enable research and business by providing custom solutions.

❑ [www.onda-dias.eu](http://www.onda-dias.eu)



# Sicilsat Communications srl

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## Company profile

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Sicilsat Communications operates in the area of satellite communication systems. The company was founded in 2010 by Concetto Squadrito which has more than thirty years of experience in the telecommunications sector. The main activities are design, manufacture, installation and testing of up-link and satellite system. Sicilsat Communications designs and manufactures fixed and mobile satellite systems, adapting them to the needs of its customers. This allows to obtain high reliability, a good standard realization, while maintaining a very competitive final price.

## Products | Services | Applications | Technologies

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Sicilsat Communications is able to design geometry for both satellite and ground antenna, single or multi reflector.

Moreover, in recent years we have specialized in the field of microstrip and planar antennas, with considerable satisfaction of our customers for space applications as cubesat and nanosatellites.



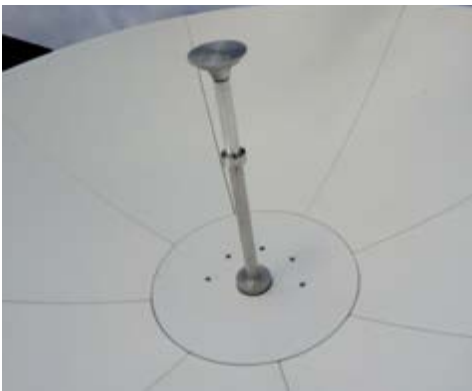
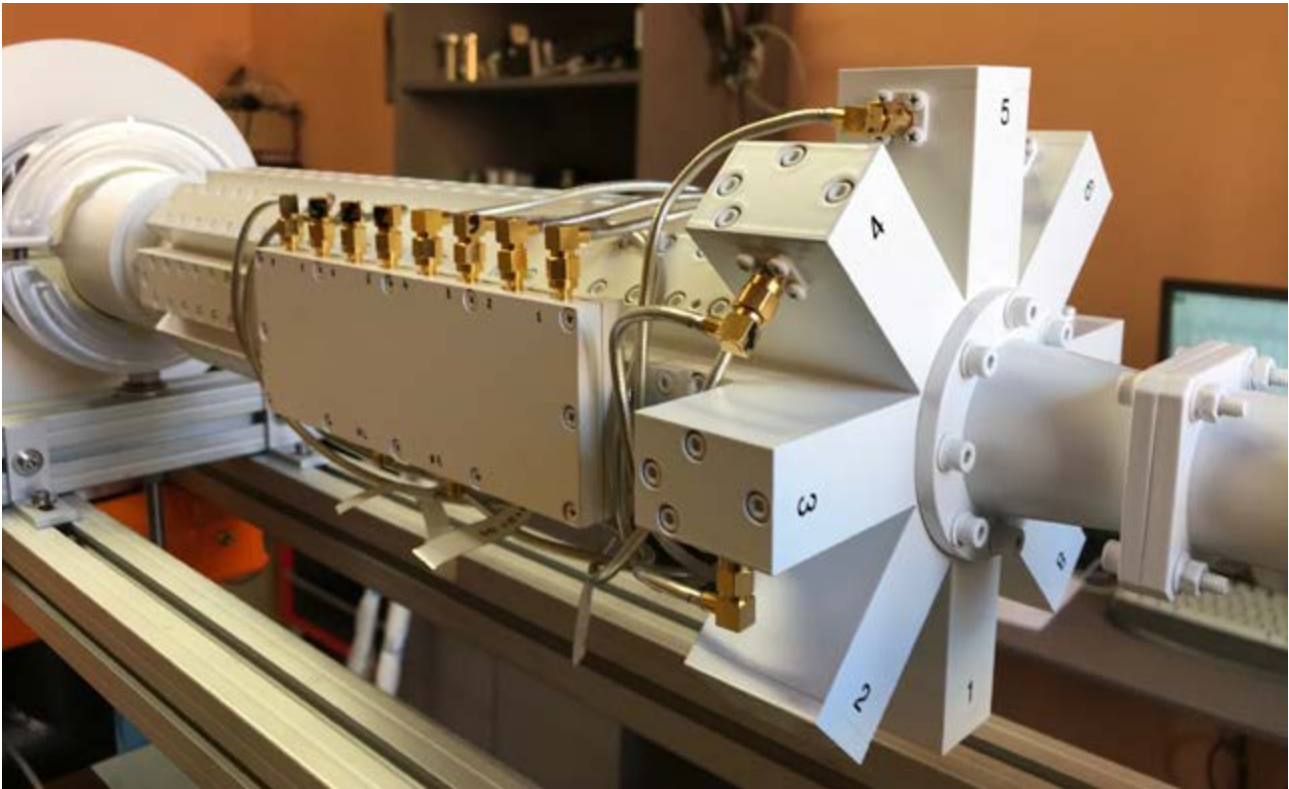
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# Sigma Consulting

## Company profile

Founded in 1998, Sigma is a System Integration Company experienced in the Design of Electronic and ICT Systems (HW and SW) for satellite, avionics, naval and ground platforms and all related services such as: Logistic Support, Training and Customer service.

The main fields of application are:

**DEFENCE & AEROSPACE:** Flight & Radar Simulators, On-Board Simulators, Avionic Defense Systems; Operation Support Centers, Ground Station Control for UAV and Aircraft Missions, Automation Test Bench.

**ENVIRONMENTAL MONITORING:** Radio Emissions Monitoring System (HW and SW).

**HOMELAND SECURITY:** ELINT Satellite, COMINT, RADAR, Intelligence Command & Control.

**CIVIL APPLICATIONS:** Inertial Location / GPS, Telemedicine, Precision Farming, Smart City, Cybersecurity.

Over its twenty years of activity, Sigma has signed agreements and partnerships with leading institutions and companies in the field of Aerospace and Defense such as the Italian Air Force, Italian Navy, Finmeccanica and Selex ES and Selex Galileo (now Leonardo), MBDA, ELT Elettronica, MES, Vitrociset, Alenia Aeronautica, Galileo Avionica, Aermacchi, Agusta Westland, Sirti, Alitalia, EADS, Northrop Grumman Italy.

Sigma steadily collaborates in R&D projects with the Universities of Rome Sapienza, Tor Vergata and Roma Tre, the University of L'Aquila and the CNR-IAC (National Research Institute).

Sigma Consulting processes are managed according to UNI EN ISO 9001:2015 quality standards.

Sigma Consulting is located in Tecnopolo Tiburtino - the main technological district in Rome, which hosts 130 companies mainly in Aerospace sector.

Sigma is the formal representative of ATEN IS Group, an Advanced Technology Network established in 2013 with the aim of developing products and services in the Aerospace and ICT sector. ATEN IS currently consists of more than 30 companies and has established international partnerships with several countries to-date including Brazil, Peru, Ecuador, Bulgaria, China.

## Products | Services | Applications | Technologies

Space and Defence Systems and Sub-Systems

- Intelligent Data Fusion Algorithms, regarding the supervision of territory from enemy threats
- Development of ELINT (Electronic Intelligence) and COMINT to installation on board a microsatellite
- LIDAR Anti-IED System for analysis of terrestrial missions through optical systems; IR, Lidar on UAV.
- Radiofrequency Protractor for Anti-IED localization with RF emission
- Phased Array and Collision Avoidance Radar used both for avionics and UAV applications, and for land and border security.

Experience with ESA / FP projects

- PNRM a2011.190 "Advanced C-ESM Intercept Systems on UAV-APR C-IED"
- PNRM a2010.49 "Configurable Electronic Defense Training Simulator - SADEC"
- POR FERS 2007-2013 - FILAS-MI-2011-1012 "Interception and Advanced Localization Emissions System"
- PNRM 2013: Presented - in collaboration with Thales Alenia Space, a technical proposal for Implementation of an ESM Satellite Technology Demonstrator



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EU project:

PANTHEON (Precision Farming of Hazelnut Orchards) is a research project funded by the European H2020 program (H2020-SFS-2016 – Sustainable Food Security). The project aims to define a new paradigm for precision farming in hazelnut orchards: a SCADA system capable of monitoring the phytosanitary status of each single geolocalized plant through data collected by drones and ground robots.

PANTHEON resorts to remote sensing capabilities to collect very large amounts of data and reach the information granularity of the single plant. Research activities concerning the management of big data, in terms of collection, storage and processing, have been included in the project.

One of the objectives of the Project is the development of techniques for the treatment of data acquired from high-level sensors (e.g. multispectral camera, LiDAR, etc.) to extract relevant features for subsequent agronomic analysis.



# Società Aerospaziale Mediterranea - SAM Scrl

## Company profile

The Mediterranean Aerospace Society SAM is composed by fourteen Companies (large, small and medium) operating in the aeronautic and space sector. SAM, a simultaneous engineering system, is one of the first Italian examples of Companies aggregation in the aerospace sector.

SAM has been founded in order to meet the market needs and to take advantage of all the development opportunities coming from national and international economic recovery.

SAM activities are focused:

- **INDUSTRY:** design, manufacturing and aircraft maintenance activities, development and manufacturing of mechanical and electronic apparatus for aeronautic-space industry
- **SERVICES:** advanced technology services on earth observation implemented through satellite, avionic platforms and ground segment for monitoring and surveillance of territorial environment parameters
- **ASTROPHISICS:** SAM is member of the Dish Consortium (SKADC) led by CETC54 of JLRAT (China), and in particular it is involved in the Structural Branch led by MT Mechatronics, Germany and in the Local Monitoring & Control, led by INAF (Italy).

**SKA Dish Consortium (SKADC)** The SKA Dish Consortium is responsible for the design and verification of the antenna structure, optics, feed suites, receivers, and all supporting systems and infrastructure for SKA1-mid and SKA1-survey.

## Products | Services | Applications | Technologies

**INDUSTRY – Astrophysics & Big Science Projects**

SAM is involved in some important “Big Science Projects”. In the biggest world Astrophysics Project SKA (Square Kilometre Array), SAM is member of the Dish Consortium led by CETC54 of JLRAT (China), and in particular it is involved in the Structural Branch led by MT Mechatronics, Germany and in the Local Monitoring & Control, led by INAF (Italy).

**APPLICATIONS & SERVICES**

Integrated earth observation system through satellite and avionic platform using multisensor technologies and possessing operating characteristics enabling data acquisition via diverse sensors in a single mission.

Ground segment which guarantees data in the field of Geographic Information 24/7 for environmental monitoring and surveillance services, mapping and value added information for GIS and DDS systems.

**SPACE & GROUND SEGMENTS**

- Design and manufacturing of space infrastructures and payloads for scientific and commercial missions, environmental monitoring, and TLC applications
- Design, development and manufacturing of on board and ground electronic equipment
- Antennas and other ground mechanical equipment
- Prototyping and reverse engineering
- Precision machining
- Composite materials design and development

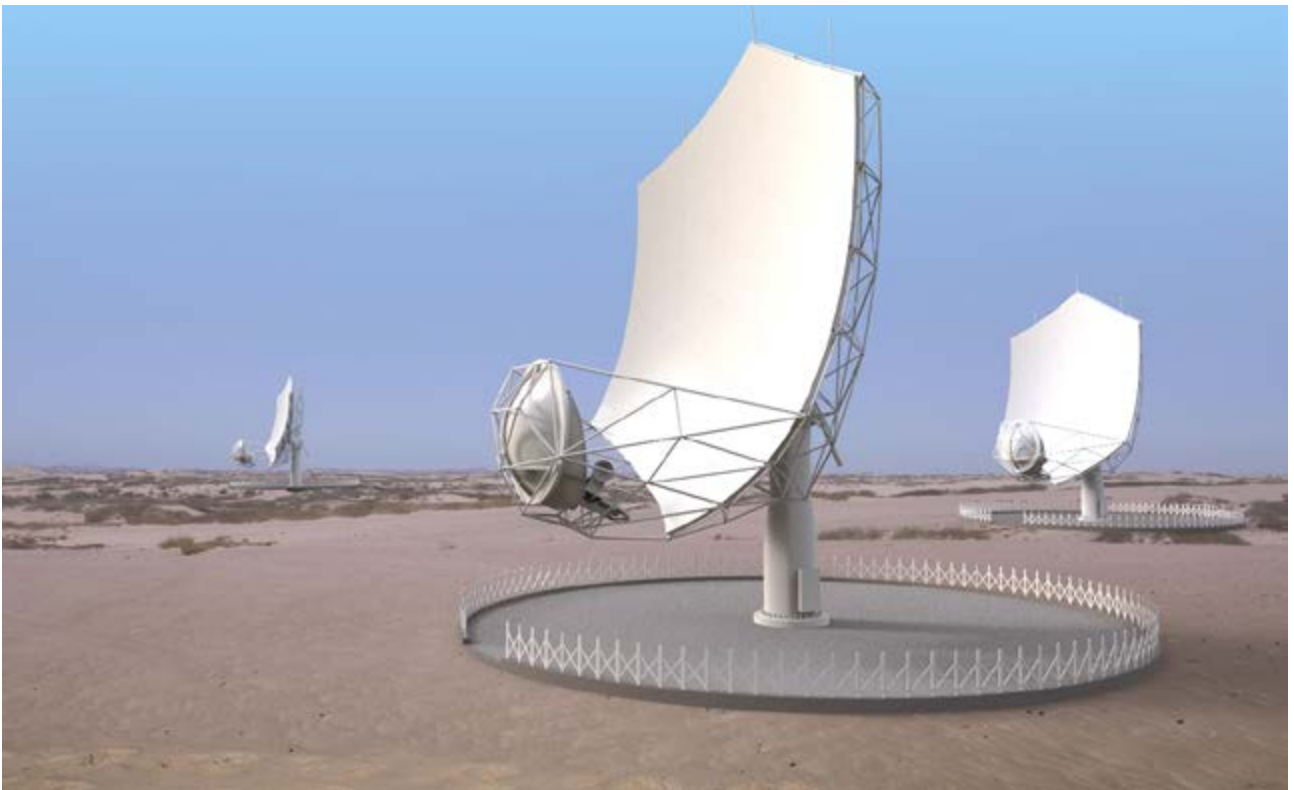


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# SO.MA.CI.S. SPA

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## Company profile

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Since more than fortyfive years SOMACIS has been a dynamic company producing high-tech PCBs and delivering innovative solutions worldwide.

SOMACIS, headquartered in Italy, is one of the leading PCB manufacturers, with more than 1000 employees and production plants in Italy, USA and China.

SOMACIS is a worldwide supplier for HDI, rigid, rigid-flex and flex PCBs for time critical NPIs as well as for mass production requirements.

## Products | Services | Applications | Technologies

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High-Technology Printed Circuit Boards

Quick Turn-Around

Material Choice Flexibility

Co-Engineering, Development, Prototyping and Mass Production

AS9100 and NADCAP Certified

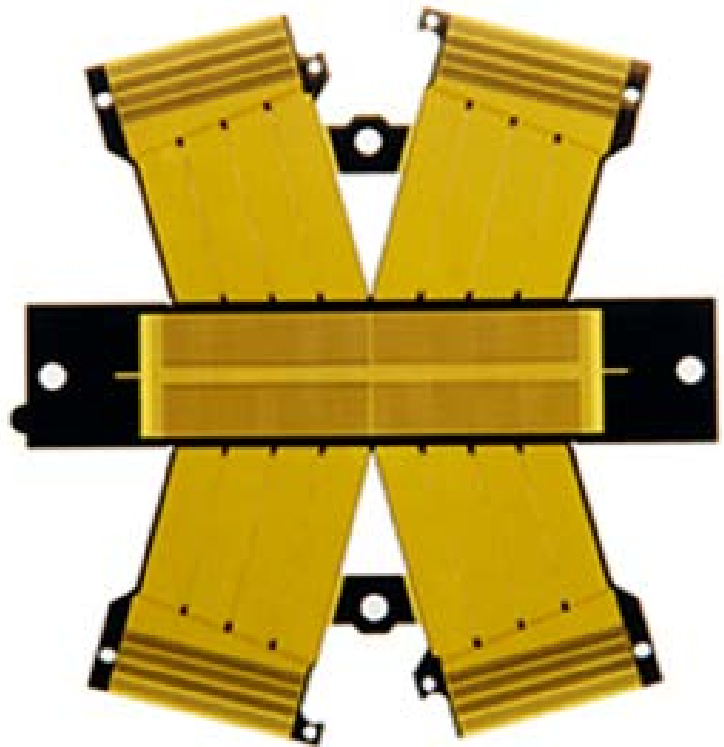
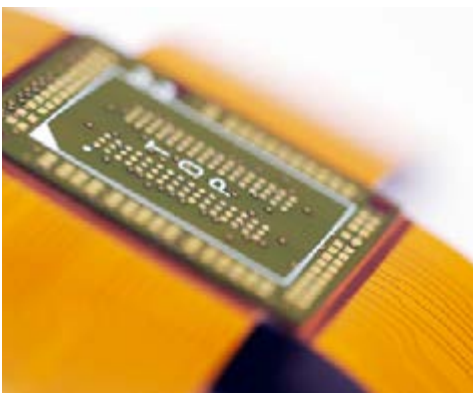


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# SÒPHIA HIGH TECH

## Company profile

SÒPHIA HIGH TECH is focused on design, development and manufacturing of mechanical components and equipments for applications in aerospace, defense and automotive field. SÒPHIA, certified according to EN 9100:2018, AS9100D, JISQ 9100:2016 Aerospace Quality Management, uses both robust CAD design methods (time and cost saving) and advanced numerical simulation techniques (linear and non-linear FEM Finite Element Method) in order to optimize the product development phase.

Pursuing technological innovation objectives, based on high professional and ethic content, SÒPHIA HIGH TECH increased its value in manufacturing sector. Production Department is equipped with high precision CNC machines and Additive Manufacturing processes. Today the Company is able to complete the production cycle in a verticalized process (turnkey project), from the concept to the realization and quality control of mechanical assemblies in the aerospace sector. SÒPHIA's products are subject to accurate dimensional and geometrical checks, during the metrology phase, and process controls to guarantee the maintenance of a high quality standard.

Company management is entrusted by PhDs with high experiences in the aerospace and defense field. It implies not only an effective and motivational coordination of the TEAM but of suppliers that work around the Company. The supply chain that has built SÒPHIA HIGH TECH, from its experience, enjoys a strong trust through the various challenges faced in an optimal way.

This extremely forward-looking and innovative way of working allowed the Company to be qualified as supplier to the major Constructors in the defense, aerospace and automotive sector.

## Products | Services | Applications | Technologies

SÒPHIA HIGH TECH core business is focused on product development and manufacturing. The Company has 3 main Business Units:

- BU 1 | Prototyping & LRIP

Low Rate Industrial Production with high precision CNC machines and Additive Manufacturing processes. SÒPHIA has a strong know-how related to product development, which has allowed the Company to become increasingly involved in the control of the production process. Using this "turnkey" approach, the Customer has the advantage of interfacing with a single company that assumes the complete responsibility for the project.

- BU2 | Design & Simulation

Structural optimization, using CAD-CAD approach, allows SÒPHIA to design lightweight and performative parts using a simulation-driven design approach. Advances in manufacturing technology also allow these sometimes complex designs to be built using both traditional processes like CNC machining, but also through Additive Manufacturing (AM) or 3D printing. Structural optimization has great potential for the aerospace construction industry. The construction industry is responsible for a large share of the worldwide consumption of natural resources, and structural optimization can help to reduce this, so improving the sustainability of the sector.

- BU 3 | Testing Equipments

In R&D are frequently required materials and structures testing fixtures for the execution of tests.

Sòphia High Tech design and manufactures a wide range of test equipments for the testing of materials, made in accordance with UNI, EN, ISO, ASTM, DIN, BS, AF, standards and following custom specifications provided by Customers.

SÒPHIA HIGH TECH is qualified as primary supplier, for design, development and manufacturing field, to the major Constructors in the defense, aerospace and automotive



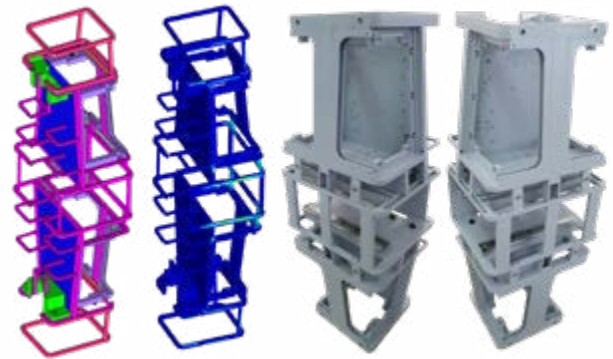
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sector:

- AVIO SPA (Italy, SPACE field, on VEGA C/E Program)
- LEONARDO SPA (Italy, AERONAUTIC field, LM C130 Program, C27J Program, C-Series)
- Italian Air Force (Italy, LM C130 Program, Air Launch Program)
- CIRA S.C.p.A - Centro Italiano Ricerche Aerospaziali (Italy, SPACE field, VEGA C/E Program , SPACE RIDER Program)
- LAMBORGHINI SPA (Italy/Germany, AUTOMOTIVE field, SIAN Program)
- FCA - Fiat Chrysler Automobiles (Italy, AUTOMOTIVE field)
- USACE - United States Army Corps of Engineers (US, Romanian Defense Dept, Custom AntiBlast doors)
- STRABAG (Austria, DEFENSE Field, Custom AntiBurglar doors)
- SAIPEM (Italy, DEFENSE field, Special Antiburglar door)
- METASENSING (Holland , SPACE field, Guardian, Wether Radars & ECR)
- MYNARIC (Germany, SPACE field)





# SpacEarth Technology

## Company profile

SpacEarth Technology is a spin-off of the the Istituto Nazionale di Geofisica e Vulcanologia. We have a team of engineers, physicists and geologist with a long involvement in research and business management

We design and develop applications, tools, software, hardware components and products for Aerospace, Maritime and Environment sectors in cooperation with major European and Italian industries, organizations, universities and research centres.

It has long standing experience in the use of GNSS receivers and algorithms development for the monitoring, forecasting, mitigation and analysis of ionospheric disturbances and their effect on high-accuracy positioning. SpacEarth Technology is the owner of the international patent "Method for forecasting ionosphere total electron content and/or scintillation parameters" (2015) able to feed mitigation algorithms aiming at improving the accuracy on real-time GNSS precise positioning techniques (RTK, NRTK, and PPP) under harsh ionospheric conditions. This can contribute to improve the scenario for the use of GNSS and SBAS (EGNOS) in several field of applications.

We also have remarkable experience in the use of optical and radar remote sensing and geodetic methods for the monitoring and analysis of geological and geophysical hazards. We provide advanced scientific products, as well as consultancy services, in these subjects. We provide tailored services and information products for geomorphological, structural and lithologic investigations, using optical and radar remote sensing data, from satellite and airborne (manned and unmanned) platforms.

Spacearth Technology has recently completed a feasibility study funded by the European Space Agency for an innovative service offering a very accurate positioning service for the maritime market in the Arctic and sub-Arctic regions.

We are also involved in the BELS+ project, funded by the European GNSS Agency under the European Union's Horizon 2020 program, which aims to develop GNSS markets for EU companies and helps EU GNSS applications gain a foothold in Southeast Asia.

The company is involved in the mine seismology sector by performing the integration of tomographic (Local Earthquake Tomography) and geodetic (GNSS and SAR) data to obtain an all-embracing picture of the alteration of the state of the rock mass during mining operations, useful to safety planning of mining activities. Here we received funding from the European Institute of Innovation and Technology (EIT) - Raw Materials and have active contracts with major mining companies.

## Products | Services | Applications | Technologies

**GNSS high accuracy positioning service:** A patented service able to forecast minutes in advance the ionospheric parameters and provide a mitigation solution. It provides high accuracy GNSS services and overcome economic losses due to large positioning errors under disturbed ionosphere for commercial applications such as precision agriculture, mining, dredging, constructions, offshore operations, aeronautics, land management and geodesy/land surveying.

**Ground deformation monitoring and source analysis:** we provide tailored services and information products for the monitoring of the ground motions and for the generation of models and scenarios, aiding in the deformation source analysis.

**AIS ionosonde (Advanced Ionospheric Sounder):** is an efficient and simple instrument capable to investigate Earth ionosphere. Designed and carried out employing the most advanced radar techniques, it allows to get an ionogram with only 250 W peak power,



## Contact

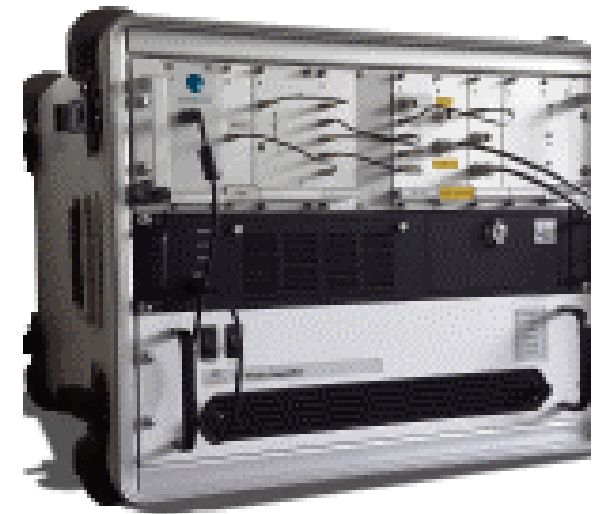
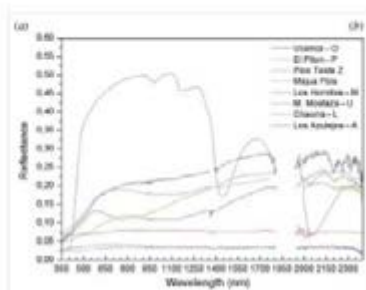
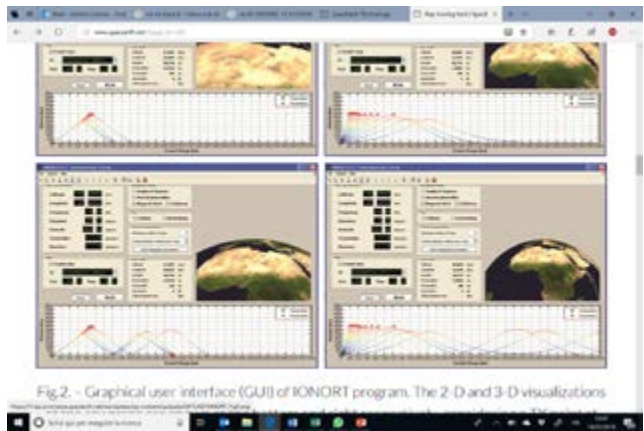
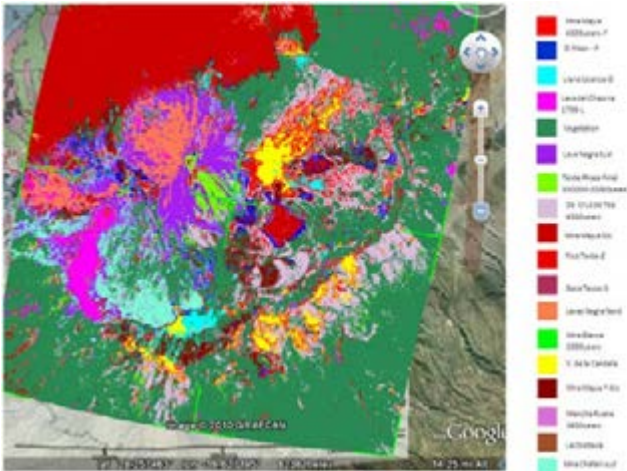
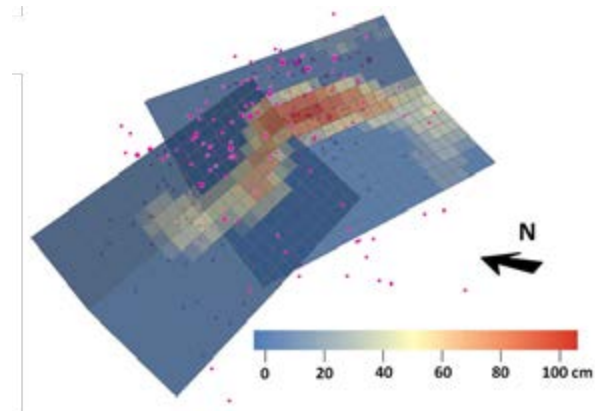
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keeping dimensions and weight low with respect to similar instruments, and above all the reliability of the measurement due to the usage of coded pulses. Various specimens of AIS are currently working in ionospheric observatories placed in different continents.

IONospheric Ray Tracing (IONORT): is an applicative software tool package for calculating a three-dimensional ray tracing of high frequency (HF) radio waves in the ionospheric medium.

Mines-In-Time: an automatic solution for monitoring in real time the stress alteration of the rock mass during mining operations, to be integrated in a traffic-light Decision Support System (DSS) and SAR-GNSS systems to avoid risks and cost related to mines collapse. The system is based on the innovative 4D LET algorithm (fourth dimension is time), able to analyze both natural and induced micro-seismicity (movements due to drilling or other mining operations).



# Space Dynamics Services srl

## Company profile

SpaceDyS s.r.l. is a company founded in 2011 as a spin-off of the Celestial Mechanics Group of the University of Pisa, located near Pisa (Italy) at "Polo Scientifico e Tecnologico di Navacchio".

The SpaceDyS's founder are eleven, the senior ones having a strong experience in the space business and Celestial Mechanics, with many years of work on programmes with space agencies such as ESA and NASA.

Starting from the experience gained by its associates, SpaceDyS is able to offer services and develop software for many Space Applications :

Orbit Determination of Asteroids from optical observations, with impact monitoring functions for NEO

Orbit Determination of Satellites and Space Debris (LEO, MEO, GEO, GTO, HEO) from optical and radar observations

Highly accurate Orbit Determination for interplanetary missions

Radio Science experiments

Planning of satellite de-orbiting

Space mission

## Products | Services | Applications | Technologies

SpaceDyS is responsible for managing and operating the NEODyS and AstDyS online services on NEOs and Asteroids, and produces on a daily basis the computation of the impact probability of an asteroid with the Earth.

SpaceDyS developed CEOD project (Computational Engine for Orbit Determination of Solar System Objects). The software will be used to monitor the position of the satellites and to make the satellite orbit determination more accurate with innovative methods.

SpaceDyS activity is mainly focused on the field of:

Orbit determination of Main Belt Asteroids (MBAs) and Near Earth Objects (NEOs) and in particular, its excellence and expertise in impact monitoring of NEOs.

Orbit determination and correlation of space debris objects

Space Missions

Data processing and management of data centers for asteroids

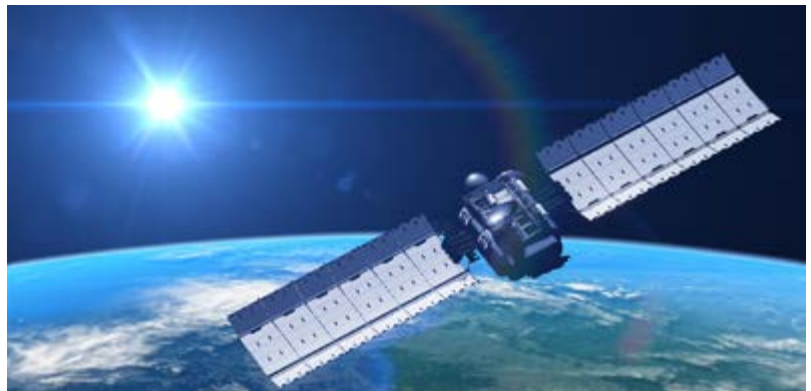
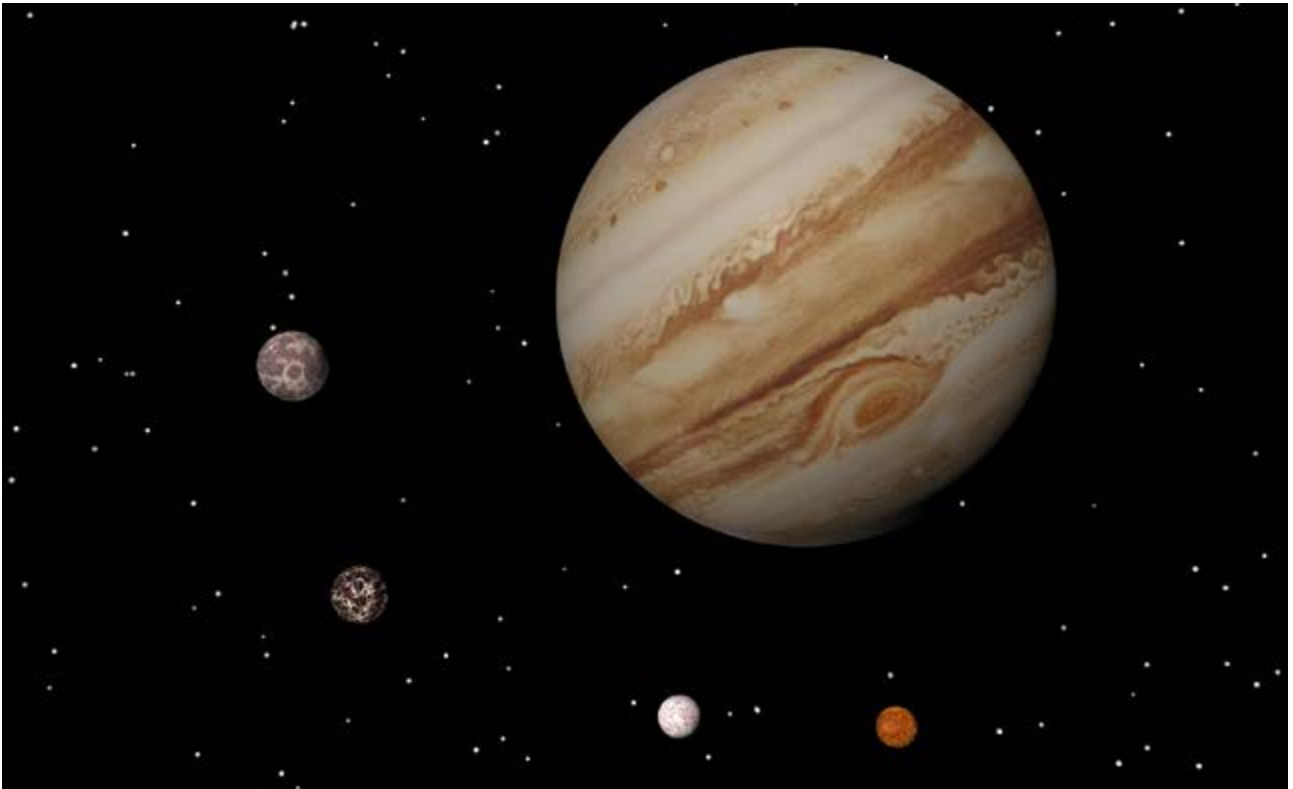
Training of very high-qualified personnel for orbit determination and data centers management.



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# Space Lab Spa

## Company profile

The company was founded in December 2000 by Avio and ASI (the Italian Space Agency) as "ELV S.p.A." and on 9 May 2018 it changed its name to "Spacelab S.p.A.", owned by Avio S.p.A. and the Italian Space Agency. Its aim is to carry out activities in Italy and internationally in the aerospace industry, and more specifically in the field of space transport systems, launchers and the associated components and equipment.

Spacelab S.p.A. focuses in particular on research and development for new technologies that can bring about product innovations, as well as on the design of cutting-edge infrastructures for experimenting with these technologies. The capacity to experiment plays an indispensable strategic part in putting new technologies into practice in industry.

Spacelab S.p.A. will take part in research, development and experimentation programmes funded by public and private clients and it will provide consulting services in the above-mentioned areas.

## Products | Services | Applications | Technologies

The company is supporting the development of new avionic architectures for future space transportation systems focusing its activity in the development of the control benches to allow real time simulation, acceptance and qualification of the above mentioned systems. The company is also developing test infrastructures to carry out firing test of large solid rocket motors and liquid propulsion systems based on storable and cryogenic propellants. The company will be progressively also involved in the development of new technologies which are considered strategic in achieving/maintaining the state of the art in the aerospace propulsion as the developing of carbon-carbon components for the nozzle of solid rocket motors and the additive layer manufacturing to manufacture components for liquid propulsion systems.



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# Space Technology for Innovation srl

## Company profile

"Space Technologies for Innovation s.r.l.", in short "ST4I", is an Italian innovative SME recently established.

Credibility, Competence, Innovative Ideas as well as Enabling Technologies development and Detailed Design Control attitude are believed of paramount importance by ST4I. That is the main reason for the presence in the company of owners - individuals and SMEs - exhibiting deep knowledge of the European Space's Industry as well as excellent technical background gained through the participation to the most important Space R&D and Commercial European programs over last 40 years. ST4I is registered in ESA-STAR.

ST4I's mission is to conceive and develop, in the field of satellite segment, products and related services based on added-value technologies, through applied research, technology transfer and engineering activities. Such effort shall be addressed to on-board satellite and on-ground at the level of component, equipment and sub-system in the domain of Telecom, Navigation, Earth Observation and Science at all operating bands and set of applications.

The embedded SMEs presence in ST4I permits to autonomously manage the whole set of the project development phases, being operational over the entire value chain, from the initial offer preparation to the product manufacturing process and test passing through all qualification processes. ST4I is therefore in the position to well manage and address all the necessary competences in terms of state-of-art electrical design, thermo-mechanical analysis, passive and active components and equipment, technology assessment and future needs as well as devices integration and test.

In addition to the above, fruitful interaction between research and industry is considered by us a must and therefore dedicated partnerships with Universities on specific R&D subjects have been already setup, enlarging the technical base at the same time providing short term opportunities for students and young engineers.

ST4I further goal is to create and consolidate the partnership with European SMEs and Primes aimed at innovative design and enabling technologies development, also in view of providing new services.

ST4I offices are placed in Rome Tiburtina - TECNOPOLO area.

## Products | Services | Applications | Technologies

Innovative enabling technologies development is considered the "key" to maintain appeal to market especially when on-board and on-ground market ask for product miniaturization and cost minimization. Typically, cost minimization asks for tolerant design and the necessary use of low-cost materials and consequently product manufacturing tolerances control is fundamental.

Several subjects and initiatives aimed at spatial technologies development are present over Europe. Among the others, ESA-ESTEC certainly represents one of the most attractive ways to maintain state-of-art competence on this subject in view of the product realization, either on-board or on-ground.

SME capabilities are considered of high value to Europe's space industry by ESA which encourages the large industrial group to involve SMEs on European Space programs creating opportunities for the SMEs to work more extensively with ESA and its space contractors.

The participation to the ESA world of opportunities - through the support of ASI - is



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considered by ST4I the preferred approach to allow the growth of SMEs according to their own identified Products roadmap. ST4I intends to become an important partner for European SMEs trying to provide an answer to the before mentioned points in terms of adequate subjects for innovative design consolidation and enabling technologies development.

ST4I is addressing its interest to technological opportunities characterized by low TRL recommending high innovation substantiated by credible solutions; their industrial validation could be carried out by either Technology Demonstration Payloads or the use of dedicated small satellite (micro, nano, CubeSat). Once validated, the developed product could be usefully considered also for Institutional programs providing the right Return of Investments spent in such development.

At the present, for on-board application, particular attention is devoted by ST4I to flexible and reconfigurable satellite payloads through analogue and/or digital configurations.

The (V)HTS scenario is the one ST4I is investing at the end identifying innovative solutions where the active antenna and associated BFNs play an important enabling role. Next figure shows an example of the evaluated multi-beams Earth coverage (>1000 beams).





# Spaceexe s.r.l.

## Company profile

Spaceexe is a technology company skilled in the design and development of IoT solutions based on GNSS and telecommunication devices. Spaceexe has a large experience in developing GNSS based products, focusing on critical infrastructure monitoring and football players tracking. Moreover is able to conceive and lead innovative R&D projects activities in satellite navigation, telco, firmware and electronics for the production of high-tech devices and services with international and national partners (ESA, GSA, ASI, Lazio Innova, etc.).

Spaceexe was founded in 2013. It was born as Startup, participating in the ESA BIC incubation program. In 2014, Spaceexe was incubated in Ericson through the EGO program. It has followed its path gaining participation in the FIWARE accelerate program and finally it took part in the acceleration program run by Telecom (#WCAP).

Spaceexe was awarded of several and prestigious prizes such as ESNC (European Satellite Navigation Competition) in 2013, 2014, 2017 and 2018. In 2014, during the ESA Investment Forum, Spaceexe was awarded as "the most promising startup". In 2016, Spaceexe won the "Think4South" awarded by Groupama and the Lazio Innovatore as "best startup 2016".

Spaceexe has presented its solution and won the BELS + project for "Continuing Building European Links toward South East Asia in the field of EGNSS" and thus gaining participation in GNSS Demo Centre at the NAVIS in Hanoi, Vietnam.

In 2018, Spaceexe has become a member of GSA Raw Measurements Task Force.

## Products | Services | Applications | Technologies

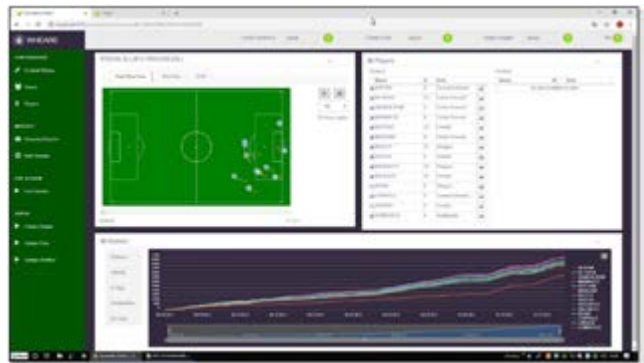
- DEDALOS is a GNSS based completely autonomous system, dedicated to continuous monitoring of surface displacement to be used in areas subject to deformation, due to landslides of deep gravitational slopes or on critical infrastructures (dams, bridges, oil pipelines or buildings), subject to sinking, subsidence or more in general to external forces endangering their stability. DEDALOS has gone through a long R&D process. First it has been designed to bring to market a low-cost, lightweight and low energy consumption IoT solution for deformation monitoring and early-warning of hazards induced by geophysical phenomena (landslides, subsidence, sinking, etc.) or by man-made activities (excavations, injection/extraction of natural gases, etc.). After that, Spaceexe has developed a second version of DEDALOS named DEDALOS-SAT.
- DEDALOS SAT aimed at the improvement of the DEDALOS system providing a satellite data transmission interface as a backup for standard ground-based (mobile phone) network. Another objective of DEDALOS SAT project was to integrate GALILEO GNSS data (multi-constellation approach) to improve the reliability of service when visual impairment due to mountains or buildings may degrade the precision of GPS alone.
- WHEARE is an innovative technical and tactical live performance monitoring system for the professional football teams. Sport performance monitoring systems have become one of the main instruments for improvement of a professional football team. Rise the need for new technologies to have better performance analysis. WHEARE pushes forward the football analysis by combining physical and tactical performances analysis, all in real-time. Through the use of GALILEO, WHEARE reaches a high accuracy in positioning detection; LIVE technology enables performance analysis during an official match; finally, the extremely miniaturized devices and its competitive price make WHEARE a unique and innovative performance monitoring system. Finally, Spaceexe has moved from a concept of GNSS integrated shin guard toward devices worn by football players as the primary source of data.
- EAGLE is an innovative device, which integrates an high precision GNSS receiver with the capability of authenticating the position through the GNSS satellite signal recording, the I.D. satellite tracked, and their position in orbit. EAGLE introduces the possibility of a "Fluid Limited Traffic Zone", in which fixed gates is no longer the standard method to regulate dynamically downtown access. Instead, Public Administration can manage traffic in a new smarter way, implementing differential access to the city centre, based for example to a political rally, block-based pollution data, urban air quality and commercial activities.



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# SPAZIO FUTURO SRL

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## Company profile

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Scientific and industrial research in aerospace , specifically in TLC and Earth Observation satellites. Design, development , test and commercialization of innovative products/ services for applications in the General Aviation,Ultralight and UAV aircrafts and in aerospace transportation.

## Products | Services | Applications | Technologies

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Service for ultralight /General Aviation aircraft and UAV for high resolution aeronautical weather forecasts and for the distribution of real-time weather observation during the flight via satellite connection. The service is covering Italian territory (GABBIANO application) and is expandable to European territory. Weather observation come from Earth Observation constellation (EMMA, European MicroMeteorology for Aircraft).through. innovative satellite weather algorithms in support to aeronautical navigation. Design and development of airborne modem for satellite point-to-point data transmission and geolocalization. Further application in the use of satellite data are in the field of wind and photovoltaic fields

Engineering support to system feasibility and general design of mini satellite transportation into low-orbit by high-performance military aircrafts:

- ESA-ESTEC Feasibility study:Aircraft Launching system ALA-SCC assessing the possibility to embark the launch module on board of European fighters.
- Italian Air Force. Collaboration agreement among IAF, Research Institution, University and Industry "Study for innovative small satellites launchers on board of military aircraft



## Contact

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## GEOMETRY (4)



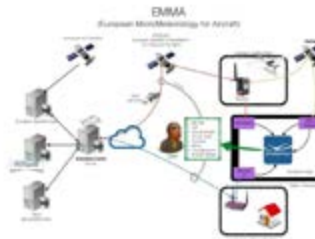
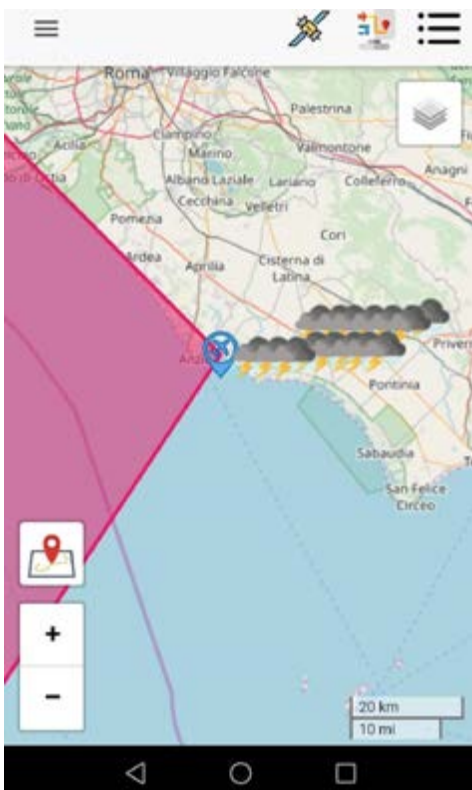
Rear MLG no interference area  
1.450 mm

MLG interference area  
2.320 mm

Forward MLG no interference area  
1470 mm

MWCA length  
5.240 mm

SPAZIOFUTURO UNCLASSIFIED





# Stam S.r.l.

## Company profile

Stam is a private engineering SME, based in Genoa, Italy, whose main mission is to provide engineering services to industries. The company was founded in 1997, thanks to the seed funding provided by the Technology Transfer Programme of ESA, to develop an innovative gearbox system. Today Stam successfully operates also in the following fields: space and defence, industry and robotics, security and transport, energy and environment.

The staff of Stam is composed of high-level professionals: 90% owns at list a M.Sc and over 70% a M.Sc. in Engineering. Mr Franco Malerba, first Italian astronaut, has been the Business Coach of Stam.

Stam has collaborated with ESA since 1999, through the Innovation Triangle Initiative and the Technology Transfer Programmes. In the recent years, Stam has been involved in the ESA Clean Space Programme and in a YGT feasibility study within TEC-MSM.

In particular, Stam was main subcontractor in the project ADRIENET "Net parametric characterisation and parabolic test", aimed at the development of a parametric simulator for active debris removal with nets, and the validation of the Active Debris Removal (ADR) concept through a parabolic flight campaign performed at the NRC-CNRC in Ottawa, Canada. The ADR technology has been further developed within the H2020 ADRIEN Project "First European System for Active Debris Removal with Nets", through upscaling activities, thermal-vacuum cycling tests at Thales Alenia Space Italy facilities, and full-scale free fall ground experiments, till the development of an ADR business plan.

Stam was also prime contractor in the ESA project "Hermetic Sealing for Rotating Shaft", focused on studying the feasibility of the mechanical sealing concept, through breadboard design, prototype and tests.

Thanks to its number of R&D projects, Stam could establish strong collaborations and partnerships with several hundreds of international companies and research institutions. In particular Stam has collaborated with key players in the space field (ESA, Thales Alenia Space Italia, DLR, GMV, OHB, Azimut Space, Arescosmo, Leonardo, QinetiQ) and a number of research bodies (e.g. ASI, CNR, ENEA, CIRA, IIT, Polytechnic University of Milan, Polytechnic University of Turin, University of Rome Tor Vergata, Tecnalìa, CEA, Fraunhofer, Sintef).

## Products | Services | Applications | Technologies

The main mission of the company is to provide engineering services to industries. Since its establishment in 1997, the company has been specializing in design and manufacturing of innovative mechanical systems, based on conventional and non-conventional mechatronics.

Stam has patented several devices, like transmissions and manufacturing machinery, and is experienced in design and integration of system mechatronics. Stam invests a significant part of its turnover in R&D, thus providing their customers with most qualified and edging competencies to drive development based on availability and affordability of technological trends.

Stam performs all stages of the product design cycle, from conception through validation, to component and subsystem design and specification, down to the definition of tools and production cycles.

Today Stam is a successful high tech company offering engineering services and products in a number of market sectors including: space and defence, automation and robotics, security and transport, energy and environment.

Stam owns the following patents, born and/or applied in the space field:

- ITSV20000049A1 "Nutating bevel gears based gearbox".
- ITRM20060609A1 "Equipment for the modeling of products in particular products



## Contact

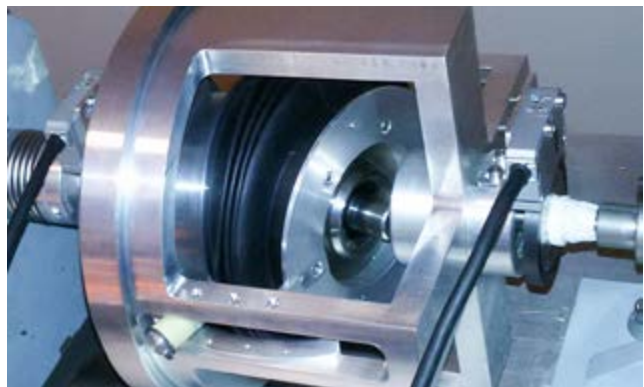
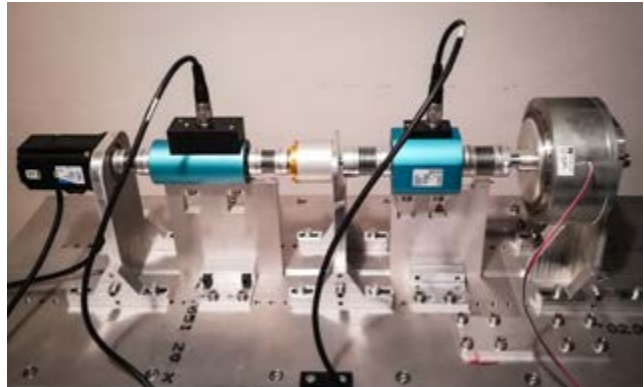
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that can be shaped to prevailing extension on a particular floor textile products and control system of the same”.

- EP2975296A2 “Planetary Gearbox based on Tilted Bevel Gears with Two Reduction Stages for Very High Gear Ratios”.
- EP3381637B1 “Apparatus for modelling products”

Besides Stam owns a laboratory equipped with a test bench to measure the performances of mechanical and mechatronic systems developed either by Stam or by third-parties. The laboratory is equipped with dedicated instrumentation and software for data acquisition and processing.



# Survey Lab

## Company profile

Survey Lab, established in 2008 as a spin-off of Sapienza University of Rome. Survey Lab is currently focused on the development of geomatic monitoring systems by means of advanced surveying and mapping technologies, including remote sensing technology. It develops applications in many fields of civil and environmental engineering, with a focus on methods for monitoring natural hazards effects on the land and on the built-up environment. The expertise of the Company in the techniques for monitoring land, structure and infrastructure derives from the strict connection with researchers of the Area of Geomatics in the Department of Civil, Environmental and Construction Engineering. Its mission is to develop and distribute innovative monitoring systems based on advanced surveying and mapping technologies with a specific focus on remote sensing data. Survey Lab aims to stimulate and spread the use of satellite technology within the community of civil and environmental engineering as means for improving structural investigations and fostering best-practice for prevention. It also promotes training courses, seminars and workshops, tailored to target audience and stakeholder's specific interests.

## Products | Services | Applications | Technologies

Survey Lab's services includes:

Geomatic monitoring of structure, infrastructure and cultural heritage - Survey Lab provides services to monitor historical-architectural, infrastructure, and facilities, based on the use of data acquired through SAR (Synthetic Aperture Radar) satellite methodology and its integration with ground-based measurements. The acquired data constitutes the basis for the development of numerical models that describe the behaviour of the investigated structures.

Land Monitoring - Survey Lab designs and implements systems for land monitoring at small and large scale through the integration of geomatics ground-based sensors and observation systems operating on aerial and satellite platforms.

Database for infrastructure management - Survey Lab takes a census of the infrastructure networks by means of GNSS survey methods, and constructs/populates georeferenced dynamic database usable and accessible in the most common GIS platforms, with precision techniques for real-time positioning and instrumentation for the acquisition of the ancillary parameters, based on the user requirements.

High precision surveying - Survey Lab designs, manufactures and surveys high-precision topographic networks through high-performance instrumentation to support large-scale scientific installations and infrastructure that need to be placed into a reference frame with the greatest precision.

Three-dimensional modelling - Survey Lab provides a reverse engineering service using high-precision measurement methods via laser scanner and digital photogrammetry and takes advantage of its three-dimensional modelling experts.

The company's core service is I.MODI, an operational prevention and investigation tool, aimed at monitoring medium-long term buildings and infrastructures. This product was born during the incubation in the ESA-BIC Lazio from 2013 to 2015, but it was developed thanks the H2020 SME Instrument Phase II funding obtained from 2016 to 2018. Now it is in the commercialization phase.

I.MODI (Implemented Monitoring system for structural Displacement) is a value added service, co-funded by European programme H2020, that integrates Earth Observation technologies, ground based data and ICT to develop services for monitoring the stability of buildings in large urban areas and for controlling critical civil infrastructures. The aim of I.MODI project is the development of a service that fully employs Earth Observation (EO) data into standard procedures, devoted to structural damage assessment, thus contributing to implement mitigation and prevention actions for potential failures.

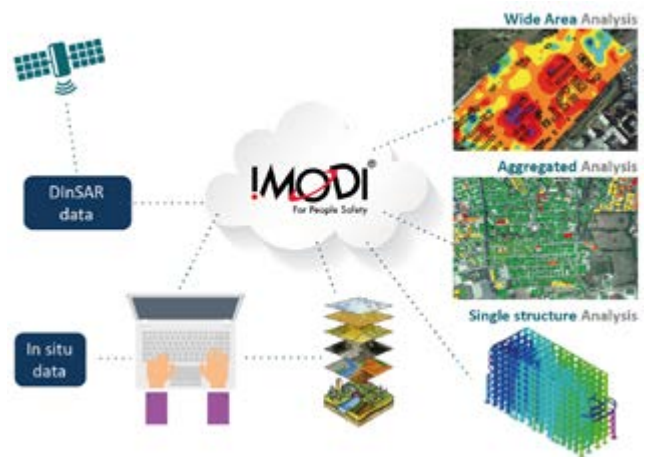
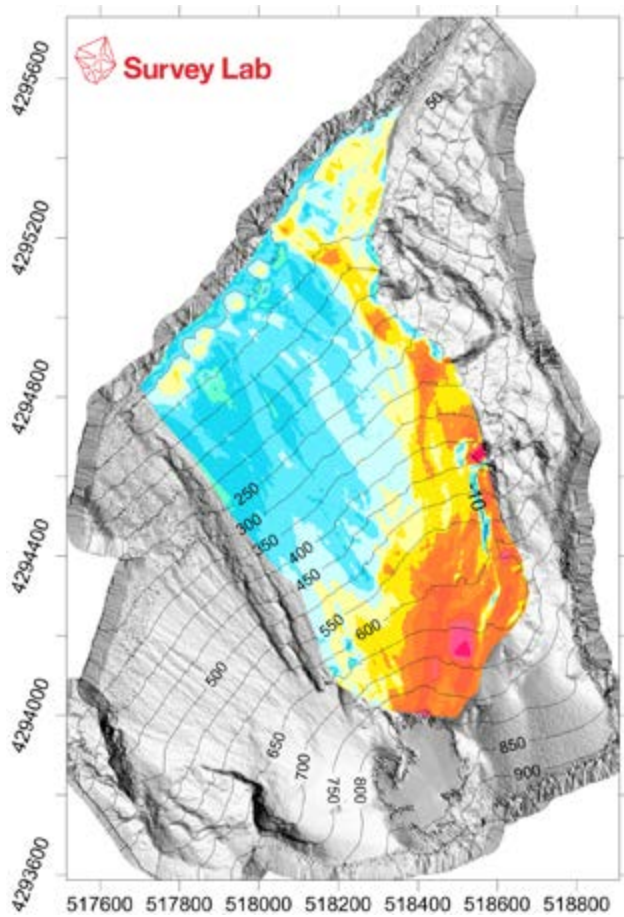


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Spin off di



SAPIENZA  
UNIVERSITÀ DI ROMA





# T4i - Technology for Propulsion and Innovation

## Company profile

### WHO WE ARE

T4i focuses on innovative engines to open unexplored mobility forms to small satellites and unlimited windows to access space. T4i key solutions are electric propulsion systems, with space thrusters based on helicon source technology, and chemical propulsion systems, with mono- bipropellant motors based on H<sub>2</sub>O<sub>2</sub> and hybrid rockets for aeronautics and space applications.

These solutions are the concretization of a vision born more than a decade ago, while T4i's team was still part of the Research Group of the University of Padua, about the necessity of the market for simple, versatile, customizable and cost-effective propulsion systems.

### MISSION

We develop innovative engines to serve small satellite platforms. We work with creativity, determination and commitment to open unexplored mobility forms to small satellites and unlimited windows to access space.

### VISION

We dream the day when each of us will have a personal satellite to move in space and to look at the Earth with new eyes.

### HISTORY

Our story started in 2006 at the University of Padua.

At that time nobody was doing space propulsion there, nobody turned-on a rocket in the previous twenty years and everybody was very skeptical about the possibility of doing something serious in rocket science with no background and with no available spaces.

We started thanks to our passion and determination, the one of the people that despite all the difficulties and obstacles believe that life is a unique experience and live to realize dreams. And our dream was to go into space with our motors.

From the beginning we selected the market of small satellite as our natural home, lacking of viable technology solutions at suitable costs. At that time the new space economy was just a far idea.

After working for more than eight years, facing economical and technical difficulties and solving everyday troubles, we flew two times on an unmanned vehicle acquiring respect from several major aerospace companies.

In 2014 we started working a new chapter of our lives. At that time we had strong indication, the motors we were developing in the University environment may turn into products. That's how we founded T4i, a Spin-Off of the Space Propulsion group of the University of Padua with a mix between entrepreneurs and engineers coming from University and Industry.

## Products | Services | Applications | Technologies

### WHAT WE DO

T4i's key products are small electric and chemical propulsion systems for in-space applications as nano and micro satellites and chemical rocket engines for micro launchers, small upper stages, sounding rockets and gas generators.

Our technologies are the result of more than 10 years of studies and tests and aim to



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revolutionize transportation in space and access to space.

#### ELECTRIC PROPULSION

Our electric propulsion module, REGULUS, is a complete and innovative 1.5U-2U electric propulsion system suitable for micro and nanosatellite platforms from 6U to 150kg and more.

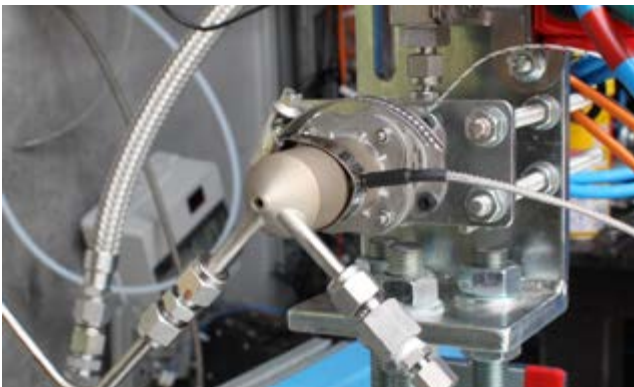
REGULUS gives mobility to satellites to cover different mission manoeuvres as orbit raising and drag compensation, formation flying and decommissioning at the end of mission.

The system is currently under qualification, the flight model will be ready by end 2019, while its In-Orbit Demonstration is scheduled for Q2/Q3 2020 onboard Unisat-7.

REGULUS is the first and only commercially viable propulsion system based on solid unpressurized propellant which combines high propulsive performances with compact design and plug & play integration, leading to drastically increased satellite versatility at a low cost. REGULUS has ones of the best thrust to power ratio and specific impulse to power ratio between the competitors, as well as the best k€/thrust and k€/total impulse ratios, making it the most convenient electric propulsion system in the market in terms of cost and performance.

#### CHEMICAL PROPULSION

Our Chemical propulsion solutions are based on highly stabilized hydrogen peroxide ( $H_2O_2$ ) that range from 50N to 10kN of thrust. Depending on the customer needs, we offer mono-propellant, bi-propellant and hybrid motors to cover different in-space and access to space applications.



# Taitus Software Italia s.r.l.

## Company profile

TAITUS was founded in 2004 by its Managing Director, Felipe Martín-Crespo, a former ESA staff for more than 15 years.

We are a software development company specializing in advanced mission analysis, planning and simulation tools for space and space-driven applications, with particular focus on Earth Observation and Remote Sensing services to improve the safety of persons and goods.

Taitus applications are powered by in-house-built technology that makes extensive use of modern 3D computer graphics, integrated with advanced user interfaces. All Taitus projects use the in-house developed components, GanttX and SatX, which greatly reduces the development cycle times and provides an enormous library of complex and continually-tested functionalities.

The high quality of our products and services have let us become a key software and software services supplier for major European Space sector players

Since 2004 Taitus Software develops software applications, specialized libraries and development kits for the aerospace industry, using the latest programming techniques of general purpose computing on GPUs to achieve breakthrough visualization, modelling and simulation power, with exceptional improvement in execution speeds.

Our technology led us to focus on the remote sensing and Earth observation services, and allowed us to reach a very good market penetration with proven technology used by space agencies and key organizations (e.g. NASA, ESA, Airbus) in 25 countries.

Our commercial activities are currently structured around our SDK (GANTTX and SATX) and around our multi-satellite swath planner SaVoir, a leader in the industry with over 150 licenses sold worldwide. We also develop bespoke applications and provide client support services. It has been precisely our success upon SaVoir that has made us realise the strong business opportunity coming from facilitating our customers the development of this type of applications for their specific needs.

Our own experience developing SaVoir has made our current basic libraries and services ready to be seamlessly integrated in more complex and specific products and we are taking this opportunity also to further transform our company from a bespoke software development company to a software services oriented company, which will strongly boost our revenues and maximise the return of our investment in space research and innovation actions.

## Products | Services | Applications | Technologies

Taitus produces software products for space-related activities specializing in remote sensing applications. The software products are available in three different formats: Applications, Plugins, Libraries. We have highly-configurable and powerful applications which are extremely user-friendly due to a highly intuitive and user-oriented interface. With the plug-in architecture available in some of our applications, we are able to offer extensions and customisations by creating plug-ins. We also provide libraries and software development kits (SDKs) so that our clients can develop their own customised applications.

Taitus Software Italia applications are powered by in-house-built technology that makes extensive use of modern 3D computer graphics, integrated with advanced user interfaces.

Taitus technology is based on careful optimization of data analysis according to its type, which determines if it will be best processed either by the CPU or the GPU. It is important to notice that the more multithreaded the data, the more advantageous GPU processing is over traditional CPU processing. All Taitus Software Italia projects use the in-house-built components, GanttX and SatX, which greatly reduces the development cycle times and provides an enormous library of complex and continually-tested functionalities.



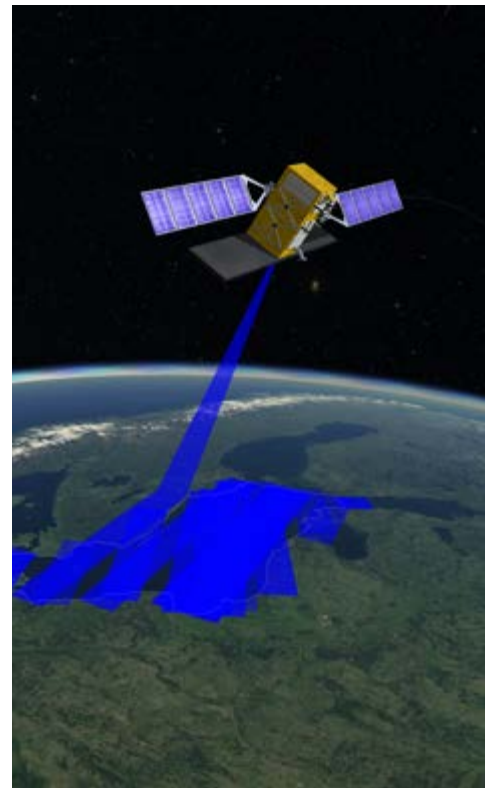
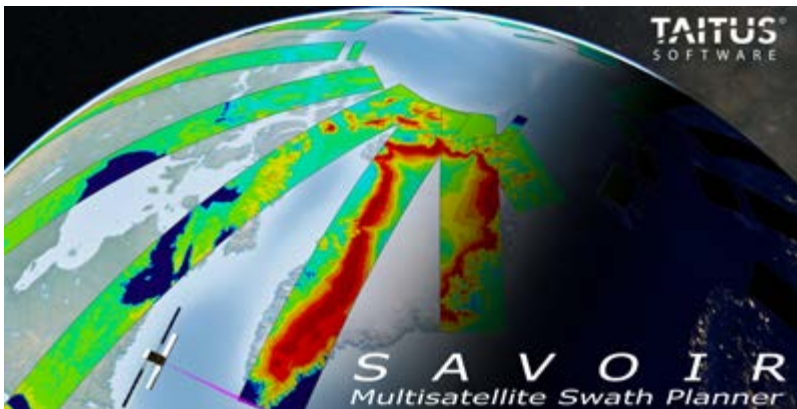
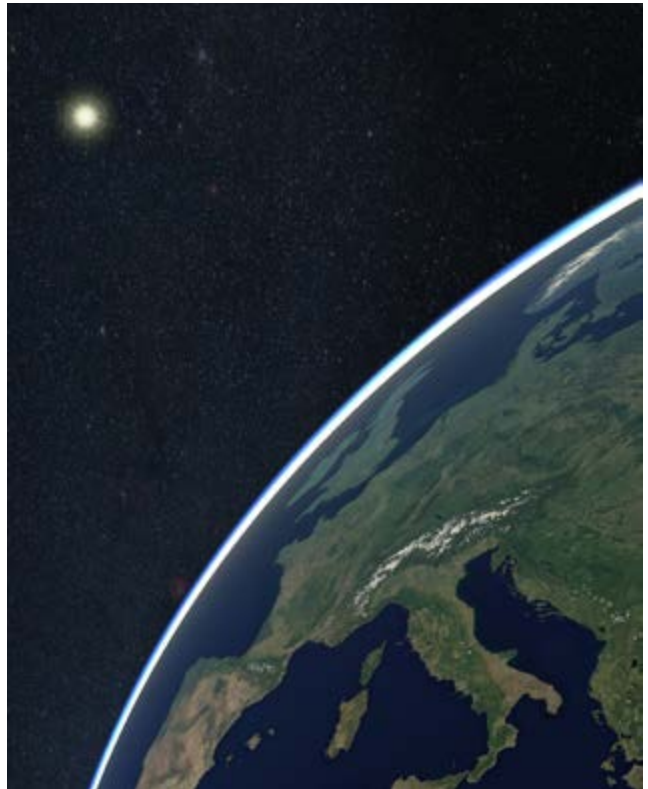
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The main product, SaVoir - Multisatellite Swath Planner, is a standard in the industry: it is a standalone application for fast planning of Earth observation Satellite sensing operations over selected Areas of Interest (AOI). By combining each satellite's orbit, sensor field of view geometry and the shape and location of a user-defined AOI, it can determine the exact times when a satellite would be capable of observing the specified area. SaVoir's functionalities can be expanded thanks to the addition of plugins, which can be customized according to the customer's needs.

HERMES is a software development ecosystem (HERMES SDK plus applications, plugins and services) that allows building quickly and efficiently software systems for the space industry, providing competitive advantages in terms of performance and visualization. It is focused on providing our customers, satellite service providers and end-users of satellite data, specifically those in the segment of Earth Observation, the perfect tool to precisely plan and design the right scheduling, the right amount of data and the right providers to cost-effectively achieve their mission goals. HERMES aims to incorporate into the space and satellite industries the latest technological innovations available in the hardware and software industries, in particular the use of GPUs to process visualization, simulation and similar data commonly used in space application.





# Techno System developments srl

## Company profile

TSD has a relevant experience in the development of Imaging Systems, Avionics and Scientific payload and Instruments for space applications on board several platforms like Satellites, ISS, Capsule, Re-entry vehicles Sounding Rockets, Balloons and UAV.

TSD technological strategy is based on:

1. Focus on small platform and real time application
  2. Look for technological excellence and for primeship in small niches
  3. Technological independence
  4. Build strong core competence
  5. Develop proprietary solutions
  6. Adopt simple and replicable architectures
  7. Use of standard I/F
  8. Easy of customisation
- TSD operates on the following space market segments:
    - Institutional, in the frame of Agency (ESA, ASI) programs with direct contract and/or under Prime contractors in the field of Microgravity, Technological developments, Earth Observation, Exploration, Navigation
    - Commercial, most in the field of Earth Observation, by providing Prime contractors with general Avionics (OBDH, GN&C, PMS, TT&C, CDMU), Digital Video systems and Optical payloads electronics
    - R &D, by supporting research centers such as CIRA (Italian Center for Aerospace research), INAF, CNR institutes and universities mostly for electronic developments in experimental/not recurrent applications
  - TSD also operates in non space markets such as Aerospace and Military

## Products | Services | Applications | Technologies

- ❑ ELECTRONICS FOR OPTICAL PAYLOADS AND VIDEO SYSTEMS
  - Space Cameras
  - Compression & Image Processing (visible/hyperspectral/multispectral)
  - Payload Data Handling & Storage
- ❑ SPACECRAFT AVIONICS
  - Command and Data Handling Systems
  - Processing Unit for Vision Based navigation
  - On Board Computers
  - Remote Terminal Units
  - Power Systems
- ❑ EQUIPMENT FOR SCIENTIFIC PAYLOADS & INSTRUMENTS
  - Data Processing Unit
  - Control and Data Management Systems
  - High Accuracy Signal Conditioning and Data Acquisition
  - Power Actuators Driving and Control



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❑ GROUND EQUIPMENT

- EGSE
- SCOE
- TELEMETRY/TELECOMMAND STATION



# TEMIS

## Company profile

TEMIS is a company, part of ART S.p.A a medium sized company (200 resources), working in space domain for more than 10 years, establishing itself in the field of test system design, electromechanical actuators and avionics/space systems. TEMIS was founded in 2006 with the mission of developing electronic products for the Motorsport sector; in the following years, the experience accumulated by the design of ECUs for F1 pushed TEMIS to face a market such as the aerospace one and it's from this challenge that a telemetry system born to be integrated in the VEGA launcher for data and video acquisition, thus contributing to the validation of the first Italian launcher.

TEMIS is now constantly present on VEGA, and it will be also on VEGA-C, providing equipment like telemetry system, video-cameras , separation command units and heat flux sensors

TEMIS has the headquarter located in Corbetta (close to Milan), distributed in 400 m<sup>2</sup> of offices and about 200 m<sup>2</sup> of laboratory for integration and test and a subsidiary office in Passignano sul trasimeno at ART headquarter

The Corbetta office counts about 20 resources, mostly highly graduated engineers deeply experienced in:

- Project Management Office (including System Engineering and Product Assurance)
- Design & Manufacturing of Test Equipment & Simulators
- Design & Manufacturing of custom Embedded Systems
- Thermo-Mechanical Analysis and Design
- Control Systems Development and Simulation (including satellite AOCS)

TEMIS premises in Umbria are equipped with state-of-the-art of the production tools in order to provide fast prototyping during design and high-quality production process.

## Products | Services | Applications | Technologies

TEMIS is placed in the market as system provider, and it's capable to provide a turn-key solution for the customers, starting from the requirement analysis until the product realization/qualification.

Attention is given to quality assurance policy to design, produce and test products responding to a high quality and reliability level for professional and space applications.

Attitude Control System (AOCS)

TEMIS supports Large systems Integrators in the design, implementation and validation of the satellite AOCS subsystem. The company can start from the system requirements and define the attitude control system specification providing also a first dimensioning and choosing sensors and actuators.

Test Systems (EGSE/SCOE)

TEMIS has been involved in some important space projects as subcontractor of Large system Integrators. The main effort has been spent in the definition, project and realization of Electrical Ground Support Equipment's (EGSE) with a special focus on the attitude and control subsystem and Payload SCOE.

In-flight telemetry systems

TEMIS, for the VEGA qualification launches, delivered the Avionic & Harness Subsystem (A&H)

The A&H has been conceived with the purpose of assisting the Launch Vehicle in the acquisition and monitoring of key parameters inside the launcher fairing and of providing separation of the payloads (satellites) inside the launcher.

In the frame of EXOMARS project TEMIS have developed and delivered the Central Electronics Unit (CEU) Boards in charge of:



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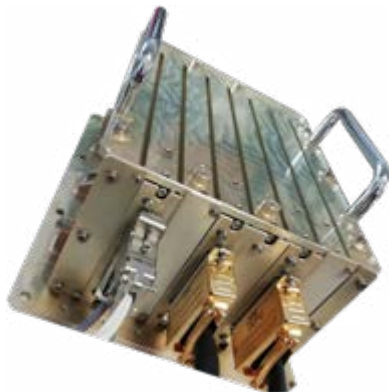


- communication I/F with CTPU for TM/TC,
- Power conditioning
- Payload sensors acquisition
- housekeeping signals acquisition

#### Electromechanical Actuators

The current trend in aerospace is the replacement of hydraulic systems with electromechanical ones in order to simplify the architecture and to reduce and almost to zero the maintenance during long term storage. For this reason, in the last years, TEMIS has added a line of electromechanical actuators to its portfolio addressing the military market.

TEMIS has gained competencies in the electrical actuator field, and it's able to provide a qualified product for avionic purpose. Both the development of the actuator itself and of the HW/SW control parts are managed from the company engineers, allowing to deliver a turn-key system to the customers.





# THERMAL SPRAY SERVICE SRL

## Company profile

TSS srl is a company that operates since 2000 in special processes and more underlined, with thermal spray coatings and brazing.

TSS srl is a small company, but with high technological profile.

Engineering specialists have an elevated skill and are present in the company with a high rate in relation to production employees. As well, all the equipment are full automatic and assisted by robot and computers.

Part of the production is of items designed and developed inside, and are actually used in aerospace field.

The production is conduct in an industrial building of 1000 sqm with the support of 600 smq for technical and administrative operation.

The company is strategically located at 2 km from the exit of Cassino of A1 highway, far only 100 km from Rome and 100 Km from Naples, linked with the same highway.

Customer list is a very qualified. Companies as CIRA (Centro Italiano Ricerche Aerospaziali), Fincantieri, Peroni Pompe, Pilkington NSG and more, are by over 15years in the list.

## Products | Services | Applications | Technologies

TSS capability is related to all technologies of thermal spray and to copper brazing processes and more underlined, concerns Metallization, Plasma and HVOF (high velocity oxy fuel) coatings. The three technologies can perform coatings of all kind of powders on the market, such as WC (tungsten carbide); CrC (chromium carbide); Ni (nickel) base metallic; Co (cobalt) base metallic; all grades of stellite; Cr2O3 (chromium oxide); Zr2O3 (zirconia); Al2O3 (alumina); TiO2 (Titanium oxide); Cu (copper) etc.

Thermal spray coatings have a wide range of applications from aeronautical field to oil & gas, as well as glass and paper production, or aluminum lamination. Furthermore, the production of thermal spray coatings for many other purposes such as dimensional restore of worn parts, thermal insulations, electrical insulations, anti-wearing of rotating parts may be considered.

Brazing of copper items are conduct in specific furnace as well as with manual torch braze.

TSS is involved in all the above fields and mainly is specialist of manufacturing of plungers of alternative pumps and mechanical seals of centrifugal pumps, being the principal producer of such items in Italy.

TSS has also a special skill to develop new application or new solution for any kind of industrial problems solvable with thermal spray coatings. To support these activities, the Group has one of the most complete laboratory to perform all kind of tests needed to set and check performance of coatings.

The production is conduct with the support of:

- Metallization, Plasma and HVOF full automatic equipment of last generations, operating in cabins capable of parts up to 5000 kg of weight and 2000x2000x1000 mm of dimension.
- Furnace for brazing;
- A complete mechanical department with lathes and grinding machines for the manufacturing of plungers and rotating mechanical seals.
- A laboratory that can perform test also for aeronautical field.

TSS has many certifications and qualification of the major companies operating in all the above fields mentioned.

TSS is also partner of the University of Naples for research and development of new coatings and new application.

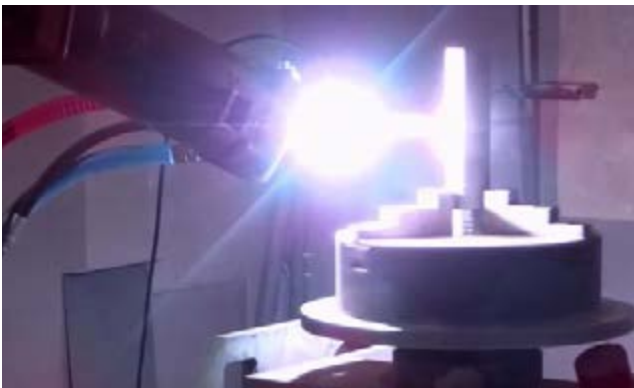
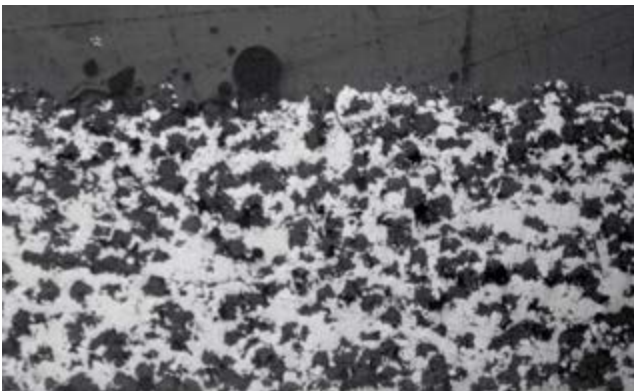
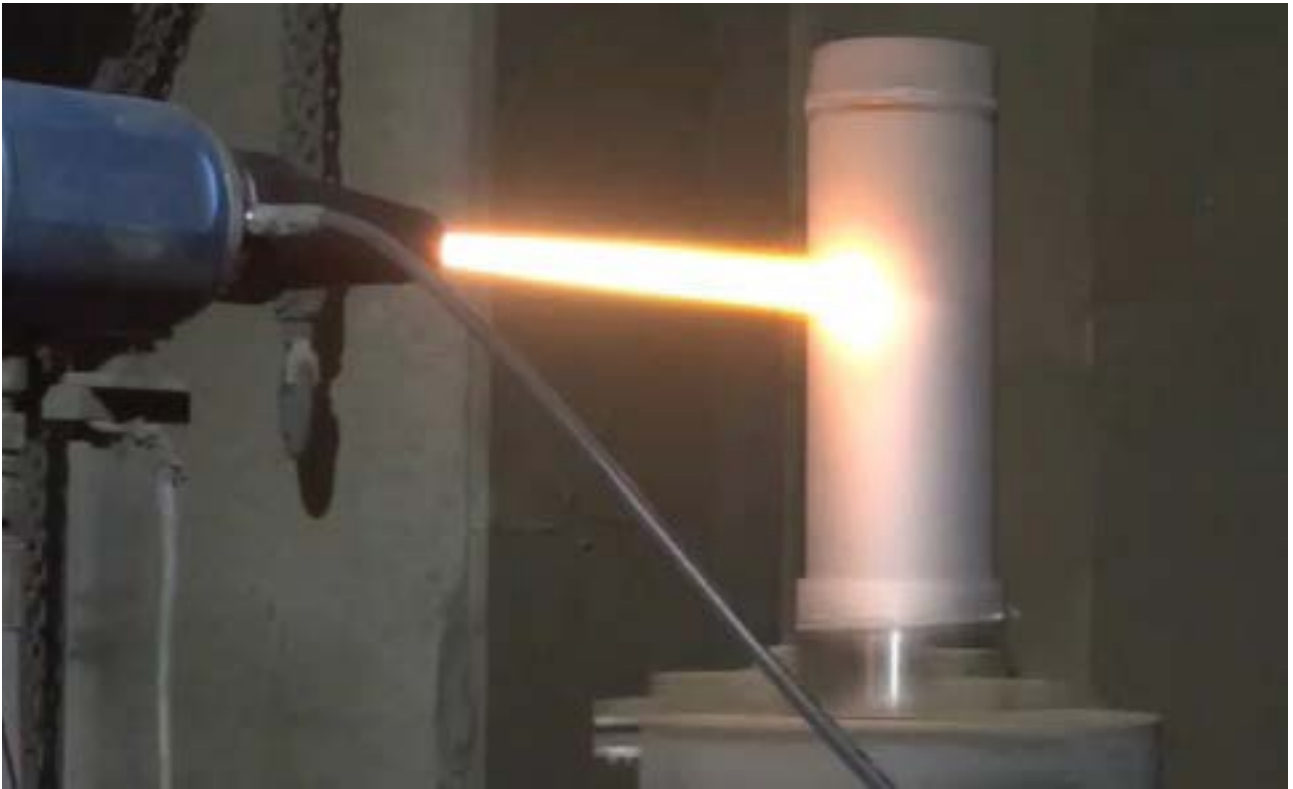


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# Tiberlab srl

## Company profile

Tiberlab Srl is a spin-off of University of Rome "Tor Vergata". Our mission is to develop innovative software solutions aimed to the design and simulation of electronic and optoelectronic devices, focusing in particular on nanostructured devices. Modern nanostructure devices pose new challenges due to the wide range of length and time scale involved. We provide tools for multiscale simulation able to perform analysis and optimization at all the relevant length scales, through state of the art physical models ranging from continuous to atomistic level. Tiberlab offers consulting services and end-user software. Our core product is TiberCAD, a software for modeling and design of innovative nanostructured devices. tiberCAD software has been and is presently used as a main simulation tool in several FP7 EU projects, for the design and the study of optoelectronic properties of quantum well and nanowire based LEDs and of advanced solar cells. Tiberlab is presently a partner in FP7 Project Deepen, aimed to the design of an open source multiscale simulation environment for electronics and optoelectronics modeling.

## Products | Services | Applications | Technologies

Our software product TiberCAD is a multiscale CAE tool for design and simulation of electronic and optoelectronic nanostructured devices. This simulation software provides novel tools to accomplish the critical requirements imposed by the recent developments in Key Enabling Technologies such as micro-nanoelectronics, nanotechnology, photonics and advanced materials.

Among the applications of TiberCAD are LEDs based on quantum wells and quantum dots, nanowire FETs, III/V heterostructures, photovoltaic cells for space applications, organic solar cells (OPVs), Dye Solar Cells (DSCs), piezoelectric nanogenerators. TiberCAD is a multiscale tool, since it allows the simultaneous solution of physical models on different length scales, ranging from the continuous level of macroscopic device to the atomistic structure of the active region at the nanoscale. The multiscale approach can be employed in several fields such as particle transport, heat dissipation and mechanical deformation. In this way, quantum and classical descriptions can be used in different regions of a device/nanostructure within the same simulation; analysis and optimization may be performed at all the relevant length scales, possibly including self-consistent coupling of different models, such as quantum, thermal and drift-diffusion ones.

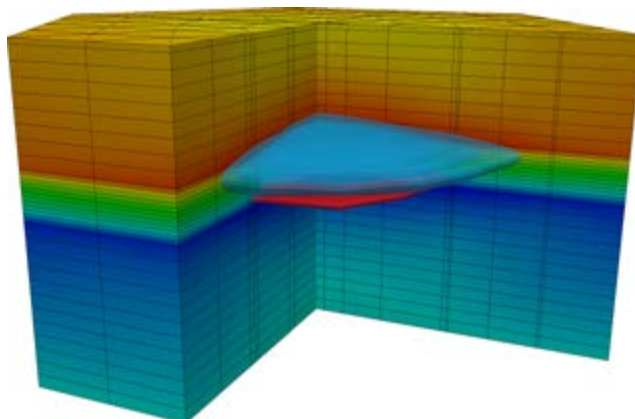
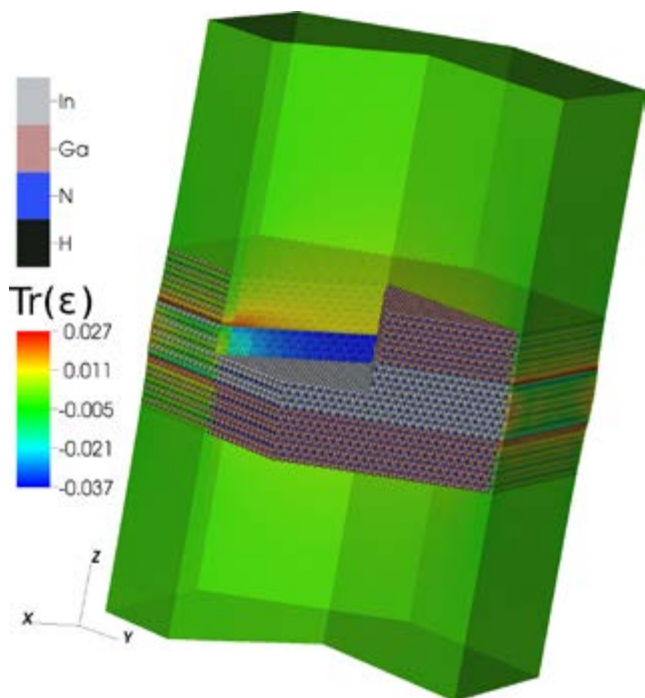
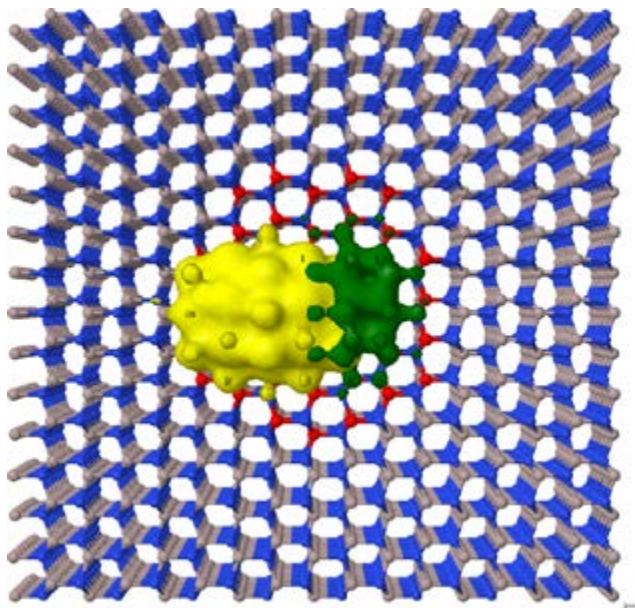
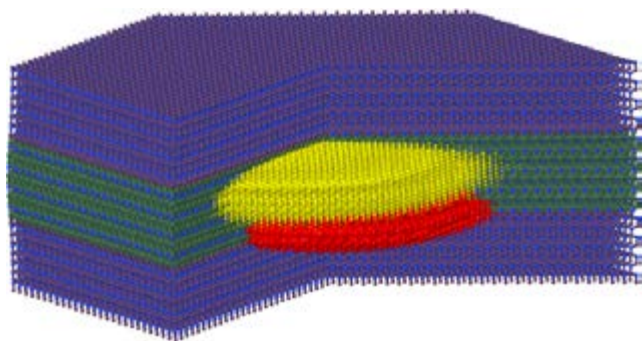
TiberCAD is capable to couple the FEM-based continuous media physical models with simulation models based on quantum approaches in an atomistic framework, such as Empirical Tight-binding (ETB) and Density Functional Theory (DFT) for electronic properties and Non-equilibrium Green Function (NEGF) for quantum transport. Based on the FEM device description and crystallographic orientation, the needed atomistic structure is generated internally in TiberCAD. Then, the atomistic structure is deformed according to the strain obtained from the continuous media elasticity model or from an atomistic approach such as Valence Force Field (VFF). TiberCAD provides models to calculate particle transport and IV characteristics, including strain and piezoelectric effects in nitride materials; a fully 3D quantum model allows to calculate optoelectronic properties at operating bias. Atomistic models for strain and electronic calculations such as VFF and ETB, together with random alloy representations of the active region, allow to study realistic material nanostructures, where the fluctuation of alloy composition may affect in a critical way the properties and performances of a LED or a solar cell. Accurate models for the most important material systems for photonics and electronics applications are provided, such as GaAs/AlGaAs and GaN/AlGaN/InGaN. Methods for parallelization of computationally heavy routines for atomistic calculations through Graphical Processing Units (GPU) and MPI techniques are implemented.



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# Trans-Tech

## Company profile

Trans-Tech is an Italian company founded on a proven 30-year experience in the aerospace sectors. For us Technologies Transfer means pushing space solutions into the market.

Trans-Tech provides requested technologies, methodologies and know-how to industry thanks to knowledge, experience and competence we've collected under a unique umbrella.

This highly valuable service is achieved also thanks to our business model: Trans-Tech embraces the Open-Enterprise concept, based on the synergic fusion of the best resources and capabilities coming from national and international companies linked each other by proper MOUs or contractual arrangements.

Trans-Tech thus represents a singularity in the Italian engineering scenario: its mature and well developed experience together with the enlarged capabilities of our partners make Trans-Tech the best support for the development of innovative projects that requires integration of comprehensive and differentiated technical competencies. Trans-Tech provides to the customers a single expert interlocutor able to intercept their needs and translate them into an efficient and effective answer, especially in a context of international and multi-national programs and collaboration.

## Products | Services | Applications | Technologies

Trans-Tech srl provides services and solutions such as:

- Advanced concepts, systems and special devices design and development
- Technology Transfer, Concepts Feasibility, Products Innovation advising services.
- Operative Support for R&D projects development (up to complete Management and team Coordination focusing on tangible results) and issuing of technical proposals for international and national funding opportunities.
- Training & Education.

The industrial sectors in which Trans-Tech naturally operates are: Space, Aeronautics and also Transport, Automotive and Energy as target for space technologies application and exploitation.

Trans-Tech develops technological concept and turnkey solutions for industry, research centers and the scientific community.

The more recent example is the Autonomous Thermal Simulator (ATS), originally designed to support the ground calibration of "MicroMED", a scientific instrument for the study of Martian environment that will be integrated on the lander of the ExoMars 2020 mission led by the European and Russian space agencies.

The ATS not only meets the specific functional and operational requirements of the development / calibration / set up tests of equipment destined for space missions similar to that of MicroMED but introduces a significant change of the overall testing process: for setting up the instruments, for its calibration, and finally for the qualification and validation.

Trans-Tech is the conceiver, team coordinator and designer of several innovative projects (have a look to our website), the most known in the world is the Hypersonic Airplane the HYPLANE. It is a "triple-use" jet for fast business travel, suborbital space tourism and mother aircraft for microsatellite orbital launch. It is a new concept of hypersonic transportation system able to offer access to stratospheric and space flights as safe, convenient and commonplace as today commercial air transportation.

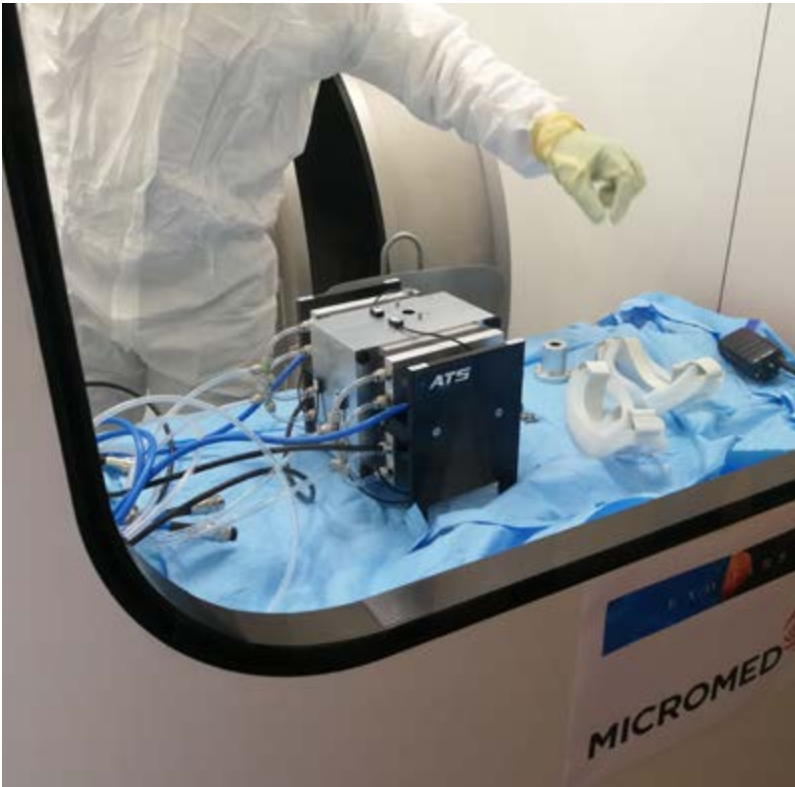
Around Hyplane project many technologies are being currently explored by Trans-Tech and its partners: High Thermal Exchange Leading edges, reconfigurable seats; innovative systems for Guidance, Navigations and Controls, On-Screen Display and many others.



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# Tyvak International srl

## Company profile

Tyvak International SRL is one of the three operating groups and the first international branch of Terran Orbital Corporation. Terran Orbital teams are leading innovators and providers of nanosatellites and microsatellite space vehicle products that target advanced state-of-the-art capabilities for government and commercial customers to support operationally and scientifically relevant missions.

Tyvak International represents the most advanced and vertical integrated offer in the market of small space vehicle products and services. The proprietary technology and know-how, based upon the continuous progress in the miniaturization of semiconductors, enable to develop, design and commercialize small satellites platforms faster and cheaper with respect to traditional satellites systems. This also provides considerable opportunities to exploit the space more effectively and profitably.

Founded in 2015, during its first year Tyvak has successfully started the process of technology transfer from the USA headquarters, being able to start its own R&D activities. So far, Tyvak International has executed considerable space engineering projects, from mission concepts and feasibility studies to nanosat development and integration, launch integration services and procurement of launch opportunities, for commercial and institutional customers at international level. The company has established partnerships with important stakeholders of the Aerospace Industry such as SMEs, Large System Integrators (LSI), Research centers and Universities. Tyvak International executes R&D programs with several of them focused on breakthrough technologies which will contribute in the next future to foster the company's growth.

Tyvak capabilities include mission & system design, software and hardware manufacturing, assembly, integration & verification, consulting services, launch integration & insurance services, operations support. The company's growth strategy will imply hiring new experienced staff and the acquisition of new facilities with up-to-date manufacturing and testing facilities. Seeking for advanced technology suppliers, in order to cover the whole range of products and services, Tyvak will maintain control of integration processes and will expand as needed in response to advanced space mission needs in the European framework.

## Products | Services | Applications | Technologies

**PRODUCTS** The Endeavour product line is Tyvak' solution to the needs of high-performance nano- and micro-satellite missions. Tyvak designed its Endeavor platforms to provide cutting-edge capabilities with inherent design flexibility to accommodate missions requiring S/Cs from 5 to 75Kg. Endeavor platform offers: High Power, electrical PMAD, custom and high-power solar array design; Advanced Thermal management; Precision attitude knowledge and control (next generation Star Tracker and reaction wheel assembly); Advanced fault handling and autonomous FDIR; Radiation-tolerant avionics; High communication data rates; Miniature Deployable Mechanisms and Structures (high-gain X-band, S-band and UHF antennas); Configurable multi-mission components and bus; Custom mission operations design; Flawless integration with existing ground networks.

**CONSULTING SERVICES** Tyvak critical role in nanosats development-and-launch activities affords the ability to provide its customers with a robust portfolio of consulting services. Mission Development and Analysis: mission design, compatibility and feasibility analysis, system engineering support and industry/application market research; Spacecraft Analysis and Development at system and subsystem level, requirements development and analysis, system engineering support; Integration and Test Support including integration process and procedure development and analysis, test plan development and test services. Ground Operations plan development, Ground station support, frequency management.

**LAUNCH INTEGRATION** Tyvak understands the unique challenges to get a customer



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satellite integrated with the right launch vehicle and mission to ensure success. To get the objective Tyvak provides its customer with System Engineering Support, including integration of complex s/c subsystems, vehicle ICD, safety and Mission Assurance; Assembly and Integration: custom deployer design, fabrication and flight certification, s/c-to-deployer integration, launch vehicle integration; System Testing of s/c system performance (environmental, shock, vibration, thermal, thermal vacuum) by aerospace test standards tailoring; Launch coordination and operations including selection of international launch opportunities, regulatory processes management and satellite on-orbit operations; Launch & Satellite Insurance characterized by competitive rates and favorable payment terms, simple process and contract, financial risks reduction analysis, to cover the full cost of launch/satellite in case of unexpected launch failure.

**APPLICATIONS** Tyvak small satellites provide an advantage over larger, more traditional and expensive satellites due to built-in redundancy, lower cost and the ability to solve a myriad of challenges. Tyvak leadership team expertise supports Commercial, Government and Academic missions ranging from Technology Demonstration in LEO to Weather Data and Climate monitoring, Disaster Management, Advanced Telecommunication, Machine-To-Machine applications, Earth Observation and Maritime Security.









# LARGE COMPANIES

An aerial photograph showing a massive glacier flowing through a rugged, mountainous terrain. The glacier is a light blue/white color, contrasting with the dark brown and grey rocky mountains. The sun is low in the sky, creating long shadows and highlighting the textures of the ice and rock.

Photo Credits: ESA

# Airbus Italia S.p.A.

## Company profile

Airbus Italia is part of Defence and Space within the world leading Airbus, Space Systems, Telecom division. The Airbus' Italian subsidiary Space Engineering S.p.A. officially changed its name to Airbus Italia S.p.A. in August 2019; Space Engineering had been a 100% Airbus Defence and Space company since 2015.

Airbus Italia operates in the satellite telecommunications sector, developing applications for the Internet of Things (IoT), mobile terminals for airborne, train and land applications, RF components and ground modems.

Since August 2017, Airbus Italia's Headquarters and Industrial Plant share the same industrial area in Rome, in Tiburtina area, thus ensuring a complete integration between Engineering and AIT effectively serving programs operations and products development. The 1.250 sqm plant has been mainly equipped for payload and electronic equipment assembly, integration and testing. Manifold facilities are available: Anechoic Chamber; Climatic Chamber; Clean Room; Motion and Attitude Simulator for mobile terminals; Digital, RF and Mechanical Laboratories.

Airbus Italia employs a highly skilled workforce of about 120 people, focusing on cutting edge solutions and technologies. The company is EN 9100:2018 and ISO 9001:2015 certified. Its significant experience in design, integration and test is serving key European programs like METOP-Second Generation, QUANTUM and EDRS.

## Products | Services | Applications | Technologies

Over the past few years, Airbus Italia evolved to progressively meet its ambition of being a recognized industrial leader for selected products, including SatCom antennas for airborne, railways and navy, passive and active RF components, ground modems. It develops On-Board and Ground products with particular attention to 5G and EO through flexible antennas and payloads, multiband ground terminals, Machine-to-Machine gateways, Inter-Satellite Link solutions, smart modems. The Company has a well-renowned expertise in research, development, engineering, simulation, prototyping, integration, testing, validation, small-scale production for Space & Ground system and components, owning a significant number of international patents on antennas, radars, scientific software and Digital Signal Processing.

Leveraging on its distinctive heritage in Antennas, RF and Digital Equipment, Communication Protocol and System Design, Airbus Italia can offer a qualified portfolio of products and solutions:

- Mobile multiband SatCom antennas for airborne applications. Airbus Italia invented the Janus line: very low profile dual-band (Ku/Ka, X/Ka) antennas for different kinds of aircrafts, including UAVs and helicopters. Janus is the unique broadband antenna concept patented by Airbus Italia (European Patent 2757632 A1) to enable remote switch between two frequencies. The switch is performed by mirror rotation with a dedicated RF chain for each frequency band. Thanks to Janus, the Janus Aero antennas can be provided in dual band configuration in Ku/Ka (X/Ka and Ka/QV also possible) with remote frequency switching. Janus Aero compact size and high throughput both in reception and transmission makes it the ideal solution for several types of Mission Patrol and UAV applications. Janus Aero product targets Institutional & Governmental Airborne. Starting from the first version Janus 1.0, Airbus Italia has been keeping on updating the antenna design considering always more advanced technical solutions and it is successfully developing the second version of the Satcom terminal named Janus 2.0.
- Gateway and Professional Terminals for Internet of Things (IoT)/Machine-to-Machine applications using SatCom
- Onboard Communication Equipment for inter-satellite link, including those enabling Data Relay systems like Globenet

# AIRBUS

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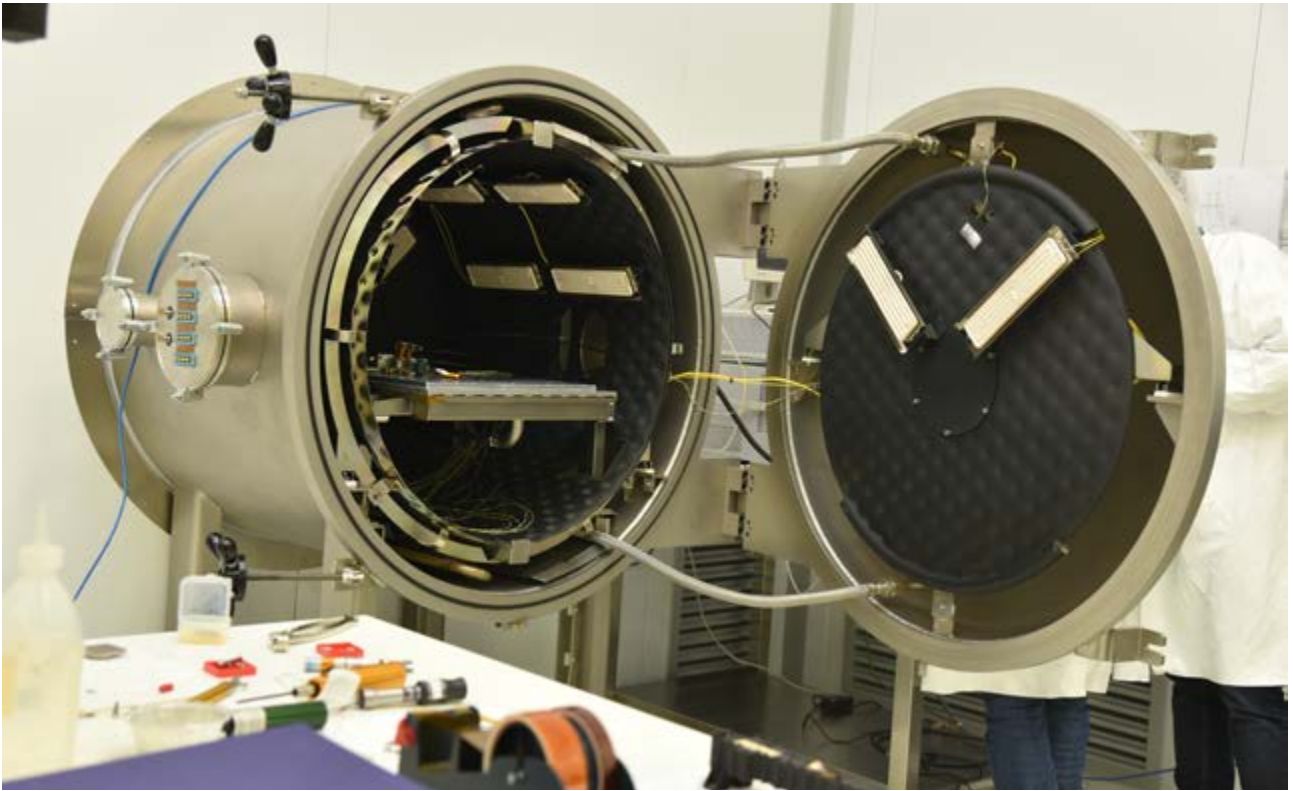


- Payload Operational Software for new generation satellites with flexible payload
- Passive Onboard RF components and Feed Chains, including high bands (Q/V/W)
- Active and reconfigurable onboard antennas for High Throughput and Flexible Satellites, new tools for the operation of flexible payloads.
- World leading supplier of Broadband SatCom terminals for trains, providing fully operational terminals in France, Turkey, Russia, Kazakhstan. Designers of the only Ka-band antenna for trains.
- Ground Transponders and Calibrators for EO Optical and SAR satellites









# ALTEC S.p.A.

## Company profile

ALTEC (Aerospace Logistics Technology Engineering Company), a public-private company owned by Thales Alenia Space Italy (63,75%) and the Italian Space Agency (36,25%), is the Italian center of excellence for the provision of engineering and logistics services to support operations and utilization of the International Space Station and the development and implementation of planetary exploration missions. ALTEC is based in Turin and has liaison offices at NASA and ESA. ALTEC services include: engineering and logistics support, astronauts training, support to in orbit experiments, operations, processing of scientific data, development and management of the ground segment of space programs and the promotion of space culture. ALTEC collaborates on large international projects defined in the context of the programs of the Italian and European Space Agencies. Participation in the programs developed for the International Space Station is the core business of the company and indicates the strong commitment to promote the development of technological innovation and scientific knowledge. ALTEC, working closely with NASA centers in the exchange of sensitive data, as part of the bilateral agreement ASI-NASA, takes the value of a prestigious international showcase of Italian industrial excellence. ESA's designation of ALTEC as the Operations Control Center for the "EXOMARS Rover" acknowledges the company's operational capabilities in the context of European research and innovation.

## Products | Services | Applications | Technologies

Engineering Support Services to the ISS

ALTEC, as Prime Contractor of ESA's ISS Training Logistics and Operations support (TLO), provides Engineering Services to support the exploitation of the International Space Station both at system and payload level.

ALTEC performs the complex ensemble of required engineering services thanks to the availability of the dedicated PMM (Pressurized Multi-purpose Module) Mission Support Centre, part of the NASA ISS related Ground Segment to which is connected by the ASINet infrastructure, and the Columbus Engineering Support Center, part of the ESA ISS related Ground Segment through the ESA IGS network.

The main provided services are:

- Integrated Logistics Services: ALTEC covers the role of "International Space Station European Logistics Center" on behalf of ESA; ALTEC is certified as Known Consignor (KC) and Authorized Economic Operator (AEO) to perform its duties. The dedicated tasks are:
  - Centralized spare warehouse
  - Ground inventory management
  - The Logistics Information System (L.I.S.)
  - Ground logistics planning
  - Launch package logistics
  - Packaging Handling Storage & Transportation (PHS&T)
  - Ground h/w maintenance management
  - On-orbit inventory monitoring
  - Launch package preparation & cargo review execution
- Engineering Support Services: ALTEC supports the activities of the Columbus Control Centre providing to its team a Flight Director, members of the STRATOS team for the on-board computer management and, as detached from Col-CC team, the COSMO and PASO positions, respectively devoted to maintain on-orbit stowage assets and assure Product Assurance and Safety to European ISS operations.
- ALTEC manages the industrial consortium that provides training to ISS assigned crewmembers, ESA astronauts, other International Partners astronauts and cosmonauts, focusing on Columbus System and ESA Payloads operations. These training tasks are carried out also through ALTEC own instructors and are mainly performed at EAC, where the instructor team is located.



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### Planetary Mission Exploration

ALTEC is responsible for the design, development and operations of the ESA EXOMARS Rover Operations Control Center (ROCC). The ExoMars ROCC encompasses also Science Operation Center (SOC) functions and is equipped with the Mars Terrain Simulator (MTS).

The MTS facility supports engineering, training, rehearsal plus testing and verifications activities in performing the followings: rover module deployment and egress from landing platforms, mobility confidence end to end test, drilling verification, sample collection and distribution to instruments payload analytical instrument operations and simulation of off-line nominal and non-nominal rover surface operations providing an easily reconfigurable Mars-like environment.

The Rover Operations are organized in line with up-to-date robotic autonomy concepts that leverage actions and tasks, the onboard high-level commanding elements that allow an event-based control of the system. From a scientific perspective the ROCC, processing is based on the ALTEC ASDP (ALTEC Space Data Processing), a proprietary multi-purpose reusable tool through which new automatic processing pipelines and software infrastructures can be built and set up.

### Scientific Data Management and Processing

ALTEC is responsible for the design and operations of the ESA Gaia Data Processing Center (DPCT), located in Turin, part of the European ground segment dedicated to the processing of the Gaia data.

The DPCT main activity is the Astrometric Verification of the scientific data performed using dedicated software products developed under ALTEC responsibility:

- ❑ AIM (Astrometric Instrument Model): to process the Astro data telemetry in order to monitor and analyze the Astro instrument response over the mission lifetime;
- ❑ BAM/AVU (Basic Angle Monitoring) software system: to process the BAM device telemetry in order to monitor and analyze the BA behavior over time
- ❑ GSR (Global Sphere Reconstruction): the mathematical and numerical framework to verify the global astrometric results produced by AGIS.

The scientific data management and processing is performed according to up-to-date "Big Data" approaches, exploiting advanced data analytics and artificial intelligence techniques.

### Sub-Orbital and Nano-Satellite Mission Control Center

In the frame of the European IXV (Intermediate eXperimental Vehicle) Mission, ALTEC has designed, developed and operated the IXV Ground Segment whose core element is the Mission Control Center located at ALTEC premises.

This asset enables the performance of the broad and complex ensemble of tasks and operations required for the controlling and commanding of Sub-orbital Vehicles, guaranteeing at the same time a safe re-entry and landing of involved spacecraft. The available asset is ready to support operations control and data management of nano-satellite systems, a dedicated research and development effort is actually on going to implement innovative approaches based on advanced mission planning systems.

### Space Commercialization

ALTEC, through its Spacegate initiative, is set to provide a turn-key service concept to offer customers flexible access to a wide range of platforms and to end-to-end services for P/L & experiments.

Thanks to its 20 years long experience in supporting customers' payloads/experiments accessing to space, ALTEC offers support from early stage of payloads design phases up to full exploitation and retrieval/disposal. This is performed

through a full set of ground engineering services, covering payload-engineering support, experiments AIT/AIV, integrated logistics, operations, data processing and exploitation. Access to space is guaranteed via a set of partnerships allowing for a wide range of space access solutions, ranging from sounding rockets and balloons, to cubesats, Space Rider and ISS.

### Research & Development according to European and National Strategic guidelines

ALTEC is partner of reference within several consortiums, participated by industries and research centers, dedicated to technical research in multidisciplinary space relevant fields with possible applications also to the life on earth.

Presently the main covered topics are:

- ❑ Big Data: Implementing big data systems to manage, process, analyze, visualize and preserve space data characterized by huge volume, variety and veracity. In particular, ALTEC is interested in the definition of data exploitation platforms for users' communities using space data in their business.
- ❑ Advanced Space Data Processing: ASDP (ALTEC SPACE DATA PROCESSING) is a distributed data processing framework dedicated to the on-ground handling and transformation of any aircraft and spacecraft data.
- ❑ Smart Center: implementing a "Station of Supervision and Coordination" designed as a multi-mission, multi-sensors system able to operate in a broad range of scenarios and with a multitude of data input coming from a variety of platforms (satellite, airborne, balloons, rpas, in-situ). Bio- and Space-medicine: aimed to understand how to deal with the physiological changes and conditions that can occur when humans are exposed to extreme environments. ALTEC interest in the gravitational physiology and the relevant technology and methodologies to support astronauts' activities and ergonomics has evident application and offer synergies with on-earth researches dedicated to other human areas such as aviation, extreme and Paralympic sports, rehabilitation.
- ❑ Virtual and Augmented Reality: participating to important European R&D projects (in the frame of H2020 program) addressed to study and develop new applications such as augment training in situ with live expert guidance in knowledge-intensive environments where effective decision making has high impact on processes.











# ANGELANTONI TEST TECHNOLOGIES

## Company profile

Angelantoni Test Technologies is a company with a turnover of around 50 million euro and 250 employees. The company is part of the Angelantoni Industrie Group, operating globally since 1932, with a turnover of around 60 million euro and 340 employees, and active also in the fields of Life Sciences, Energy efficiency devices and Thin Film Deposition Technology. Angelantoni Test Technologies is now present with its own branch companies in Germany, France, China and India, in addition to being well represented worldwide in over 40 countries.

Since 1952, Angelantoni has been producing and marketing worldwide, under the ACS brand, environmental test chambers for all types of tests on materials, components, and finished products. The ACS brand has always been associated with experience and flexibility in customized solutions, undisputed expertise and technological innovations.

The ACS brand has acquired a strong leadership position in the Aerospace sector, the most challenging environment for simulation: after the first Thermal Vacuum Chamber (TVC) in 1988, Angelantoni became one of the few leading international manufacturers at international level, and a supplier for the most important Space Research Centers testing satellites, subsystems, and components

## Products | Services | Applications | Technologies

### THERMAL VACUUM CHAMBERS (TVC)

Angelantoni Test Technologies has developed a wide range of Thermal Vacuum Chambers thanks to its wide experience in several techniques applied in the environmental simulation and testing.

TVC are able to artificially create the operating conditions (temperature and high vacuum) of whole satellites or equipment used on board of satellites.

- Wide range of TVC sizes, with diameters ranging from under 1m up to 10m
- High quality and vast experience in vacuum pumping systems
- High quality of black shroud paint with a solution for low outgassing at maximum temperatures ( $>+150^{\circ}\text{C}$ ) according to ESA standard ECSS-Q-ST-70-02C
- Special shroud design to withstand the highest heat dissipations ( $>5\text{ kW/m}^2$ )
- Special attention to minimizing consumption through hardware solutions and software management of the plant
- Integrated control and monitoring system totally developed by ACS
- Special attention to and experience in redundancy aspects
- Full capability for supplying turnkey systems

### MODULAR AND CUSTOMIZED WALK-IN CHAMBERS

ACS prefabricated chambers can be supplied for temperature only or temperature/humidity tests, and are suitable for tests on electronic modules or complete assemblies (solar panels, satellites, antennas, etc...). Where high power dissipation by the specimen is expected, i.e. testing of complete assemblies, the temperature humidity chamber incorporates the indirect system for climatic thermoregulation.

Entrance doors for technicians or materials can be supplied for any size chamber, either side hung and automatic sliding type.

### TRANSPARENT THERMAL CHAMBERS

Special chambers to combine thermal tests and Radio Frequency measurements on active antennas.

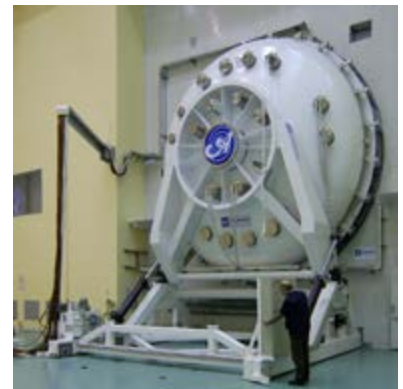
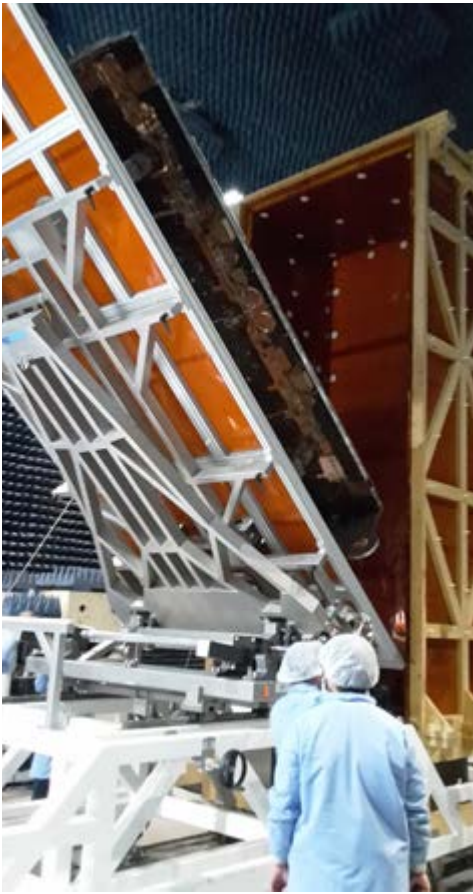
### STANDARD T & RH CHAMBERS



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# AVIO S.p.A.

## Company profile

Avio SpA, the Colleferro, Rome-based leading Company in Space Transportation Systems, has been working in the space segment for more than 50 years.

Thanks to the Ariane and Vega programs, we have acquired knowledge and expertise to design, manufacture, test and integrate not only solid / liquid fuel propulsion engines for space and defense applications, but also a complete Launcher System, i.e. Vega and its upcoming evolutions Vega C / Vega E. AVIO is a public Company listed on the Milan Stock Exchange since April 2017 (70% of free floating, 4% Management share), we are more than 1000 people working in Italy, France and French Guiana, successfully running propellant, filament-wound structures and stage integration plants as well as operating the Vega launch pad at CSG, Kourou.

## Products | Services | Applications | Technologies

### SOLID ROCKET PROPULSION

Design, manufacturing, assembly and testing of Solid Rocket Motors (SRM) and their different sub-assembly (Inert Motor Case, Thermal Protections, Loaded Motor Case, Nozzle):

- SRM P230  
Solid Rocket Motors of about 240 tons of propellant and a Maximum Thrust of about 7000 kN, used as first stage booster of Ariane 5 launcher.
- P80 1  
Solid Rocket Motor of about 88 tons of propellant and a Maximum Thrust of about 3000 kN, used as first stage of Vega launcher.
- P120C 1  
Solid Rocket Motor of about 140 tons of propellant and a Maximum Thrust of about 4300 kN, to be used as first stage of Vega C launcher and booster of Ariane 6 launcher.
- Z40  
Solid Rocket Motor of about 36 tons of propellant and a Maximum Thrust of about 1300 kN, to be used as second stage of Vega C launcher.

### LIQUID ROCKET PROPULSION

Design, manufacturing, integration and testing of Liquid Rocket Propulsive Systems and their different sub-assembly:

- AVUM Liquid Propulsion System  
Vega launcher fourth stage main propulsion system; NTO/UDMH bipropellant pressure regulated system.
- Vulcain 1/2 and Vinci Turbo Pump Oxygene<sup>1</sup>

Liquid Oxygen Turbo Pumps for Vulcain 1/2 engines used for the first core stage of Ariane 5 launcher. & VINCI used for Ariane 6 upper cryogenic stage.

- M10 Engine  
Cryogenic LOX/LCH<sub>4</sub> 10-tons class liquid rocket engine that will be the upper stage of the Vega E launcher. At the nominal point and steady-state M10 engine has to provide 98 kN thrust, with propellants mixture ratio 3.4
- Satellites chemical liquid propulsion systems  
MON3/MMH bipropellant regulated chemical propulsion systems of the geostationary satellites Small GEO and EDRS-C.

### Vega Launch Vehicle

Vega is a 4-stage Launch Vehicle. It is composed by:

- 1st stage: P80 SRM (88 tons)



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- 2nd stage: Z23 SRM (24 tons)
- 3rd stage: Z9 SRM (10,5 tons)
- 4th stage: AVUM liquid stage (including Liquid Propulsion System, Roll Attitude Control System, Avionics)

#### Flight Program Software

- Upper Composite: Payload Adapter & Fairing for the satellite accommodation

#### Vega C Launch Vehicle

It is an upgrade of present launcher Vega configuration aimed to improve the launch system performance.

Vega C is a 4-stage Launch Vehicle. It is composed by:

- 1st stage: P120C SRM (140 tons)
- 2nd stage: Z40 SRM (36 tons)
- 3rd stage: Z9 SRM (10,5 tons)
- 4th stage: AVUM+ (including enhanced Liquid Propulsion System, Roll Attitude and Control System, upgraded Avionics)
- Flight Program Software
- Upper Composite: Payload Adapter & Fairing (larger than the VEGA fairing) for the satellite accommodation.

#### SPACE RIDER (under development)

Space Rider is a reusable space transportation system to be launched by the VEGA-C launcher and able to perform experimentation and demonstration of multiple application missions in low Earth orbit and recovered.

The Space Rider System is managed in co-premiership with TAS-I. It is made of the AVUM Orbital Module (AOM), designed and developed by AVIO, and a Re-entry Module (RM) integrated in a single stack-up.

The AVUM Orbital Module is made by:

- AVUM+
- PLA1194-LEK: standard 1194mm conical adapter modified for Space Rider
- ALEK: hosts the avionics dedicated to the orbital operations and the solar panels.

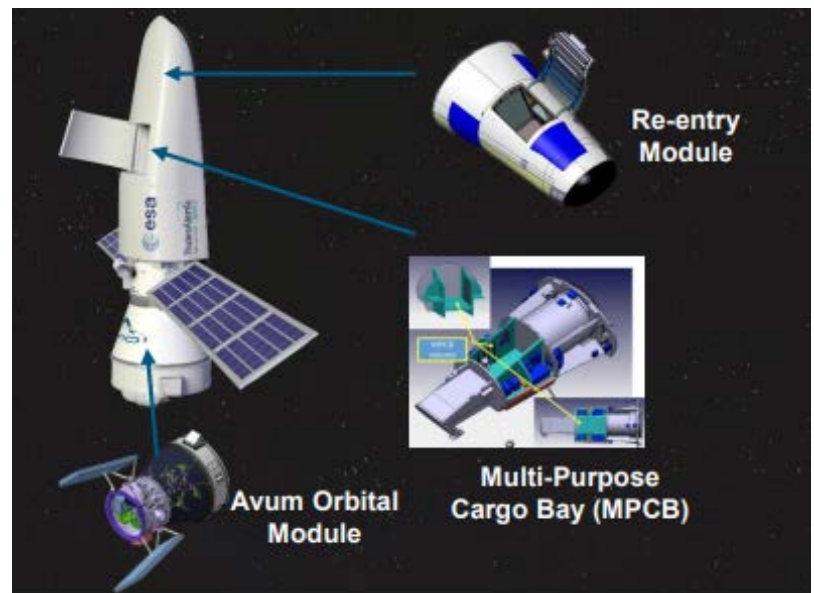
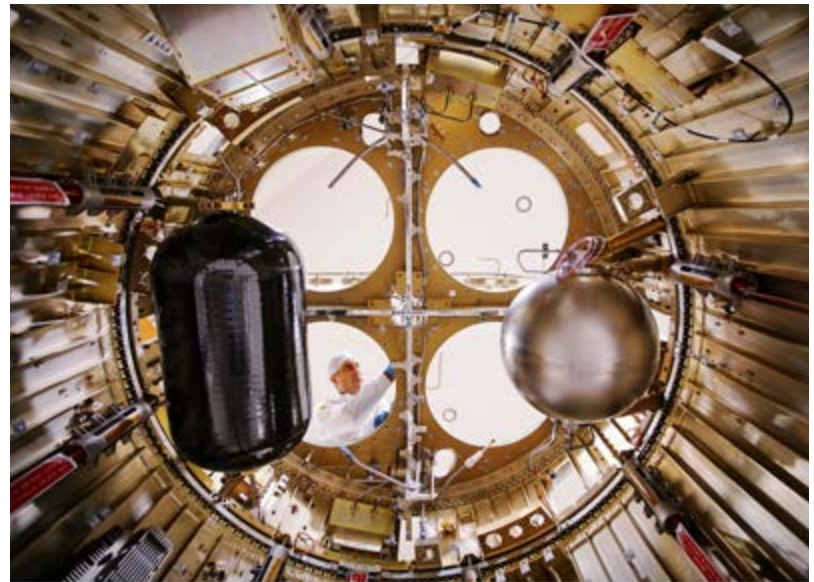
The AOM will start its operations as service module after the initial orbit acquisition at the end of the VegaC ascent phase and it is able to service the Space Rider System for more than 2 months supplying:

- Power
- Propulsion
- Attitude Control
- Guidance & Navigation











# BEAMIT

## Company profile

BEAMIT SpA ([www.beam-it.eu](http://www.beam-it.eu)) is a Highly Qualified Italian Company specialized in Additive Manufacturing (AM), established in two facilities: Fornovo di Taro and, since 2015, Rubbiano (both in Parma area, Italy). By July 2019, SANDVIK Machining Solutions, as minority shareholder, is entered in BEAMIT SpA.

BEAMIT has more than 20 years' experience in Rapid Prototyping before and Additive Manufacturing later on.

BEAMIT has a leading role, having installed an AM park of 33 (28 Metal dedicated) different technology machines at its headquarters: this made it possible for BEAMIT to become one of the largest European AM companies. BEAMIT is active in several high-value markets and applications with several materials qualified and operative in various sectors as aeronautical, aerospace, racing, automotive and food domains.

In particular, for aeronautical and biomedical applications BEAMIT is strictly following several procedures qualified by main worldwide customers and certified in accordance to ISO9001, ISO9100 and NADCAP accreditation.

## Products | Services | Applications | Technologies

BEAMIT has 14 different metallic materials and few new materials in R&D. Applications and products are several thanks to flexibility of the additive manufacturing technologies.



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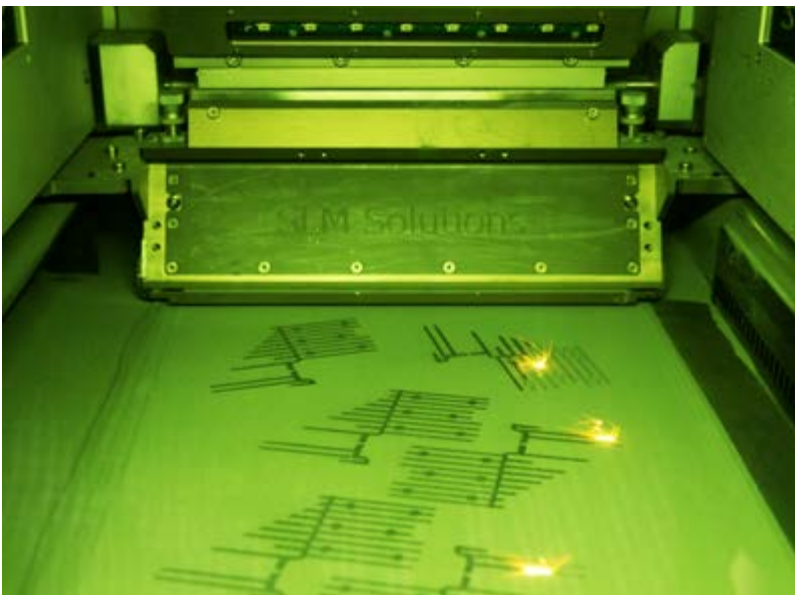
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# BLUE Engineering Srl

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## Company profile

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BLUE Engineering, founded in 1993, provides engineering services in the areas of transport excellence, such as automotive, rail, aerospace and naval. The strong multi-sectoral know-how and the singular specialization in numerical analysis distinguish us on the market and allow us to develop innovative projects, at the highest quality level, during all phases of development: style, design, engineering, Virtual prototyping, testing and validation.

BLUE Engineering develops its 'business' beyond the technological and geographic frontiers. We work with important national and international customers, always looking towards new markets. We offer a full turnkey service, including vocational education, in order to transfer our skills to the customer team.

BLUE Engineering is a good partner for project development, thanks to the integration of competences in all their aspects: design, functionality and innovative features. Our team of designers and specialized technicians work in close collaboration, thus optimizing time planning and achieving results of high reliability. BLUE Engineering constantly invests in education and vocational training, to promote the development of the skills of its team.

### BLUE Engineering PLUS

- Innovation development.
- Product quality optimization.
- Processes and methodologies development.
- Excellent knowledge of CAD/CAE computer systems.
- Excellent TEAM of expertise and experience.
- Flexibility

### Provided Services:

- Turnkey project development.
- Management of engineering development platforms.
- Contract management.
- Technical specifications issue.
- Technical documents.
- ICT MES (Manufacturing Execution System) and SW of traceability.

## Products | Services | Applications | Technologies

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BLUE Engineering has many years of experience in Engineering, Design, Software Development, Verification and Validation, Testing.

Our services are applied to space structures, payloads & subsystems, propulsion test bench and manufacturing tools. We collaborated to the development of several international space programmes such as:

- ISS Cupola
- ISS Nodo2
- ATV
- RADAR SAT Satellite
- ALADIN Equipment
- ASTR Equipment
- IRES Equipment
- CDP Equipment
- VEGA Launcher



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- EXOMARS
- GALILEO
- CYGNUS PCM

Main partners of our activities are Leonardo, ThalesAleniaSpace, Airbus Defence & Space and ESA.

For several programmes and payloads BLUE provides the following capabilities:

Structural Analysis.

For the realization of Node2, ATV and Cupola, the interconnection element between the various pressurized modules for the International Space Station, Blue has been responsible for the following activities:

- Structural check of the overall structure.
- Verification of the resistance to buckling of the single components.
- Structural inspection of riveting and bolting.

Thermal Control.

- Model Analysis
- Model Reduction
- Reporting
- Model Correlation with thermal vacuum tests data.
- Sensitivity Analysis
- Requirements Checking.
- Attitude simulation.

Fluid Mechanics

- Re-Entry Aerodynamics.
- Thermo-chemical non-equilibrium effects.
- Unsteady Aerodynamics: damping derivative and dynamic stability.
- Low-Gravity fluid dynamics and transport phenomena.
- CFD in propulsion: combustor chamber, turbine stage, pump stage.
- Climate Control and Thermal Comfort.

Testing

- Testing facility design:
- Structures,
- Instruments
- Environment simulation (CO<sub>2</sub>, high temperatures)
- Test procedures definition & Execution
- Reporting.

Software Development

Since 2004 BLUE Engineering increase its experience on software development, we start a collaboration with ESA on the development of the Thermal Concept design tool, we participate actively in national programmes like STEPS, STEPS2 and CADET developing software tools for system modelling and advanced calculation methodologies such as GPGPU programming, IR image processing and recognition, MBSE.

BLUE is focused also on research and development in order to ensure the innovative contents to its projects and products. In particular main R&D activities and products can be summarised as follows:

Research and Development.

Participation to several research and development projects in different fields: aerospace, railway, automotive. The subjects of R&D projects are of very different type:

- Application of advance materials.
- Application of advanced manufacturing methodologies (3D print for metal and plastic parts, Carbon Fiber grid panel technology)
- Advanced design and verification methodology
- New ground transportation vehicles (hybrid, unmanned, ...)
- Development of system design tools

Some internal developments became products such as:

P.ANA.MA

The Parametric Analysis Manager performs multi-disciplinary sensitivity & optimization analyses with the stochastic method, it has the following features:

- Definition of variations of Parameters
- Management of REMOTE ANALYSIS (structural, thermal ...)
- Possibility of performing MULTIDISCIPLINARY ANALYSIS CASES
- Data Processing
- Stochastic sensitivity and optimisation.

COSM

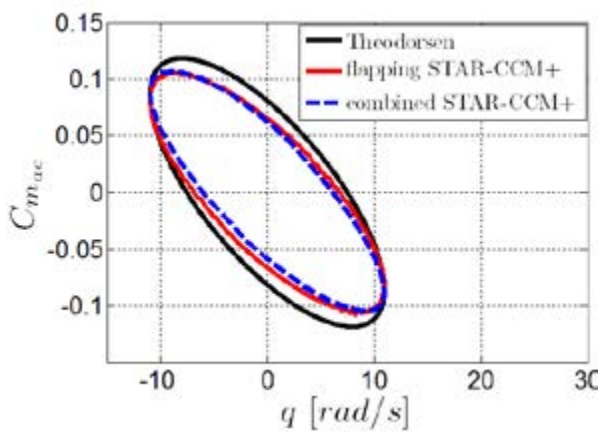
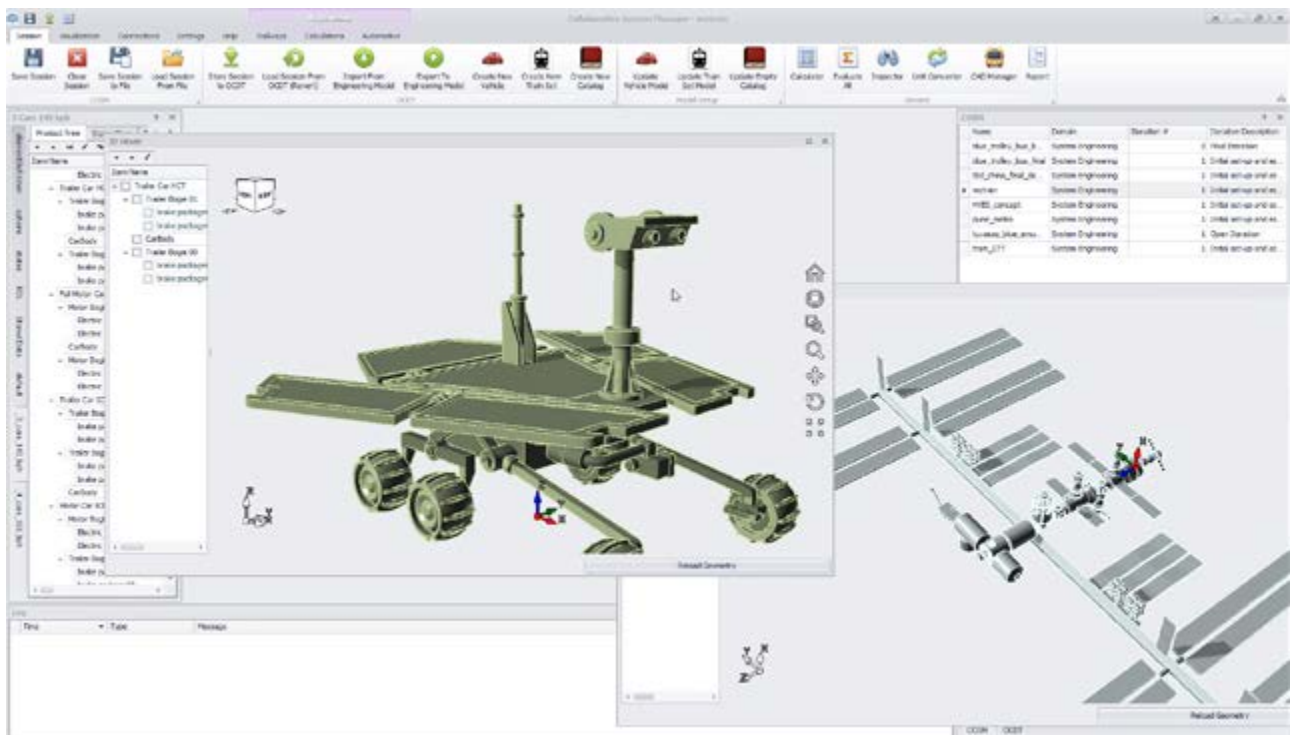
The Purpose of Collaborative System Manager is to support the calculation and analysis of several sectors projects performed at discipline level through a common and user friendly environment with flexible degree of accuracy.

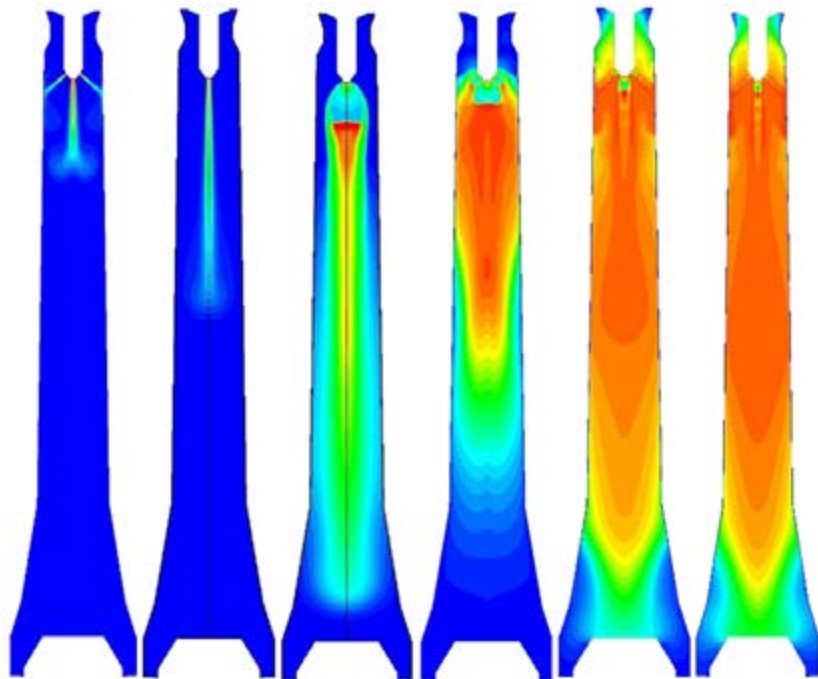
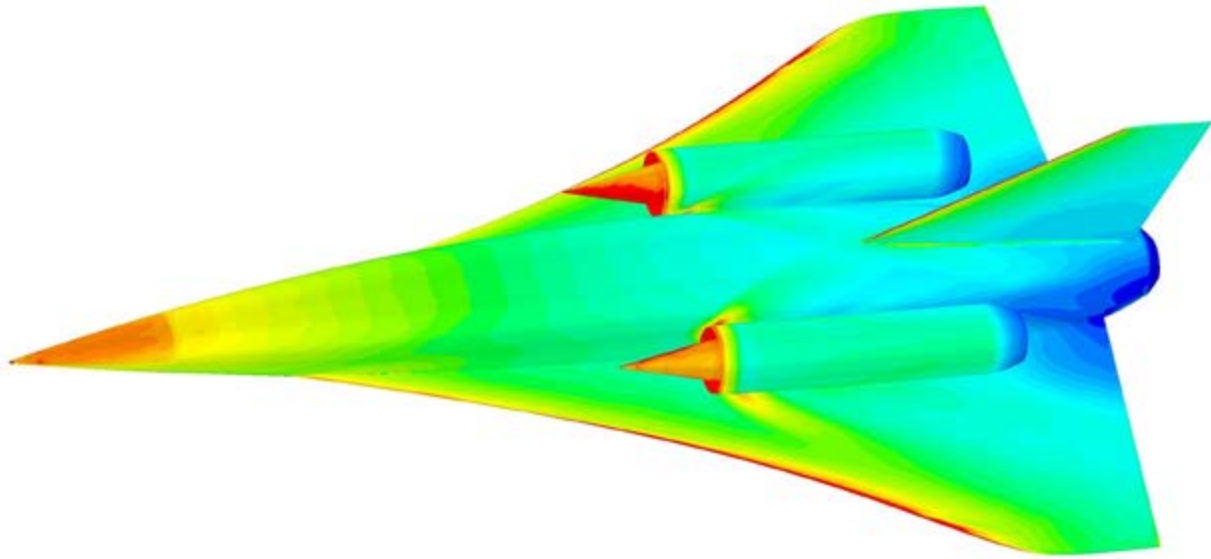
It shall describe space scenarios, run computation processes, analyse result with extended post-processing and easily build reports with curve, picture and animations. To each engineer is shown a well-defined and easy to use environment with a fast learning curve.

COSM was initially developed for aerospace sector, and now collect features and can manage models relevant to automotive and railway sectors.

COSM is made in collaboration with ThalesAlenia Space Italia.







# CESI – Centro Elettrotecnico Sperimentale Italiano “Giacinto Motta” S.p.A.

## Company profile

CESI is a world-leading technical consulting and engineering company in the field of technology and innovation for the energy sector. With a legacy of more than 60 years of experience, CESI operates in 40 countries and supports its global clients in meeting the Energy Transition challenges. CESI also provides testing and certification services to the power equipment industry, as well as civil and environmental engineering services.

CESI is a fully independent joint-stock company headquartered in Milan (Italy) and with facilities in Berlin, Mannheim, Dubai, Abu Dhabi, Washington DC, Knoxville, Rio de Janeiro, Santiago de Chile and Bogota. CESI operates through three Divisions: Testing & Certification (which includes the Solar Cells Facility), Consulting, Solutions and Services and Engineering & Environment.

CESI has been involved since 30 years in the manufacturing of high efficiency space solar cells based on III-V semiconductors for civil applications and it is one of the main international suppliers of space solar cells. CESI has strongly invested for decades in developing its own proprietary technology going through all the roadmap steps from single junction to multi-junctions, while being involved in the main space research and development programs at EU and international level.

The research activities of CESI have been performed through time thanks to relevant internal investments and to the financial support of the Italian Space Agency and of the European Space Agency.

CESI has cooperated in many significant projects for interplanetary missions (Mercury, Mars and Jupiter). The heritage of CESI includes more than 150,000 manufactured solar cells, powering more than 70 civil satellites for Clients from over 25 different countries worldwide.

Solar cells are manufactured at our facility in Milan and can be provided either bare or SCA (aka CIC) to serve the civil application markets with the best cost versus quality mix.

CESI is particularly proud of its distinctive positioning based on our attention and capability to shape and fine tune our solar cells for the specific needs and applications of our customers.

Our standard triple junction space cells are state of the art 30% typical efficiency, qualified for both LEO and GEO missions according to ECSS-E-ST20-08C standard. In our continuous improvement effort, we are already investing with effective results into four-junction cells towards space efficiencies beyond 35%.

The CESI Management System complies and has been certified to the international Standards ISO-9001, BS-OHSAS-18001, ISO-14001. The Code of Ethics, adopted in 2002 was updated on 2009.

## Products | Services | Applications | Technologies

High efficiency multi junction solar cells based on III-V compounds for civil space applications:

Triple-Junction Solar Cell for Space Application (CTJ30)

The CESI Standard space Triple Junction solar cell named CTJ30 is qualified for LEO and GEO missions have to date powered more than 70 satellites of clients from over 25 countries.

Features & Characteristics (bare level)

- 29.5% efficiency at AMO
- Triple Junction Solar Cells InGaP/GaAs/Ge for Space Applications
- Very low solar cell mass (81-89 mg/cm<sup>2</sup>)



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- Thickness 150  $\mu\text{m}$
- Fully qualified according to ECSS E ST20-08C standard for LEO and GEO orbit
- High Radiation Resistance

Thin Triple-Junction Solar Cell for Space Applications (CTJ30-thin)

The Thin triple junction solar cell named CTJ30-Thin (80 $\mu\text{m}$  thin, bendable) maintains the high quality features and the electrical performances of CTJ30, while reducing of about one half the whole cell thickness. These cells are aimed at the New Generation Array (NGA) designs requiring flexibility features.

Features & Characteristics (bare level)

- 29% efficiency at AMO
- High Radiation Resistance
- Thickness 150  $\mu\text{m}$
- 50 mg/cm<sup>2</sup> mass
- >0.7 W/gr (power-to-mass ratio)
- Fully qualified according to standard ECSS E ST20-08C rev. 1 standard for LEO and GEO orbit (qualification at SCA level pending)

Low Cost Triple-Junction Solar Cell for Space Applications (CTJ-LC)

The Low Cost solar cell named CTJ-LC supports the achievement of costs/prices 30% lower than current commercial market levels, being especially suitable for the new mini/micro/cube satellite macro-constellation emerging market where the costs are key (the new CTJ-LC2 version (efficiency 27% @ AMO) with price towards 50% lower, is already available);

Features & Characteristics (bare level)

- 28% efficiency at AMO
- High radiation resistance
- Standard assembly approach for solar cell interconnection and coverglassing
- Applicability of low cost concept also to thin and/or large area cells
- Higher volume production capacity
- Fully Qualified according to ECSS E ST20-08C rev.1 standard for LEO and GEO orbit at bare level (qualification at SCA level pending)

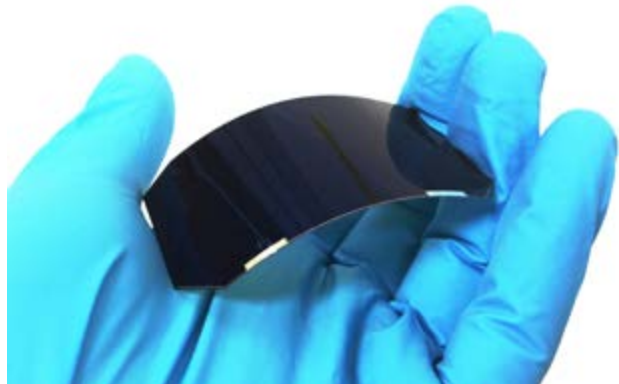
Large Area Triple-Junction Solar Cell for Space Applications (CTJ-LA)

The Large Area solar cells named CTJ-LA (c.a. 69cm<sup>2</sup>) maintains the high quality features and the electrical performances of our standard cell with typical AMO efficiency 30%. This new class of solar cells is mainly devoted to the market of Telecom satellites and in general to the high power demanding missions powered by large area solar arrays that are requested to be increasingly lighter and cheaper and more efficient, while maintaining their high reliability.

Features & Characteristics

- 30% efficiency at AMO
- Lower manufacturing costs per cm<sup>2</sup> at cell level
- Lower assembly costs at solar generator level Space saving at solar generator level

The Low Cost the Thin and the Large Area features can be COMBINED to manufacture and supply, either as bare cells or Solar Cell Assembly (SCA), new convergent space solar cell products fine tuned to the requirement needs of any satellite program.





# Cistelaier S.p.A.

## Company profile

Cistelaier S.p.A. is a Printed Circuit Boards manufacturing company belonging to the Finmasi Group PCB Division, consisting of Cistelaier S.p.A. in Italy, Techci Rhône-Alpes in France and EPN Electroprint GmbH in Germany.

The task of the PCB Division is to enhance the specific competences of the three factories in order to offer customers excellent results thanks to their synergies in terms of technology, production and service.

The solution provider's vocation coupled with the long-standing skills of Cistelaier, Techci and EPN to support their partner since the early stage of a new project with codesign activities make Finmasi Group's PCB Division an ideal partner for supplying printed circuits boards of any typology and for any application.

Cistelaier S.p.A., established in 1998 merging the two industrial entities, Cistel S.r.l., established in Genoa in 1976 and Laier S.r.l., established in Modena in 1986, manufactures prototypes, small, medium and large series of a very wide range of printed circuit boards (up to 40 layers): double-sided, multilayer, rigid-flex, HDI (multilayer as well as flex-rigid) PCBs and boards realised with special materials.

Cistelaier S.p.A.'s mission is to become the main benchmark in Europe for companies seeking service, quality and know-how to make the PCB a strategic instrument for their business. With more than 40 years' experience, Cistelaier S.p.A. manufactured thousands of PCBs for businesses active in the Aerospace & Defence, Space, Rail, Automotive and Medical sectors. In order to continue to develop competences and know-how to meet all different and increasing market demands, Cistelaier S.p.A. is constantly investing in machineries, methods and research.

### ACCREDITATION AND STANDARDS

What makes Cistelaier S.p.A. a unique interlocutor is to be homologated for:

Aerospace & Defence sector: UNI EN 9100:2016

Automotive sector: IATF:2016

Medical devices: ISO 13485

Railway sector: ISO/TS 22163.

Products are manufactured according to the following standards and specific control plans are agreed with customers when needed:

IPC-A-600, class 2, 3 or class 3DS(A)

IPC 6012 (Rigid), IPC 6013 (Rigid-Flex), IPC 6016 (HDI) and IPC 6018 (Microwave)

MIL-P-55110 (Rigid) and MIL-P-50884 (Rigid-Flex)

ESA-ECSS - Q ST 70 10C / 11C / 12C

ESA-ECSS - Q ST 70 60C

## Products | Services | Applications | Technologies

### SERVICES

Cistelaier's processes have been designed in order to be fast and reliable from feasibility analysis to shipment of the finished printed circuit boards.

Cistelaier S.p.A. designed its factory and implemented the necessary organization in order to be able to deliver quick turnaround (QTA) service: this enable Cistelaier's customers to get prototypes with short lead time so to improve their time to market and their business performance. Cistelaier's Manufacturing System is managed according to Lean principles and this increase its capabilities to deliver quality and service to customers.

All information related to products coming from customers are systematically verified (Key Point Analysis) in order to identify any risk factors (Risk Analysis) with the use of



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DFM and FMEA type evaluation techniques.

Its valuable heritage in “all” market sectors enable Cistelaier S.p.A. to support customers since the early stage of their projects in order to implement the best practices for PCB design to increase effectiveness of the PCBs in each and every specific application.

#### MARKET SECTORS

Thanks to its know-how and accreditations, to its absolutely reliable products and to its extremely flexible service Cistelaier has been able to become a technological partner of customers performing in the following sectors:

Avionics  
Aerospace & Defense  
Space  
Electronics for the Railway sector  
Telecommunications  
Vision technology systems  
Automotive  
Motorsport  
Infotainment  
Medical  
Industrial Automation  
Renewable energy sources  
University and R&D

Up today more than 50% of the turnover of Cistelaier S.p.A. is related to Aerospace & Defense applications.

#### TECHNOLOGY

Cistelaier S.p.A. constantly invests in machineries and equipments at the state of the art of technology and suitable for QTA management and flexibility to produce for the whole of the market sectors/applications where different and specific materials are needed.

Cistelaier S.p.A. validated its processes to produce with more than 100 different base materials.

Cistelaier S.p.A. is also partner of several of its suppliers for machineries, equipment, material and chemistry for R&D projects to develop new solutions for the PCB industry.

Technological capabilities are also assured by Cistelaier's highly skilled people in PCB industrialization, in PCB manufacturing and in Production and Quality methods.

#### PRODUCTS

Cistelaier S.p.A. produces all kind of PCBs

PCB families: rigid (up to 40 layers) and rigid flex (up to 12 flex layers) PCBs / rigid HDI and rigid flex HDI PCBs

Materials: standard and high performance materials (i.e. Hi Tg, Alogen Free, Hi speed, epoxy and polyimidic resin materials, copper/invar/copper, Hi frequency materials Teflon and not Teflon based, thick copper materials) / mixed materials

Power Management: busbars , heavy copper , copper inlay, different thickness on same layer and selective plating;

Heat Management: heat dissipator, paste dissipator application, metal back PCB, copper coin technology

Size: up to 860 mm length and 470 mm width

Thickness: up to 5.5 mm

Fine line/space: down to 75 µm

Finishes: Tin-Lead reflow; HASL with and without Lead;

Enig (Al bondable); Chemical Tin & Chemical Ag; ENIG (Au bondable); Galvanic hard and soft gold

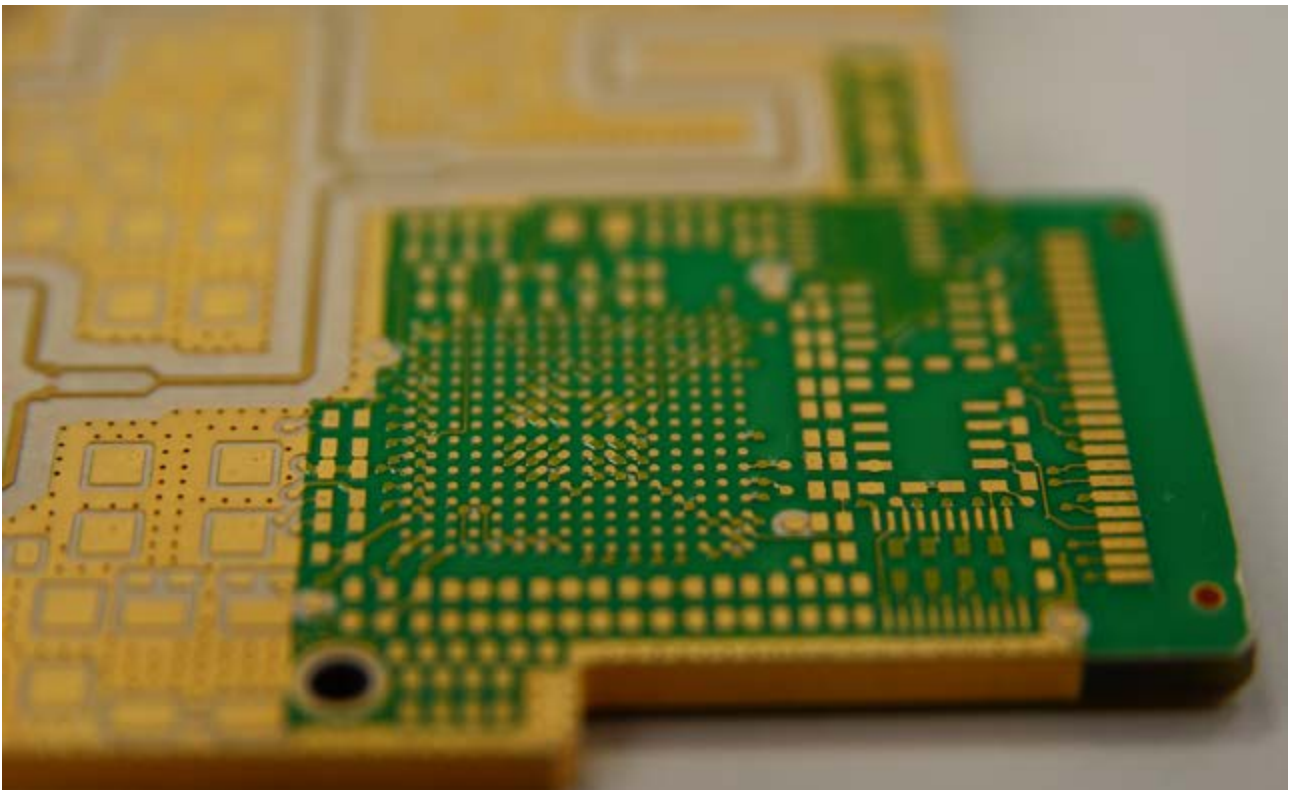
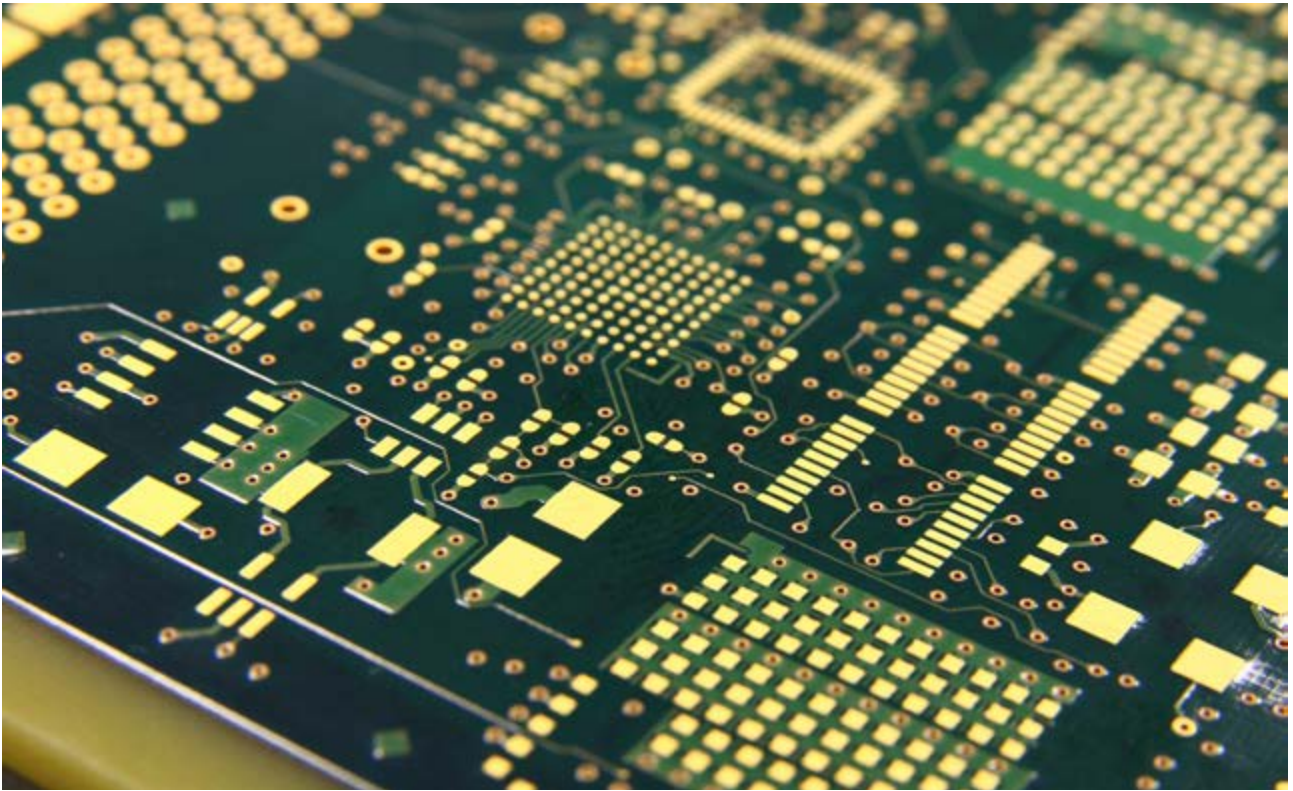
#### SPACE SECTOR

Even if is producing PCBs for Space applications since more than 10 years, Cistelaier S.p.A. is more and more focusing in Space sector since year 2013.

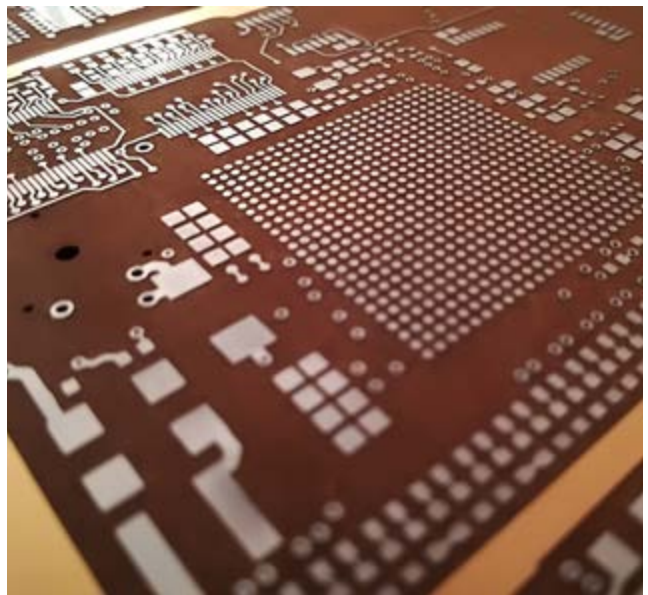
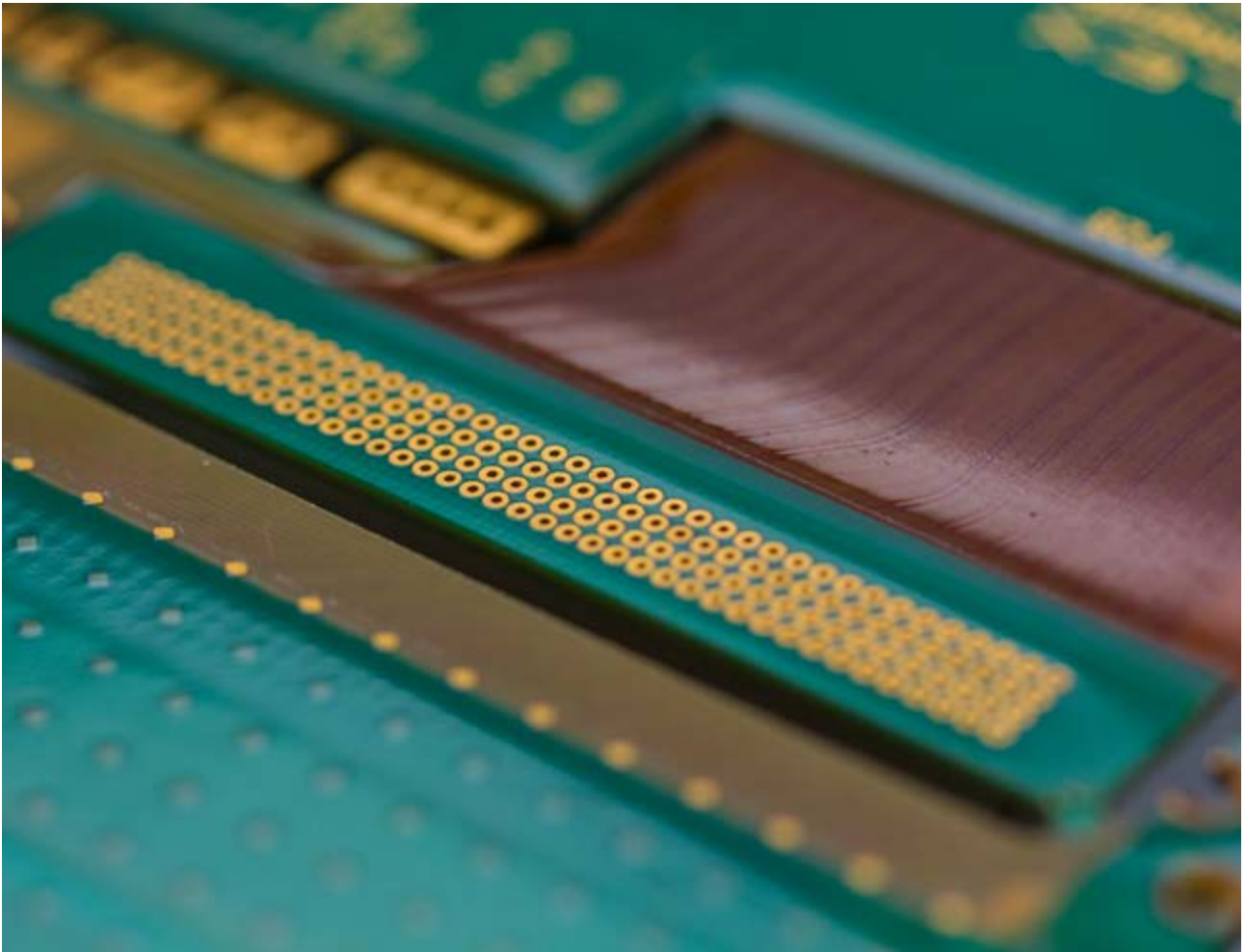
In the last 5 years Cistelaier manufactured according to ECSS more than 50 part numbers and tested all PCBs manufactured for “fly purpose” through ECSS Group 6 qualification process.

Cistelaier S.p.A. manufactured for Space sector PCBs with the following features

Multilayers PCBs up to 18 layers  
Epoxy & Polyimide resin base material, glass or para-aramidic fiber support  
Standard ML , Sequential Lamination and HDI build up  
Laser drilled and copper filled vias  
Mechanically drilled Filled & Capped vias  
Minimum vias of 0.15 mm  
Thickness up to 2.80 mm  
Aspect ratio up to 9.3:1  
Tin-Lead Reflow finishing  
Selective Electrolytic Nickel/Gold  
Test results showed high reliability of the PCBs manufactured by Cistelaier S.p.A.









# DEMA SPA

## Company profile

DEMA - Design Manufacturing SpA has been operating in the aerospace industry since 1993 as an innovative company with the capabilities to offer a complete, integrated product. By contributing to the most important international aerospace programs and Research & Development initiatives, DEMA has the ability to offer a wide variety of up-to-date products and to perform as an integrator for other suppliers and their customers.

Dema's mission is to be Aerostructures World-Class Supplier, to create Added Value integrating Design, Industrialization and Manufacturing, and to be the Partner to Share the Challenges.

The company took up the challenge imposed by today's competitive market and has consequently developed significant research programs and technological innovations at an international level.

Dema group, with a forecasted turnover of approx. 65 million Euros and with a staff of 800 employees, is located in Italy and precisely in Somma Vesuviana (Naples), Paolisi (Benevento) and Brindisi with manufacturing facilities and engineering offices. Lastly, Dema is also present in Montreal (Canada) with Dema Aeronautics, a design and engineering center.

### OUR CORE COMPETENCIES

- Aerostructure Design, Industrialization, Manufacturing and Assembly.
- Sheet Metal forming and fabrication, Machining, Composites.
- Innovative Processes and Materials.

## Products | Services | Applications | Technologies

### CAPABILITIES

#### ENGINEERING

Transport aircraft and helicopter's primary and secondary structure, with conventional materials and composites.

Airborne system installations and components design.

Static, fatigue and damage tolerance analysis.

Certification documentation.

Structural testing definition and planning.

#### MANUFACTURING ENGINEERING

Manufacturing operational definition and instructions.

Tool and jig design.

Numerical control programming and simulation testing.

Definition of methods and work process.

#### MANUFACTURING

Tool and jig fabrication.

NC machining fabrication.

Sheet metal stretch forming and fabrication.

Heat and surface treatments of aluminium alloys and steels.

Manufacturing of composite components (Kevlar, Fiberglass, Carbon Epoxy).

Quality control and non-destructive testing.

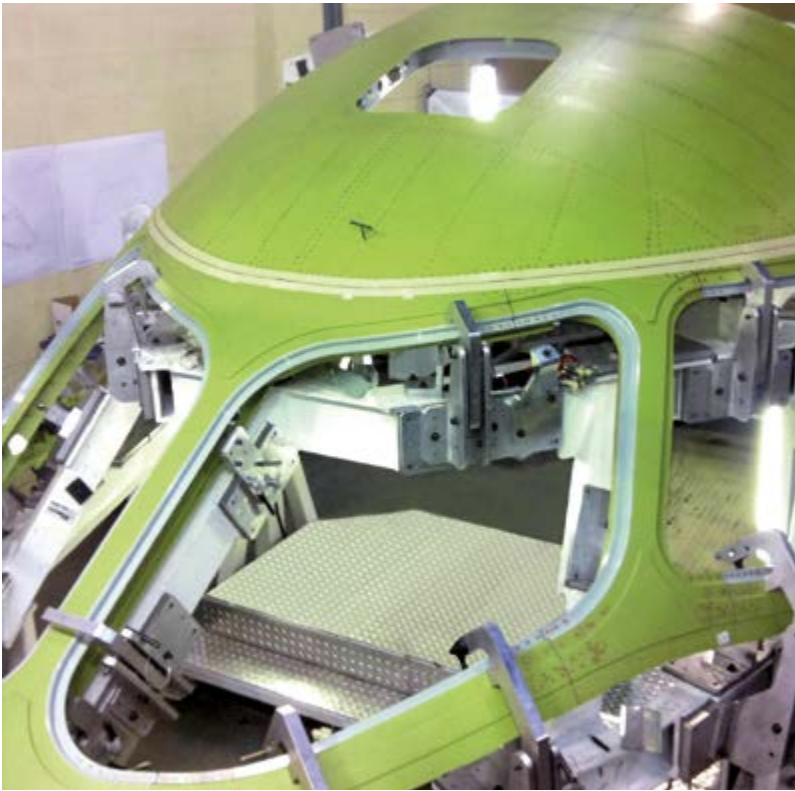
Aerostructures assembly.



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# e-GEOS SPA

## Company profile

e-GEOS, an ASI (20%) / Telespazio (80%) company, is a leading international player in the Earth Observation and Geo-Spatial Information business.

e-GEOS is the exclusive global distributor for the COSMO-SkyMed and COSMO Second Generation data, the most advanced and performing Radar Satellite constellation available today.

Through the Matera Space Centre e-GEOS acquires, processes, stores and distributes remotely-sensed data from the main Earth observation satellites, and also produces images, products and services in near real-time for maritime surveillance.

In particular, the Centre contributed to the design, integration, and testing of the civil ground segment data of the Italian radar satellite constellation COSMO-SkyMed, for which it has provided operation and maintenance service since the launch of the first satellite in 2007.

Since 2012, the Matera Space Centre has been one of the four stations of the Core Ground Segment of the European Space Agency (ESA) for the reception and processing in real-time of radar and optical data acquired by Sentinel satellites within Copernicus, the European Earth observation programme.

The e-GEOS portfolio includes whole spectrum of geoinformation services, cloud based application platforms dedicated to different markets and, CLEOS, the geoinformation digital marketplace and gateway to digital services and the environment taking benefit of Data Analytics and Artificial Intelligence based solutions for information extraction. The solutions cover all the spectrum of domain:

- Land management
- Defence & Intelligence • Maritime Surveillance
- Environmental monitoring and Ice monitoring
- Infrastructure and City monitoring.
- Agriculture
- Emergency support

Company's goal is to transform geographic information in actionable data as a valuable decision making support for both Public Sector and private market.

## Products | Services | Applications | Technologies

In addition to the provision of data from most of the Earth Observation satellite missions available on the world-wide market, e-GEOS offers a unique portfolio of application services. Thanks to the superior monitoring capabilities of the COSMO-SkyMed constellation and the fusion with a broad range of EO and non EO data, e-GEOS has become one of the global leaders in geospatial services and acquired a leading position also within the European Copernicus Program. COSMO-SkyMed Constellation and its Second Generation satellites, represent the forefront technology in the SAR (Synthetic Aperture Radar), e-GEOS is the global distributor for the data acquired. The systems is designed and built, under the prime contractorship of Thales Alenia Space, with major contribution from Telespazio and Leonardo divisions. Today, the planning activities and the main receiving antennas of this important investment, cofounded by the Italian Space Agency and the Italian MoD, are in the Matera Space Center.

Covering the whole value chain, from data acquisition to the generation of analytics and insight reports, e-GEOS, thanks to proprietary assets, algorithms and AI based features, integrates data from all satellites with the IoT information gathered over different sources, creating a big data lake where all the e-GEOS platforms are able to extract signals and key indicators dedicated to different markets. This approach is one of the key assets of the new services and products offered by the company and it can be run both on premises and mainly on cloud.



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## **AWARE**

Aware is the platform designed by e-GEOS to support both Public Administrations and private companies along the whole lifecycle of an infrastructure. It provides a set of services to monitor linear infrastructures, buildings, urban areas, monuments. Using the most advanced radar data techniques combined with IoT, In Situ sensors and drones generated information AWARE provides information through standard GIS layers and a set of user customized data analytics workbench from the planning phase to the management and maintenance of complex infrastructures.

## **SEonSE**

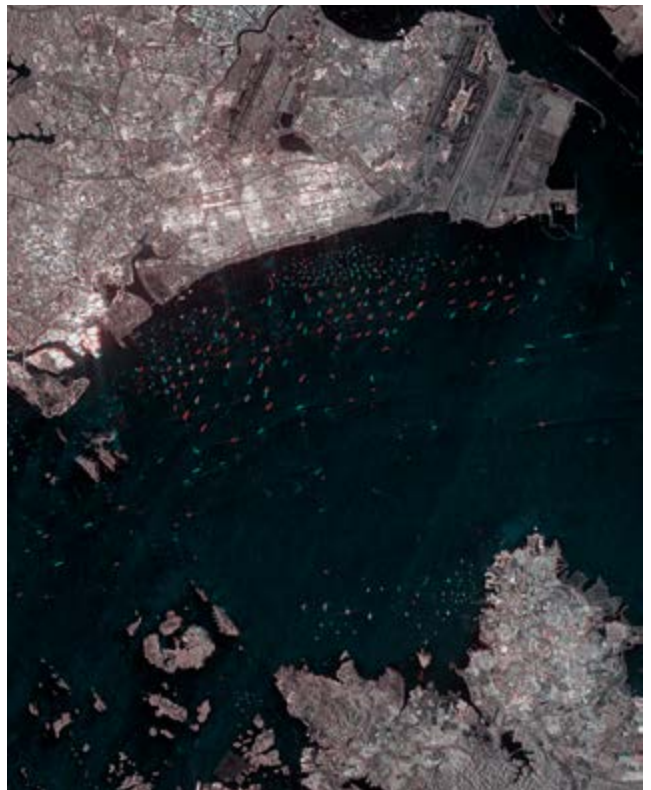
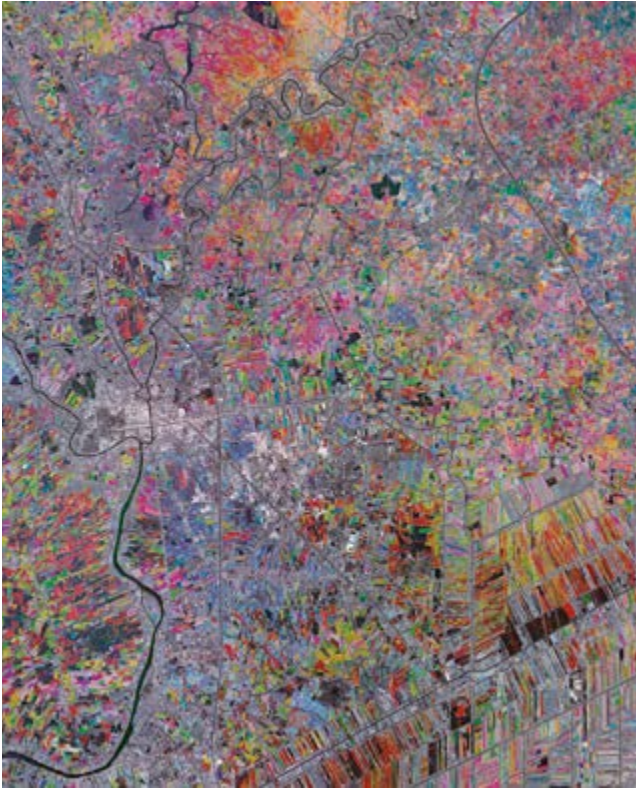
SEonSE (Smart Eyes on the SEas) is the e-GEOS new Maritime Surveillance Platform providing an innovative way to gain access to maritime domain awareness and tailored information, including early warning notifications, based on criteria established with the users.

SEonSE to deliver Maritime Domain Awareness applications in Near Real Time, leverages on SEonSE-engine, the e-GEOS toolkit, for an advanced exploitation of Multimission and COSMO-SkyMed satellite data, integrating marine traffic data (e.g. SatAIS, AIS), meteo information and open-data satellites.

## **BRAINT**

Image Intelligence analytical capability is continually improving as the technical performance of Earth Observation (EO) satellite missions evolve. In parallel to the proliferation of Open Source geospatial information, the intelligence community is set to experience a transformational sea change in capability, however as sources become more diverse and plentiful, so analysts need a platform to effectively and efficiently consolidate and synthesize it. braINT™ is the e-GEOS solution for imagery based actionable intelligence analysis, a modular environment for IMINT analysis and report generation. Based on a blended integration of proprietary algorithms braINT™ provides at its core a range of tailored operational workflows providing easy access to satellite imagery exploitation through simple steps to support analysts during each intelligence assessment phase.







# Elettronica SpA

## Company profile

Elettronica (ELT), since 1951 has been one of the European leaders in the world of electronic defense (EW). The company provides EW and SIGINT solutions and systems, interception capacity during law enforcement operations, surveillance of risk areas, platform self-protection in hostile scenarios, monitoring of the electromagnetic scenario, Cyber ElectroMagnetic Activity and develops its peculiar EW capabilities in five domains: Earth, Air, Sea, Cyber and Space.

## Products | Services | Applications | Technologies

Elettronica has extensive experience in controlling the entire electromagnetic spectrum, advanced radio frequency signal processing, designing antennas and microwave components and developing software applications for command and control centres.

Distinctive capabilities:

- Electronic Attack & Self Protection, for radar signal interception, processing and contrast using state-of-the-art technology (DRFM, digital receiver, very wide band solid state transceiver modules, AESA broadband antennas, high power transmitters).
- IR-based ECM System, for the protection of avionics platforms against threats MANPad with solid state laser sources. Intelligence, Surveillance and Reconnaissance, for the detection, classification, identification and contrast of a wide variety of threats in both the radar and communications domain.
- Cyber defence for the protection of wireless networks and nodes from cyber attacks through innovative systems based on cognitive techniques.

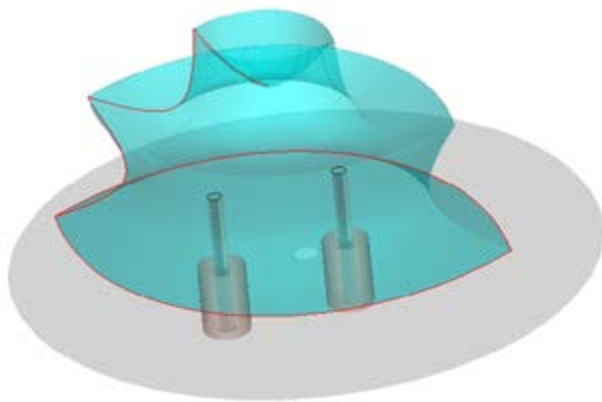


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# Engineering

## Company profile

Engineering is the leading national software and services company, with 10,500 employees and 50 branches in Italy and overseas (Germany, Spain Belgium, Republic of Serbia, United States, Brazil and Argentina) with a consolidated revenue portfolio at the end of 2017 of 1 Billion Euro.

The company carries out IT innovation combining the potential of a full, integrated offer of Business Integration, infrastructural Outsourcing and Cloud services (provided by 5 Data Centers) Consulting, customized proprietary solutions for vertical markets - from Industry Space sector to Healthcare, Utilities, Finance and Public Administration - and technologically cross-market, such as geo-referencing and Open Source Business Intelligence solutions.

Special attention must be given to the Defense , Space & Security Division, which historically has decades of experience and technological, methodological and managerial expertise specific to the Defence & Homeland Security sector.

With 420 researchers located in many R&D laboratories the Engineering Group plays a leading role in ICT research, coordinating and participating to several national and international projects thanks to established open partnerships with other EU companies, universities and research centers.

The research areas that the company focuses in, in line with the European Research Agenda of Horizon 2020 are linked to the notion of smart cities conceived as ecosystems of digital services. Specifically, the research and innovation activities concentrate on the following research topics: Smart Health, Smart Government, Smart Enterprise, Smart Tourism, Smart Energy, Secure societies, Digital Transformation.

## Products | Services | Applications | Technologies

DSI (Data Consolidation and Bulk Processing Service Initiative)

Engineering offers consolidated Infrastructure services providing data reception, processing, distribution, data quality control and archiving services to the mission operated by ESA and member states. A relevant reference is the ESA Project called DSI (Data Consolidation and Bulk Processing Service Initiative) for management of various activities concerning Earth Observation(EO) data and to provide a solution for ESA EO Data Users, focused in particular on activities systematically performed upon acquisition of data concerning:

ESA missions (ERS, ENVISAT, Earth Explorers);

ESA Third Party Missions (e.g., Landsat, etc.)

Past, present and future missions (with future ESA missions limited to Earth Explorers).

During the project the following operations on missions have been carried out:

### CORE SERVICES

Data Collection and Data Consolidation

Processing System Integration

Reprocessing / Bulk processing / Format Conversion

### SUPPORT SERVICE

Data Repatriation / delivery

Data Information and Configuration Management

Project and Service Process management and other support services.

### SIMONA

With "SIMONA" Engineering is providing an information platform for the completion and improvement of existing services in Maritime Situation Awareness, improving the skills that the Italian Coast Guard and the Italian Navy currently have, as well as providing added value services based on satellite assets in support of private subjects, such as merchant naval transport companies and insurance brokerage, insurance and assistance companies. The main functions of the SIMONA platform can be summarized in:



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Contributing to the generation of an enriched Common Operating Picture (eCOP) by integrating data coming from various sources of information (EO images, data on weather and oceanographic conditions, Local Pictures supplied by collaborative users) in adherence with the main reference standards (GRIB, VMS)

Supporting maritime surveillance, S&R and safe navigation operations, by providing services that integrate the satellite assets, and such as to guarantee safety, integrity, precision and reliability characteristics.

During the SIMONA project a bidirectional narrowband satellite module has been developed, in order to take advantage of SIMONA services also with absence of a common traditional communication channel (WIFI, UMTS, etc.) This narrowband lighter module (named SatcomBox) is tailored for a more wide market of private leisure boat users and linked through SIMONA services to Insurance contracts. The SatcomBox includes a GPS function and, during normal navigation conditions, will support only offshore (SATCOM) navigation telecommunications from/to crafts. The use of the SatcomBox by the leisure boat users is also well seen by Italian Coast Guard because enabling continuity of communication from coastline to open sea, increasing the safety of the leisure navigation.

#### CLOUD

Engineering services are available through different technology stacks:

CloudEng offering based on the "Microsoft Azure Pack" platform, these services allow you to build both Private Cloud and Hybrid Cloud thanks to the perfect combination between the IT services offered by the Engineering Data Centers and its Cloud platform based over Microsoft WAP technology.

CLOE (Cloud Computing by Engineering) is the Engineering platform for the provision of Cloud services based on the Vmware technology platform (Vmware Vcloud director) according to various innovative modes: IaaS: virtual servers on demand with a wide range of standard catalogue and customized operating systems; PaaS: service development platforms with main stacks; SaaS, document, contact management and service collaboration applications, CRM and asset management applications, electronic mail systems.

The management policy of the Information security for Cloud services is defined in harmony and within the compliance with

legal regulations Italian and European (<https://vetrina.cloudeng.it>)

#### BIG DATA

Cloud Computing facilitates the commercial use of Big Data, especially for Space. The main benefits cloud computing provides are the systematic evaluation of big data, understanding the collected information and how it relates to each other as well as the near real-time analysis of the collected data. Moreover, the recent increase of free and open access initiatives to big data from space, such as the European Copernicus programme, extends the spectrum of users.

The Big Data Competency Center, which includes data analysts, data architects, data developers, data scientists, research scientists, is the specialized organizational unit that supports the Engineering Group's offer and coordinates its initiatives involving big data skills and technologies. The competencies include goal definition and solution design; big data architecture design and realization; specialized skills on technologies and development methods; data collection, open data management, advanced data analysis and visualization; presentation and communication skills, and business development support.

#### DIGITAL TRANSFORMATION

Digital Transformation affects all organizations and is based on the introduction of innovative technology transversely to working areas. Technology is at the service of business renewal and must be enhanced through analysis processes and structural planning.

Engineering Ingegneria Informatica combines a great knowledge of the ICT world with a consultant approach that accompanies the Customer in identifying needs and making changes useful for systemic evolution. We are inspired by the methodologies of System and Design Thinking to support our Customers and identify the processes and systems object of the transformation, employing all the most suitable professionals for each single area.

[https://www.osservatori.net/it\\_it/osservatori/design-thinking-for-business](https://www.osservatori.net/it_it/osservatori/design-thinking-for-business)

<http://www.ingenium-magazine.it/inail-da-e-government-a-digital-government-intervista-a-stefano-tomasini/>



# Exprivia

## Company profile

Exprivia is an international group currently employing about 1800 professionals capable of enabling the digital transformation processes through solutions that involve the entire value chain. <http://www.exprivia.it/en/>

With its know-how and experience gained in more than 30 years of continuous operation on the market, Exprivia has a team of experts specialized in various technologies and domain areas. The Exprivia sites can be found at the different locations in Italy and abroad (Europe, America and Asia).

Listed on the MTA STAR segment of the Borsa Italiana Stock Exchange (XPR) since 2000, Exprivia works alongside its customers in the Banking&Finance, Telco&Media, Energy&Utilities, Aerospace&Defence, Manufacturing&Distribution, Healthcare and Public Sector.

Exprivia has established a quality system compliant to UNI EN ISO 9001, UNI EN ISO 13485, UNI CEI ISO/IEC 20000-1 and UNI CEI ISO/IEC 27001 standards.

In December 2018, Advanced Computer Systems ACS S.r.l. became one of the Exprivia Account and Digital Factory units. Delivering custom tailored solutions to aerospace and defence industry the unit will continue legacy of the ACS company as the Payload Data Ground Segment specialist and innovative software and system designer. Thus, a profound knowledge of and capabilities in handling different satellite data, metadata, sensors, products, facilities interactions, associated services delivery is concentrated today in the Exprivia Defense & Aerospace unit.

The unit offers integrated systems, software, services and consultancy in:

Earth Observation Satellites Payload Data Ground Segments

Environment monitoring Applications development

Advanced & Immersive data visualization

We develop ground segments, subsystems and components for satellite data acquisition, dissemination, processing. Almost 40-year long record testifies to profound knowledge of and capabilities in handling different satellite data, metadata, sensors, products, facilities interactions, associated services delivery. Our cutting end technology solutions are serving customers in thirty countries.

## Products | Services | Applications | Technologies

### PRODUCTS:

Payload Data Ground Segments

Exprivia Aerospace & Defence Digital Factory develop PDGS SW infrastructures embedding facilities and components to enable mission specific data ingestion and processing. The modular and scalable Ground Station solution features multimission acquisition, real time ingestion, data processing and dissemination. As a technological partner to Primes within large industrial European consortiums ACS has participated to Core PDGS implementation for Sentinel 1, 2, and 3. Exprivia SW is running in all of ESA Copernicus PDGS operating centers and is currently maintained by Exprivia.

Exprivia Main EO contracts in the last years

The SW products developed in the recent years testify to our knowledge on relevant SW technologies, coding languages and specific functionalities of the ground segment. We design and develop Facilities and Tools to support different functions performed at ground segment:

Data Processing & Calibration

Exprivia have designed, developed, tested and certified different Processors (SAR, optical, meteorological, altimetric, gravimetric). These Processors consent basic and value-added processing: Level 0, Level 1A, Level 1B and Level 2 products generation.



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For products' quality control Exprivia have realized Quality Control and Calibration/Validation Facilities.

#### A complete range of services

Exprivia is structured to properly manage challenging project from the definition of the requirement, through design, implementation/procurement, integration/validation and up to support to operations and maintenance. We provide long-term maintenance services for our systems. Majority of these space contracted Services are OME (Operation, Maintenance, Evolutions) and/or Framework contracts with the major Space Agencies (ESA, ASI, EMSA, EUMETSAT) under which we provide maintenance, engineering and enhancements support (including development of Test scenarios and TDS for new developments), systems performance monitoring and consulting.

In addition to maintenance services for the in-house developed SW, we are specialized to provide maintenance services also for third parties developed SW (including procurement, corrective maintenance, evolutions, integration, testing and deployment into operational environments).

APPLICATIONS: cover a wide range of both research and commercial/operational activities. From VR& augmented reality for 3D models and scientific data visualization to EMSA IMDatE surveillance system for maritime safety and security business. IMDatE is a complex 24/7 monitoring service addressing different Maritime Safety and Security scenarios. (Virtually) unlimited number of users worldwide can access the Web Based Display system. The Web User Interface displays integrated maritime information on a single console. Data is updated in real time. Powerful search and query

mechanisms allow retrieving past information for the purpose of their analysis. All data objects are displayed using the map, time and tabular display paradigms. The fully scalable system currently manages +80k vessels in real time, with a data flow of thousands positions per second and a historical database of 1 billion records. The system integrates all existing maritime data types and sources (AIS, satellite, costal radars, port information, reports), displaying the resulting information in an interactive 3D Web interface. A configurable surveillance engine allows automatic detection of suspicious behaviours. Notifications are sent to interested users. A strong security module allows protecting / tailoring data access. IMDatE v2.0 reaches 1700 messages per second objective. This amount of messages is the input of the ingestion system that stores vessel positions into the Oracle Exadata database. These positions are returned by a set of REST services exposed by the application backend.

TECHNOLOGY: Exprivia is not only implementing, but also developing innovative technology. From large-scale industrial systems to Internet of Things, Exprivia has been driving forward innovation in Space, Cloud Computing and Healthcare.





# Intecs Solutions S.p.A.

## Company profile

Intecs core business is in the area software controlling advanced defence systems. Intecs extended its market areas to cover also the Space sector in the 80's. This led to the acquisition of expertise in key technological areas, ranging from earth observation infrastructures and applications to satellite navigation and on-board/embedded systems. The close working relationship with the European and national space agencies, exposing Intecs to cutting-edge technologies and standards, has become the vehicle for technological innovation in Intecs itself. An important expansion into neighbouring sectors occurred in the 1990's, when Intecs was able to leverage upon own experience with standards-based, mission-critical Space systems, to enter into the railway sector, developing safety-critical railway systems and certifying them against stringent safety standards.

In the 2000's, Intecs was once again able to leverage upon its experience to make another strategic expansion into the Aerospace, Telecom, and Automotive sectors, expanding once again its portfolio of systems development and expert services of process and safety consulting.

As of today, Intecs has headquarters in Rome and other Italy offices in Pisa, Naples, Milan, Turin, Genoa.

Intecs Solutions currently delivers high-tech systems across a wide range of markets, spanning from Railway to Telecom, Automotive, traffic Control, Defence and Aerospace, and offers expert services of processes and safety consulting. It provides big national and international organizations with consultancy services on high-tech systems, as well as prototypes, products, and "turn-key" software systems developments.

Large and prestigious industries, such as ESA, Ansaldo STS, RFI, Leonardo Company, ASI, and Thales Alenia Space Italia, figure among Intecs' main customers. Intecs' consulting activities cover leading edge topics, ranging from the CENELEC norms for Railways to ESA SW engineering standards, namely the European Cooperation for Space Standardization (ECSS), ISO 26262 Automotive functional safety, CMMI®, SPICE® and related Software Life Cycle processes.

Large emphasis is also placed on the study and experimentation of innovative technologies, aiming at maintaining its expertise updated with the state-of-the-art. To this end, Intecs Solutions dedicates over 15% of its annual budget to R&D activities. Intecs Solutions expertise in the Aerospace market covers the following areas:

- Earth Observation Infrastructures and Applications;
- Geographic Information Systems;
- Satellite Navigation Applications;
- Software Engineering and Software Quality;
- Scientific Visualisation Architectures;
- On-Board Software Systems;
- Embedded and Control Systems;
- Communications Software;
- Operating Systems and Software Architectures;
- Check-out Systems.

## Products | Services | Applications | Technologies

The experiences of Intecs Solutions in advanced technological developments led to the identification and implementation of some products used in new applications and advanced systems productions.

The following products are carriers of experience and investment consolidated over the years in both research and industrial fields.



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**SOFT-REC:** The SOFT-REC family includes two main product lines: a real-time software receiver and a software digital signal analysis tool. The first, called Softrec, supports GPS and EGNOS constellations. The second, called SoftrecG3, supports all GNSS Navigation signals.

**gLab:** is the result of INTECS's experience in GNSS signal analysis, particularly in GPS, Galileo and EGNOS performance and signal quality monitoring: its flexibility allows to analyze the Galileo signals currently under definition.

**SIRIO-OD:** SIRIO is an automatic system for the detection of targets along the railway lines. It consists of a remote-control system and many peripheral boards that are so-called SIRIO nodes.

**DEJAMM-R:** The DEJAMM-R sentinels are autonomous devices that continuously monitor all the downlink and uplink GSM-R bands, which are used for ETCS Level 2 signalling in high-speed rail systems.

**DLT Analyzer** is a software tool designed to collect and analyze log and trace information from a vehicle ECU. The tool works in the Eclipse environment

**SIMIS** is a Sustainable and Intelligent Mobility Integrated System Ethernet Repeater (TL): TL-ER TechnoLabs Ethernet Repeater is a new system that can be used on existing Ethernet cabling to transparently drive Ethernet communications beyond the maximum permissible IEEE 802.3 Ethernet distance. Traditional 10/100/1000 Base-T Ethernet Networks utilize CAT5e copper cabling which has a distance limitations of 100 meters between geographically separated LANs

**DDF (TL):** The DDF is a passive equipment used to minimize high density of the cables for distribution and communication from/to digital terminal equipment. All the transmission rate is based on 2Mbit/s. **EFAS (TL)** is an innovative transport system designed for the next generation of access networks commonly known as Metro Ethernet.

**HRT-UML:** The Hard Real-Time Unified Modelling Language (HRT-UML) method, and the supporting toolset, aims at providing a comprehensive solution to the modelling of hard real-time and dependable systems and their early verification, according to rigorous techniques based on formal theories, such as schedulability analysis and simulation, formal verification and quantitative evaluation of dependability attributes.

**Microsek** is an INTECS Hard Real-Time and Networked Operating System compliant to the Osek/Vdx standard and suitable for the development of Embedded Real-Time Applications.

**D.I.A.N.A.:** Intecs has developed the test bench, to automate the validation process of network layer of the control units, Digital Instrument for Automatic Network Analysis.

**Sirio-LX** is an automatic system for preventing trains from colliding with obstacles on the track at level crossings.

**EMUSER** is an innovative solution providing a satellite Broad Band link certified to be used in the Railway domain. The usage of satellite datalink introduces a change of perspective for addressing safety issues in the railway domain providing a fast and cost effective solution.

**DEDALO** is a Passive Anti Drone System for detection, classification and localization of commercial drones (micro

and nano UAV) in order to protect airports, prisons, critical infrastructures and sensitive sites (in urban and suburban context), without interfering with public infrastructures.

**ADRANO** is a passive Acoustic Detection system which is able to recognize and localize the sound of sniper or drones, providing real time alert of sniper attack or unauthorized drone, enabling a rapid and coordinated response.



# Leonardo S.p.A.

## Company profile

Leonardo is a global high-tech Aerospace, Defence and Security company. Our consolidated industrial capabilities, together with our outstanding human capital and constant attention to innovation, have led us to become one of the top ten players in the world in Aerospace, Defence and Security, with revenues of € 12.2 billion, 85% of which deriving from international markets. Leonardo - headquartered in Italy - has a strong industrial presence in four domestic markets: Italy, the United Kingdom, the United States and Poland.

We are a partner of choice for governments, institutions and Armed Forces, as well as for private customers and entities. We deliver products and integrated solutions based on cutting-edge technologies with dual-use applications, to strengthen global security; protect people, the territories, infrastructures and information networks; contribute to the sustainable management of the environment, urban spaces and climate.

Air, land, sea, space and cyberspace: wherever defence and security are needed, our customers find in Leonardo effective solutions for their requirements in each of these areas through a complete and integrated offer in strategic sectors such as helicopters, aeronautics, unmanned systems, defence and security electronics, defence systems, and satellite systems and services.

Leonardo's activities in Space date back to the mid-60s when Officine Galileo and FIAR participated to the first European programs promoted by the European Agencies ELDO (European Launcher Development Organisation) and ESRO (European Space Research Organisation). Since then, Leonardo has designed and produced qualified instrumentation for space activities implementing optical systems, star trackers, radio frequency devices, photovoltaic assembly, distribution and power control systems and robotic devices. At present, the products are used on-board the most important European space missions such as Rosetta, Exomars, Galileo, Copernicus, Cosmo-Skymed, METOP, MeteoSat Third Generation, Earth Explorer, within other ESA and NASA missions as well as for other international customers.

## Products | Services | Applications | Technologies

### EARTH OBSERVATION OPTICAL PAYLOADS

- PRISMA hyperspectral payload (ASI)
- Thermal-InfraRed payload for PLATiNO (ASI)
- Sea Land and Surface Temperature Radiometer (SLSTR): 2 units Flying on Copernicus Sentinel 3 A and B
- Lightning Imager (LI) for MTG
- Multi-viewing Multi-channel Multi-polarization Imager (3MI) for MetOp-SG
- FLEX on Earth Explorer 7

### PLANETARY EXPLORATION OPTICAL PAYLOADS

- Visible InfraRed Thermal Imaging Spectrometer (VIRTIS) flown on Venus Express, Rosetta and DAWN
- Spectrometer and Imager SIMBIO-SYS in flight on BepiColombo.
- Jovian Infrared Auroral Mapper (JIRAM) - Camera and Spectrometer for the Juno mission to Jupiter
- MAJIS and JANUS optical instruments for JUICE mission to Jupiter

### ATTITUDE SENSORS

Autonomous Star Trackers (A-STR, AA-STR): more than 100 ASTR and AA-STR produced

- SPACESTAR for Iridium NEXT constellation (240 units in flight).



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space

- InfraRed Earth Sensor (IRES): over 500 Earth Sensors delivered
- IRES-N2 for Galileo GNSS, SICRAL ..., IRES-C for LEO satellites
- Smart Sun Sensor (S3): for LEO, MEO, GEO or Interplanetary missions (GOCE, LISA Pathfinder, SICRAL, Earthcare ...)

#### POWER CONDITIONING AND DISTRIBUTION

- Electrical Power Systems & Equipment composed of standard, flight proven functional blocks, ranging from a few watt up to 6 kW
- Cosmo-Skymed, Copernicus, GAIA, ATV, Exomars, ...
- Specific Application High Voltage Power Supply, EPC for TWTAs and Converters for Electric Propulsion

#### ATOMIC CLOCKS

- Passive Hydrogen MASER (PHM). It is the master clock developed for Galileo Navigation Satellite System (more than 50 units delivered). The PHM is the most stable clock: frequency drift less than 10<sup>-14</sup>.
- Rb POP atomic clock: under development in ESA program GSTP, more compact and lighter and an higher stability than the PHM.
- PhotoVoltaic Assemblies for Scientific missions (Rosetta Orbiter and Lander, GAIA, LISA Pathfinder, Exomars TGO, Exomars 2020 carrier and Lander), LEO missions (COSMO SkyMed, ATVs, Pleiades), MEO/GEO missions (GIOVE A, MTG)
- Small satellite applications (AGILE, PRISMA, PROBA, DUBAISAT)
- More than 200,000 solar cells integrated on PVA and operating on orbit.

#### GROUND SEGMENT

- Complete solution, from Master/Anchor Station to set of Terminals both for Military and Civil Applications:
- Commercial and Military GEO Earth Terminals for telecom and LEO Earth Station for Earth Observation systems. Example:

Ground terminals and anchoring stations for SICRAL and Athena/FIDUS

- Satellite network Management Solution providing a complete FCAPS model services

#### GALILEO PRS

- Galileo PRS receivers: P3RS-2, the first operational "unclassified when keyed"; PR2C (Prototipo Ricevitore Dual-Constellation), combining navigation data acquired from Galileo and GPS constellations
- Galileo Security Monitoring Center (GSMC), part of the Galileo Ground Segment, for managing Galileo PRS users and users' access to the PRS service

#### ON ORBIT PROPULSION

- Cold Gas Micropropulsion subsystem: ON/OFF Propulsion (SmallGEO) Micro thruster (1-500mN)
- Linear control Micro-thruster (LISA Pathfinder, Microscope, Euclid) up to 2mN, Low thrust noise
- In-flight heritage on GAIA, LISA Pathfinder and Microscope.
- Micropropulsion Components: Pressure Regulation, Propellant Flow Regulation/Gauging
- Hollow Cathodes and Thermionic Neutralizers

#### ROBOTICS AND DRILLING

- DEXARM (Dextrous Robot System): 7 degrees-of-freedom manipulator for exploration and servicing
- DELIAN: lightweight robotic arm
- Rosetta SD2: drilling, sampling and sample distribution system (operated in 2014 on the comet CG 67P)
- ExoMars Drill system (up to 2 meters depth) with embedded spectrometer and control system to drive the Drill and the Sample Preparation and Distribution System mechanisms to be flown in 2020 on Mars
- Lunar driller for icy soil sampling to be flown in 2021.
- Bio-containment system for Mars Sample Return.

#### RF EQUIPMENT

- Solid State Power Amplifiers (SSPA)
- UHF SSPA cover the bands from 200 to 1000MHz and deliver up to 200 W of output RF power
- ATV, SkyNet V, Sicral missions
- BIOMASS PAS (Power Amplifier System)
- Vacuum Tube Power Amplifiers (pulsed and continuous TWT and Klystron)
- Vacuum Tube Amplifiers are integrated with high voltage Electronic Power Conditioning units and cover the bands from 1 to 40 GHz (EarthCare, Cloud Profiling Radar)
- Ka and EHF satellite transceivers providing high integrated solution for Vsat Terminals operating in enhanced High Frequencies 30..50GHz

#### LASER transmitters

- High Power Laser TxA for atmospheric LIDAR
- ALADIN on board ADM-Aeolus since 2018 and to be flown on Earth-CARE, the two ESA "Earth Explorer" missions to the study Earth atmosphere.
- Laser High Power Transmitter (TxA), with an optical output power of 120mJ @ 355 nm with very high frequency stability.
- ALADIN is the most powerful laser source ever built in the UV band.

#### SPACE COATINGS

- Center of Excellence for Thin Film Coatings (optical and functional) for space, aeronautics, defense and industrial applications.
- Coating systems: n.6 EB-PVD, n. 1 new Plasma and Ion Assisted Deposition (PIAD), n.5 Sputtering, n.3 PE-CVD.
- Testing: Spectrophotometers and Climatic chambers. Clean room area class 1000 (class 100 in loading zones). 20k coated surfaces per year, over 70 qualified optical coatings.

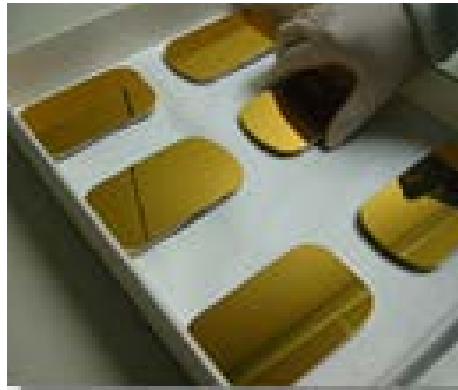
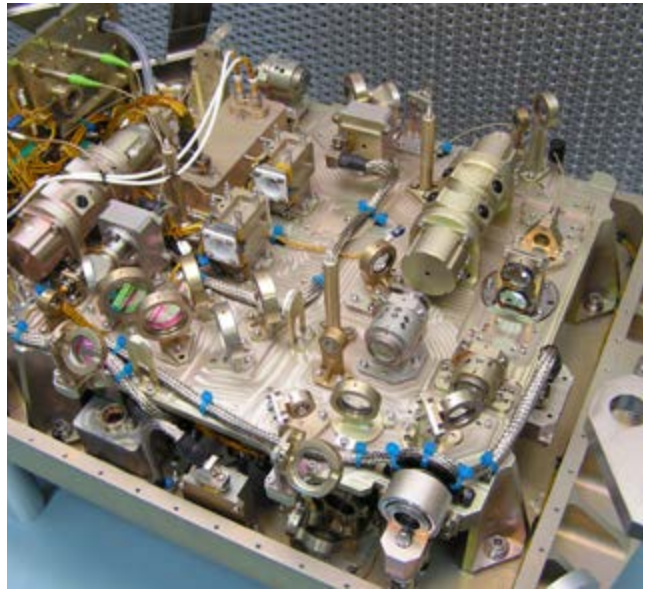
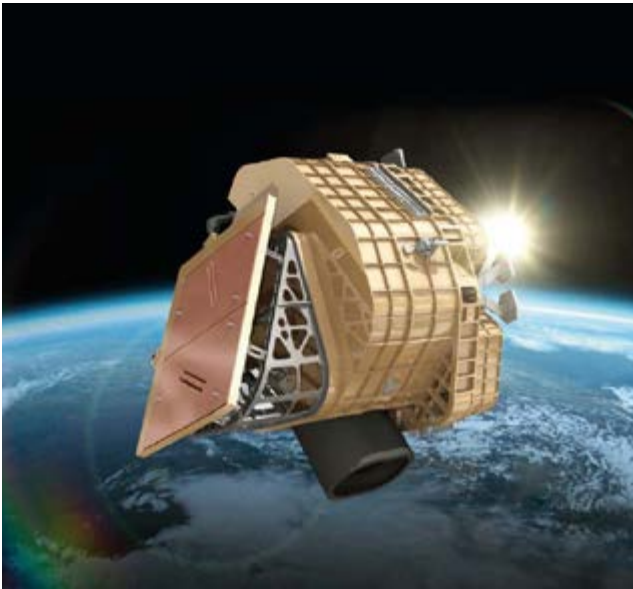
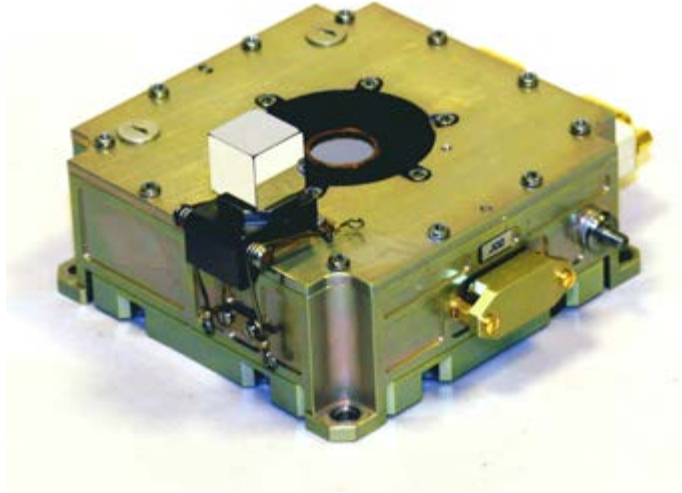
#### GaAs/GaN foundry

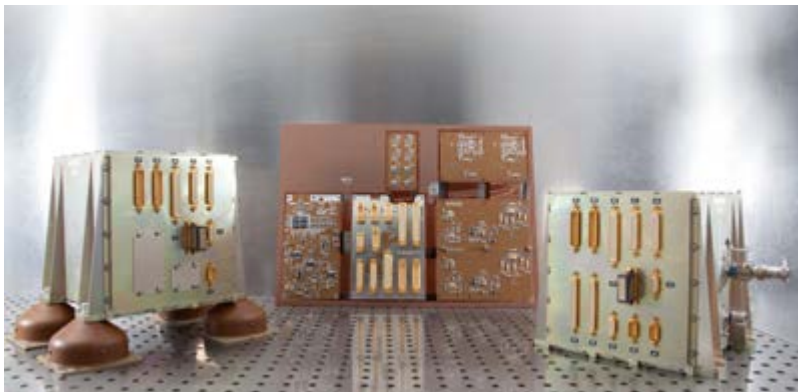
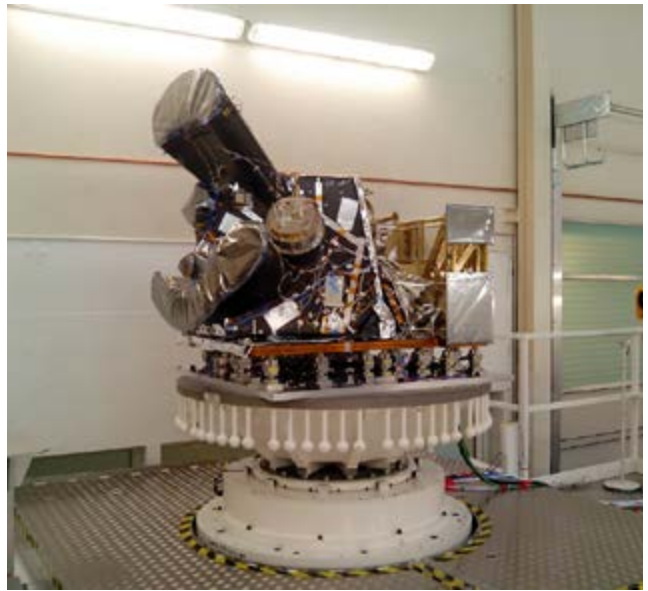
- Development and Production of GaAs/ GaN devices (LNA, HPA, ...) and T/R modules from L band to X band.
- Microelectronics Technologies for RF Sub-systems
- 900 m2 ISO 5 clean room: from wafer to packaged device processing.

#### SPACE SOFTWARE

- On-board s/w (OBDH for Cosmo-Skymed, SICRAL, PICS, Sentinel 1 and PRIMA; SAR payload s/w), Mission planning for remote sensing (CSK) and telecom (SICRAL, Athena-FIDUS).
- Network management/monitoring and control (SICRAL, CSK)







# N.P.C. New Production Concept S.r.l.

## Company profile

N.P.C. New Production Concept S.r.l. is a dynamic Italian company operating in multiple business sector ranging from assembly and delivery of complex mechatronic machines and groups in the field of automation towards the design and realization of space system and astronomical professional instrumentation. Nowadays NPC can count on 35 employees with more then 6000m2 of assembly facility and warehouse. The space business unit is represented by Spacemind division created in 2013. Spacemind's mission is to become a solution provider for nano satellite and space related applications offering complete package solutions and permitting to bring a scientific research to a commercial industrialized product and service.

The strenght of the company at the basis of the business idea is to offer qualified space engineering know-how combined with more then 15 years experience in assembling complex automatic machines. Nevertheless, thanks to it shareholder companies CURTI Spa and ECOR Spa, specialized in mechanical production with experience in complex manufacturing techniques in the field of aerospace, food, beverage and pharmaceutical, NPC is able to offer end-to-end solutions from concept design towards manufacturing, prototyping, integration, test and delivery. It's flexible structure is based on a transparent open book approach towards the customer, supported by WCM methodologies and lean production strategy, allowing thus to provide cost competitive services ranging from different level of involvement in the development and implementation of product customer. The production process has always been characterized since the beginning by a strong focus on quality management system that today led to ISO 9001 and ISO 14100 certificate.

The main output of the proposed business model is the capability to provide end-to-end solutions starting from engineering services to complete product design and realization. The concretization of the proposed model is represented by the products that NPC Spacemind developed in the field of ground equipment for astronomy and SST/SSA activity, and nanosatellites space sector. Thanks to a consolidated network of suppliers and relations with Italian academic key players, nowadays NPC is able to provide full nanosatellite mission development for industry, commercial and scientific activities.

## Products | Services | Applications | Technologies

NPC Spacemind operates in three main areas for which it can provide products and services.

- Space products for nano satellite platforms; Space mission design and development; High performance ground based tracking solutions;
- a. Considering space products the company has developed a range of subsystems for CubeSats exploiting the experience in the research and development and transversal competences and its hands-on experience on several satellite missions. NPC has developed ARTICA a family of deorbiting devices compatible with CubeSat applications as an effective action to the issue of space debris. The goal of the system is to allow the reentry of the satellite at the end of its operative life by deploying a thin membrane (a square sail). By interacting with atmosphere the system is able to increase the drag and accelerate the reentry of the satellite. The reentry is ensured also in case of satellite failure, since the system can work in a fully autonomous way, being equipped with proper control board and power unit. The system has been integrated on a nanosatellite to perform IOD and launched on 2017 on board a 3U CubeSat.

NPC experience in structural design has been exploited for the development a family of lightweight structures for nanosatellites characterized by enhanced accessibility and ease of integration while ensuring stiffness and capability to withstand severe loading condition. A set of structures ranging from 1U to 12 U form factor have been produced. The design of the structures can be easily customized to satisfy specific



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user needs. NPC structures have been ground qualified for launch (mechanical and thermal testing have been carried out) and passed ESA review for launch acceptance. NPC Spacemind division has also R&D experience on other fields including: attitude control systems based on magnetorquers and wheels, deployable structures and EPS.

b. NPC Spacemind is provider of end to end nano and microsatellite based missions and solutions for different applications. Thanks to its consolidated network of partners and qualified suppliers NPC is able to cover all aspects of a space mission from preliminary feasibility studies and design to in orbit operations. Among its competences NPC Spacemind can perform the dimensioning and selection of sensors for remote observation. NPC can provide also services for communication and tracking of the satellite. The list of services carried in house by NPC include:

- Feasibility study; Mission profile trade off; Definition of mission requirements; Cost analysis; System requirement definition; Assessment of budgets; Design and production of subsystems; Satellite integration; Management of test campaign; Documentation management; Launch integration and in-orbit operations; Ground system design and production;

NPC has performed the study and design of several nanosatellite missions based on user needs:

- Advanced communication missions; EO missions for maritime traffic monitoring; EO missions for disaster recovery; Agriculture monitoring missions;

The company has already taken part to 3 nanosatellite mission as payload responsible, designer and integrator and supplier of structural subsystem.

c. NPC Spacemind has developed a family of high performance ground based systems with features suitable for SSA, SST and aerial tracking applications. The systems are compatible with a wide range of optical instruments, ranging from 300 mm to 1000 mm in diameter.

Different aspects have been optimized during the project in order to achieve the desired level of performance in terms of accuracy, precision, slew rate acceleration.

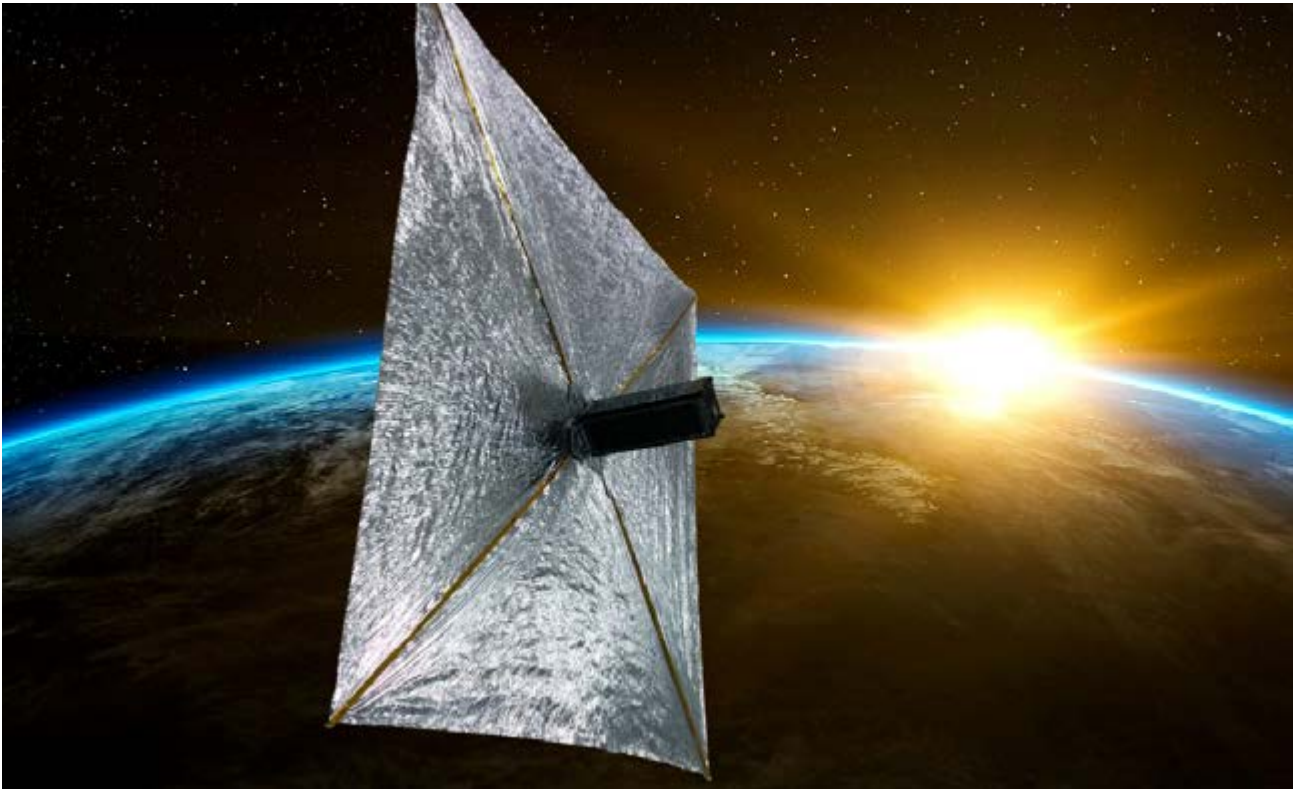
The systems exploit direct drive motors coupled with high resolution absolute optical encoders in order to achieve desired accuracy for pointing and tracking.

An optimization has been carried out on the mechanical design in order to improve the static and dynamic behavior of the mount in relevant operative conditions, aiming at increasing stiffness and ensuring an overall lightweight structure. The family of telescope mounts include M1000, M700 and M500 respectively for one meter, 700 mm and 500 mm class telescopes: all the systems share top level of performance.

Moral has been designed in order to be easily operated by commercial software and user developed software exploiting ASCOM interface and TCP/IP open protocol. It has been however developed a user interface that offers the possibility to exploit specific built-in algorithm for high performance operation. The scope of the system is to provide modular open platform for professional observatories allowing the user to explore the level of customization of the mount operating at different levels with its proper tool and ease the integration of the system in an existing network. Thanks to consolidated partnership with optics producers, NPC can provide a complete package with required telescope integrated which can be

designed and produced according to specific user needs. NPC can provide tailor made solutions for the complete package solution, covering all aspects of dimensioning and design to fit within customer technical requirements and performing trade-off between commercial solutions.







# OHB ITALIA SPA

## Company profile

OHB Italia S.p.A. is part of the European Space and Technology Group OHB (Orbitale Hochtechnologie Bremen), listed on the Frankfurt Stock Exchange. It is one of the three top system integrators in Europe with 2900 employees worldwide and total revenues exceeded EUR 1 billion in 2018. OHB Italia S.p.A. was founded in 1981, nowadays it is one of the two major satellite system integrators in Italy with more than 200M€ backlog and 96M€ revenues in 2019. It is a recognized national leader in the fields of Satellite&Missions, Earth Observation, Space Situational Awareness, Electronics&Mechanisms, Scientific&Planetary Instruments, with headquarters and Clean Room facilities in Milan and offices in Rome and Benevento. OHB Italia S.p.A. employs 210 people between staff and collaborators, with a high percentage of graduates (78,5%) whose degrees are mainly in Aerospace Engineering, Math and Physics, Electronic Engineering, Information Technology. OHB Italia S.p.A. is prime contractor for various ASI/ESA missions and the main customers are the Italian and European Space Agencies, Research Institutes, Universities and all the industrial key players in the space market, with special attention to export domain.

## Products | Services | Applications | Technologies

**Satellites & Missions** - PRISMA (PRecursore IperSpettrale della Missione Applicativa) satellite was realized for the Italian Space Agency (ASI) by a consortium led by OHB Italia S.p.A. as Prime Contractor with an innovative hyperspectral optical instrument developed by Leonardo. It was successfully launched atop a Vega launcher on 22nd March 2019 from Arianespace's Kourou Spaceport in French Guyana. In December 2019 ASI declared the successful conclusion of the Operational Qualification phase and thereby the formal completion of the Commissioning of the satellite. - NAOS (National Advanced Optical System) is a very-high-resolution optical satellite system developed by OHB Italia S.p.A. as the Prime Contractor for the Luxembourg Government. NAOS contract is an end-to-end agreement for the provision both of the satellite and of its ground segment. - ADVANCED MiSat CONSTELLATION is composed of 57 MiniSat with worldwide coverage and very small revisit time (every 30 min.). The constellation will monitor climate changes, marine/land surveillance as well as enable security and emergency services. - VENUS is an electrical Transfer/Module to be installed on VEGA payload interface to perform constellation precise orbit positioning, in orbit services and orbit transfers - LARES is a spherical passive satellite launched in 2012 on VEGA maiden flight. LARES 2 is to be launched in 2020 on VEGA-C maiden flight. Both systems were developed under ASI flag. **Earth Observation Instruments** - MWI is a conically scanning microwave radiometer providing measurement of precipitation, observations of clouds, snow, sea-ice coverage, water vapor, temperature and surface imagery. Met-Op mission, a program that was jointly established by ESA and the European Organisation for the Exploitation of Meteorological Satellites (Eumetsat), is forming the space segment of Eumetsat's Polar System (EPS). **Space Situational Awareness** - FLYEYE is an innovative large-field-of-view telescope developed by OHB Italia S.p.A for the Italian Space Agency ASI and the European Space Agency ESA for early discovery of asteroids passing in the vicinity of our planet as well as the detection of space debris circling in Earth orbits. **Electronics and Mechanisms** - OHB Italia realized several Launch Locking Device (LLD) for MetOp-SG, MWI Inst., ICI Inst. and also Separation Subsystem for LARES and LARES II. **Scientific and Planetary Instruments** - EUCLID: In October 2019 OHB Italia S.p.A. has completed the delivery to the Prime Contractor TAS-I in Turin, Italy, of all flight hardware of the Visible InStrument and the Near Infrared Spectrometer / Photometer to be flown as ASI's contribution to ESA's Euclid mission to map the geometry of the Universe and better understand the mysterious dark matter and dark energy. - ISRU (In Situ Resources Utilization) is a Demonstrator Payload for extraction of Oxygen from lunar regolith.

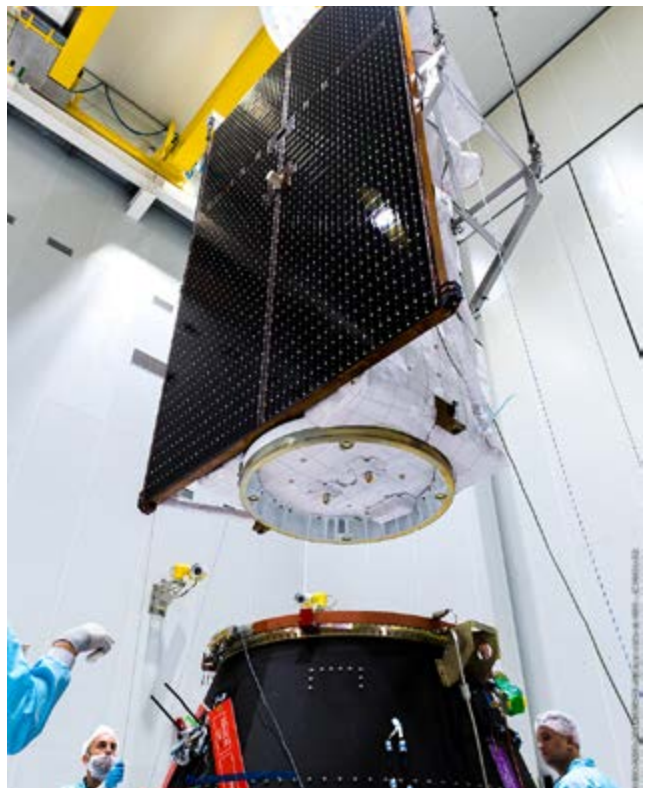


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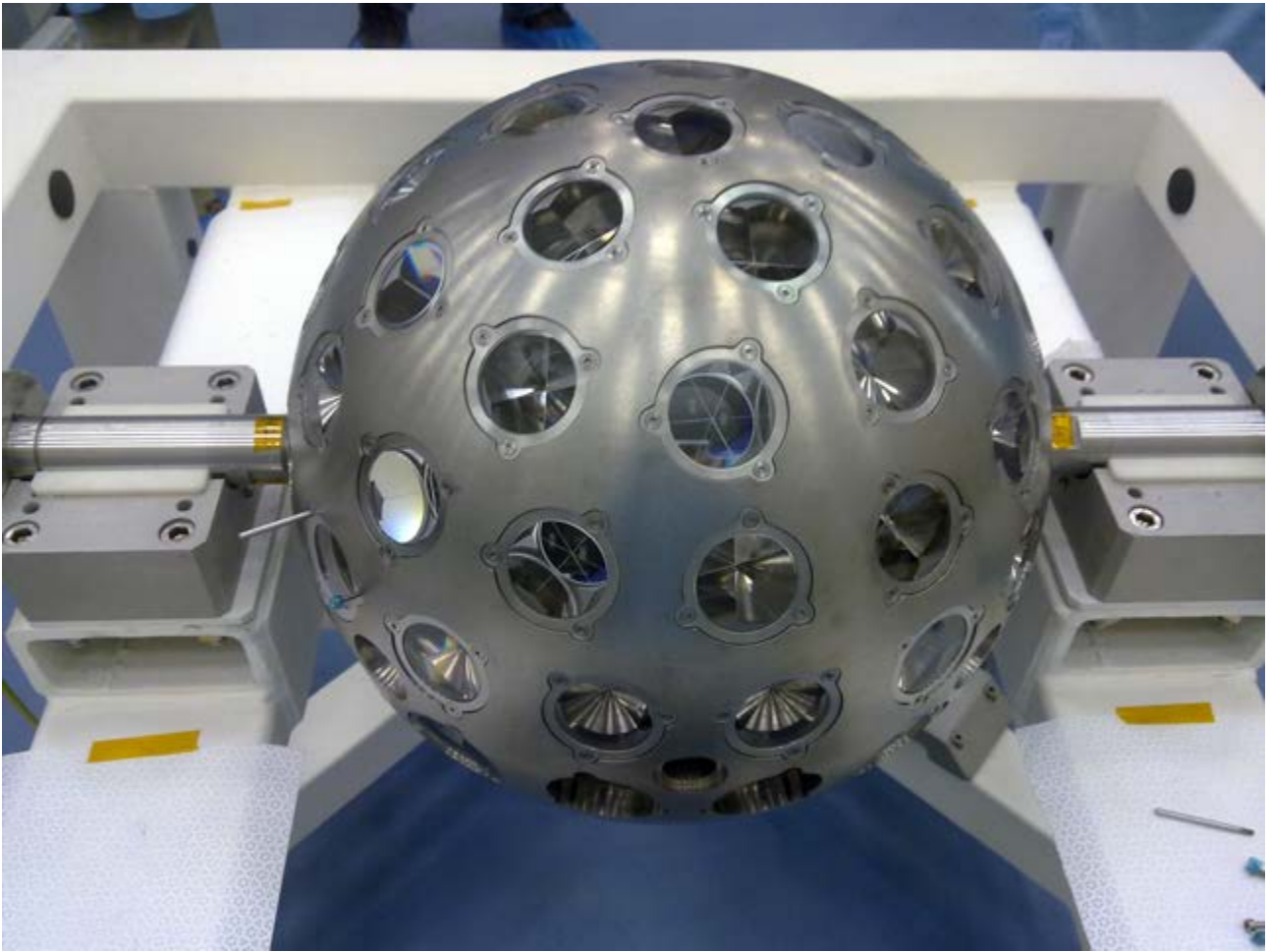












# RINA Consulting

## Company profile

RINA provides a wide range of high quality tailored solutions in the Energy, Marine, Certification, Transport & Infrastructure, Industry sectors. Multiple assets for a unique purpose: to build mutual trust with customers and to be recognized as the right choice in any step of a project lifecycle.

Our activities contribute to developing the qualitative level of the market by adopting measures to protect health and safety.

RINA believes in the value of visionary ideas and the importance of protecting life and environment. For this reason, innovation and sustainability run through our business and increase the reputation of both RINA and the customers who care for the planet, look ahead and want to lead the way in the market.

RINA's commitment to excellence is full and fuelled by our people's work and competences, essential to bring the best solutions on the stage where the market leaders play.

RINA vision on strategic growth is to progress with the changing world, turning challenges into opportunities and visionary ideas into excellent solutions.

RINA's ambition is to be identified as the smartest partner to work with: extraordinary promptness, the value of teamwork, courage in making choices, out-of-the-box thinking and innovative mindset are the values we believe in.

The very same approach is in our focus for the services offered to the Space Economy: no boundaries and limits to the services we want to offer providing top performing project support to ranges of stakeholders operating in space.

Services to the space assets are offered through two legal entities: RINA Consulting SPA and RINA Consulting CSM: the former focused on the consulting services and on-premises applications, the latter with deep specialization and competences on laboratories, materials testing, development of new materials for extreme applications

## Products | Services | Applications | Technologies

Products: whole range of materials, components and design of parts suited to be exposed to extreme space conditions and environments. Verification of the performances and modelling suites permitting the virtual verification of the performances under e.g. extreme temperatures, radiations, thermal or mechanical stresses (typical in space conditions)

Services:

- ☐ Security & cyber-security (security by design for systems and HW/SW, support to accreditation, support to certification, vulnerability assessment/penetration testing, governance, PRS, etc). [saverio.scopelliti@rina.org](mailto:saverio.scopelliti@rina.org)
- ☐ SW/FW Engineering services to design, develop, prototype and test applications and tools (e.g. command and controls, simulators/emulators, validation tools, interface management, TM/TC data analysis) [saverio.scopelliti@rina.org](mailto:saverio.scopelliti@rina.org)
- ☐ System Safety (Hazard Analysis, Qualitative and Quantitative Risk Assessments and Risk Acceptance, Safety Requirements and SIL Assessments, Software Assurance and V&V, Design Validation through Simulation, Safety Risk Analysis and Assessment for CE Marking). [enrico.maggiani@rina.org](mailto:enrico.maggiani@rina.org)
- ☐ Independent Safety Assessment (Independent Safety and Environmental Audit, Independent Technical Evaluation, Safety Advisor, Safety Management). [enrico.maggiani@rina.org](mailto:enrico.maggiani@rina.org)
- ☐ Electromagnetic Compatibility (EMC testing and specialist measurements, Support of E3 protection & mitigation measures, EMC management & control, EMC design consultancy, EMC risk analysis & mitigation, EM Modelling & simulation, EMC qualification & validation). [rocco.catalano@rina.org](mailto:rocco.catalano@rina.org)



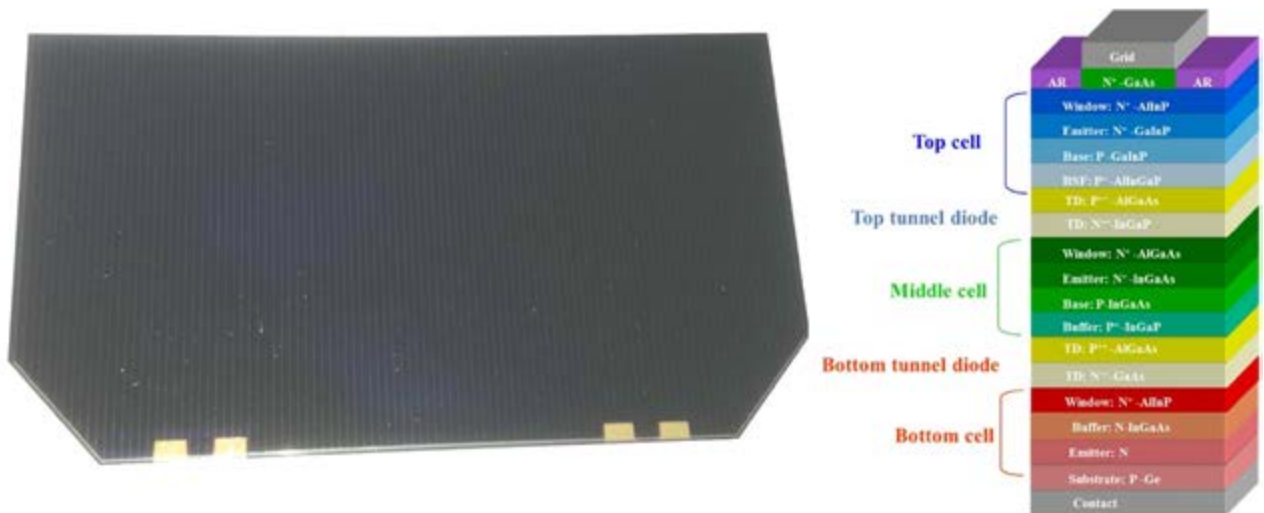
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- ❑ Technology Transfer: mapping, promotion, support to exploitation and effective implementation of space technologies in terrestrial domain (RINA is since 1992 the Broker for Italy of the Technology Transfer programme of ESA). This service is erogated to industrial owners of space technologies developed in the framework of ESA missions, and to a full range of technology stakeholders from the ground willing to radically improve the technologies they operate and to solve their needs through non-obvious instruments. andrea.ferrari@rina.org
- ❑ Advanced modelling services: modelling of different physical phenomena: thermal, mechanical, chemical and coupled events, Finite Elements and Computational Fluid dynamic models. Aero-elastic modelling, Reduced Order Methods (ROMs), Impact models and large deformations modelling. alessandro.bozzolo@rina.org
- ❑ System Engineering (telecommunication systems integration, data management, 5G data security and data access; satellite communication). Coupling of satellite communication capabilities, terrestrial 5G and NTN-5G IOT to the benefit of industrial processes. Enterprise Architecture definition; Capture, analysis and management of requirements; Stakeholder identification and management; Functional & physical integration management and support; Acceptance Testing and evaluation. alessandro.dimezza@rina.org
- ❑ Management Services (Definition of requirements and preparation of System documents, Management of industrial activities including reviews of design, follow up of in factory tests and on site installations and acceptance tests Cost and Schedule Management Risk Management Support to configuration, documentation, Product Assurance, safety, assets and security management). alessio.ponte@rina.org
- ❑ Integrated Logistics Support (RAM&T - modelling&analysisofavailability, reliability, maintainability, testability, Configuration Management, System Reliability and Maintainability, Maintenance planningand Level of Repair Analysis, Systems' Availability & Life Cycle Cost, Failure Report Analysisand Corrective Action System, Technical Publications development (S1000D), ILS Data Management, Maintenance Management & Monitoring System). luca.peruzzo@rina.org
- ❑ Training & Learning (Training consultancy, Training analysis including the application of SAT ADDIE, Learning and development research studies, Training design and development, Human factors integration, Multi media learning solutions, Delivery and evaluation of training, Competence management, Trainer development. luca.peruzzo@rina.org
- ❑ Supply Chain and Quality (Suppliers Technical Assessment, Supplier delivery management and coordination, Planning, tracking and production processes mapping for costs optimization, Supply monitoring and definition of key indicators (KPI), Product testing and verifications Product Services:Acceptance, First Article Inspection, Not Conformity Management Root Cause Analysis and Corrective ActionManagement, Production process optimization and industrialization, FOD ( Foreign Object Damage Debris ) procedure application management). valentina.decicco@rina.org
- ❑ Advanced Materials: integral materials engineering and consultancy; materials composition (metallic, ceramic, polymeric), processing, special testing design and execution. dante.pocci@rina.org
- ❑ Advanced Coatings: design and development of advanced coatings for specific space applications (e.g. thermal barriers, oxidation protection, optical coatings). Manufacturing of prototypes for testing in operative conditions. Modelling of coating composition evolution in service conditions. dante.pocci@rina.org
- ❑ Advanced characterization and testing: characterization of materials, components and systems according to standard testing procedures or taylored testing procedures developed for specific environments and operating conditions. Measure and analysis of material properties: microstructure (e.g. grain size, morphology), physical properties (e.g. dffusivity, thermal expansion), chemical properties (e.g. composition, phases), mechanical properties (e.g. UTS, elongation, young modulus). Standard test facilities include: mechanical testing, oxidation and corrosion testing, tribological testing, electric, electronic and magnetic testing. Capability to develop specific test rigs to test materials subject to multiple and combined sources of stress (e.g. wear/temperature, wear/corrosion). Full scale testing (e.g. satellite antenna frame multiaxial load testing). stefano.lionetti@rina.org
- ❑ Additive Manufacturing: design, development and manufacturing of standard and special alloys taylored for Additive manufacturing process. Production of gas atomized powders for AM, material characterization (powders and products) and process parameters optimization (atomization and AM consolidation). Development of light alloys for space application. dante.pocci@rina.org





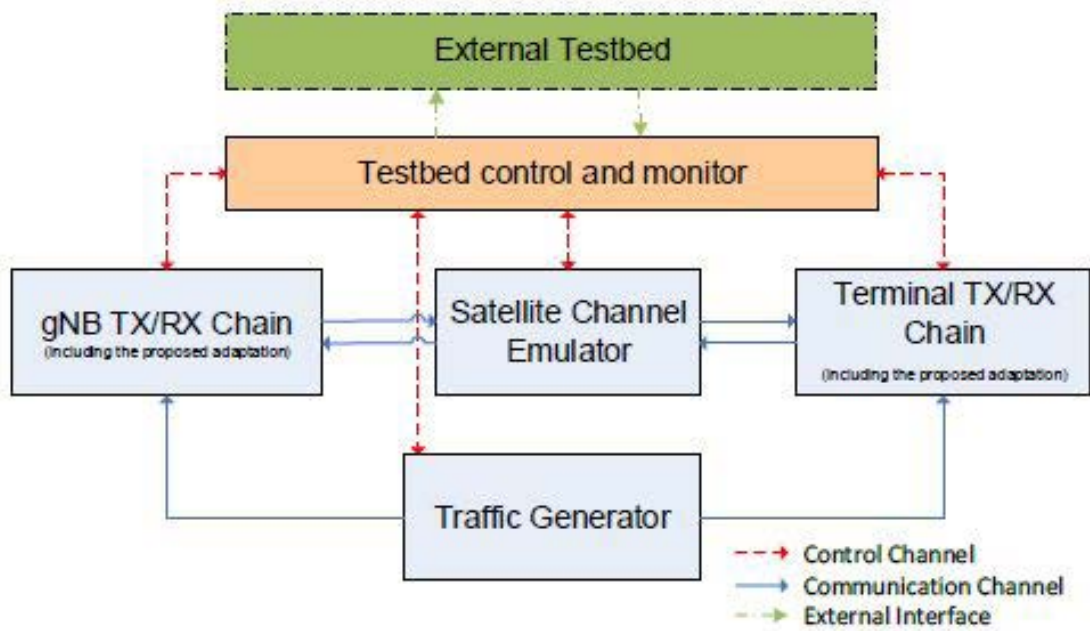


Figure 1: Verification Platform Diagram



# Sabelt S.p.A

## Company profile

Sabelt, founded in 1972, is a global leader in development and manufacturing of original equipment car seats, motorsport products and special applications including cargo retaining systems.

The quality of Sabelt products is the result of intensive Research and Development, which allows to achieve the highest levels of performance and safety.

Sabelt yearly invests 8% of its resources in this department and is the only company of its kind to have an internal dynamic test lab to perform ECE and FIA tests, verifying strength and effectiveness of its products. Thanks to its long-lasting experience in safety, it has been able to reduce the mass of the retaining systems for the space cargo module up to 40% of its' original weight (around 100 kg mass reduction achieved thanks to high tech materials and new geometry design). It extended also the product portfolio for space with new fireproof EPP bag support used in the space cargo operations to optimize load storage.

## Products | Services | Applications | Technologies

### **Cygnus Cargo Modul retaining systems**

Sabelt retain systems have been studied to improve the cygnus module maximum cargo load.

100kg mass reduction has been achieved thanks to high tech materials and new geometry design.

New components make the on-orbit operation easier and quicker for full astronauts' satisfaction.

Volume reduction thanks to flexible webbing straps instead of metal structure.

Latest geometry development gave more storage flexibility in dimension and shape for both bags and experiment.

### **Ultralight Aircraft Seat Belts**

A three points seat belts designed for aircraft cockpit where the weight is the major issue. Two inches webbing able to resist up to 26kN, hardware tested at 15kN and a complete flight configuration for 700g only. All components are competition parts carry over to guarantee the maximum safety level. Fully adjustable for shoulder straps and lap belt, it is easy to fit and dress while the two inches webbing give the maximum comfort on the body. These harnesses are produced mainly with polyester webbing to achieve the common market positioning but Sabelt is the only company able to replicate this geometries with different ultralight material (Zylon two inches webbing is 24g per meter).

### **Cargo Modul Foam Support**

Sabelt supplies cargo module foam supports used for building a regular floor to fit bags and instruments. Foams are made by EPP material produced by mold with a specific shape, rounded to match the module primary structure and flat to permit bags positioning.

The EPP material is flame retardant with good performance at compression, rigidity and with good characteristics of thermal and acoustic isolation. They can be designed in order to create space for additional bags, with holes to reach the primary structure. It is also possible to co-mold fixing and create boxes and cover to protect the payload.



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# SITAE S.p.a.

## Company profile

SITAE is the largest privately-owned Space Company in Italy and worldwide leader in the Small Satellites sector. With highly qualified employees and state-of-the-art facilities, SITAE covers a wide range of activities in development of small satellite platforms, advanced propulsion systems and on board avionics, providing turn-key solutions for Earth observation, telecom and science.

Being one of the main players of the Space Economy, SITAE is changing the way to conceive space products, both in the upstream and downstream segments, providing, thanks to its IoT capabilities, competitive smart services for a wide range of applications.

SITAE belongs to Angel Group, an Italian holding world leader in Railway, Aerospace and Aeronautics markets.

## Products | Services | Applications | Technologies

### SMALL SATELLITES

SITAE offers a complete new generation Small Satellites Product Line, based on smart, modular, scalable all-electric platform solutions in the class range from 50 kg to 350 kg. SITAE platforms are designed to host multiple payload technologies, covering applications from LEO Earth Observation (PAN-VIS, NIR/SWIR/TIR, Multi/Hyperspectral, small SAR) to Telecom (i.e. LEO/MEO small constellations, Internet-Of-Things, Machine-To-Machine), IoD/IoV and Science missions.

[Fig. Sitael Satellite Product Portfolio]

### SMALL SATELLITE BASED TURN-KEY SERVICES

SITAE is able to provide Small Satellites based “Turn-Key” services to meet customer’s needs, taking care of the complete chain from Mission Concept to Small Satellites Production up to Ground Infrastructure services.

SITAE Earth Observation services exploit the benefits of constellations, with very low revisit times, high reliability and strong redundancy. The combination of data from Small Satellites, Institutional and Commercial Satellites, Airborne and In-situ sensors, through an innovative and efficient Data Integration Centre, is able to provide useful services for Environmental Monitoring, Humanitarian Aid & Civil Protection, Industrial & Home activities and Security, Surveillance and Defence applications.

In addition, through the STRIVING service, SITAE offers affordable and effective access to space for IoD/IoV missions to both private and public entities that want to validate in orbit their innovative technologies. STRIVING is a one-stop-shop commercial service in which SITAE, the Space Mission Provider (SMP), acts as a single interface to customers and offers an end-to-end service including small satellite platforms from 3U-class cubesats to 300kg-class minisats, AIT/AIV, ground segment and launch.

### ELECTRIC PROPULSION

Since the early ‘80s, SITAE is involved in development of Advanced Propulsion Systems based on innovative proprietary technologies.

SITAE is one of the worldwide leading companies in designing, manufacturing and testing of Hall Effect Thrusters ranging from the very low power HT100 (100W operating power) suitable for small satellites up to the high power HT20K designed for interplanetary missions. Moreover, SITAE’s electric propulsion systems include Electrothermal Thrusters, micro-Newton Field Emission Electric Propulsion Systems, hundreds of kilowatt Magneto Plasma Dynamic Thrusters. The Electric Propulsion team successfully developed the proprietary air-breathing technology (ram-EP) demonstrating, for the first time in the world, the feasibility of creating thrust in orbit using residual gases of the atmosphere instead of onboard propellant.

[Fig. Sitael Electric Thruster HT5k new]

### SPACE AVIONICS



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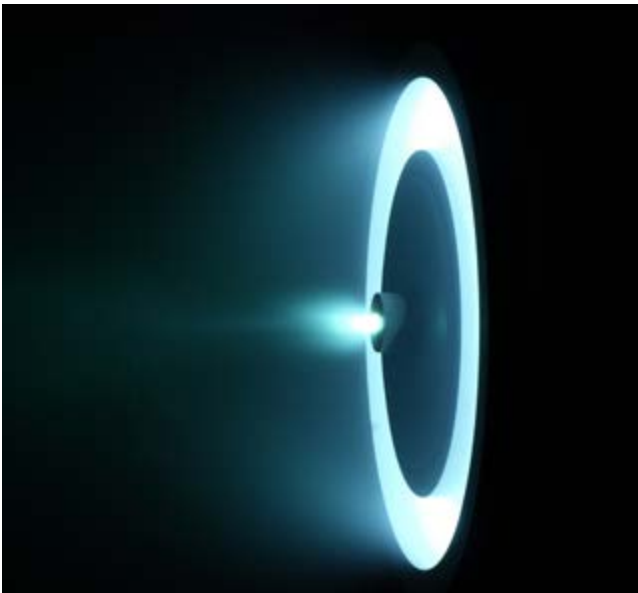
SITAEL provides reliable equipment and sub-systems for space missions. In order to assure the best product quality, the highest level system design techniques are used to provide flight equipment and components for satellite data processing, handling, storage and communications. With more than 20 years of space heritage, SITAEL portfolio includes small satellite specific products based on COTS components, such as OBC, TT&C, PCDU, Solar Arrays, Battery Packs and AOCS, but also several reliable and high efficiency space-born electronics products, ranging from power supplies, drive and control equipment to satellite data processing, handling, storage and communications. Moreover, SITAEL Microelectronics Design Center has been pioneering radiation hardening techniques for the design of Integrated Circuits suitable for space environment.

[Fig. Sitael Instrument and Control Unit]

TEST SERVICES AND PRODUCTS

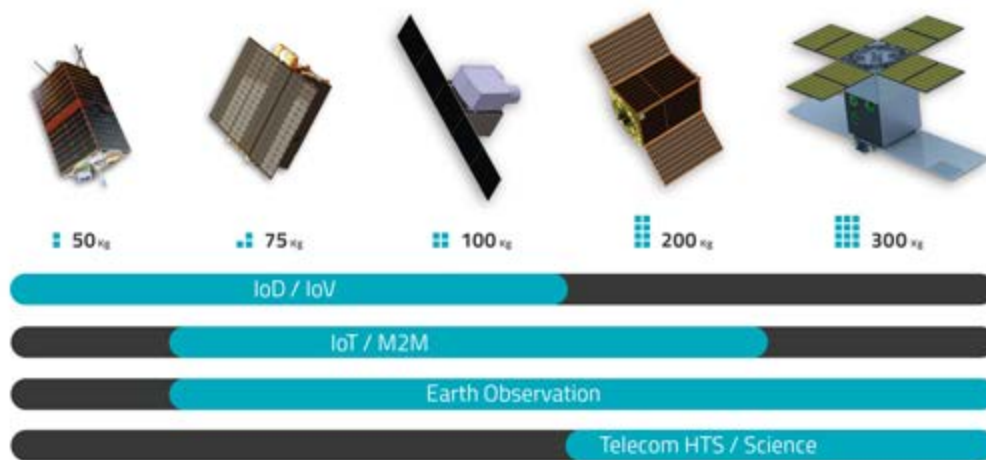
SITAEL is equipped with a unique set of test facilities, covering all phases of advanced Space technology development and qualification. Besides the extensive test services offered, SITAEL can manufacture custom turn-key test infrastructures, such as vacuum and thermal-vacuum facilities fully equipped with diagnostics, control and feeding systems.

[Fig. Sitael IV10 Test Facility]











# STMicroelectronics S.r.l.

## Company profile

STMicroelectronics is a world leader in providing the semiconductor solutions that make a positive contribution to people's lives, today and into the future.

- Among the world's largest semiconductor companies
- A leading Integrated Device Manufacturer delivering solutions that are key to Smart Driving and the Internet of Things
- A leading technology innovator: ~7,800 people working in R&D, ~18,500 patents, ~9,600 patent families and ~ 590 new patent filings in 2019
- An unwavering commitment to sustainability
- Corporate Headquarters: Geneva, Switzerland
- President and CEO: Jean-Marc Chery
- 2019 revenue: \$9.56 billion
- ~46,000 employees worldwide
- 80 sales & marketing offices in 35 countries
- More than 100,000 customers worldwide
- 11 main manufacturing sites
- Public since 1994: shares traded on the New York Stock Exchange (NYSE: STM), Euronext Paris, and Borsa Italiana
- Created as SGS-THOMSON Microelectronics in June 1987, from merger of SGS Microelettronica (Italy) and Thomson Semiconducteurs (France). Renamed STMicroelectronics in May 1998

## Products | Services | Applications | Technologies

In the Space Domain ST proposes a large portfolio of products specifically designed, packaged, tested and qualified to comply with the standard defined by the Space agencies and to meet the customer needs.

ST has supported European space applications for long time, being qualified by ESA (European Space Agency) since 1977 and enlarging to the American QML-V certification since 2000, in accordance with RHA certification (Radiation Hardness Assurance).

ST, present at world-wide level and recognized by the biggest accounts, offers a wide Space product range from Diodes, Power MOSFET and Transistors to Sub-micron technologies digital ASICs, through Smart Power ICs, Logic and Analog components. It is actively working to enlarge its product portfolio pursuing innovation, application coverage, top-level service and quality.



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# TELEMATIC SOLUTIONS SRL

## Company profile

Telematic Solutions Srl is an Italian company, with headquarters in Milan, specialized in EPC (Engineering, Procurement and Construction) projects, maintenance and exploitation services within the space sector, specifically in the ground segment and telemetry domains.

The company has a continued and valued presence in major European space programs, and in many other projects in low current & security, fluids, TT&C at the Guyana Space Center (CSG) where the company has a permanent work force through Telematic Solutions Guyane.

For fifteen years the main space players, such as the European Space Agency (ESA), the Italian Space Agency (ASI), the Centre National des Etudes Spatiales (CNES) have continuously renewed their trust in Telematic Solutions by awarding contracts for ambitious space projects on a European scale, such as the operation and the maintenance of VEGA fluid ground segment and the engineering, procurement, delivery and installation of telemetry stations for IXV (Intermediate eXperimental Vehicle) reentry vehicle.

The expertise and the commitment to fulfill each customers' specific needs are Telematic Solutions features upon which Customer's rely to build their space programs.

## Products | Services | Applications | Technologies

### TT&C

Engineering, procurement and integration as well as operations of  
TM and Tracking Ground Stations

Integration of ground stations for telemetry reception

Antenna Control Unit and tracking receiver stations

Telemetry ground stations monitoring and control

Telemetry data recording and re-play tools.

Telemetry post-processing tools.

Telemetry distribution

Development of Transportable Ground Station

Naval Ground Station integration



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**Managing Director**

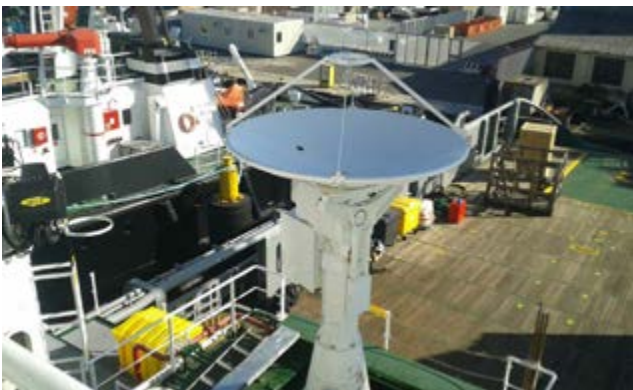
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# Telespazio Spa

## Company profile

Telespazio, a joint venture between Leonardo (67%) and Thales (33%), is one of Europe's leaders and one of the world's main players in satellite solutions and services. The company has its headquarters in Rome, Italy, and is supported by a staff of approximately 2600 people.

Telespazio operates worldwide through numerous companies, and has a wide international network of space centres and teleports. In particular, it is present: in France with Telespazio France; in Germany with Telespazio VEGA Deutschland, GAF and Spaceopal (a joint venture in which the German space agency DLR holds a 50% interest); in the United Kingdom with Telespazio VEGA UK; in Spain with Telespazio Iberica and in Romania with Rartel. Telespazio has a consolidated presence in South America with Telespazio Brasil and Telespazio Argentina. In Italy, the company is also present through e-GEOS (in which the Italian Space Agency holds a 20% interest).

Telespazio is a leading company in "key" sectors for public institutions, business operators and consumers, with activities ranging from the design and development of space systems to the management of launch services and in orbit satellite control; from Earth observation services, integrated communication, satellite navigation and localisation, to scientific programmes. Telespazio relies on a wealth of experience of the highest level, stemming from technological expertise acquired over 50 years of business practice.

The Company's experience is also drawn from the management of space infrastructure - including the Fucino Space Centre, one of the world's largest civilian teleports - as well as from its qualified involvement in space programmes of great significance, including: Galileo, EGNOS, Copernicus, COSMO-SkyMed and SICRAL.

The company now covers the whole space market value chain through its three lines of business: Satellite Communications, Geo Information, Satellite Systems and Operations. Telespazio responds to new demands in the market with innovative ideas and solutions. Today, more than ever, Telespazio is a true innovator, transforming what were once just possibilities into real services available to an increasingly wide audience worldwide.

## Products | Services | Applications | Technologies

### SATELLITE COMMUNICATIONS :

With its long track record in the satellite telecommunication and television sectors and thanks to a portfolio of cutting-edge products and services, Telespazio offers its clients secure, reliable and globally available solutions. Telespazio is the Italian leader and a major European player in radio and television broadcasting, thanks to its facilities at the Fucino and Lario Space Centres and to the equipment installed and managed at clients' premises. The company manages communications networks capable of integrating satellite and ground-based infrastructure, responding effectively to the requirements of business and institutional markets, media and broadcast sectors and global telecommunications operators. In the business market Telespazio offers dedicated services for the oil & gas, utilities, maritime and telco sectors, implementing fixed-line, mobile broadband satellite services in Italy and abroad. In tactical military satellite communications (Milsatcom), Telespazio provides telecommunications services to the armed forces of NATO countries, through its involvement in the Italian defence programme SICRAL. In non-tactical military communications (Comsatcom), the company offers telemedicine, distance learning and wideband connectivity services. As part of the institutional satellite communications, Telespazio participates with a strategic role in the ATHENA-FIDUS programme and delivers innovative applications and services in the field of civil protection, security and e-government. Finally, in its Fucino and Scanzano Space Centers, Telespazio hosts ground segment equipment dedicated to telecommunications satellite systems managed by leading international operators (Inmarsat, Eutelsat).



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#### GEOINFORMATION:

Telespazio is one of the major global suppliers of geospatial application solutions and services. Through its subsidiaries - mainly through e-GEOS in Italy and GAF in Germany - Telespazio is active in all areas relating to the Earth observation market: from acquiring and processing satellite data to develop and sell software and products. The company provides application services such as environmental protection monitoring, rush mapping in support to natural disaster management, specialized products for defense and intelligence, oil spill and ship detection for maritime surveillance, interferometric measurements for landslides and ground subsidence analysis, thematic mapping for agriculture and forestry. Telespazio is involved in the major Earth Observation programmes including the European Copernicus and the Italian COSMO-SkyMed. Lastly, in the geoinformation sector, Telespazio offers GIS solutions and applications for the control of vehicle fleets, the monitoring of dangerous sites and e-tourism services. In support to its operational applications, e-GEOS - a joint venture between Telespazio (80%) and ASI (20%) - operates the Matera Space Centre for acquisition, archiving and processing of multi-mission satellite data including COSMO-SkyMed and ESA Sentinels. e-GEOS is the exclusive distributors of COSMO-SkyMed data worldwide.

#### SATELLITE SYSTEM AND OPERATIONS:

Telespazio is one of the world leaders in the design, development and qualification of Integrated Satellite Systems and in the supply of In Orbit Control services for launch, early

orbit phase and routine operations (LEOP, IOT, relocation, mission operations) during the working life of satellites in low, medium Earth and geostationary orbits. These services are provided by means of proprietary ground elements:

satellite control center, flight dynamics systems and ground stations, together with all the necessary teleport facilities (aux systems, communications, logistic and security facilities). Telespazio employs highly skilled staff, with internationally recognized know-how, to operate via the proprietary Space Centres in Italy (Fucino, Lario and Scanzano), as well as through customer infrastructures throughout the world. Based on 50 years' experience supporting the majority of National and European agencies, Telespazio provides engineering, operations and logistic services for large and complex institutional Earth Observation programmes (COSMO-SkyMed, Copernicus), Navigation (Galileo, EGNOS) and the relevant downstream applications. In this field Telespazio is a key innovator in the development of systems, applications and services providing:

in Earth Observation missions, the user ground segment elements and processor applications that properly handle and elaborate the optical or radar images; for Navigation and Aviation missions, the capability - thanks to proprietary laboratory, simulators and facilities - to develop and provide applications and qualify new services for the downstream market. The most important customers are the main satellite operators and satellite manufacturers, the main National and European space agencies and defence administrations.

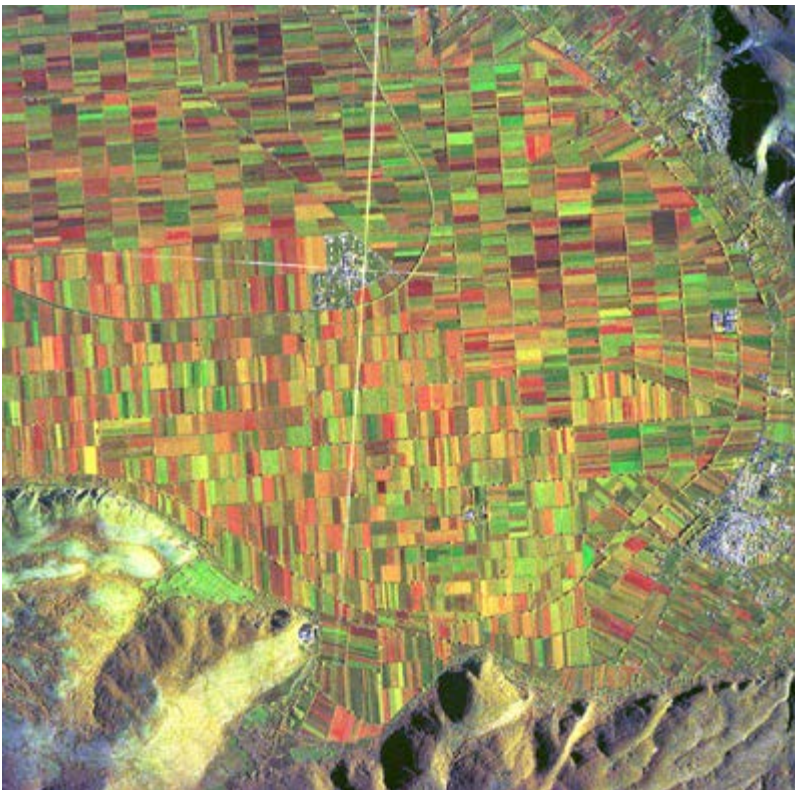






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# Thales Alenia Space Italia S. p. A.

## Company profile

Thales Alenia Space, joint venture between Thales (67%) and Leonardo (33%), is a key European player in space Telecommunications, Navigation, Earth Observation, Science & Exploration, Orbital, Infrastructures & Space Transport. Since 1982 the Company has designed, integrated, tested, operated and delivered innovative space systems. With our cutting-edge products and services in space, defense, science and security markets, we meet the needs of commercial and government customers around the world. Thales Alenia Space's satellites and payloads are recognized worldwide as benchmarks in delivering communications and navigation services, monitoring our environment and the oceans, better understanding climate change and supporting scientific research. Because of our unrivaled expertise in dual (civil-military) missions, constellations, flexible payloads, altimetry, meteorology and high-resolution radar and optical observation, Thales Alenia Space is the natural partner to countries that want to expand their space program. In order to offer a complete range of solutions and services to our customers, Thales Alenia Space and Telespazio have formed the Space Alliance.

Thales Alenia Space Italia S.p.A. is the Italian component of Thales Alenia Space. The company is based on experience gained through over two hundred satellites for Telecommunications, Navigation, Science and Exploration, Remote sensing.

Today, Thales Alenia Space is also one of the main suppliers to the ISS and a pivotal player in systems to explore our Universe. She is responsible for over half of its pressurized volume and played a major role on the ATV (Automated Transfer Vehicle) cargo vessels for ESA and on NASA's Cygnus program, which will also bring supplies to the ISS. The company collaborates with the leading international space industries on the programs of the most prestigious agencies, such as NASA, the European Space Agency and the Italian Space Agency.

Thales Alenia Space en route for the Red Planet

ExoMars is a 50/50 joint program between ESA and the Russian space agency, Roscosmos. Thales Alenia Space is prime contractor for the two missions in this program. For the first mission Thales Alenia Space was in charge of designing the reentry module and designing and integrating in orbital module. On the second mission (2020), the joint venture is in charge of developing the navigation and guidance system for the orbital and descent modules, designing the Martian rover and building the analysis lab carried by the rover. This lab features a perforator, capable of drilling two meters deep into the Martian soil and removing samples.

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Products | Services | Applications | Technologies

**ATHENA-FIDUS:** telecommunication system based on a geostationary satellite for dual use broadband communications services. Is a satellite communication system in Ka Band dedicated to institutional and governmental services. The Company is responsible for the development, construction testing and putting in orbit of the satellite, construction and testing of the satellite center. The programme is one of the first European cooperation for dual-use civil/military communications space programme.

**BEPICOLOMBO**

BepiColombo is the very first European mission dedicated to the exploration of Mercury.

The Company is responsible for the telecommunication, thermal control, electric power distribution systems, integration and tests of the complete satellite and of the support for the launch campaign. She develops the X and Ka-band transponder, the onboard computer, the mass memory and the high-gain antenna.

**COSMO-SkyMed**

Earth observation programmes. The project is based on four satellites equipped with radar sensors that can operate in any meteorological condition or visibility with a very high revisit frequency. The company is responsible for the entire system including the space and ground segments. The Second Generation of COSMO-SkyMed envisages the continuity of the dual purpose (civil and military) Earth Observation satellites.

**Copernicus-Sentinel:**

These Earth observation programme provides accurate, timely and easily accessible information that enables the monitoring of the earth, marine and atmospheric environments, understanding and mitigating the effects of climate change and ensuring civil security. The Sentinels provide high-resolution radar and optical images of our planet.

**Exomars**

Trace Gas Orbiter which has made the journey to Mars and after orbiting the planet he observe the atmosphere and surface and investigate the planet's surface and subsurface.

Entry, Descent and Landing Demonstrator designed to measure wind speed, humidity, atmospheric pressure, ground temperature, atmospheric transparency, electrical fields and more.

**Galileo**

The purpose is to create a global navigation system for a highly accurate and reliable global positioning service and to provide Europe with an independent navigation system capable of satisfying a wide range of sectors such as transport (by air, rail, road and sea), telecommunications (geo-location

services) and sectors requiring the highest safety standards. The company provides also some key elements as the signal generation units and the antennas for the first 22 satellites of the Full Operational Capability phase and has developed in the site of Rome the assembly, integration and test of 4 In Orbit Validation satellites.

**The International Space Station (ISS)**

Thales Alenia Space Italia, gave an essential contribution to the ISS's development building several modules of the "orbiting home". The three (Multi-Purpose Logistic Modules are among the symbol projects. Other crowning achievements are the Columbus European laboratory for microgravity research, the Automated Transfer Vehicle modules, automatic logistics system with maximum refuelling and materials loads for astronauts up to 7,300 kilograms; NODES 2 and 3, elements that connect the pressurize modules of the "orbiting home" together and the CUPOLA, a special observatory to allow the astronauts on board the station to operate in remote robotic arm during the module assembly operations. The company also makes the Pressurized Cargo Modules for the Cygnus resupply vessel and is prime contractor for ESA's IXV and Expert reentry demonstrators.

**EOS20 Radar:** platforms for Earth Observation high performance imaging, global coverage and high revisit times exploiting innovative technologies as PDHT (Payload Data Handling & Transmission), CMG (Control Moment Gyro), Radar reflector for VHR (Very High Resolution), End-to-End & Ground Systems Solutions.

Different platforms (HP-R, HE-R1000, HE-R500 and HR-R) are available for different scenario in order to satisfy both military and civil users interests.

HE-R1000 platform optimized for Export market requiring Earth Observation at very high resolution (new contract with South Korea "SmallSAT Korea 425").

HE-R500 is the compact solution for multiple launch and maritime surveillance.

HR-R microsatellites solution for global coverage and high revisit (PLATINO is developing a very low cost multi-mission platform) exploiting innovative technologies as mini-CMG and IPAC (Integrated Processing, data-handling and AOCS Controller).

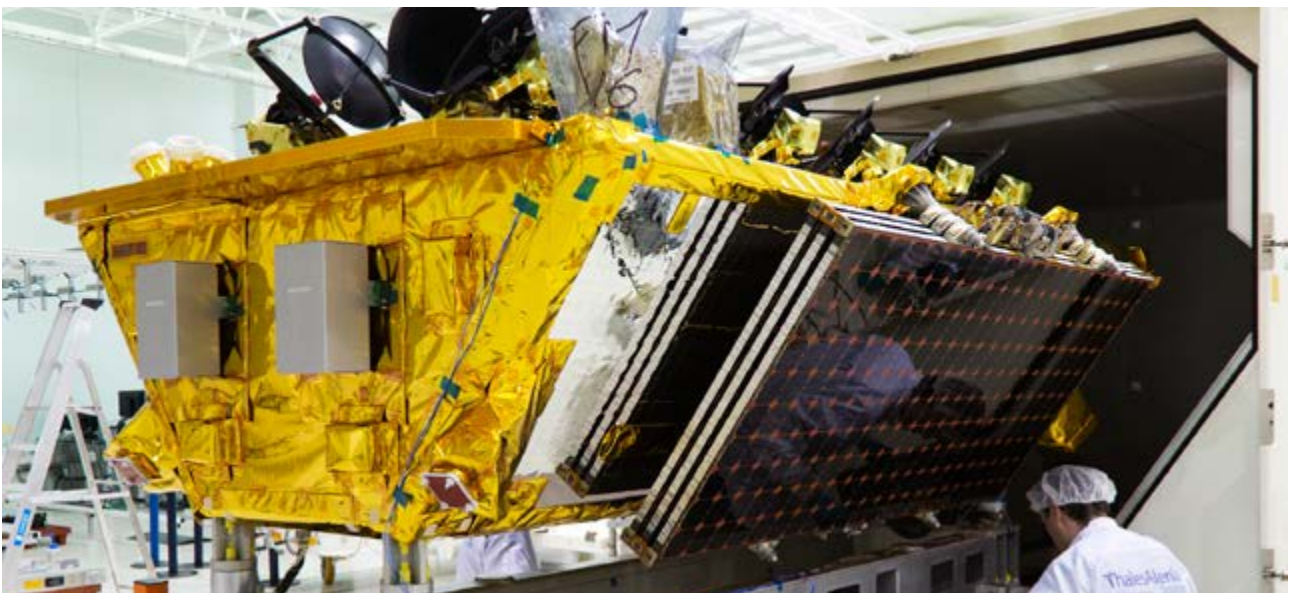
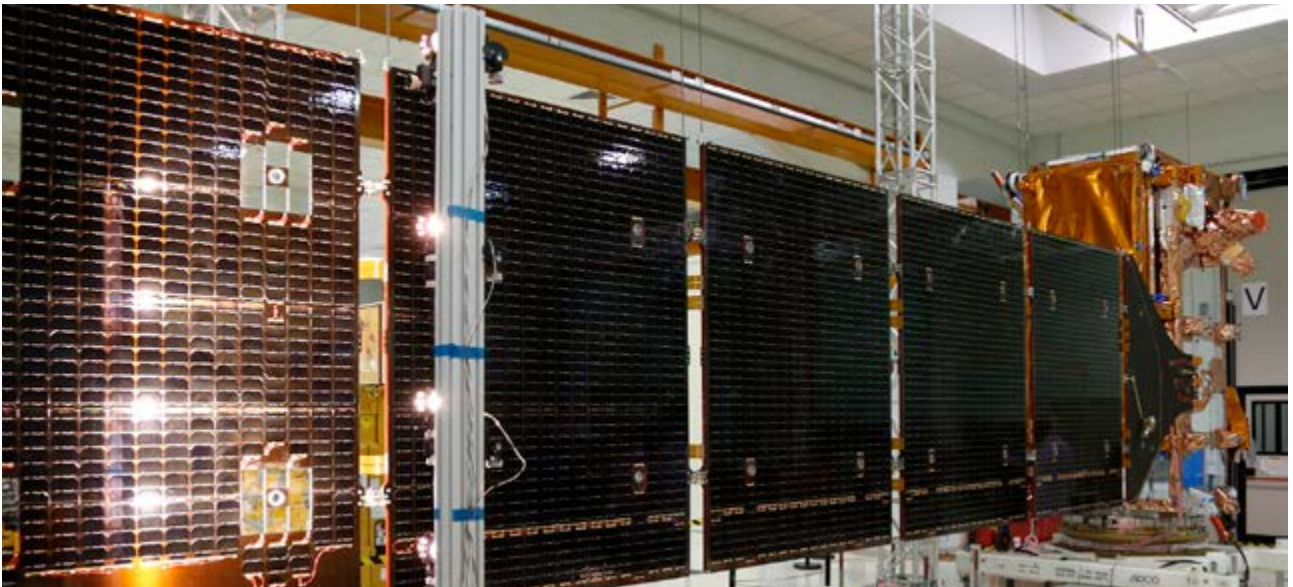
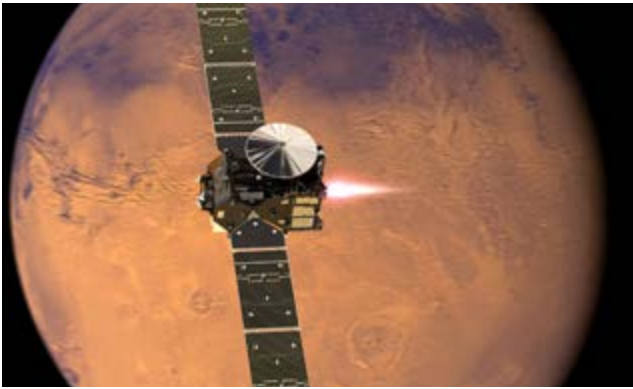
HP-R: direct heritage of COSMO-SkyMed is the National and EU champions in fully active phased array

**NAVCOM:** MEO payload products and services for Institutional and commercial customers. Implemented for Galileo Constellation through on board digital processor, Space receiver on Chip (SparCh), Multispot L band Antenna (MLAnt) and COTS (Commercial Off The Shelf) based Software Defined Radio (SDR) for Space GNSS Receivers.

**SpaceHOME:** in-habited space modules for Institutional customers (ESA, ISS, etc...). Strong heritage to gain the commercial market (Chinese Orbital Station, Moon Village, etc...). SpaceHOME is suitable also for high technological laboratories thanks comfortable areas for crew in term of temperature and breathable air, regeneration of air and water, protection from radiation, meteoroids, debris impingement and vacuum space.









# Vitrociset SpA

## Company profile

More than fifty years of experience in logistics to support operations in mission critical areas, expertise in integrating complex systems, consolidated presence all over Europe and in several other countries in the world, the substantial investments in Research & Development, the high skilled staff with young graduates coordinated by experienced professionals, make VITROCISSET, a LEONARDO company, the ideal technology partner for Companies and Public Administrations. The areas of intervention of VITROCISSET range from systems for the Defense to those for Air Traffic Control, from Satellite Technologies to Telecommunications, from Transportation to Integrated Logistics. In particular, VITROCISSET's activity in Space business area dates back to 1982 with the awarding of a turnkey contract for the ESA Redu tracking station. The gradual and constant expansion of its offer to the key players of the sector (ESA, ASI, CNES, Arianespace, Space Systems Manufacturers and Satellite Operators) has required the diversification of its products and services, such as the design and development of mission-critical systems

## Products | Services | Applications | Technologies

### Ground Data Systems

VITROCISSET designs, implements, validates and maintains checkout software and operating systems for Ground Segment of different Space Programmes.

The Company's involvement includes Mission Control Systems (VITROCISSET participated in the development of SCOS 2000 and it is now involved for ESA in the development of EGS Common Core), Mission Automation and Planning Systems, Central Checkout systems and Database Engineering.

In this context, VITROCISSET works with the main space agencies (ESA, CNES, ASI), with large system integrators (TAS, Airbus D&S, Leonardo) and the most important commercial players (Arianespace, EUTELSAT, INMARSAT), to support the provision of services to public and private sector.

VITROCISSET has been general contractor for ESA for VEGA Ground Segment development, from 2004 till successful maiden flight in February 2012. Since then VITROCISSET has participated as Design Authority to all VEGA launch campaigns and it is currently involved in VEGA-C program development.

More recent achievements are the VEGA EGSE at AVIO premises and Command and Control Bench at CSG in French Guyane for ESA; the re-engineering of Tracking Radars (Amazonie, Bretagne) for CNES, the EGSE systems for different space programs: METOP, Sentinel, Cosmo 2G for TAS and ADS;.

In 2018 the company has been awarded by CNES with the Contract for the refurbishment of the cinetodolite located on the Ile Royale, normally used in the frame of Ariane, VEGA and Soyuz launches.

Moreover, VITROCISSET is involved in a project, called SESAME (Smart European Space Access through Modern Exploitation) aiming to apply machine learning algorithms on big data, retrieved from historical Launch Operations Informations, in order to implement new optimized processes on the CSG, such as, for example, a proactive risk management, a predictive maintenance and quality management system of new adaptive logistic processes.

### Space G/S ILS & Operations

Working at the Centre Spatial Guyanaise (CSG) since more than 30 years, VITROCISSET has acquired a sound experience in technical operational support and ad-hoc critical developments of ground systems in the space launchers domain.



## Contact

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Extending the perimeter from VEGA also to Ariane 5 and Soyuz launchers, VITROCISET is supporting operational team for trajectography and localization systems, telecommand and neutralization systems, meteorological system, quality assurance and services.

Taking into account the Broglio Space Centre in Malindi, Kenya, the Company, in cooperation with Telespazio, is supporting the Italian Space Agency since 2011 for logistics and operations of the Centre.

The Company is also deeply involved in European satellite navigation systems, where, following the consolidated experience in delivery of site survey services for EGNOS, the Company (through its subsidiary -VITROCISET BELGIUM) has been awarded 10 years contract by GSA in cooperation with Spaceopal, being prime the main responsible for integrated logistics support and maintenance of Galileo worldwide ground infrastructures.

#### Applications & Services

For Operations & System Engineering, VITROCISET has consolidated a strong focus in all phases of mission life cycle - from the early feasibility studies through its realization and operation, and finally to the exploitation of the results. Since more than 30 years, VITROCISET has developed a wide range of support activities to provide technical, operational and engineering services to ESA and other major Space Agencies (DLR, ASI, NASA, CNES). This has allowed the development and consolidation of capabilities related with Satellite Ground Segment Services and Systems. Qualified and motivated staff are greatly contributing, with a strong commitment, to maintain the highest quality throughout the work carried out, all over this period of longstanding presence in Noordwijk (NL), at the European Space Research and Technology Centre (ESTEC), and in Darmstadt (D), at the European Satellite Operation Centre (ESOC), and nowadays in Spain at European Science Astronomy Centre (ESAC), in Germany at European Astronaut Centre (EAC), in Belgium at European space Security and Education Centre (ESEC), in UK at European Centre for Space Applications and Telecommunications (ECSAT), in Italy at European Space Research Institute (ESRIN) and in France at ESA Head Quarter.

VITROCISET is also supporting the Italian Consortium for the implementation of SST operations based on radar technologies. UHF transmitter has been provided and installed by VITROCISET and it is currently operated with the support of VITROCISET team, working in bi-static configuration with other Italian assets provided by the Italian National Institute for Astrophysics, granting the capability to discover objects with an area less than 10 cm<sup>2</sup>, at a distance up to 2,000 km.

In parallel, VITROCISET is providing its expertise in the frame of the feasibility study of the refurbishment of an existing radar system to be used for Surveillance and Tracking purposes, located in CHEIA (RU).

In the frame of Italian Galileo Program, VITROCISET is part of the industrial group (which includes the biggest Italian industrial players working in the Space market), awarded by the Italian Space Agency with the contracts to design and develop the receiver for Galileo PRS (Public Regulated Services) Service and the PRS National Center, i.e. the building in which all activities relevant to Galileo PRS Services will be carried out.

Big Science

Building on its experience in the space market and on its capabilities in critical system management, and command & control systems development, VITROCISET works on different international projects, supporting the implementation of large experimental physical facilities, providing highly specialized systems engineering services and developing ad-hoc systems.

VITROCISET is involved in ITER program (International Thermonuclear Experimental Reactor project), working in command&control (CODAC) and diagnostic domain, being one of the few authorized CODAC Core System development center worldwide. VITROCISET is also working at Fusion For Energy (F4E), the European Agency supporting the ITER program, in the Instrumentation and Control department.

At European Spallation Source (ESS) program in Sweden, VITROCISET has been awarded with three framework contracts for electronics, SW development and mechanical consultancy services.

The Company has recently provided the complete command and control system for STAR Materia, a linear accelerator developed for University of Calabria, in South of Italy and is currently developing for the ITER Program the control system for the remote handling in operation maintenance activities.”









