

# ITALIAN SPACE INDUSTRY

Products - Services - Applications - Technologies

Catalogue 2019

# 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 edited jointly 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 third edition of the Italian Space Industry Catalogue, issued concurrently with my arrival in ASI. This edition comes with a new graphic design and a wider and more detailed coverage of the national industrial system.

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 an extraordinary 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 inspire and boost socio-economic benefits deriving from space activities, a Space Economy Strategic Plan has been defined 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. We have a competitive space industry with solid and long lasting capabilities, of system integration, payload and subsystems design, value added services and applications. In Italy can be found 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 goals of the 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. ASI supports and promotes internalization initiatives of the Italian industry.

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

My commitment for the next years is to come up with a new edition with an even wider presentation of the Italian space sector and its competences.

# Carlo Ferro

## President of ITA - Italian Trade Agency

The aerospace industry plays a leading role in the national economy and stands out as one of the few high tech industries producing innovation capable of generating positive ripple effects in other national industry sectors.

Today, the Italian aerospace industry ranks fourth in Europe and seventh in the world with global projection. It should however be emphasized that since the early 2000s the industry achieved an international profile through acquisitions and the commercial success of innovative products that allow the total control of a volume of industrial activity around 18 billion euros. With regard to the activities carried out in factories located in Italy, which are predominant, revenues rose to 13 billion euros, with a total work force of 64,000 employees, including more than 52,000 in the fields of aeronautics and space.

The substantial investment in R&D, accounting for 15% of turnover, achieved certain objectives in terms of growth and stimulated technological innovations and spill-over effects in other technology-intensive industrial areas such as nanotechnology, new materials, microelectronics, defense, communications and electronics.

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.

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.



# 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

**AIPAS, Association of  
Italian Space Companies**

00186 Rome (Italy), Via del Tempio 1  
info@aipas.it, +39 066869222, 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



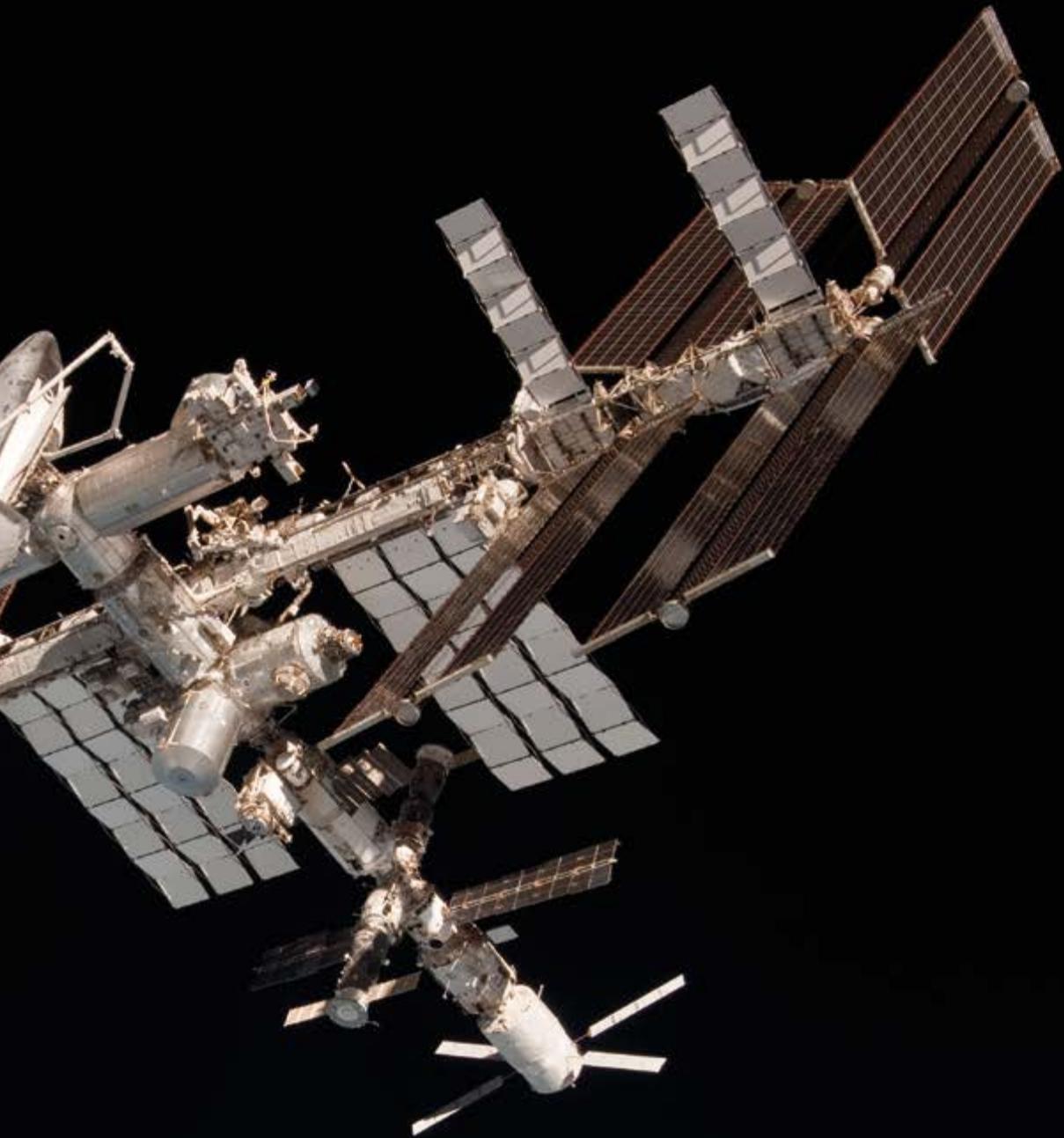


Photo: International Space Station



# “Mars, river of sand”

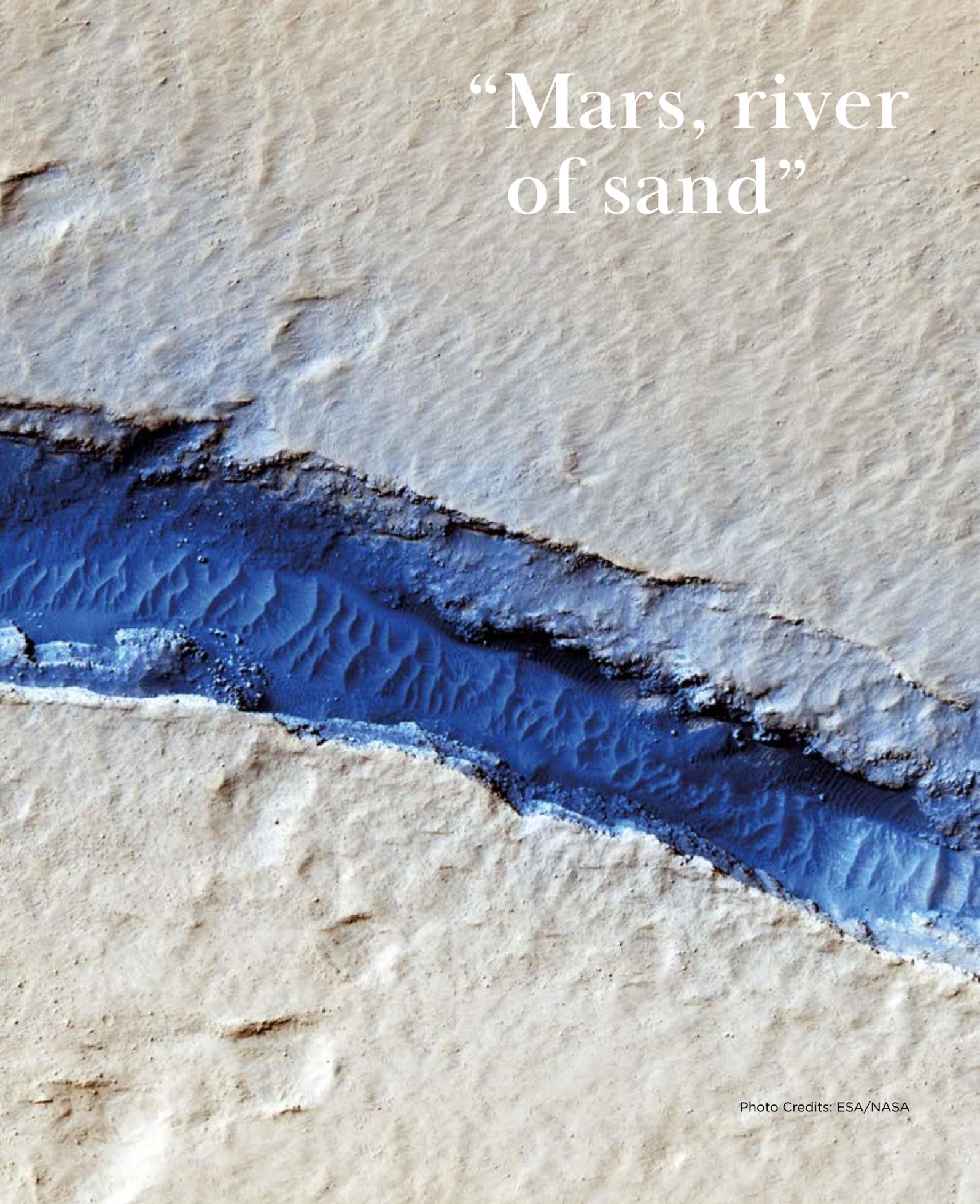


Photo Credits: ESA/NASA

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EDITION 2019

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**ASI** - Silvia Ciccarelli, Rosa Maria Parrella and Caterina De Fano  
Information gathering and content management

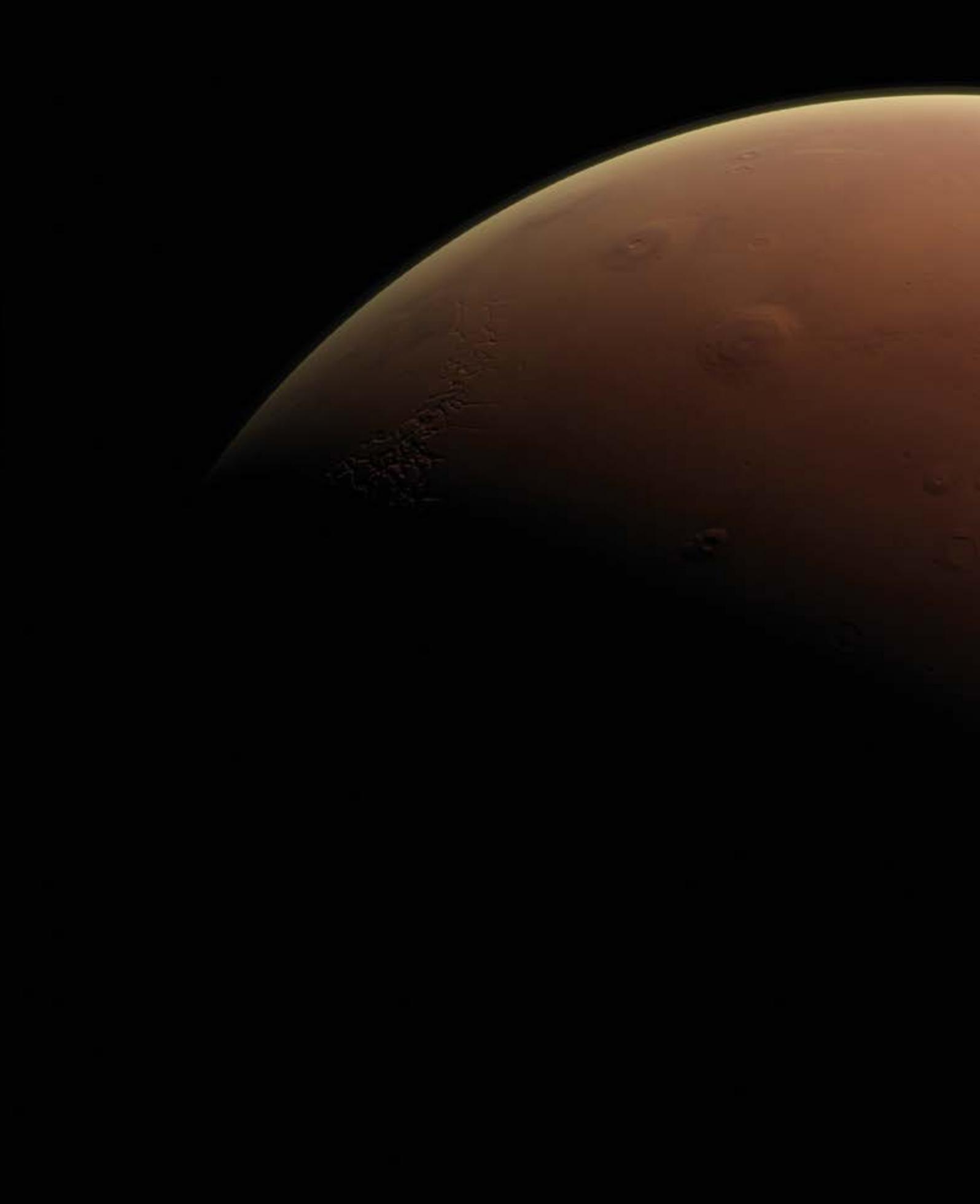
**ASI** - Walter O. Piperno and Danilo Rubini  
Supervision of technical contents

**ITA - ITALIAN TRADE AGENCY**

Made in Italy Export Promotion Department,

Graphic Design & Layout:

**Vincenzo Lioi, Irene Caterina Luca, Alessandro Mearini.**





# Application Domains and Enabling Technologies

Photo: Mars

Company name	APPLICATION DOMAINS							ENABLING TECHNOLOGIES				SYSTEM CAPABILITY				*Other (max 3 keywords)	
	Earth observation systems	Satellite navigation systems	Telecommunication systems	Space transportation, launch and re-entry systems	Human exploration, space station, capsule manned	Integrated applications and services, security	Observing the universe, science and robotic exploration	Materials, structures, thermo-mechanical, mechanisms	Electronics, photonics, optics, integrated sensors and cryogenic components	Informatics, data and signal processing	Technologies for space transport	Platform design and integration					
												Nano/Micro up to 50 kg	Small 50-500 kg	Medium 500-2000 kg	Large more than 2000 kg		Payload Design and Intergration
AEROSPAZIO TECNOLOGIE s.r.l.				X					X		X						Electric Propulsion, Testing, Thermal Vacuum
AGT	X			X		X		X	X	X							Technology Transfer, Expert and semantic systems, Internationalization
ALI Scarl	X		X	X				X	X	X	X	X	X			X	Re-entry; Deployable; Earth-Observation
Alma Sistemi S.r.l	X		X	X			X	X		X	X	X				X	PLASMA, MGSE, EO
ALPHA	X	X	X			X											UAV; ITS; Business plan
ALTEC SpA				X	X	X	X			X	X					X	
AMDL	X					X	X		X	X	X						
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
APR				X				X			X						• pump • valve • fan
Arescosmo				X	X		X	X			X						Inflatable, textile, Customize space products
ARESIS	X					X			X	X							
Argotec Srl		X			X	X	X	X				X				X	satellite platforms, 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 SPA								X	X		X	X	X	X			Additive manufacturing, Technology transfer
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	advanced materials, new manufacturing technology, digital modelling, simulation and testing.
Bright Aerospace Srl	X	X	X				X	X	X							X	Laser, Optical, Lidar
Bright Solutions Srl	X	X	X				X	X	X							X	Laser, Optical, Lidar
Cbl Electronics	X	X	X		X		X	X	X			X	X				Electronic design
CESI SpA	X	X	X			X		X	X								Multijunction solar cells based on 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					Additive, FEM
Consorzio di ricerca Hypatia						X		X	X								Technology Transfer
D-Orbit				X					X	X	X	X	X			X	CubeSat, Debris, Systems

■ LARGE COMPANY  
■ SMALL AND MEDIUM ENTERPRISE (SME)

Company name	APPLICATION DOMAINS							ENABLING TECHNOLOGIES				SYSTEM CAPABILITY					*Other (max 3 keywords)
	Earth observation systems	Satellite navigation systems	Telecommunication systems	Space transportation, launch and re-entry systems	Human exploration, space station, capsule manned	Integrated applications and services, security	Observing the universe, science and robotic exploration	Materials, structures, thermo-mechanical, mechanisms	Electronics, photonics, optics, integrated sensors and cryogenic components	Informatics, data and signal processing	Technologies for space transport	Platform design and integration				Payload Design and Intergration	
											Nano/Micro up to 50 kg	Small 50-500 kg	Medium 500-2000 kg	Large more than 2000 kg			
Davi - Promau srl	X	X	X	X	X		X	X		X							Bending machine; jet propulsion
DEMA SPA						X	X			X					X		Engineering, tooling.
Digmat	X	X	X			X			X								Processing, Acquisition, Monitor&Control
Dragonfly							X										additive manufacturing, engineering, know how transfer
DTM srl	X			X	X	X	X	X			X	X	X		X		M/T/F GSE
e-GEOS	X					X	X		X		X	X	X	X			Big Data Analytics, Geoinformation, Artificial Intelligence
EICAS Automazione S.p.A.		X						X	X								multicamera star tracker, Autonomous Attitude Determination
EIE GROUP Srl	X		X				X	X									GSE, Ground Stations
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
Exprivia S.p.A.	X					X			X								PDGS Data Processing EO applications
ESSETI MECCANICA DI PRECISIONE SRL	X	X															
EURO SOFT	X	X	X			X		X	X								
FLYBY SRL	X	X	X			X			X								Remote Sensing, Big Data Analytics, Real-time analysis
GAP srl						X			X								technology transfer, dissemination, education
GAROFOLI SPA	X		X	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
GEO-K S.r.l.	X					X			X								Artificial intelligence, Education, Drone services
GEOCART S.P.A.	X	X						X	X		X						Remote Sensing, Integrated multi-sensor Platforms
GMSPAZIO	X	X	X	X		X			X								Modeling & Simulation
IMT srl	X							X		X							EEE parts testing
IngeniArs S.r.l.	X	X	X		X	X	X		X	X							IP Cores Ground Test Equipments Communications (SpaceWire, SpaceFibre, CCSDS 131.2-B)
INNOVA	X					X			X								

- LARGE COMPANY
- SMALL AND MEDIUM ENTERPRISE (SME)

Company name	APPLICATION DOMAINS							ENABLING TECHNOLOGIES				SYSTEM CAPABILITY				*Other (max 3 keywords)	
	Earth observation systems	Satellite navigation systems	Telecommunication systems	Space transportation, launch and re-entry systems	Human exploration,space station, capsule manned	Integrated applications and services, security	Observing the universe, science and robotic exploration	Materials, structures, thermo-mechanical, mechanisms	Electronics, photonics, optics, integrated sensors and cryogenic components	Informatics,data and signal processing	Technologies for space transport	Platform design and integration					
												Nano/Micro up to 50 kg	Small 50-500 kg	Medium 500-2000 kg	Large more than 2000 kg		Payload Design and Intergration
Intecs SPA	X	X	X														User Ground Segment, Standard, Spatial data Infrastructure, INSPIRE
Intelligentia S.r.l.		X	X		X	X			X	X							Software Embedded Systems Industry 4.0
IPTSAT	X									X							PRECISION FARMING AGRICULTURE, DEM-DSM-DTM, CHANGE DETECTION, earth observation, big data
ISSEL NORD			X			X				X							Integrated Logistic Support
Italconsul				X	X	X	X	X		X						X	
Italspazio	X		X						X	X		X	X				Satellite Bandwidth CubeSat GEO localization systems
ITS Srl	X	X	X		X	X				X						X	Supercomputer, Antispoofing, OBDD
ITSLAB srl						X				X							Maritime & Health Applications, Secure Hybrid Communication, Digital Transformation
Kayser Italia					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
Leaf Space S.r.l.	X		X			X			X	X		X	X				Ground segment services
Leonardo Spa	X	X	X		X	X	X	X	X	X						X	technology transfer, training, robotics
MAPSAT	X					X				X			X				direct broadcast, VHR, near real time
MEC SRL	X	X	X				X	X	X								MICROWAVE TECHNOLOGY
Media Lario	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							Applications, EO mapping, System Dependability
NCM TECNOLOGY SRL		X					X	X									
NEXT INGEGNERIA DEI SISTEMI S.p.A.	X	X	X			X				X							Ground Segment, Cal/Val, Software

■ LARGE COMPANY  
■ SMALL AND MEDIUM ENTERPRISE (SME)

Company name	APPLICATION DOMAINS							ENABLING TECHNOLOGIES				SYSTEM CAPABILITY				*Other (max 3 keywords)
	Earth observation systems	Satellite navigation systems	Telecommunication systems	Space transportation, launch and re-entry systems	Human exploration, space station, capsule manned	Integrated applications and services, security	Observing the universe, science and robotic exploration	Materials, structures, thermo-mechanical, mechanisms	Electronics, photonics, optics, integrated sensors and cryogenic components	Informatics, data and signal processing	Technologies for space transport	Platform design and integration				
											Nano/Micro up to 50 kg	Small 50-500 kg	Medium 500-2000 kg	Large more than 2000 kg	Payload Design and Intergration	
NOVOTECH SRL				X	X			X							X	COMPOSITES STRUCTURES, CRYOGENIC TANK WITH AFP TECHNOLOGY
N.P.C. New Production Concept S.r.l.								X	X			X			X	Tracking telescope mount
NURJANA	X	X		X		X	X			X					X	DataFusion, Test&Evaluation, Tracking
OFFICINA STELLARE SPA	X					X	X	X	X						X	LASER COMMUNICATION TRACKING PLATFORM TELESCOPE
OHB ITALIA SpA	X			X	X			X			X	X			X	
PICOSATS SRL			X			X	X	X			X					CUBESAT, Ka band
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	Elint, Observation, Navigation
Progressive Systems	X									X						Big EO data, Processing on-demand, Application development support
Radio Analog Micro Electronics srl	X		X						X	X	X				X	ASIC, MW&RF, Ground Segment
RADIOLABS		X	X			X										localisation systems, data analysis, security
REDCAT DEVICES	X								X							RAD-HARD volatile and non-volatile memories;
RIBA Composites S.r.l.		X	X	X		X		X					X	X		Carbon fiber composite parts, structural parts
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
SAB Launch Services				X												
SABELT SPA	X			X	X	X	X	X		X					X	cargo retaining system, belt/straps application
SAM srl	X							X								
SAMET S.r.l.					X			X					X			
S.A.T.E - Systems & Advanced Technologies Engineering srl		X		X	X	X		X		X	X	X	X	X	X	simulation, control, data analysis
SICILSAT Communications s.r.l.	X	X	X													Antenna& RF Components design
SITAEI	X	X	X			X		X	X	X	X	X			X	space economy, electric propulsion, integrity

■ LARGE COMPANY

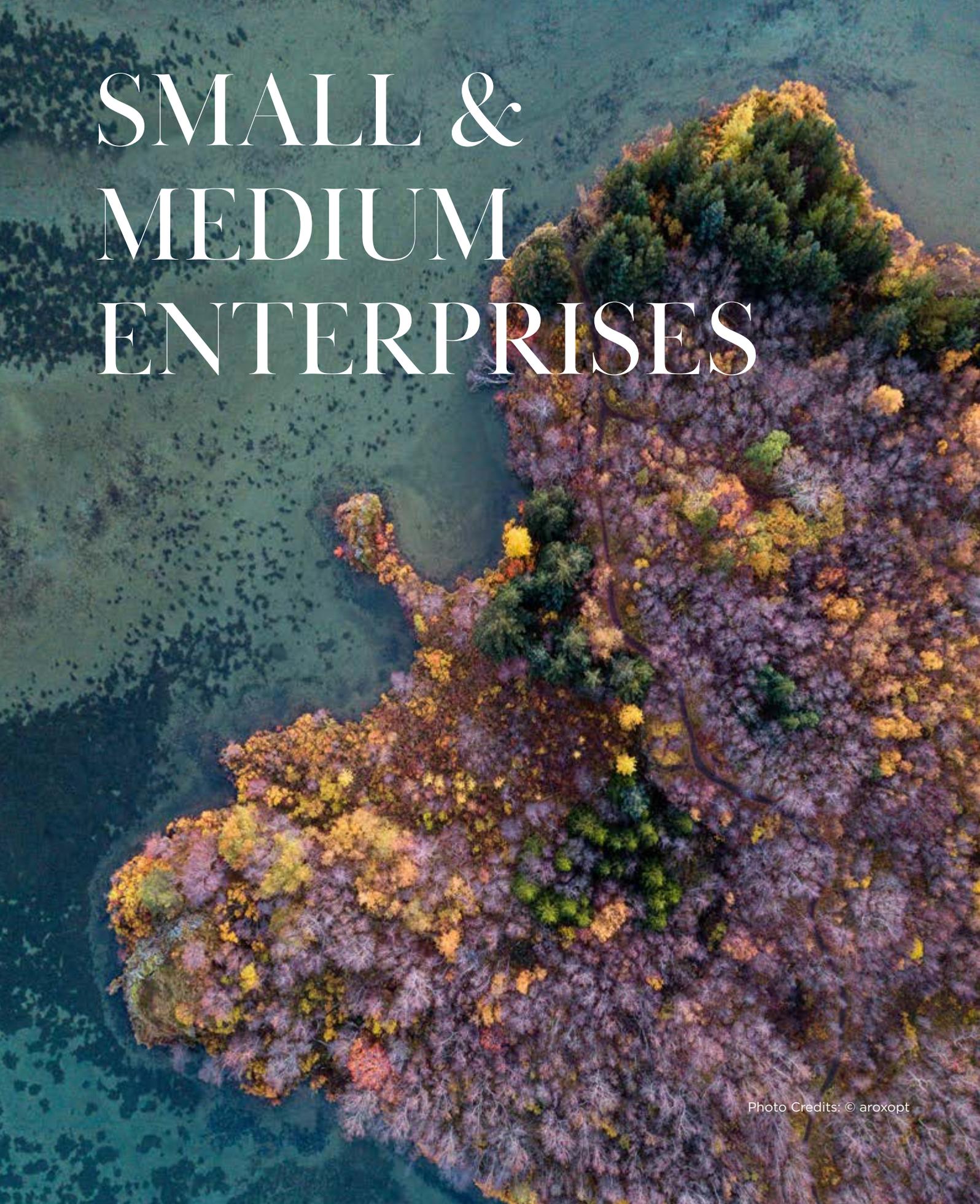
■ SMALL AND MEDIUM ENTERPRISE (SME)

Company name	APPLICATION DOMAINS							ENABLING TECHNOLOGIES				SYSTEM CAPABILITY						*Other (max 3 keywords)
	Earth observation systems	Satellite navigation systems	Telecommunication systems	Space transportation, launch and re-entry systems	Human exploration:space station, capsule manned	Integrated applications and services, security	Observing the universe, science and robotic exploration	Materials, structures, thermo-mechanical, mechanisms	Electronics, photonics, optics, integrated sensors and cryogenic components	Informatics,data and signal processing	Technologies for space transport	Platform design and integration				Payload Design and Intergration	Launch vehicle mission design and integration	
											Nano/Micro up to 50 kg	Small 50-500 kg	Medium 500-2000 kg	Large more than 2000 kg				
SOMACIS SpA								X									High Technology PCB	
SPACE DYNAMICS SERVICES		X				X	X		X									
Space Engineering	X	X	X			X	X	X	X						X			
Spacearth Technology Srl	X	X						X	X									
Space Factory			X	X			X				X						AEROSPACE RE-ENTRY; DEPLOYABLE ANTENNAS; SPACE OPENING MECHANISMS	
SPACELAB				X			X	X	X	X							propulsion, Avionic, software	
ST4I	X	X	X	X		X	X	X			X				X		active antenna, satellite payload, RF sub-system	
Stam S.r.l.						X	X	X	X								mechanisms, space debris, EO applications	
STELLAR PROJECT SRL	X		X			X	X	X	X		X	X						
STMicroelectronics									X								Semiconductors Manufacturer	
Survey Lab	X					X											DInSAR, Monitoring Systems, Damage Assessment	
T4i				X						X	X	X					electrical propulsion, chemical pulsion, microsattelites	
Taitus Software Italia Srl	X																advanced mission analysis, planning and simulation tools , efficient data processing	
TECHSEMA			X			X											transport safety	
TELEMATIC SOLUTIONS				X						X							GROUND SEGMENT, GROUND STATION, LAUNCH PAD DESIGN	
TELESPAZIO	X	X	X	X		X			X								Telexport infrastructures and operations	
TEMIS	X	X		X		X					X						Telemetry, EGSE, electromechanical	
THALES ALENIA SPACE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	technology transfer	
TIBERLAB srl						X	X	X									device and material modeling and simulation	
TRANS TECH		X		X		X	X	X	X						X		Space technologies, suborbital systems, technology transfer	
TSD	X	X		X	X	X		X	X		X	X	X		X		Imaging System	
Tyvak International SRL	X	X	X	X		X		X	X	X	X				X		high performance ADCS; mission design; launch integraiton services;	
Vitrociset SpA		X	X	X		X	X	X	X								technology transfer	

- LARGE COMPANY
- SMALL AND MEDIUM ENTERPRISE (SME)





An aerial photograph of a forest with vibrant autumn foliage in shades of yellow, orange, and purple, situated next to a body of water. The text 'SMALL & MEDIUM ENTERPRISES' is overlaid in white serif font on the left side of the image.

# SMALL & MEDIUM ENTERPRISES

Photo Credits: © aroxoip

# AEROSPAZIO TECNOLOGIE s.r.l.

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## Company profile

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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

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### 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



## Contact

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Via Provinciale Nord, 42a Rapolano Terme SI 53040

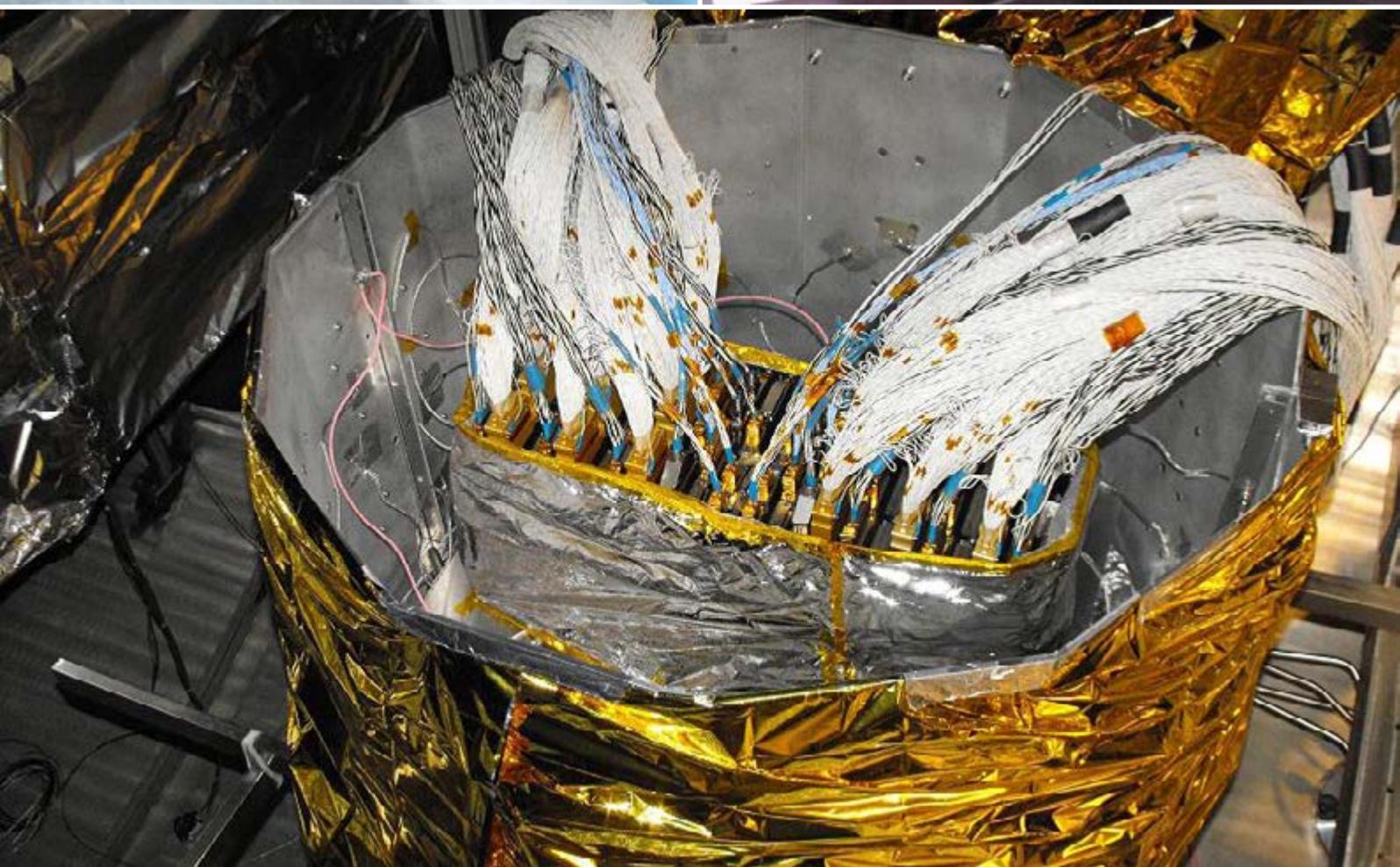
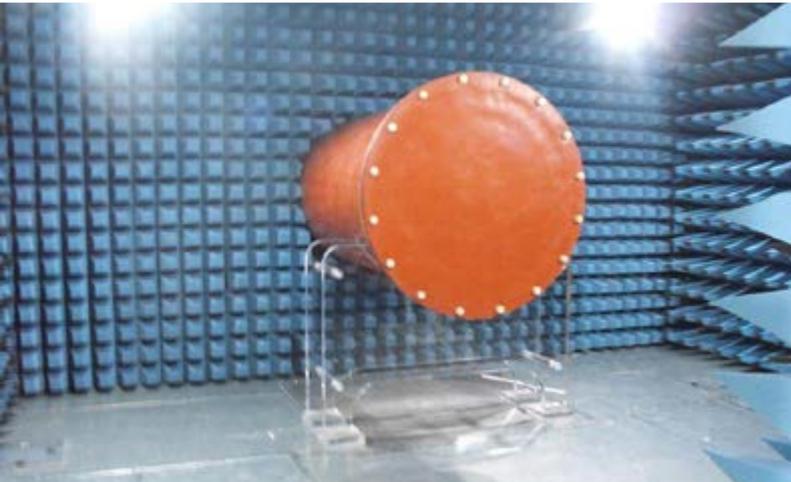
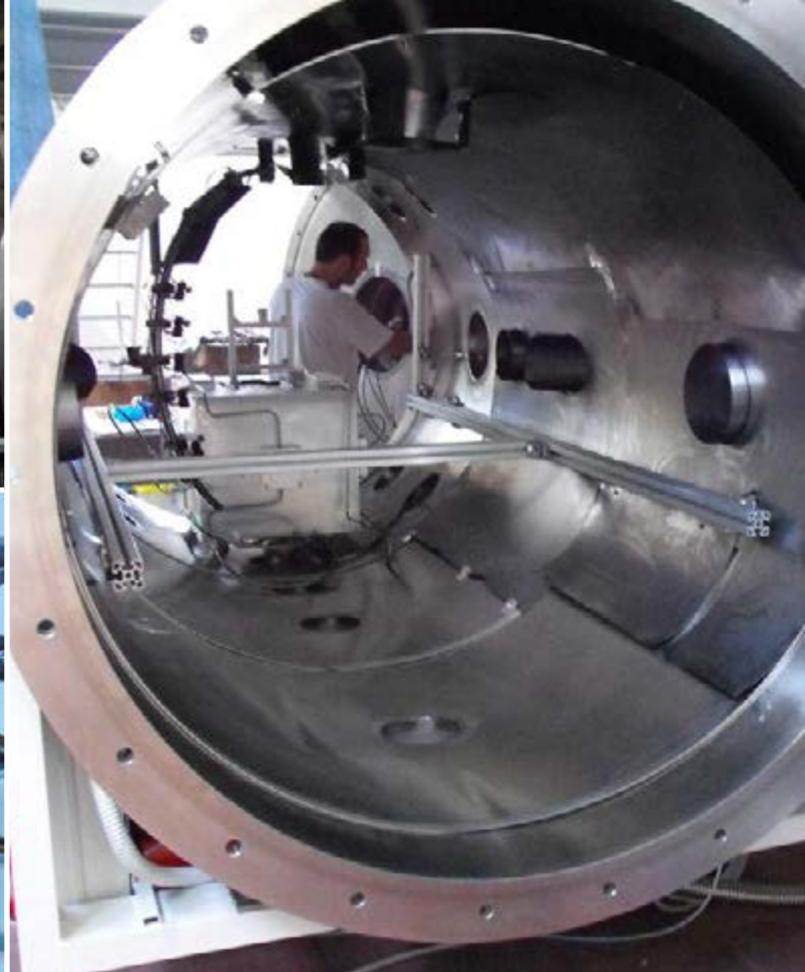
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# AGT Engineering s.r.l.

## 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.



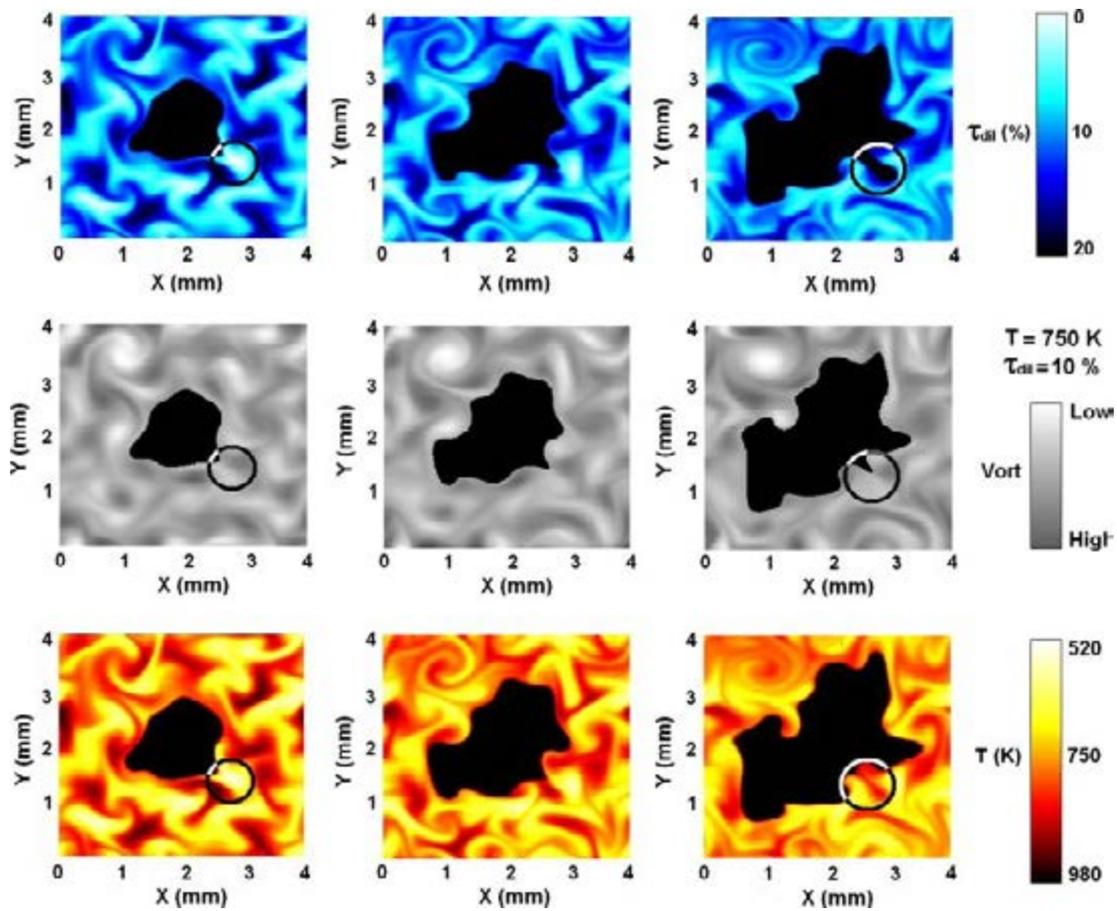
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# ALI - Aerospace Laboratory for Innovative Components - s.c.a r.l

## 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, Fabbrica 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.



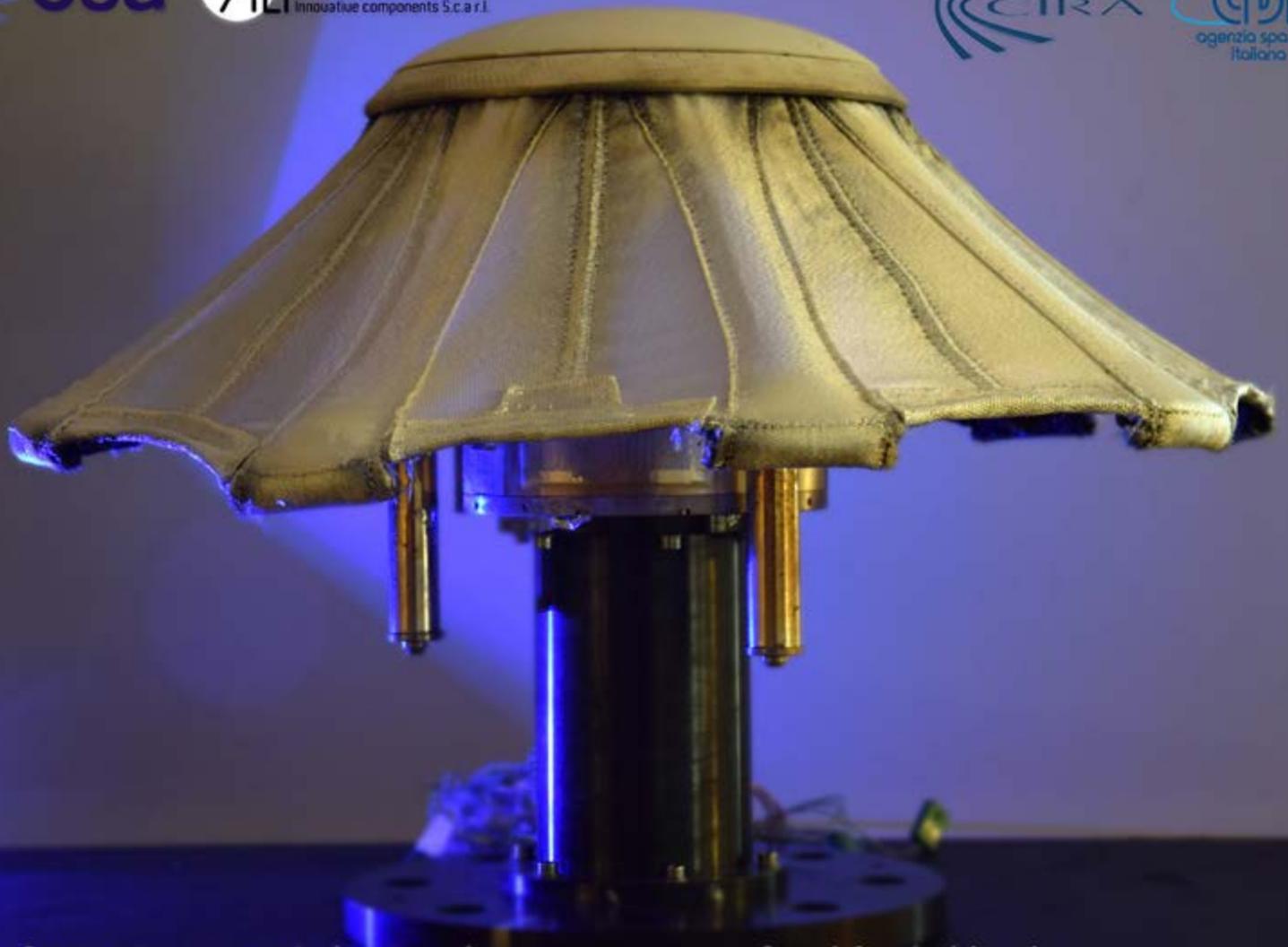
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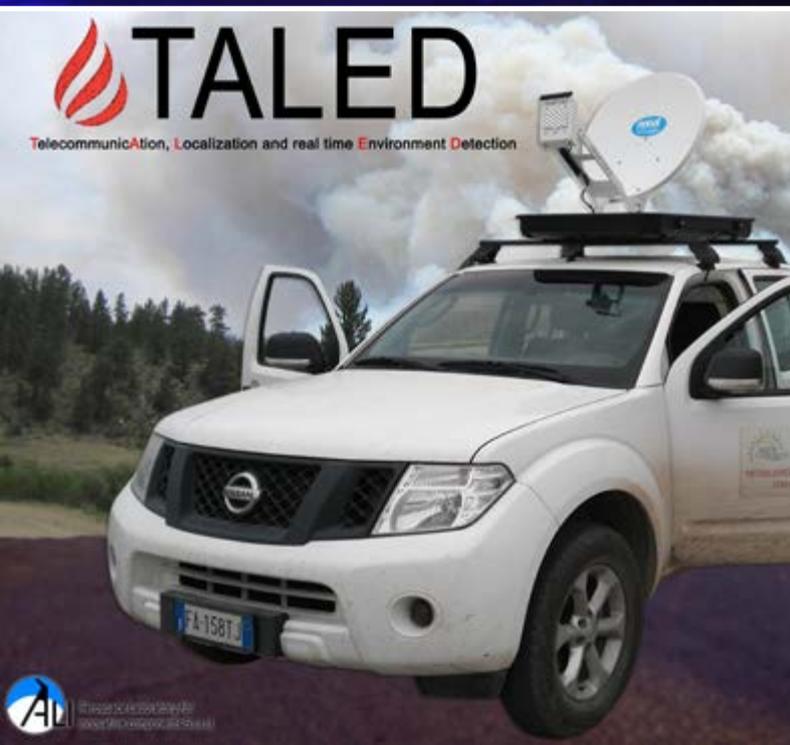
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The Contract was carried out under a programme of and funded by the European Space Agency



# ALMA Sistemi S.r.l

## Company profile

ALMA Sistemi Srl is an Italian SME established in 2005 providing high level consultancy in the space and defence market for industries and research centers.

### Mission & Goal

- Providing consultancy in the establishing of international consortium and preparation of project proposals in reply to ITT/RFQ and calls issued by Space agencies, EU and Large-Scale Integrators in the space sector - Project & Proposal / Bid Management
- Helping research organisations and industries to identify potential opportunities, providing marketing strategies and development plans of new products and services - Business Development Services
- Providing specific services in the field of management, quality assurance mechanical and software engineering for SMEs and research organizations

### Technological developments

ALMA provides services in:

Project and Proposal / Bid Management; Mechanical and Software Engineering; CADM and Product / Quality Assurance; Business Development and Market analysis

In the following marketplaces:

European Space Agency - ESA; European Commission - EC; Italian Space Agency - ASI; Research organizations; Aerospace Industry

### Business Development Services

ALMA provides consultancy for business development and proposal preparation in ESA, ASI and EU contexts covering:

- Business Development: liaison and presentation toward potential customers , identification of opportunities, scouting and establishment of international consortia in reply to ESA ITT, EU and national calls;
- Proposal management and support in the preparation of the complete bid package covering management, financial and compliance sections as well as technical in some contexts (E-GSE, M-GSE, software, EO applications, services)

### Market Analysis in the aerospace sector Engineering Services

ALMA covers the inception, establishing and execution of RTD and industrial projects in the public (ESA, EU, ASI) and private space market covering:

- System engineering for satellite and payloads check-out equipment (Mechanical and Electrical Ground Segment Equipment) covering development and verification
- Added-value services in the space market focusing on Earth Observation, Scientific data exploitation and navigation application
- High level software development for aerospace applications with specific regard to remote sensing data and image processing
- Support services: Project Management, Quality Assurance, CADM and documentation

## Products | Services | Applications | Technologies

- HORUS - Heritage and Observation Retrieval Under Sand, in cooperation with Roving A/S (DK).; customer European Space Agency - ESA.
- PAGIS - Planetary Geoscience Information System in cooperation with IRSPS (I); final customer Italian Space Agency - ASI;
- WHERE - in cooperation with Nextant SpA (I).; final customer: Italian Space Agency - ASI;
- SIMONA - Satellite assets Integration for Maritime situatiON Awareness in partnership with Engineering SpA (I). Customer ESA (ARTES-20).
- Aphorism - Innovative methods for ash plume and earthquake monitoring by remote sensing in partnership with INGV (I). customer EU-FP7;
- ITACA - Innovative Technologies for Underwater archaeology by remote sensing in partnership with Planetek Hellas (GR); customer EU-FP7.



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### SME

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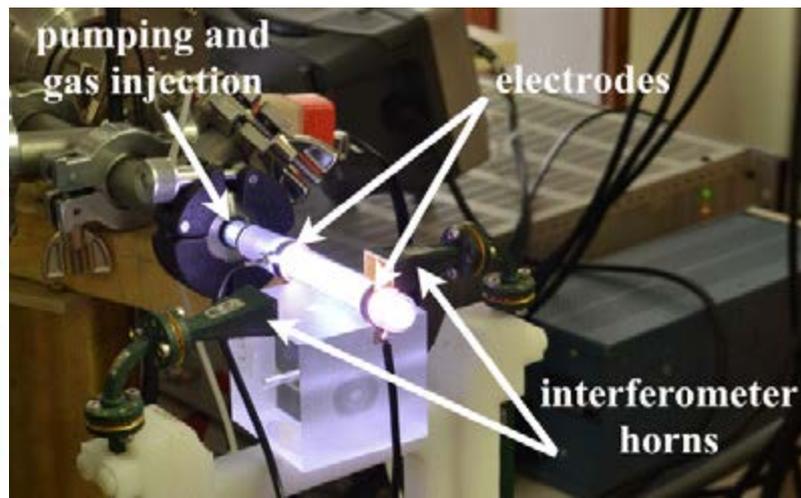
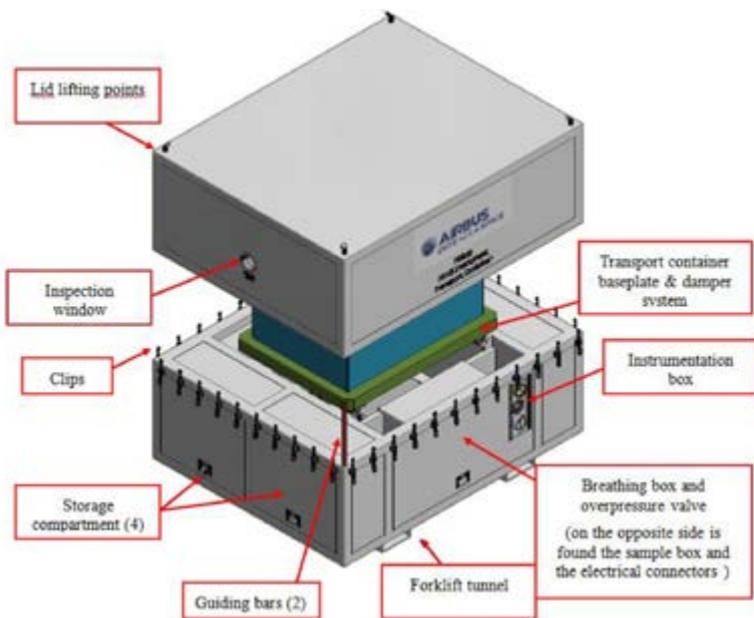
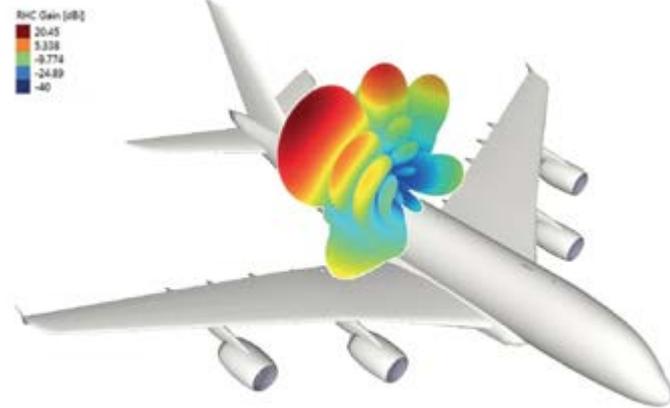
- CLIMA- Cultural Landscape risk Identification, Management and Assessment.; Customer Joint-Program-Initiative Cultural Heritage (JPI-CH, EU).
- PALADIN - H2020 - SME Instrument phase 1 - Market Analysis for avionic plasma antenna. customer EU.
- STARLET - Plasma antenna for satellite navigation., customer ASI..
- EVER-EST - H2020-INFRA European Virtual Environment for Research - Earth Science Themes; (H2020 coordinated by European Space Agency).
- PATH - H2020-RISE, Plasma Advanced Technologies - Research & Innovation Staff Exchange- Coordinator.
- Lumino- Por-Fesr Lazio 2014/2020- Aerospazio e Sicurezza intends to develop an original and innovative device able to produce useful data for an in-depth study of Martian Geology - Coordinator.
- M2p- Por-Fesr Lazio 2014/2020-Kets Tecnologie abilitanti which launches new application technologies telecommunications through the use of advanced materials- Coordinator.
- In Time- 2020-MSCA-RISE-2018 that addresses the technological and economic viability of a leading-edge instrument for dating of Mars' sub-surface. Coordinator.
- Stable , 2020-MSCA-RISE-2018 a project that addresses risk maps of Cultural Heritage (CH) at medium scale (block of buildings and large structures) to derive forecast for seismic movements impacting on the structural stability of the CH. Coordinator.
- Research, 2020-MSCA-RISE-2018 the design and development of a multi-task platform, integrating satellite remote sensing and ground-based technologies with GIS application for mapping, diagnostics and long term monitoring of cultural heritage sites. Coordinator.

MGSE Industrial Acquired proposals and Contracts in ESA Programmes

- MeteoSat Third Generation (MTG) Spacecraft Transport Container - Customer: Thales Alenia Space, Cannes, France
- MTG Platform Transport Container - Customer: OHB Sistema GmbH, Bremen, German
- MTG Platform Radiator Tilting Stands - Customer: OHB Sistema GmbH, Bremen, Germany
- EnMAP Mechanical Ground Support Equipment - Kayser-Threde GmbH, Munich, Germany
- ExoMars Rover Transport Container - Airbus Defence & Space, Stevenage, UK
- MetOp-2G MicroWaveSounder (MWS) Mechanical Ground Support Equipment - Airbus Defence & Space, Portsmouth, UK. Completed.
- MetOp-2G Lifting and Handling Devices for Satellite A & B MGSE - Airbus Defence & Space GmbH, Friderishafen, DE (ongoing, CDR phase)
- MetOp-2G Scatterometer Electronic (SES) MGSE - Airbus Defence & Space GmbH, Friderishafen, DE (ongoing, MAIT phase)
- NEOSAT - MGSE BATCH 15- Thales Alenia , Cannes
- NEOSAT - MGSE BATCH 6- Thales Alenia , CannesCustomers

ALMA Sistemi has been providing services to the following customers:

Garofoli S.p.a; Elital Srl, Italy; AVIO SpA, Vitrociset Belgium Sprl, Belgium; Vitrociset SpA, Italy; Rovsing A/S, Denmark; Nextant SpA, Italy; International Research School Of Planetary Science, Italy.



# ALPHA Consult

## 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).

## Products | Services | Applications | Technologies

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 are in Milan (Italy), with a branch office in London (UK).

ALPHA Consult works with all manner of stakeholders providing high quality consultancy about all aspects of satellite navigation, earth observation, ITS, and UAVs concepts and technologies. Our core services are strategy, business case and technology advices.

Our broad staff profiles mean 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. By combining innovative thinking with a practical approach, we are helping our customers to meet the new and emerging challenges they are facing.

We provide services to large European aerospace conglomerates and research centers and we have a long track record in studies both for the European GNSS Agency, the European Commission, the European Space Agency, as well as institutional/ service provider organisations in Europe and in Africa.



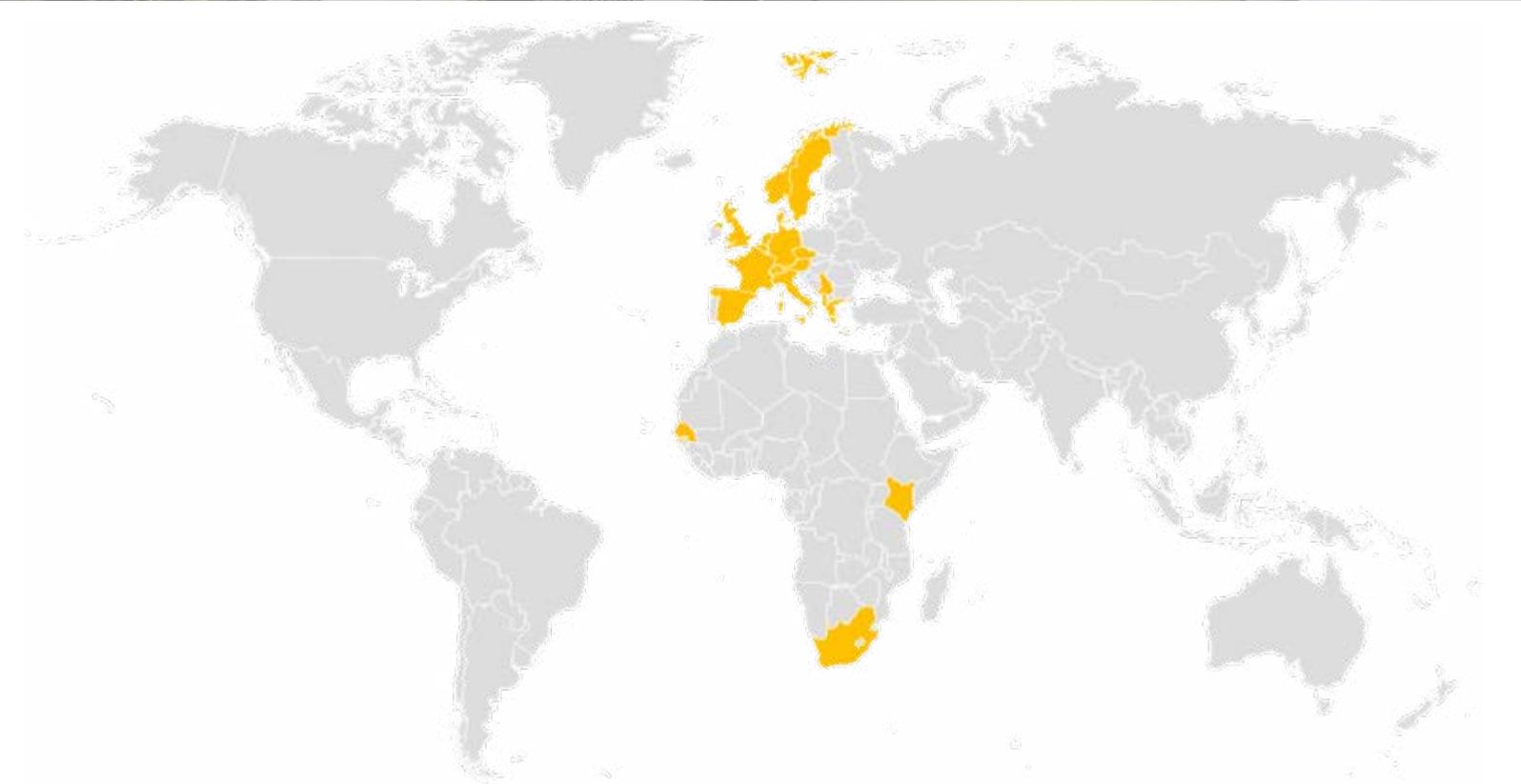
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<p style="text-align: center;"><b>Business Strategy</b></p> <ul style="list-style-type: none"> <li>• Restructuring</li> <li>• Strategy Definition</li> <li>• Market Assessment</li> <li>• Competitive Environment Analysis</li> <li>• Users' Needs Evaluation</li> <li>• Pricing and Positioning Strategy</li> </ul>	<p style="text-align: center;"><b>Corporate Finance</b></p> <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>	<p style="text-align: center;"><b>Go-to-Market Strategy</b></p> <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>
<p style="text-align: center;"><b>Project Management</b></p> <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>	<p style="text-align: center;"><b>Dissemination</b></p> <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>	<p style="text-align: center;"><b>Technical Support</b></p> <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>

# AMDL Srl

## Company profile

AMDL Srl is small company, which thanks to the Space experience of its founder has been involved in several planetary space missions, supporting the development of Data Processing Units (DPUs), on-board sensors, detectors and Ground Support Equipments. AMDL Srl has developed for ESA space programs a wide set of Leon 3FT based DPUs on 8 / 16 and 32 bit buses. It has been the first European company to prototype an ECSS compliant board with the first qualified multicore Aeroflex GR712RC. AMDL Srl has patented the ELENA shutter, being the first atomic camera based on nanogratings, flown last October in the frame of BepiColombo ESA Mercury mission. It has a pending patent technology for micro thruster essential to operate the small satellites in LEO orbits. The Company is continuously addressing new space instrumentation and ground sensors prototyping custom design solutions for Research Institutes and Universities. Track record:

- ESA Cluster 1 - CIS: Cis-2 4 x DPU Design & On-Board S/W
- ESA Cluster 2 - CIS: Cis-2 4 x DPU Design & On-Board S/W
- Soviet Union Mars-96 - PFS: 1 x FFT DPU Design & On-Board S/W
- ESA MarsExpress - PFS: 1 x FFT DPU Design & On-Board S/W
- DARA-NASA Equator-S mission -ESIC: 1x DPU Breadboard, On-Board S/W Design, GSE
- NASA DAWN - VIR: Vir EGSE, on board compression S/W
- ESA INTEGRAL mission - IBIS esperiment: EM & QM operation management.
- ESA First mission: SPIRE & HIFI ground simulators H/W & S/W control
- ESA Smart-1 mission - AMIE Camera: Power Supply & 1x S/C I/F board Design.
- International Space Station - Lazio SIRAD DPU
- ESA-China Republic - Double Star Mission - Ion Composition esperiment: 1 x On-Board S/W
- Limadou Chinese Mission: Instrument HEPD DAQ Board design
- ESA BepiCombo: Instrument SERENA, SCU & ELENA Design and manufacturing. On board S/W

## Products | Services | Applications | Technologies

- Multicore On board processing Unit / Leon Sparc FT systems
- On board S/W, Real Time Operating Systems
- Data compression
- Parallel computation FPGA based
- Ground Support Equipments
- Atomic cameras
- Optical systems
- Microthrusting
- Space compliant PCB prototyping



## Contact

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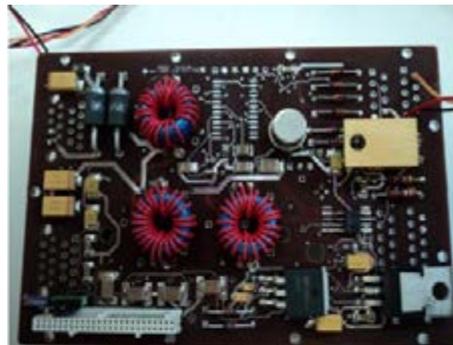
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# Antech Space Srl

## 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

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.

Antech Space provides satellite space capacities for particular application like Falco-EVO project. The company also 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).

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.

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# APR srl

## Company profile

APR delivers complex mechanical solutions and equipments for both the aero-engine, aero-structure and space industry, aiming to take costs out of the product through design-to-cost teamworking.

Leveraging on a strong technology footprint and on R&D investments, APR can support its international customers from the development stage to the full rate turn-key production of assy and equipment, from concurrent development to final testing.

## Products | Services | Applications | Technologies

- co-design development and production of equipment, with special focus on fluidic, aerodynamic, structural and mechanical components
- competence centre for application of cutting-edge manufacturing technologies (including Additive manufacturing) to space program
- EN9100 approved



## Contact

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**SME**

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Sales

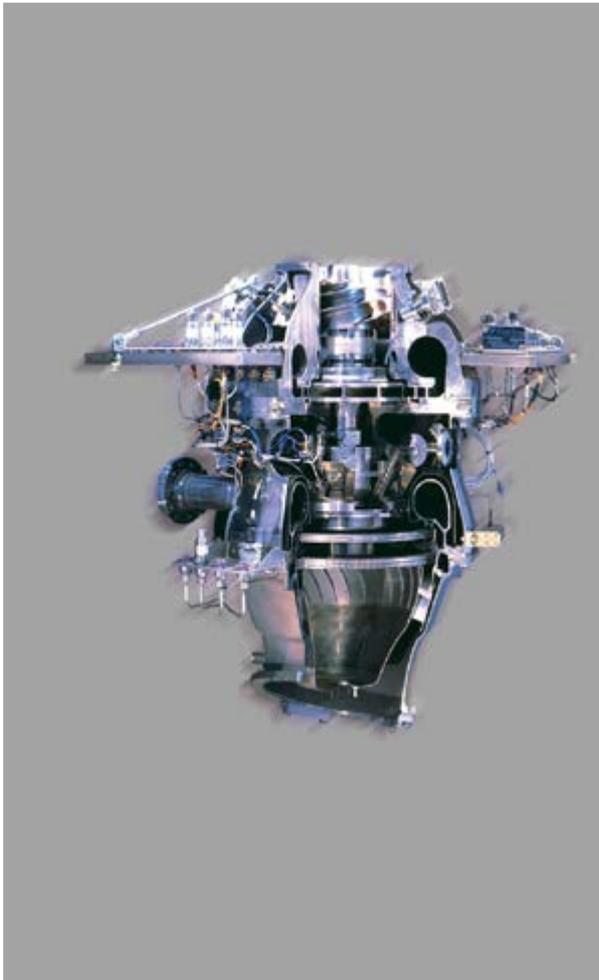
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# Arescosmo S.p.a.

## 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 to the qualification.

This capability is exploited by means of the consolidated experience of the engineering group and through the capabilities in managing up to 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



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## Space Rider Descent system

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

#### ☐ Ø 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

ARESIS, 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.

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

ARESIS 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 ARESIS 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, SARNT 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:** ARESIS 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 ARESIS 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:** ARESIS 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, ARESIS can offer a unique support service starting from SAR system concept, to SAR operations support, SAR calibration and SAR data processing.

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



## Contact

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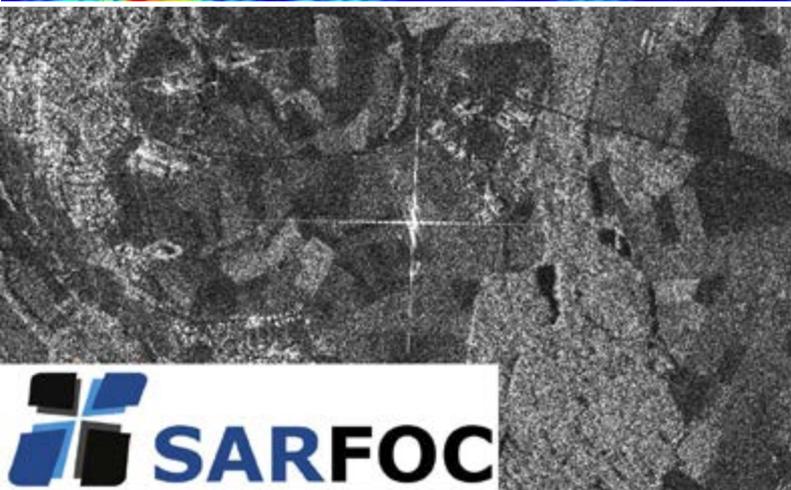
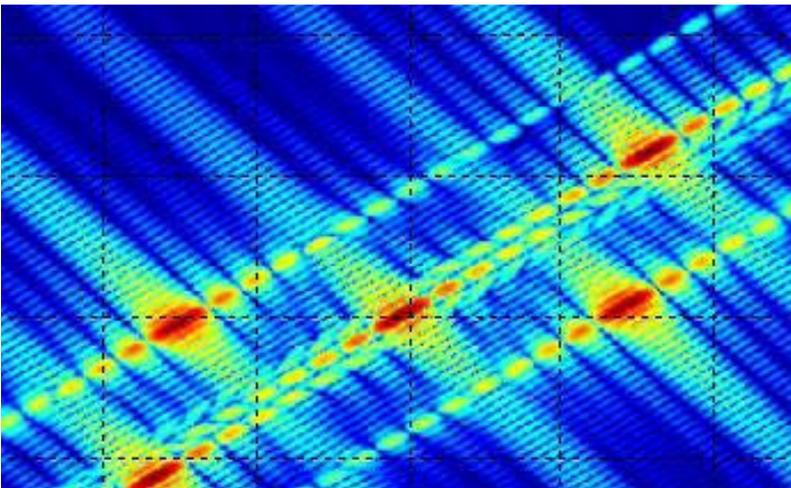
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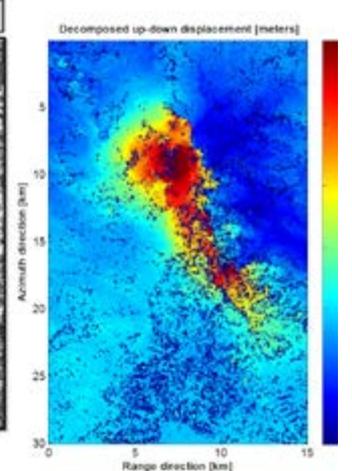
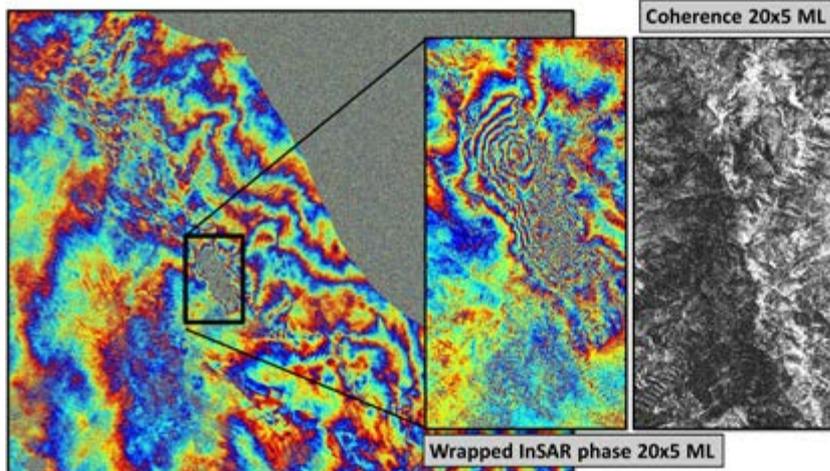
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 SARFOC



# 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 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. The Argotec 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.

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



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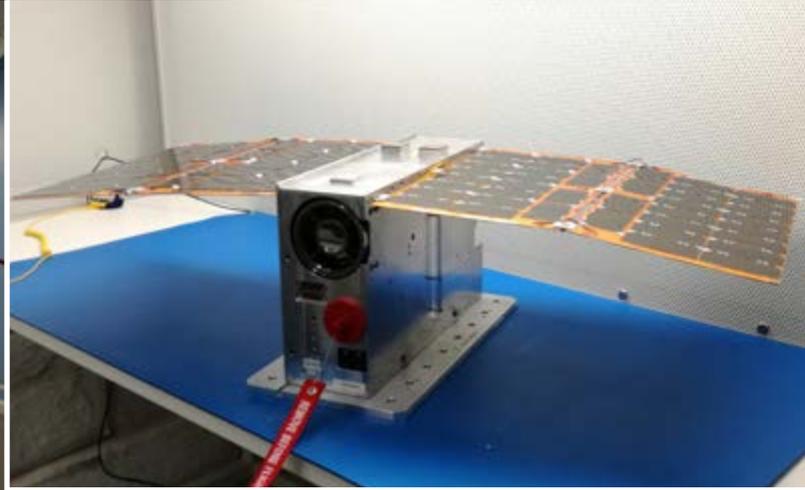


On-Board Computers. From the software perspective, the Unit works on FPGA "Robust" IP Cores, whole On-Board Software solution and AI-based control algorithms.

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.

The company offers custom solutions based on passive thermal exchange for thermal management both for ground and space applications. Argotec's heritage in the field of two-phase heat transfer devices includes the design, development and qualification of heat pipes, loop heat pipes, and pulsating heat pipes.

Argotec's instructors, certified by NASA and/or ESA, train the astronauts at the European Astronaut Centre in Cologne.



# 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 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



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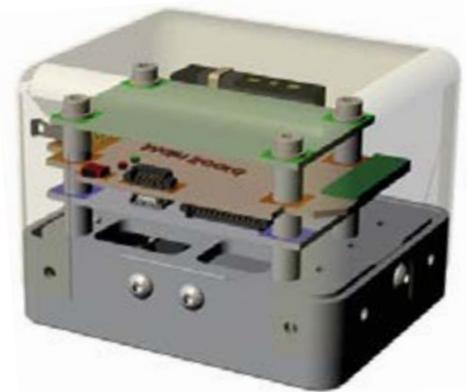
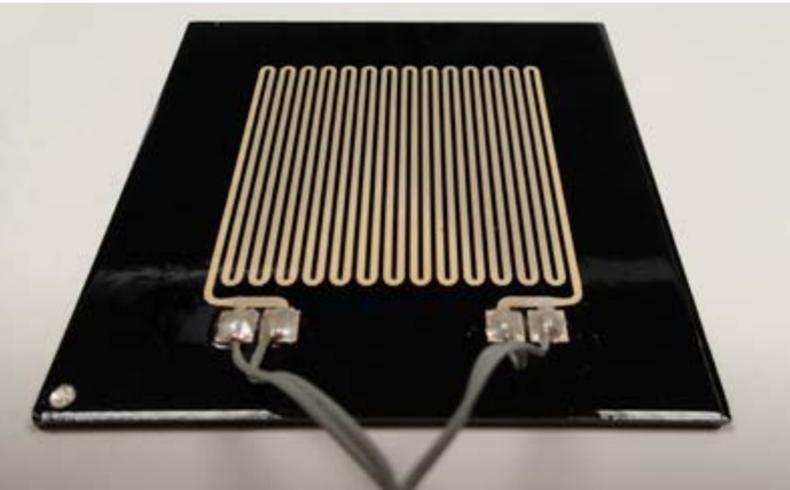
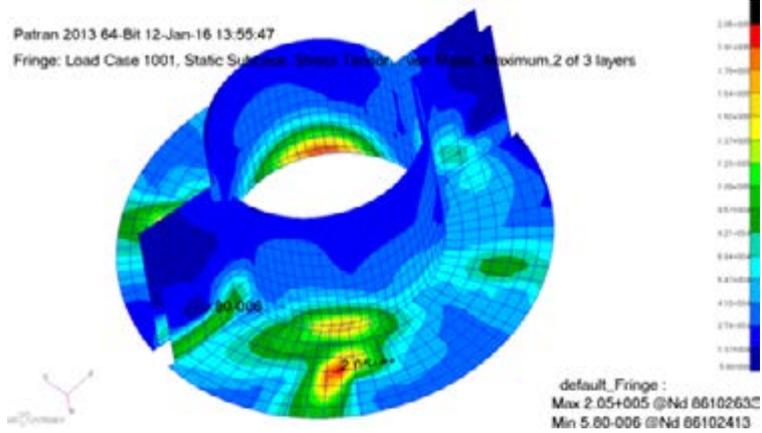
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separation. The communication system is composed by a multi-radio communication platform capable of using, in cognitive and opportunistic mode, heterogeneous wireless communication technologies for monitoring and control of complex systems for industrial 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.



# BEAMIT SPA

## Company profile

BEAMIT SpA is a Highly Qualified Private Italian Company specialized in Additive Manufacturing (AM), established in two facilities: Fornovo di Taro and, since 2015, Rubbiano (both in Parma area, Italy). Also, BEAMIT has an affiliated R&D unit, namely BEAMIT Space, located at Italian Space Agency (ASI) headquarters in Rome.

BEAMIT with more than 20 years' experience in Rapid Prototyping before and Additive Manufacturing after, in the European context, BEAMIT has a leading role, having installed an AM park of 28 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 like for biomedical applications, and operative in various sectors as aeronautical, aerospace, racing, automotive and food domains.

For aeronautical and biomedical applications BEAMIT is strictly following several procedures qualified by main worldwide customers and certified in accordance to ISO9001 & ISO9100. Special processes as heat treatments are performed in accordance with ASTM standard and NADCAP accreditation.

The major skill developed by BeamIT staff consists in supporting and training any customer (technical/engineering office) to profitably exploit AM technologies of any kind, starting from topological optimization to design for manufacturing, construction and testing. AM techniques are used in BEAMIT both for adaptation of old projects/components and for design of completely new ideas/projects. Also, BEAMIT offers in-house capability for CNC machining, post processing, finishing, coating and any heat treatments (thanks to the internal under vacuum and furnace, ISO9100 certified).

## Products | Services | Applications | Technologies

BEAMIT main capabilities include:

- Management of entire AM production item: from re-design or design for manufacturing to production series in according with OEMs requirements;
- Design and Analysis (FEM, FEA, topological optimization, etc.) of almost any IGT (Industrial Gas Turbine), aeronautics and aerospace component;
- EN 9100:2009 (EN9104-001:2013) Certification about "Manufacture of components in Ni metal alloys for Aerospace with techniques of Additive Manufacturing and Selective Laser Sintering (IAF 21, 17)".
- 3D CAD engineering (using ProEngineer, Wildfire, CREO, Catia, SpaceClaims, etc.);
- Development of 3D LATTICE structures (also as structural grounds) for aviation, aerospace and biomedical applications;
- SLS (Selective Laser Sintering) AM and assembling of big SLS components;
- Any AM metal powder melting both on Standard Systems (250mm x 250mm x 360mm) and on Large Systems (400mm x 400mm x 400mm and 500mm x 280mm x 360mm);
- Under Vacuum Furnace for any HT (Heat Treatment) on metals, including stress relieving, Quench, Aging and so on;
- EDM (Electrical Discharge Machining) cutting;
- Grinding;
- Blasting, shot peening, tumbling, complex surfaces special finishing;
- Lab for Metallurgy and Microstructure analysis (included density);
- Quality Management (powder, process, systems and products) and quality management of entire certified productions (biomedical, IGT, Oil & Gas, Aviation, Aerospace), including FAI and quality control;
- ERP (Enterprise Resource Planning) management that includes also any Customer Terms of delivery.
- In light with this, BEAMIT can:
- Check/analyze any raw materials (AM powders) using own systems.
- Design and re-design (for additive manufacturing) any 3D data from old projects or



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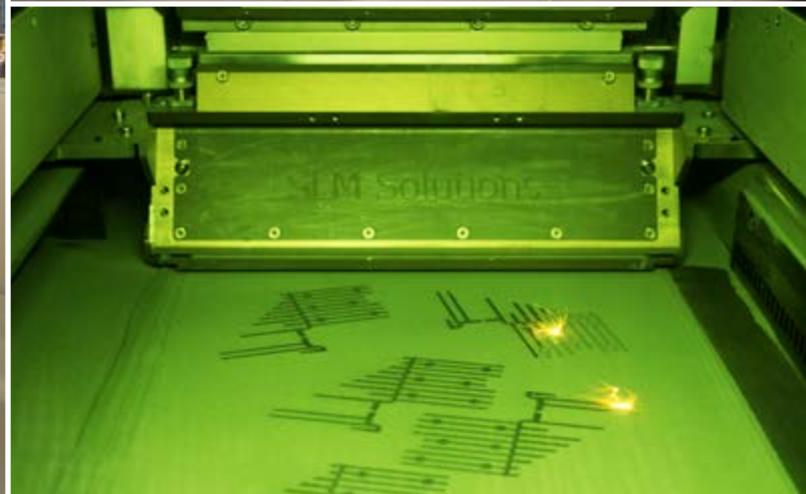
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support customer to start the design of new ones.

- Manufacture through AM systems according to EN 9100:2009 and thermal treating any product according to the following phases:
  - AM job preparation (placement, supporting, slicing);
  - Melting process and process control;
  - Heat Treatments (under vacuum furnace) of any AM materials;
  - EDM (small and big AM substrates);
  - Supports removal and surface treatment: cleaning, tumbling, polishing, grinding;
  - CNC/lathe processes.
- Test manufactured components through:
  - PT/NDT/DT, FPI, FAI (Penetrant Test, Non-Destructive Test, Destructive test as metallographic inspection, Fluorescent Particle Inspection, First Article Inspection);
  - CT scan/ X-Ray (Computer Tomography Scanning).
- Implement Quality Management with certified production BEAMIT



# 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

Product Service:

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 Hershel 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

Applications:

EARTH OBSERVATION SYSTEMS



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CEO/Legale Rappresentante

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SATELLITE NAVIGATION SYSTEMS

SPACE TRANSPORTATION, LAUNCH AND RE-ENTRY SYSTEMS

HUMAN EXPLORATION, SPACE STATION, CAPSULE MANNED

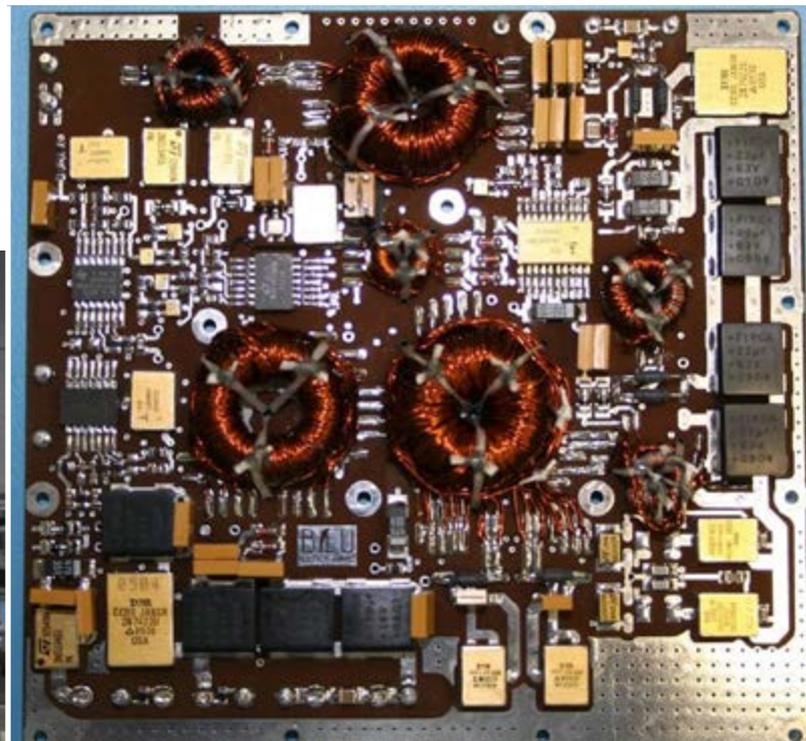
OBSERVING THE UNIVERSE, SCIENCE AND ROBOTIC EXPLORATION

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.



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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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CEO

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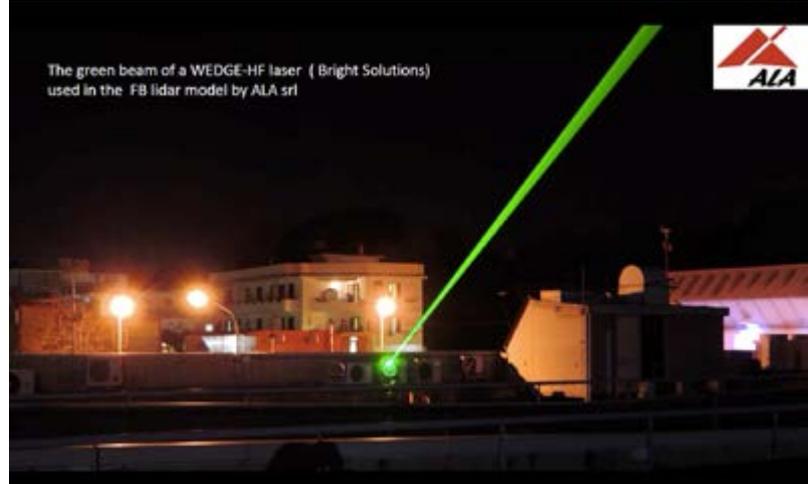
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# CBL ELECTRONICS SRL

## Company profile

CBL Electronics is an engineering company providing complete turnkey solutions, achieving equipment and electronic systems from the most simple to the most complex.

“We proudly took part in the following space missions in cooperation with Leonardo Company

- ❑ SENTINEL
  - Design and manufacturing PCDU and EGSE PCDU
- ❑ EXOMARS
  - Design and manufacturing PCDU and EGSE PCDU
- ❑ COSMO SG
  - Design and manufacturing PCDU
- ❑ ROSETTA
  - Solar Array Simulator Philae Lander
- ❑ ORION
  - Design and Test MPCV PCDU – Design –tested EM1 to EM 4 – FM1-FM2 tested FM spare ongoing based on Leonardo Company requirements.

Cbl Electronics started in 2002, founded in 2002 on the solid experiences gained by the three owners, providing testing services to semiconductors industry, afterwards, company evolution and growth let it to succeed in other fields and markets.

Its reliable services lead to be accredited as official supplier by StMicroelectronics, Finmeccanica for avionics and space and to be considered a solution provider for key players in aerospace, defense, naval and semiconductors fields. Our core competence is customization capability, helping our customers to satisfy any requirements from specifications acquisition to final product manufacturing, managing the whole workflow.

Our staff is composed by high-skilled persons, average age 35. Staff trend keeps increasing and to enrich with new collaborators arriving over the years to almost 80 persons, who share the passion for innovation and the desire to grow together and to make progress.

Our engineering team includes professionals in field of: electronic design, FW FPGA design, mechanical design, software design, embedded software, CAD layout design. Under electronic design, we specifically are involved in: schematics design (OrCad, DxDesigner) PCB Layout (Allegro, PADS, Altium), embedded systems (FPGA, uP, DSP, SoC, SOM), communication interfaces management CANBUS, PCIe, I2C, SPI, UART, ETHERNET, USB, ARINC429, MIL-STD1553, mixed Signal Acquisition and conditioning, power management and addressing distribution, worst-case analysis, parts stress analysis, FMEA (Failure Mode and Effect Analysis, prototype development and debug, design requirements traceability. automatic test based on Boundary Scan

Boundary Scan test and design bed of nails (electrical and mechanical) design, BSCAN systems development (JTAG e GOEPEL)

acquisition mixed board (discrete/digital/analog), GND/OPEN, 28V/OPEN, OPEN/CLOSE, analog input, arbitrary signals boards generation (DAC, DDS, PLL).

## Products | Services | Applications | Technologies

Products:

- Avionics and Defence (Terrestrial and Naval) systems
- Space systems (Power conditioning and distribution)
- Semiconductor test equipments and test programs
- Test Benches (Including Test Fixtures and bed of nails) for functional and Bscan test programs
- RTLS (Real-Time-Locating-System) for industrial indoor environments

Services:



## Contact

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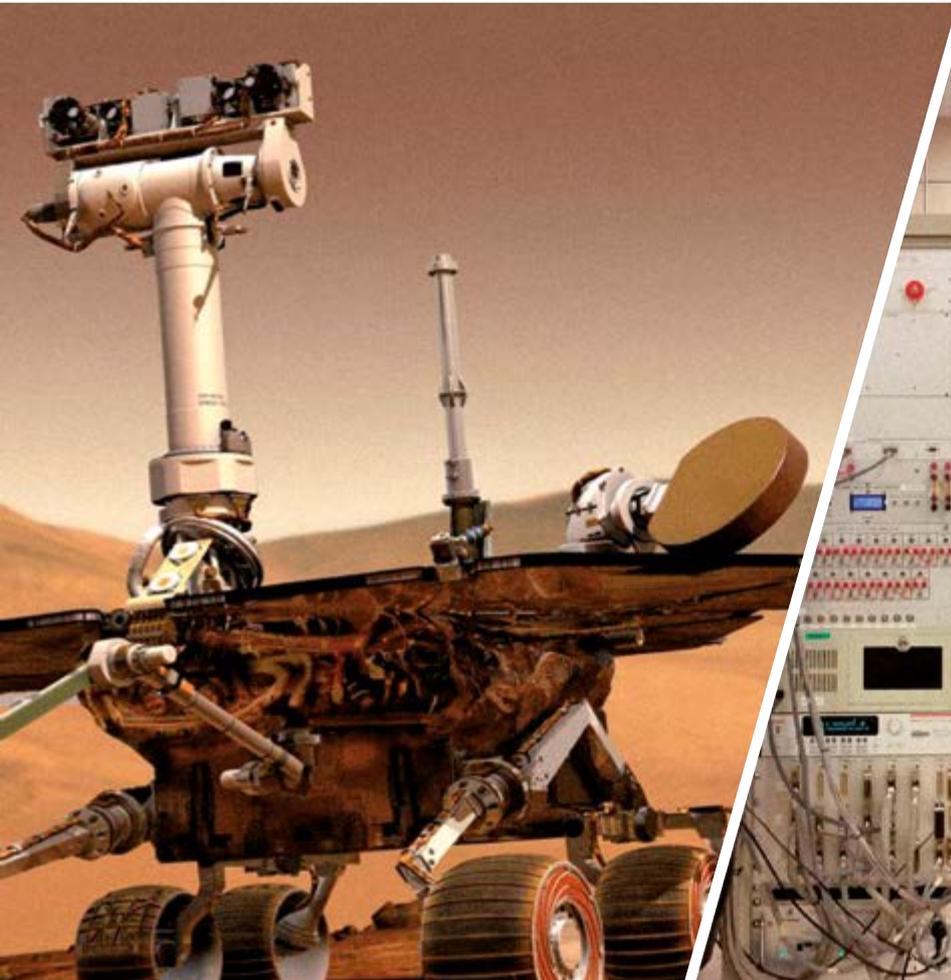
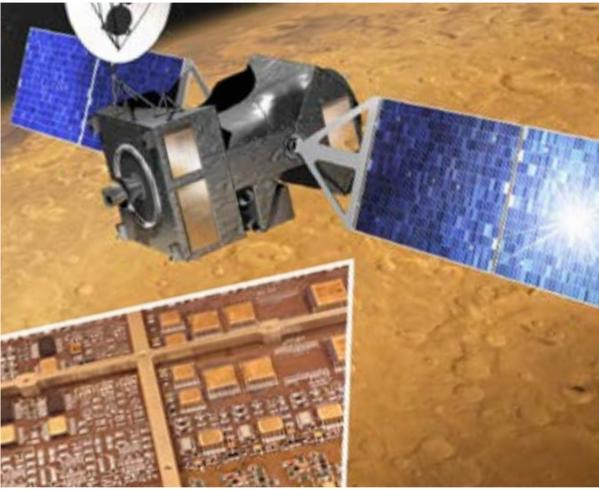
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- Electronic hardware design
- Software design
- Embedded systems design
- FPGA firmware development
- CAD Layout design
- Mechanical design

Applications :

- Power management
- Data acquisition
- Data processing
- Communication
- Test Programs



# 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 ManufacturingDesign 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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Giuseppe Sgrò

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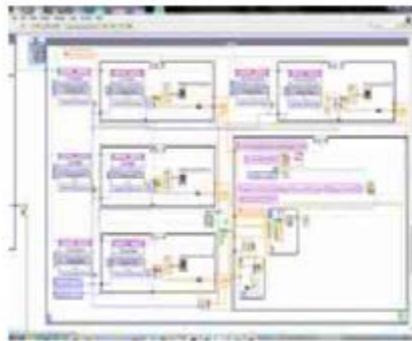
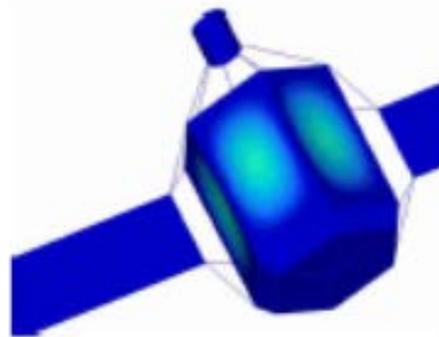
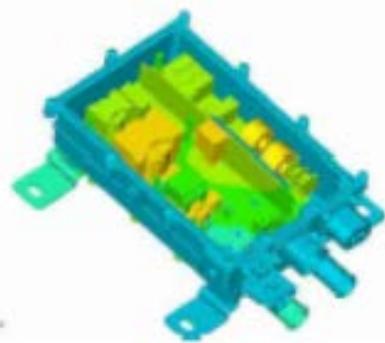
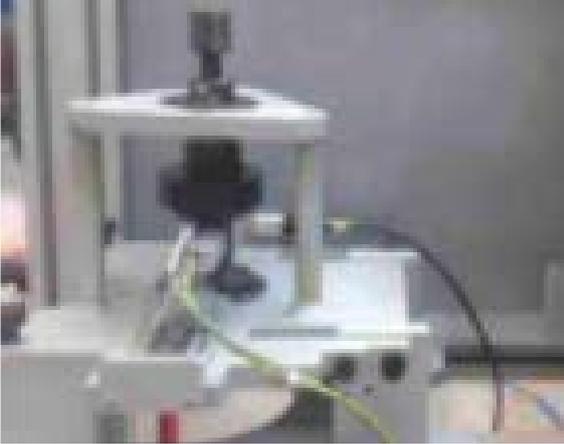
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# Consorzio di ricerca Hypatia

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## Company profile

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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 through KetLab facilities and laboratories 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

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The principal technology areas covered by Hypatia activities include: Advanced Manufacturing, Advanced Materials, Biomaterials, Integrated Applications, Nanotechnologies 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.



## Contact

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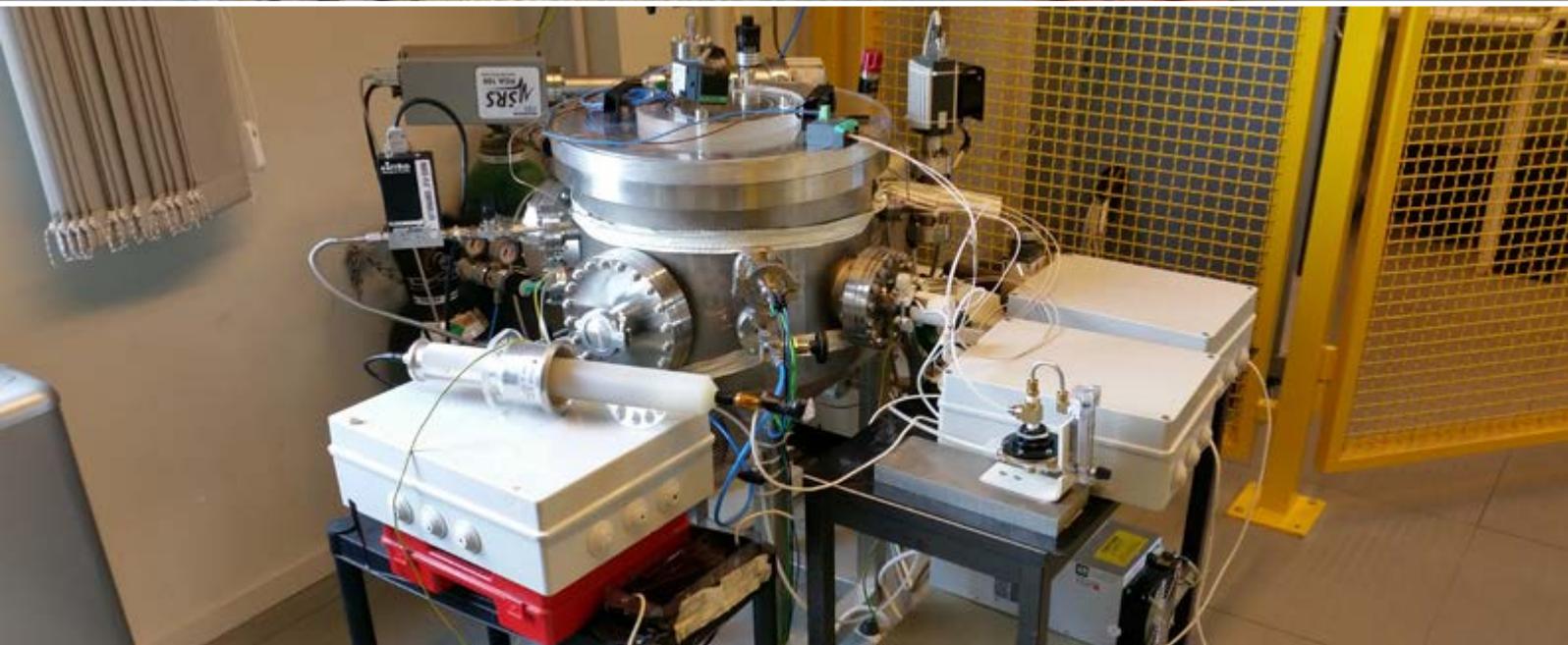
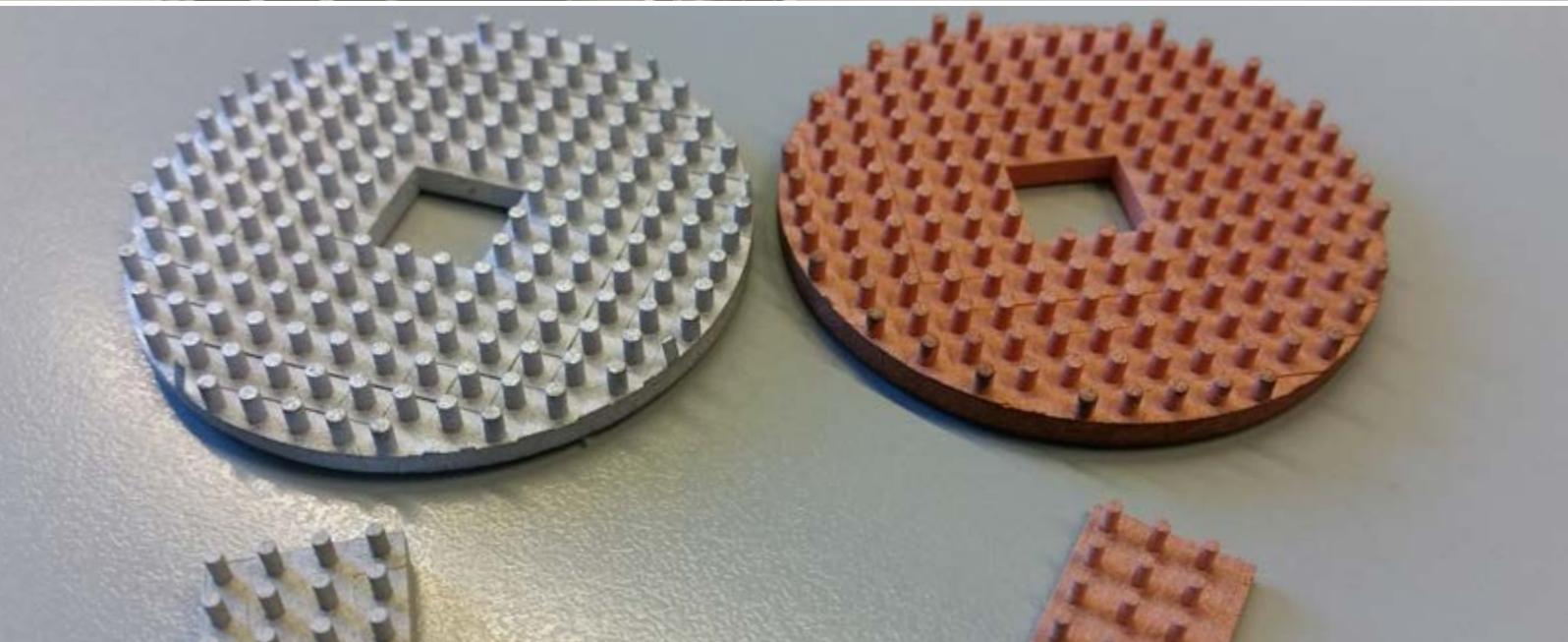
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# D-Orbit

## Company profile

D-Orbit is a service provider for the traditional and new space sectors, with capabilities in satellite manufacturing, launch, deployment, satellite operations, end-of-life strategies and solutions, space propulsion and related critical software. Its products and services cover the entire lifecycle of a space mission, including mission analysis and design, engineering, manufacturing, integration, testing, launch, and end-of-life decommissioning.

## Products | Services | Applications | Technologies

InOrbit NOW, the Company core service, is the first SmallSat launch and deployment service in the market that can deliver up to 16 CubeSats to orbit and release them individually into distinct orbital slots. The service guarantees a wider separation between CubeSats, enabling a faster signal acquisition and a stable collision-free formation that is essential for spacecraft with no independent propulsion.



## Contact

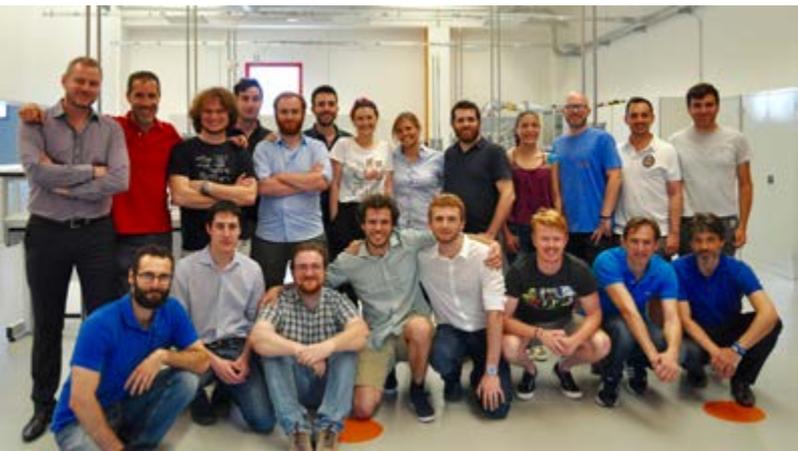
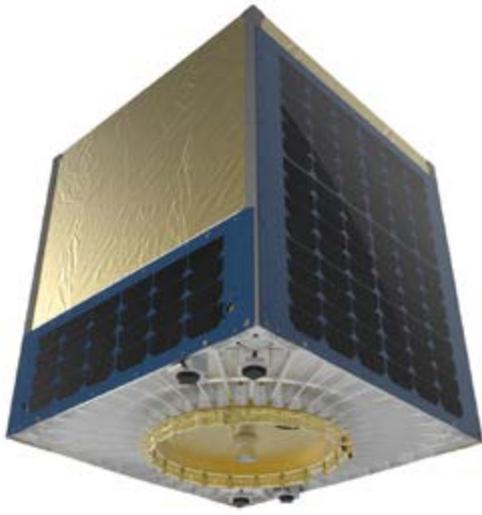
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# Davi - Promau srl

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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.



## Contact

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National Aeronautics and Space Administration



### Side Panel Fabrication

A side panel is bent the proper shape to be attached to the side of the simulated crew module.

# Digmat SpA

## Company profile

Digmat 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 of 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. Two-business unit in which structures the company: On the one hand "Software Development and Research & Development", on the other the "IT Services and Consulting". The first section develops Software for SMEs, large company, public bodies and research institutes. The research laboratory has the knowledge, expertise, professionalism and equipment to carry out the study, and development of SW systems oriented to the management of geo-located data for indoor and outdoor environmental monitoring.

In the telecommunication context, Digmat 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, Digmat, 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", Digmat 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 Digmat being one of the founding members), EXO, CETMA. Digmat is also involved as partner of Telespazio in the SPACE-ECONOMY-Mirror GovSatCom Program and in several research project in Precision Farming.

## Products | Services | Applications | Technologies

In order to acquire data from several satellites related to different missions, many acquisition systems are in use at the Matera Space Center. Digmat 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.

ACQ: Digmat 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. Digmat has developed the ScanSAR data processor and the CCSDS payload data formatter. In addition, together with Thales Alenia Space, Digmat has worked on the KOMPSAT 5 project and has developed the geocoding and orthorectification processor for all SAR



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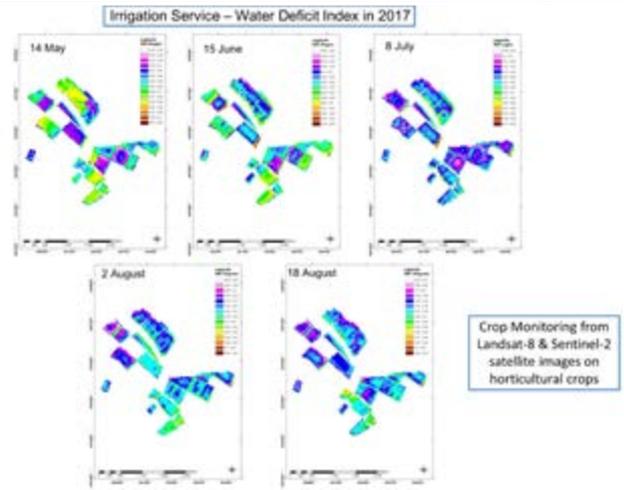
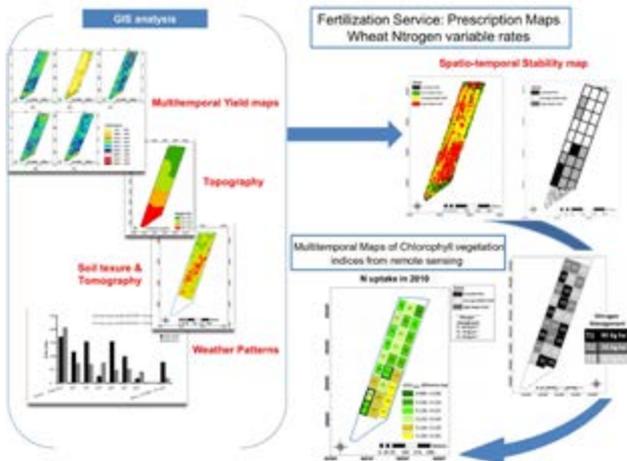
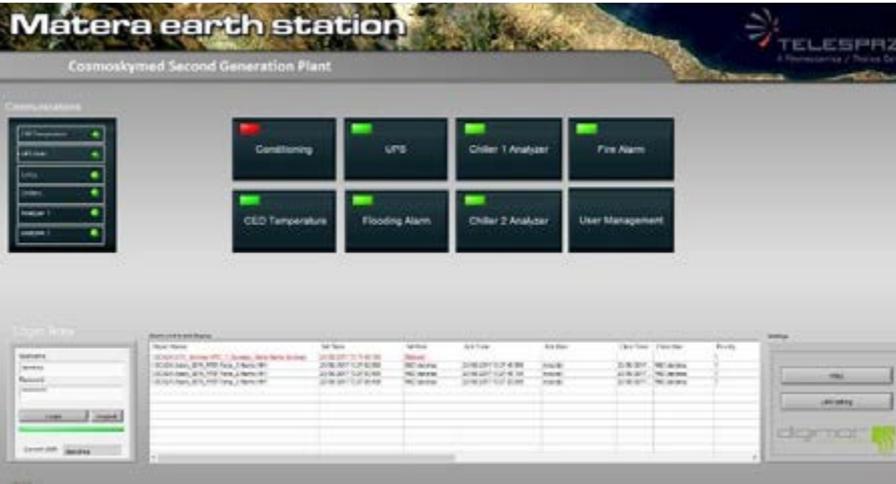
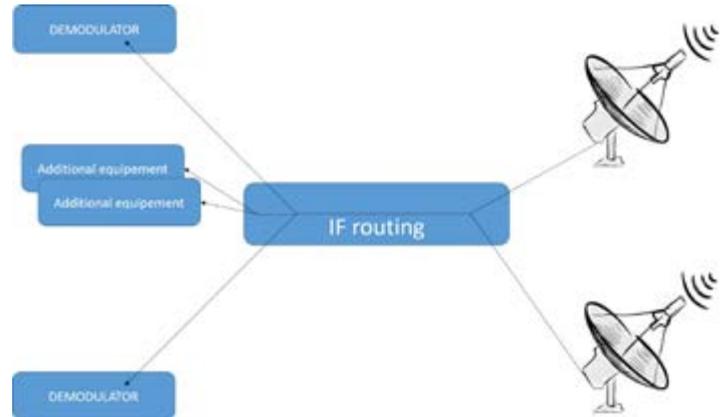


data and the validation system.

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). We would like to mention:

- 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;



# Dragonfly srl

## Company profile

Dragonfly is an innovative start-up offering an all-around support to enable customers adopting Additive Manufacturing technologies within their industrial process.

Dragonfly has been established following a two-year experience as trusted advisor for the Additive Manufacturing adoption within Finmeccanica / Leonardo Group. From 2014 to 2016 Dragonfly enabled a leading missile system company to the industrialization and serial AM production of critical parts in aluminium, titanium and stainless steel alloys.

Today, Dragonfly offer a wide range of industrial 3D printing product and services, from customized business cases to system integration services and from products engineering design to third parties prototyping & production.

Dragonfly has developed a strong experience with top customers in fields such as aerospace and defence, automotive and Formula1, energy and power generation, mechanical automation and electronics.

Dragonfly Srl has been established in Rome with technical and operating offices at San Lazzaro di Savena (BO) and a research office at the University of Brescia .

## Products | Services | Applications | Technologies

### ADOPTION

To quickly deliver an industrial assessment on AM technologies adoption, Dragonfly developed a specialized methodology (AMALFI Additive Manufacturing Assessment for Lean and Fast Introduction), which simulates the economic and financial benefits (EBIT and FOCF impacts) from the EOS additive manufacturing technologies.

### ENGINEERING

Dragonfly engineers combine the use of traditional software (CAD, CAM and FEM) with new additive design tools to obtain components with superior performance in terms of weight, strength and fluid dynamics. The result is the design and validation of lighter parts, with optimized lattice structures, the consolidation of assemblies and the upgrading of thermal performance with conformal channels. The redesign experience of lightened satellite component (in partnership with EOS and Thales Alenia Space - Italia) put Dragonfly at the top of this specific design activity in aerospace.

### MANUFACTURING

Dragonfly's Service for rapid prototyping and production has integrated EOS additive manufacturing technology (ISO EN9100 certified) and is able to produce parts compliant with the Aerospace and Automotive F1 quality standards. For its projects, Dragonfly uses EOS powders such as AlSi10Mg, Titanium Ti64 and an engineered aluminium alloy reinforced with ceramic material (Al 2024X) ensuring high mechanical properties even at high temperatures.

### ELECTRONICS

3D Printing of electronic components complete Dragonfly offering. With the first Optomec Aerosol Jet printer installed at the University of Brescia, Dragonfly is able to provide research, experimentation and prototyping for the development of integrated sensors and antennas of "smart" products for IoT applications.



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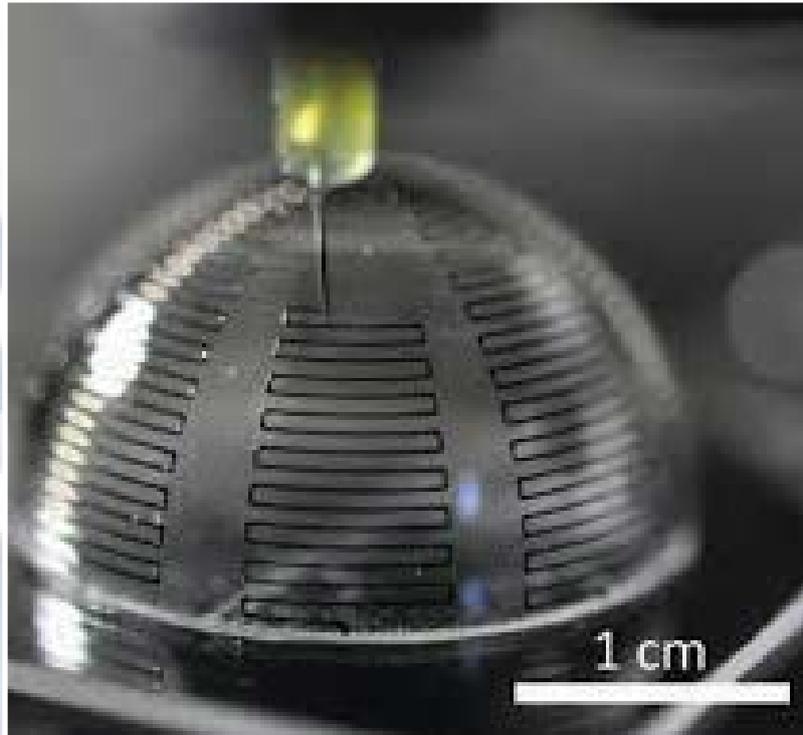
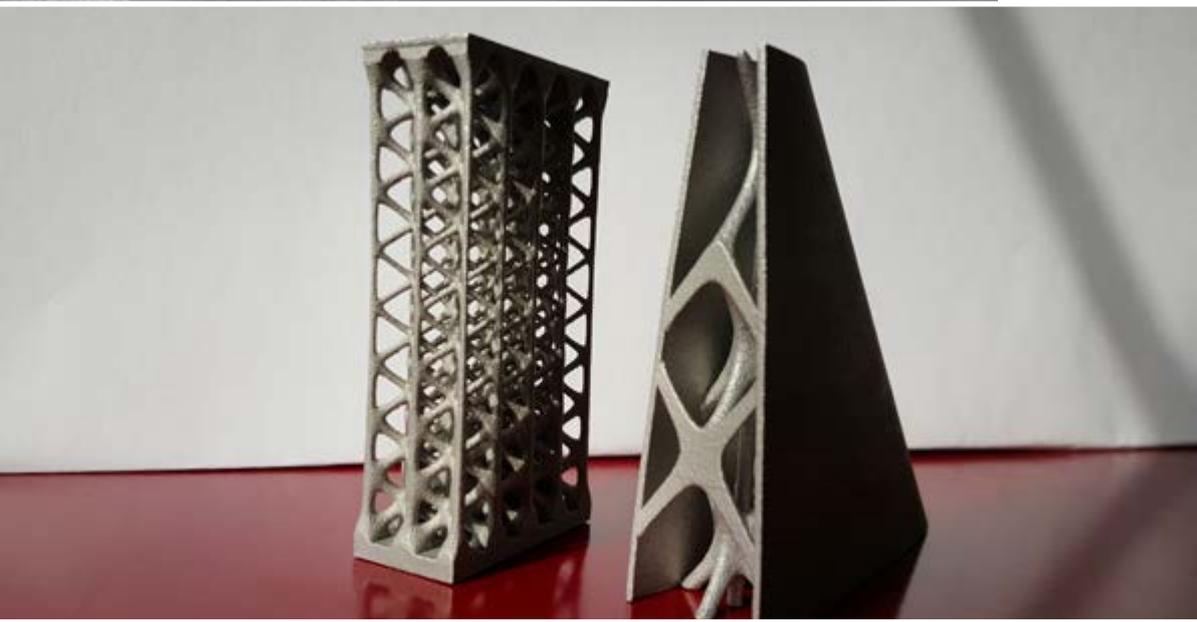
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## Company profile

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.



## Contact

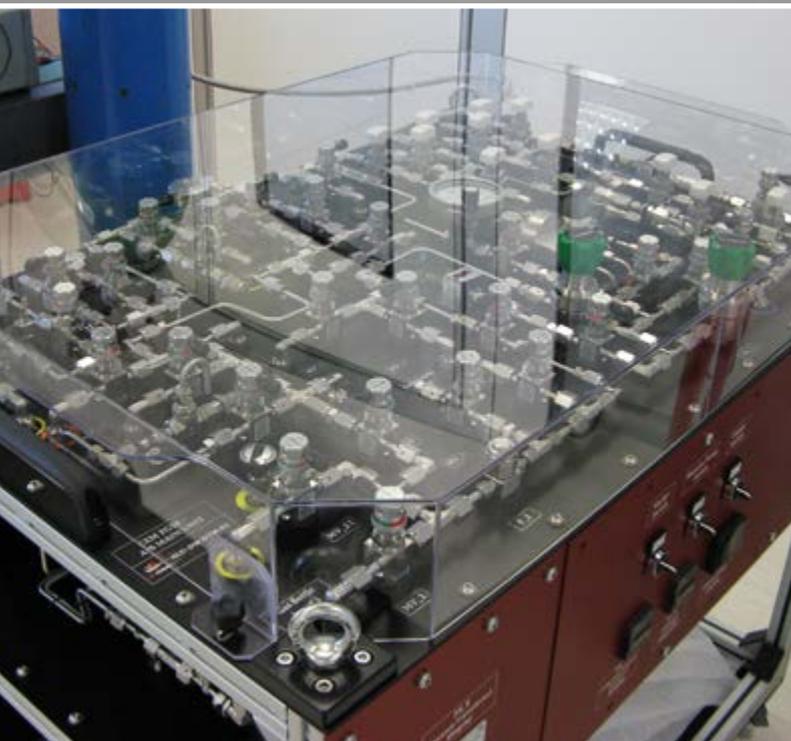
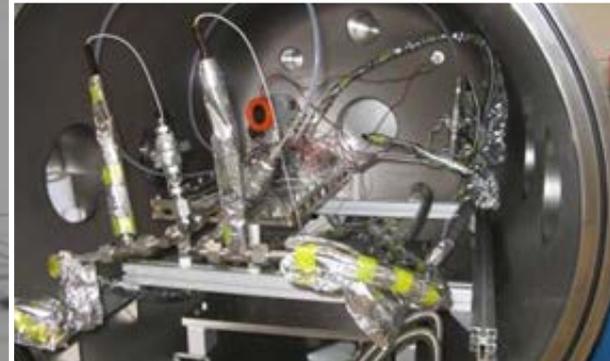
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# EICAS Automazione S.p.A.

## 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:

1. **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.
2. **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.
3. **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 cooperation 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 Tracker is tailored for the emerging market of SmallSats where the trade-off performance/cost/size is fundamental for spacecraft manufacturers. The system is currently being tested at TRL 9 in a IOD co-funded by H2020 EIC SME Instrument Programme.

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.

- 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



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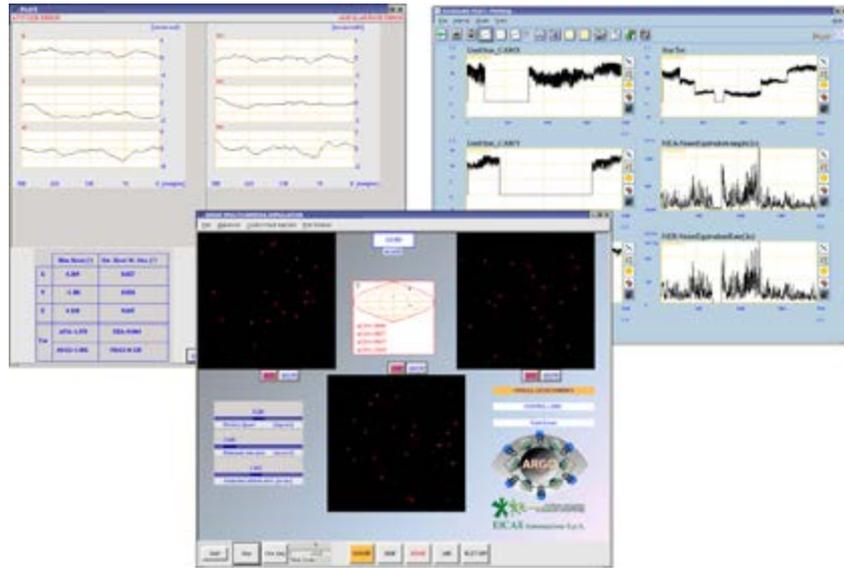


Multisensory precise localisation system for safer and autonomous vehicles, applicable in automotive sector (active safety, autonomous vehicles), industrial automation (automated guided vehicles), in aerospace (unmanned aerial vehicles, AUTOTAXI functionality on the airport surface).

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 -Institute 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.

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.

Through EIE Space Technologies the subsidiary of EIE GROUP dedicated to aerospace 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.



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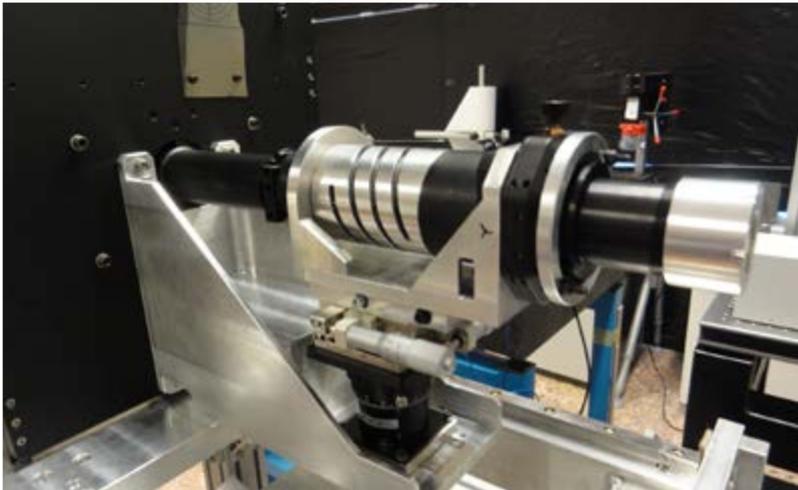
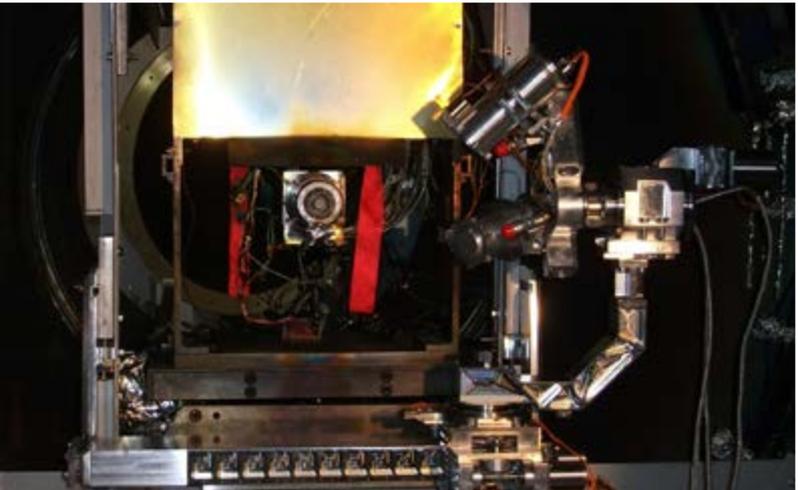
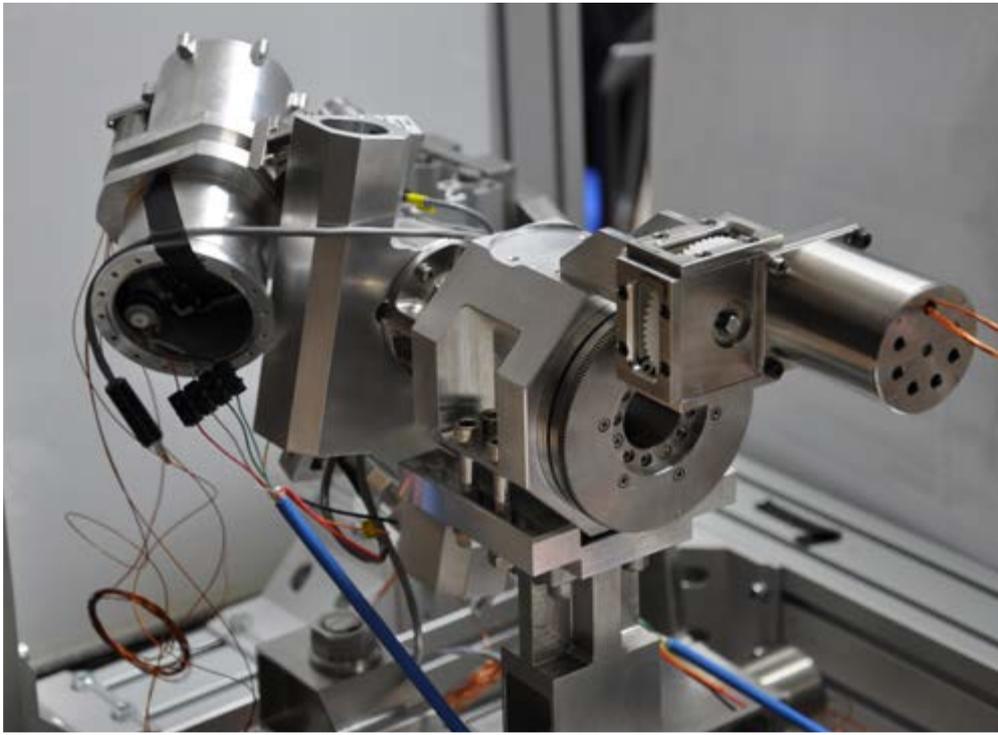
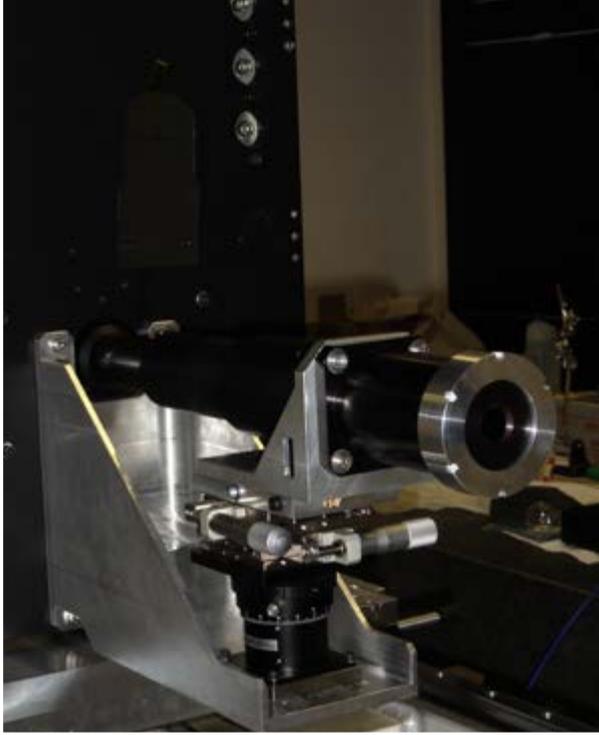
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# Elital srl

## 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 Italy 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, EUROSKYWAY, 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).



## Contact

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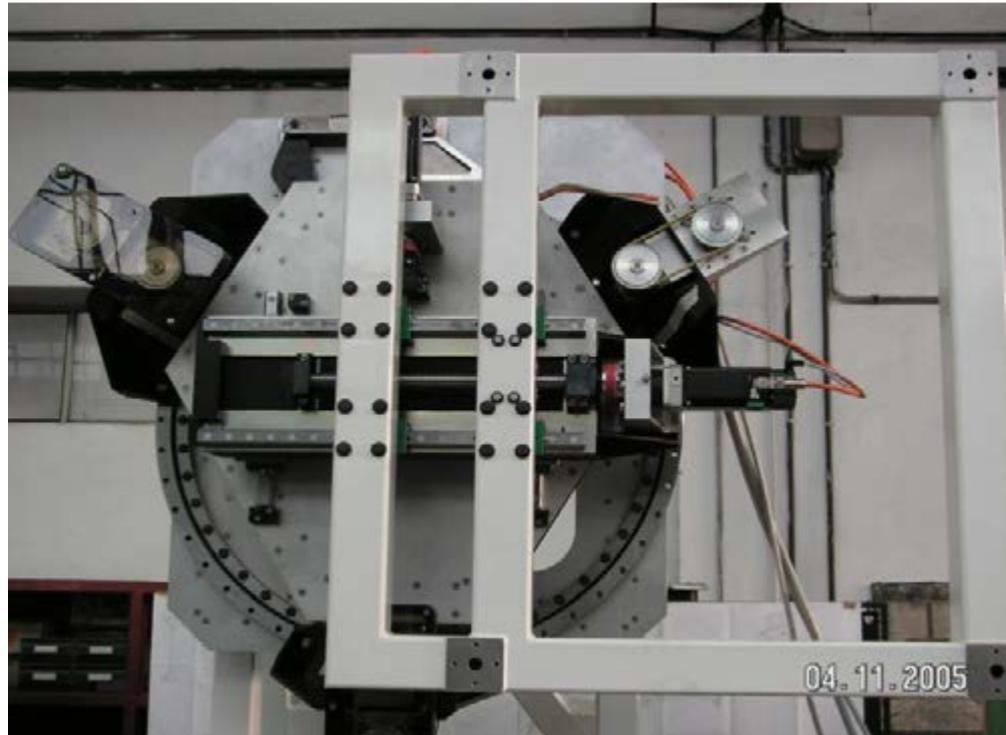
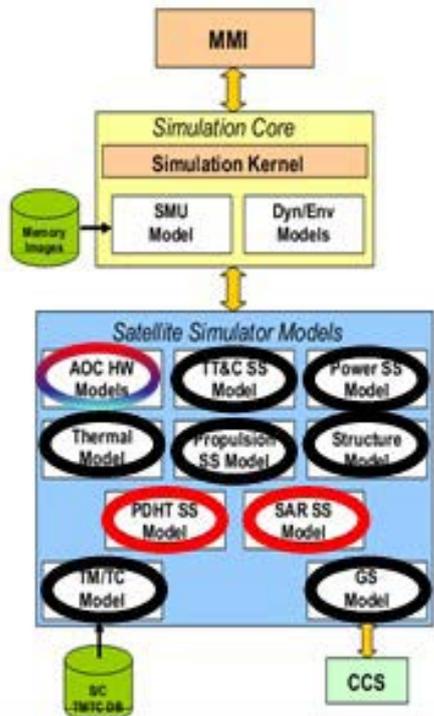
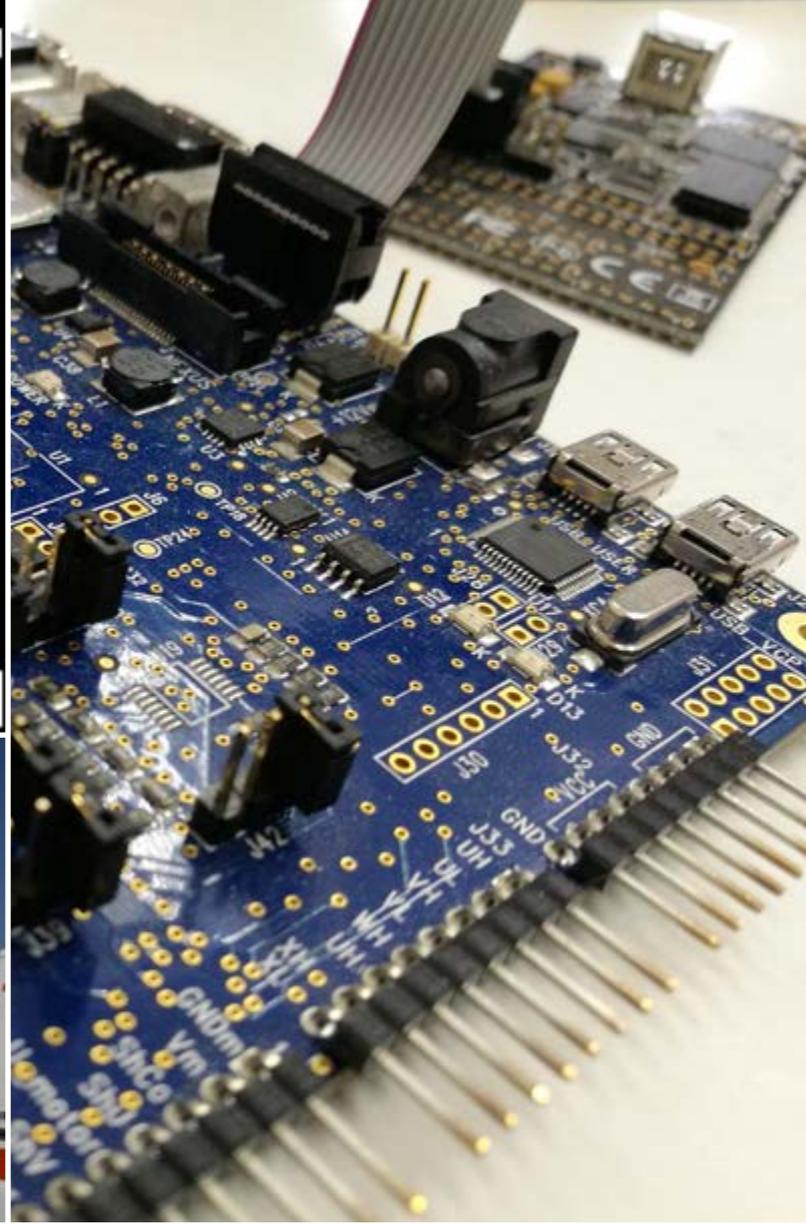
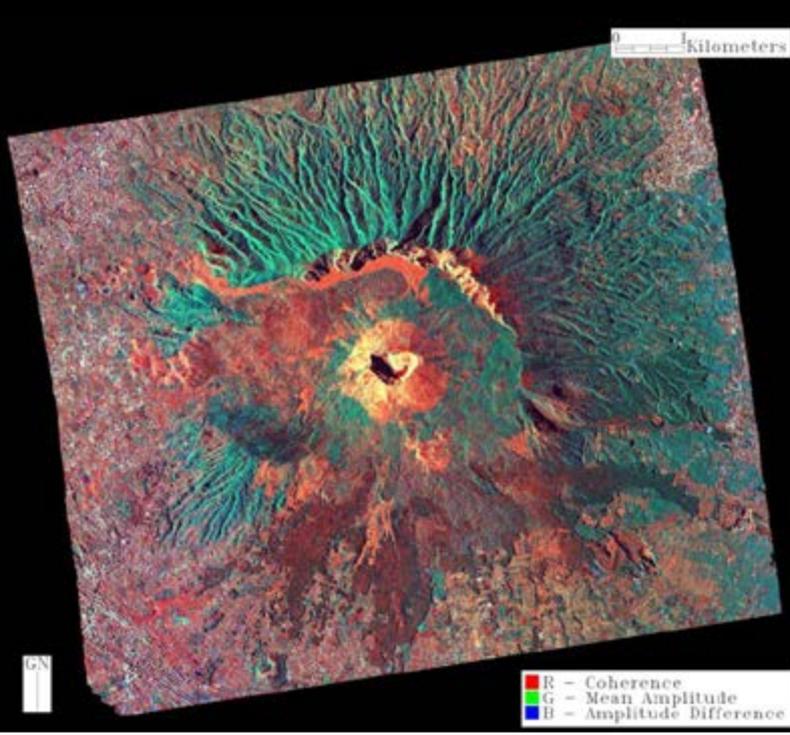
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## Company profile

FlySight is the Strategic Business Unit in Defence and Security of Flyby Srl, company specialized in the development of DSSs (Decision Support Systems) exploiting edge technologies in the fields of Remote Sensing and Big Data Analytics. The FlySight Team provides solutions for 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

The 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 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.



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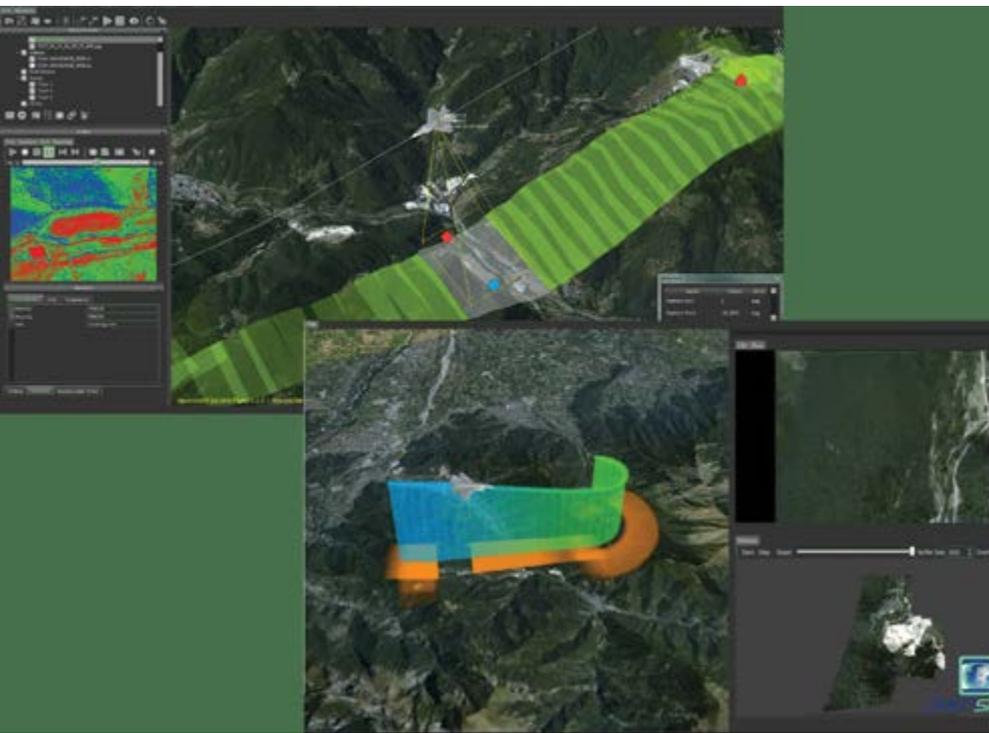
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Share information:

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.



# GAROFOLI S.p.A.

## Company profile

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

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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CEO

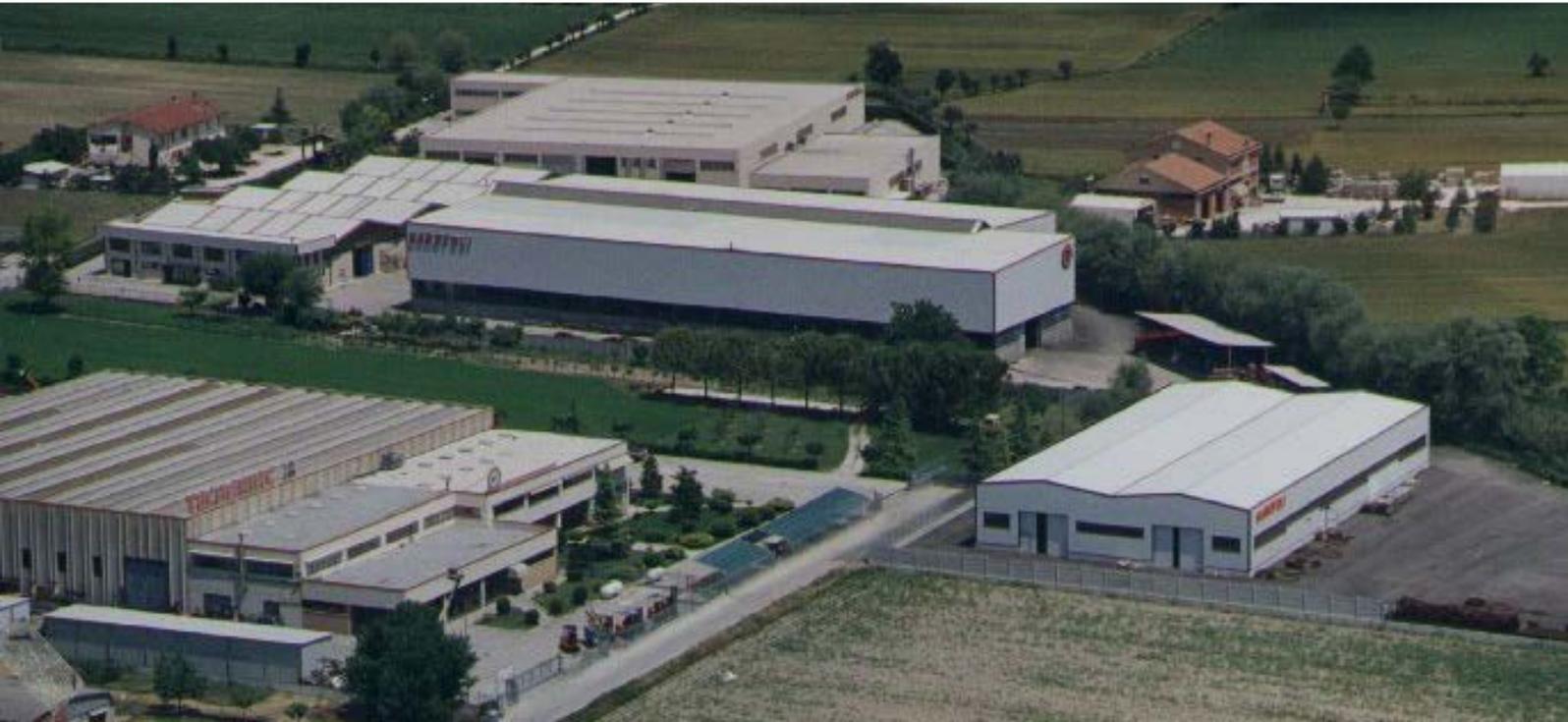
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# GAUSS SRL

## 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.

### 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



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orbit.

#### HERCULES ON BOARD COMPUTER

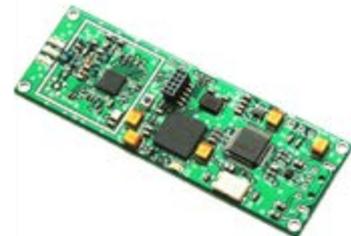
HERCULES is an advanced OBC that features a dual-core 220MHz ARM Cortex R4F 32-Bit CPU, with cores working in lockstep. It integrates two 9DoF IMUs, a FRAM memory, a NOR flash and SDCard. The CPU architecture makes it able to detect and to recover from common mode faults.

#### GAUSS RADIO UHF

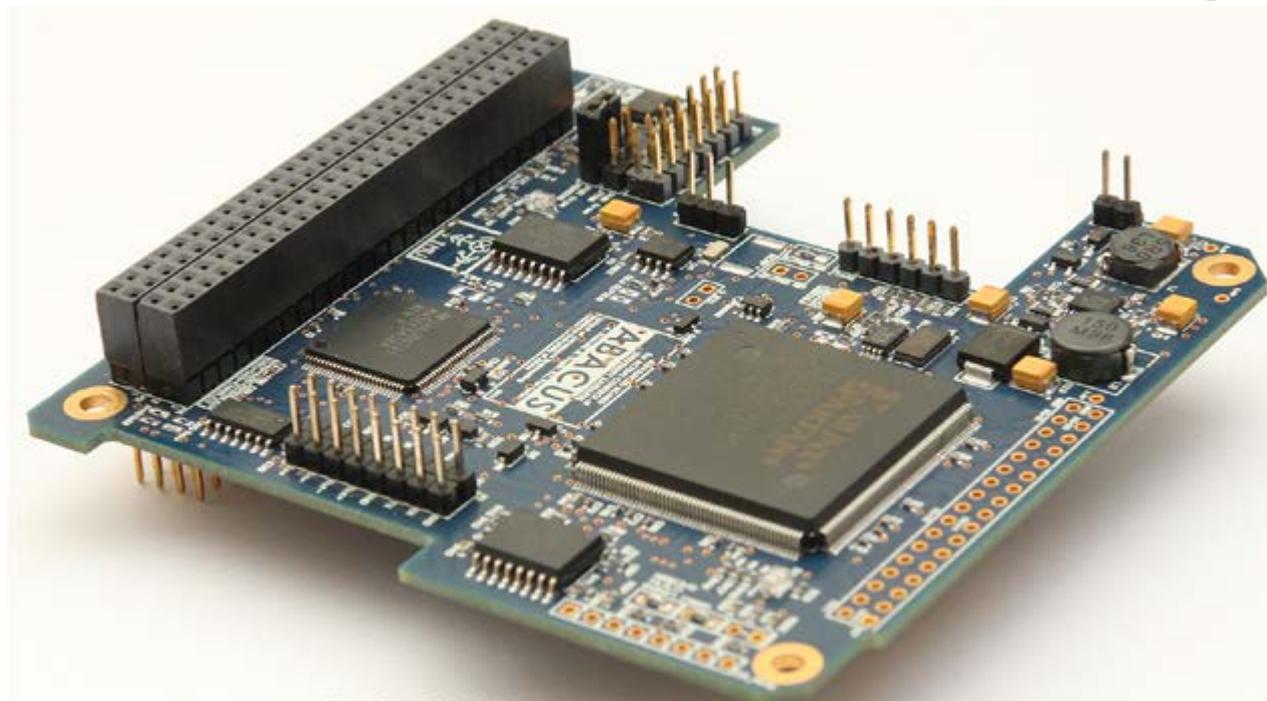
The GAUSS UHF transceiver is designed for nano and microsatellites and it is available in two RF power versions (2W and 5W). It includes a TNC, with speeds up to 125kbps, using RAW, AX25 and FEC protocols. Its small dimension allows to stack two radios on the same PC104 board. Test equipment and software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



GPOD



ABACUS OBC

# 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 object's features. Applied to ocean monitoring, this approach



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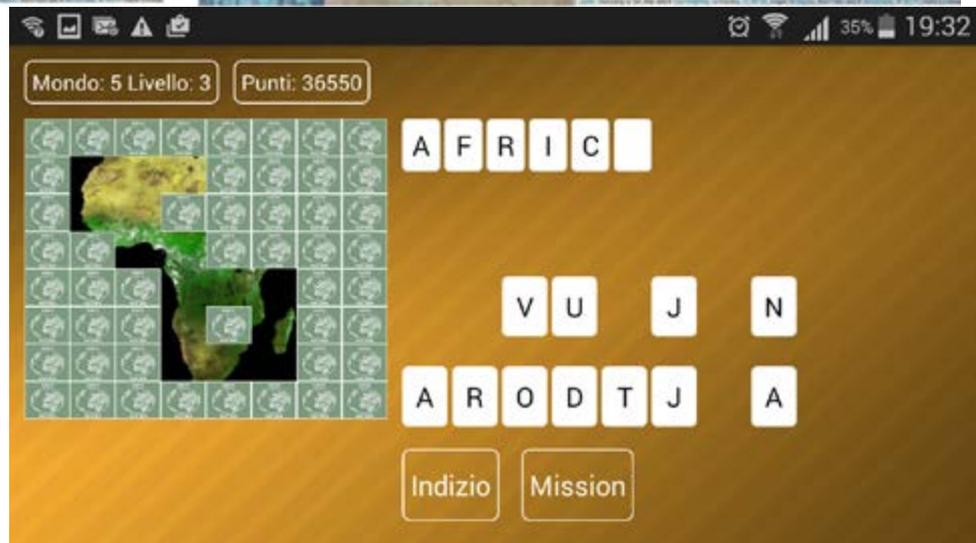
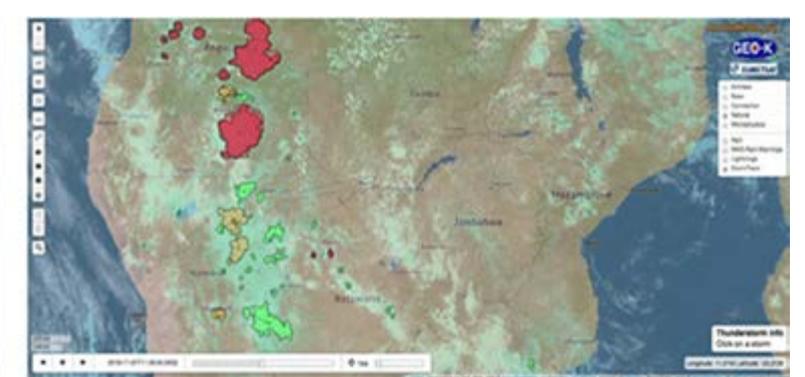
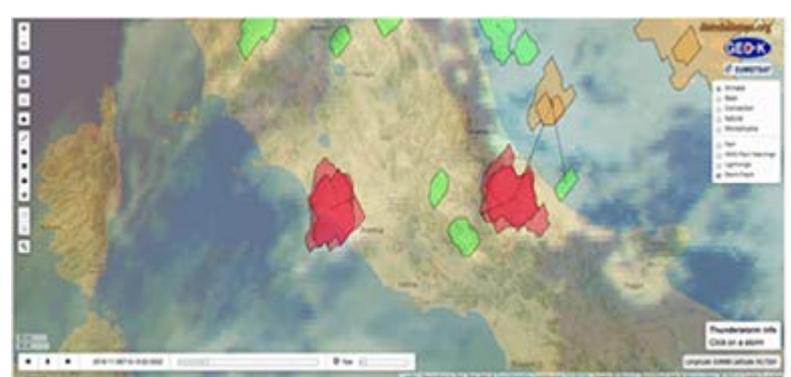
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can, for example, detect ships and oil spills in a radar image.

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 Antropic 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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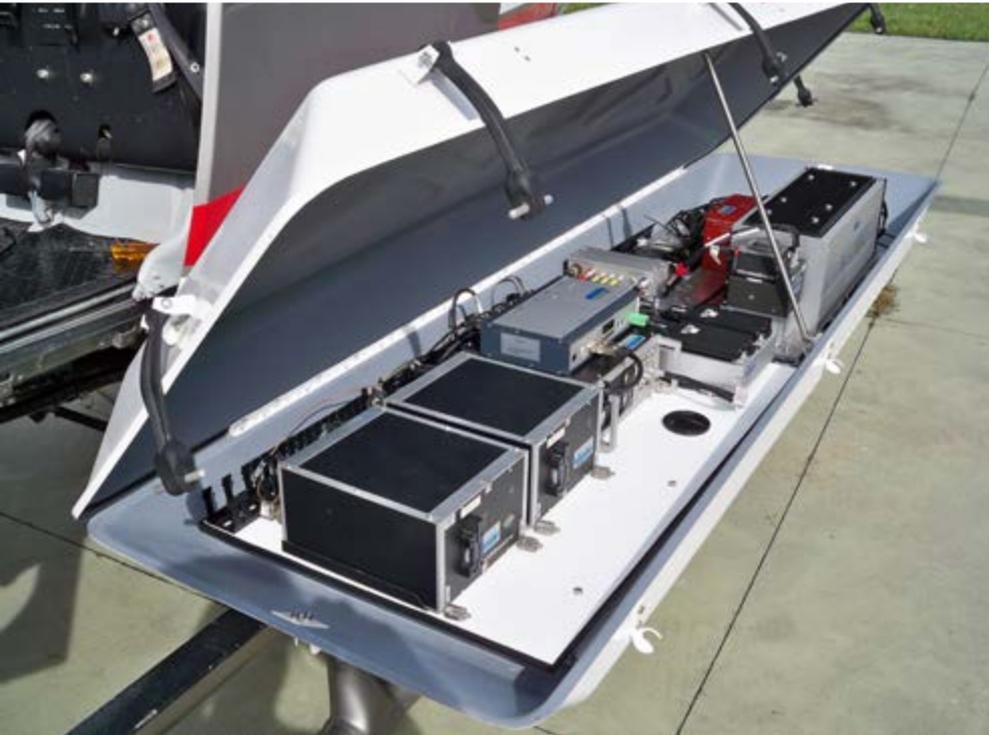
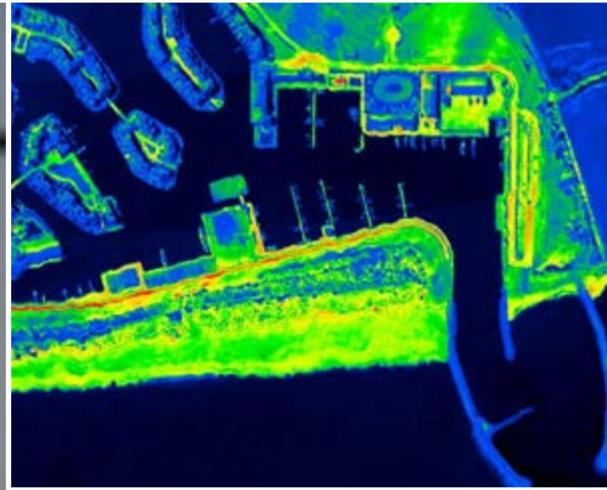
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# GEOPHYSICAL APPLICATION PROCESSING (GAP) SRL

## Company profile

Geophysical Applications Processing s.r.l. is a spin-off company of Politecnico di Bari, established 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.

All the activity is performed on the basis of competencies and pay-offs of research projects, particularly in the Remote Sensing Group of the Department of Physics of Bari, in collaboration with the Institute for high studies on Intelligent Automation Systems (ISSIA) of the National Council of Research (CNR), based in Bari, Italy.

During the last twenty years, the following scientific competences have been acquired:

- Synthetic Aperture Radar (SAR) data processing;
- Developing of a multi-temporal SAR interferometric processing chain (SPINUA © - Stable Points Identification in Non Urbanized Areas) for ground instability monitoring (subsidence, landslides, earthquakes);
- Analysis of optical data acquired by satellite platforms aimed at the inference of biophysical parameters such as water quality and chlorophyll;
- Meteorological and climate data processing; high resolution forecast services using numerical meteorological models;
- Development of signal and image processing algorithms using both interpreted and compiled programming languages (MATLAB, SCILAB, IDL, C, C++) as well as Assembly;
- Development of algorithms on parallel architectures and computational grids.

Starting from this scientific background, GAP intends to provide products and services characterised by high level of innovation and scientific / technological contents in the field of remote sensing and 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 of satellite remote sensed data;
- Training activities dedicated to the product users;
- Activities of research and development aimed at updating the scientific knowledge in the specific fields of interest.

Shareholders of GAP are Politecnico di Bari, Planetek Italia srl, SITAEL SpA and seven professionals among Polytechnic professors, CNR researchers and young Physics and Engineering graduates.

## Products | Services | Applications | Technologies

Remote sensing by satellite-borne SAR sensors

- Subsidence Maps
- Landslide Monitoring and Warning Maps
- High Resolution DSM
- Buildings and Infrastructures Stability Monitoring
- Ground Displacements Generated by Earthquakes
- Flood Maps
- Oil Spill Detection

UAV technologies for Photogrammetry and Remote Sensing

- Landslides monitoring (orthophotos and 3D)
- Stability analysis of buildings, monuments, bridges, dams, infrastructures (HR



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videos)

- Natural hazards monitoring (HR videos)
- Inspection of wind turbines and plants (HR Photos and Videos)
- Dumps and mines (orthophotos and volumetric analysis)
- Archaeological sites (orthophotos)
- Monuments (3D reconstruction)
- Buildings and construction industry (HR orthophotos and DSM)

VIS/NIR Satellite Remote Sensing

- Coastal Erosion Maps
- Water Quality Products
- Dynamic Modelling of physical and biological parameters in coastal waters
- Water Leaving Reflectance
- Air Quality

Meteorological Services

- HIGH RESOLUTION METEOROLOGICAL MODELLING
- WIND REANALYSIS
- METEO-CLIMATOLOGICAL DATA PROCESSING
- CUSTOMIZED WEATHER SERVICES

Other products and services:

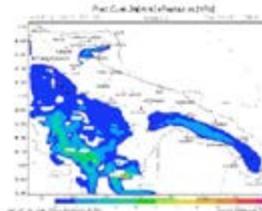
The long-term experience in the field of digital signal processing has enabled the transfer of GAP algorithms, developed for remote sensing, in other areas where advanced techniques are required for digital processing of data. Examples of this technological transfer are:

Stereo Vision & 3D Tracking

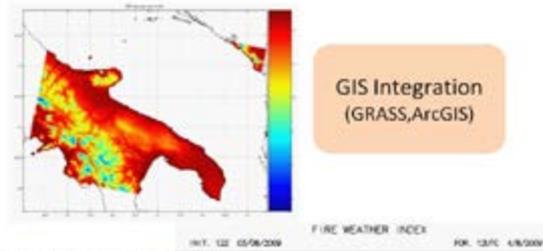
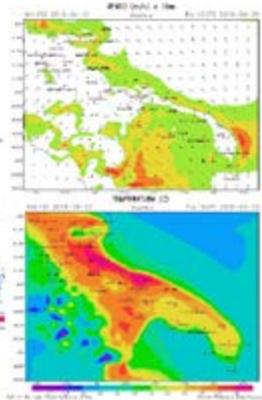
Biomedical Applications

## Meteorological forecast

*RAMS and WRF models  
Max operative res.  
4km and 2km*



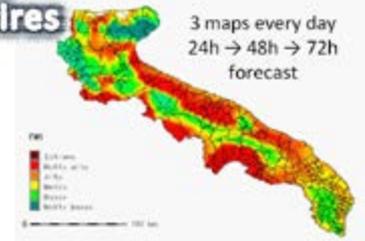
*72 h forecast maps with  
hourly frequency*



GIS Integration  
(GRASS, ArcGIS)

## Forest Fires

Prediction of  
daily forest  
fire hazard  
on municipal  
scale



3 maps every day  
24h → 48h → 72h  
forecast

## UAV technologies for Photogrammetry and Remote Sensing

Coastal Areas Monitoring



Landslides Monitoring



Archaeological Sites Mapping



Irsi Mountain

## 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 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).



## Contact

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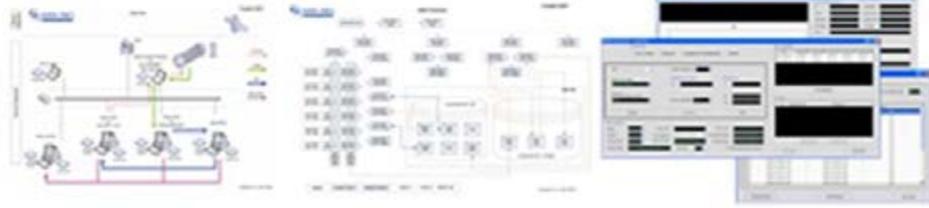
[www.gmspazio.com](http://www.gmspazio.com)  
[info@gmspazio.com](mailto:info@gmspazio.com)



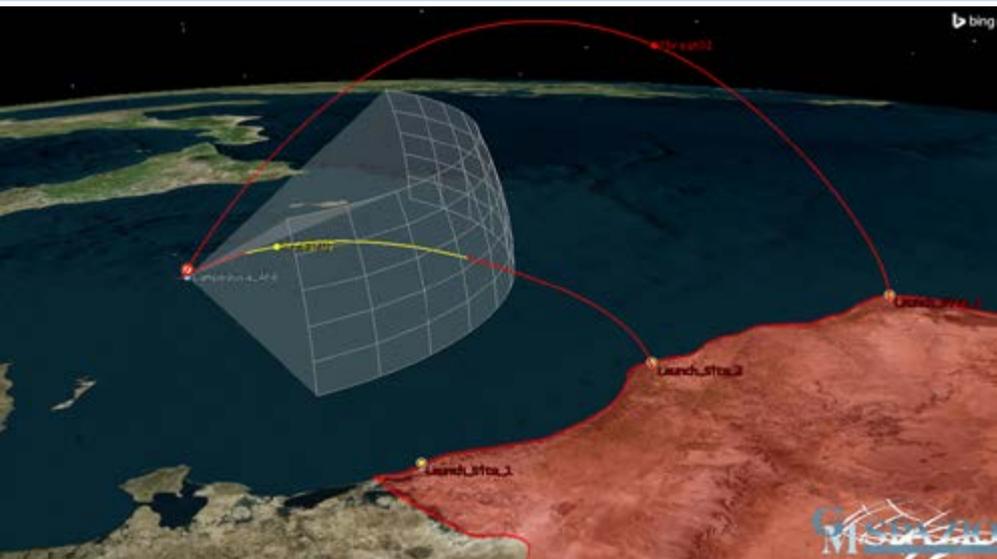
# SENSING LAYERS



**GM SPAZIO**



**agi**  
Analysis software for land, sea, air, & space



## Company profile

IMT is a private SME, founded in 1991 and active in the space sector on two 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.

IMT srl's Quality Management System has been formally certified by Det Norske Veritas (DNV) and declared compliant with standard UNI EN ISO 9001:2008 (ISO 9001:2008). Certification number is CERT-18458-2007-AQ-ROM-SINCERT.

The certification applies to the following application fields:

Design and Development of equipment prototypes for Space and Defense. Engineering support in the field of systems and quality disciplines such as: Product Assurance, QA, Software QA, Reliability, Safety, Component characterization and tests, Materials and Processes.

## Products | Services | Applications | Technologies

ERMES is a scientific nanosatellite, based on Cubesat 3U form factor, compatible both with PPOD and ISIPOD dispenser. The Cubesat is developed at IMT as result of a Regional program based on EU funding. The total mass is 4 Kg.

Solar Array Drive Assembly (SADA)

The SADA is composed by a solar array deployable system (6 panels) and a drive mechanism for solar pointing, compliant with 3U Cubesat Platforms.

The system is able to increase the power transfer by a peak of 5W to an average of 30W. An autonomous control system is available, both for logic and actuation. Suitable slip-rings allow rotation above 360° on the rotation axis.

NADIR - NANosatellite for Didactics and Research

NADIR, the nanosatellite developed by IMT, has been conceived to be a low-cost and medium-high capabilities multifunctional platform. Its main features are:

Two fully separable modules

- The BUS module
- The P/L module

Main Characteristics:

- Modular configuration (each module 300x300x150 mm)
- 15 Kg Satellite BUS
- 10 Kg Custom Payload Accommodation Capability
- 100 W (EOL) available power
- Enhanced Solar Array with Motorized Deployment Mechanism
- Use of Commercial and Mil-Standard Components
- Radiation Hardening features
- 3-years minimum Design Lifetime

EEE Parts Characterisation and Testing

IMT is providing services to main Space actors for testing of eEEE parts, including Upscreening, DPA, Constructional Analysis, Failure Analysis, Environmental Testing, Radiation Testing (TID, SEE, Displacement), Xray, SEM



## Contact

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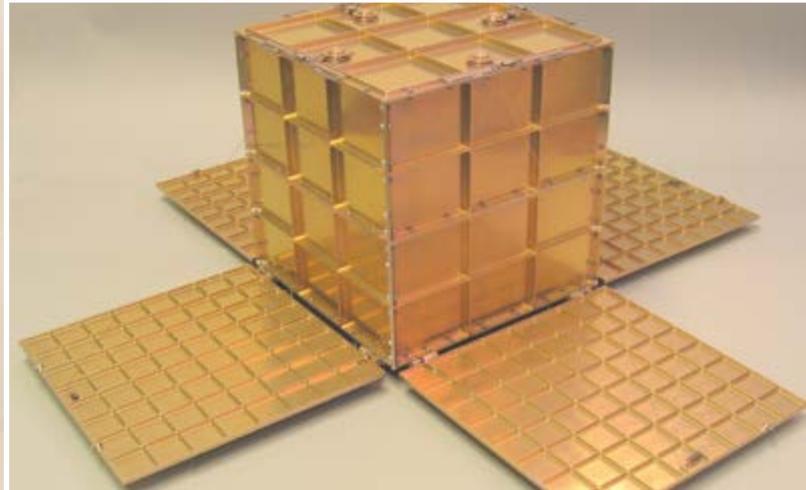
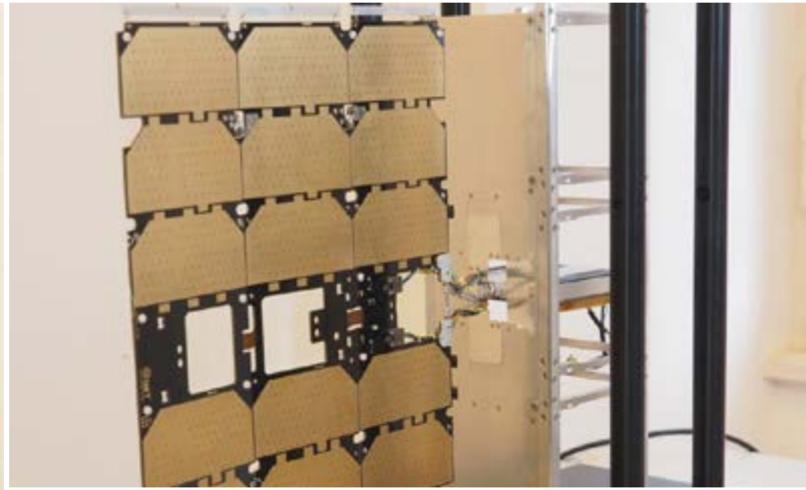
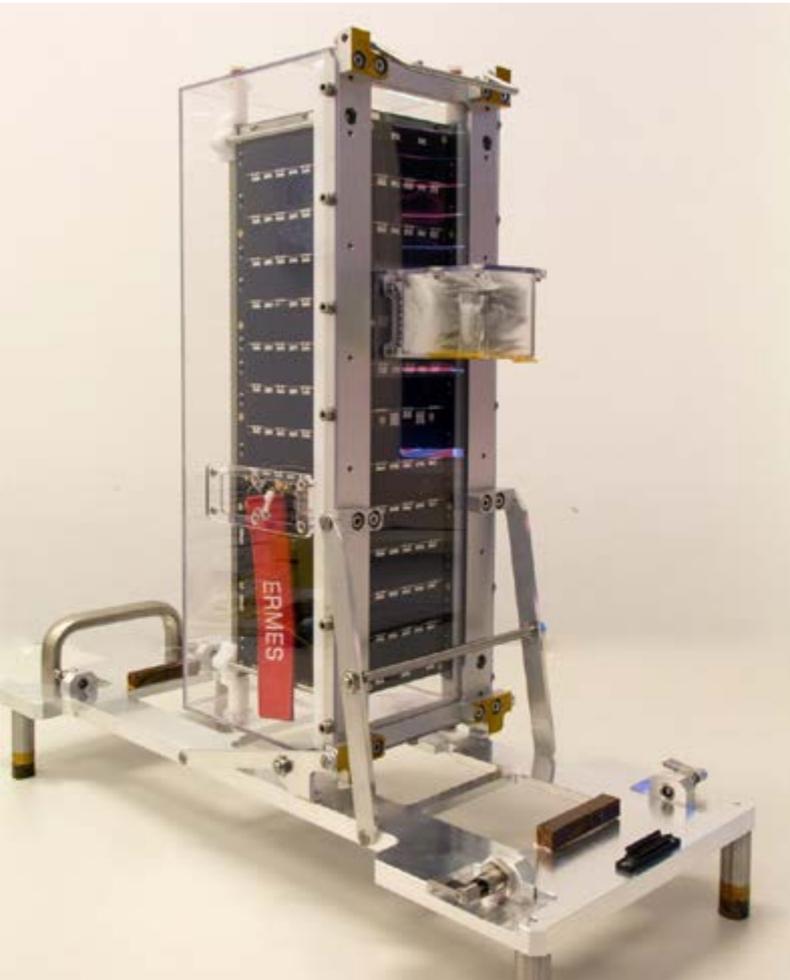
**SME**

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[www.imtsrl.it](http://www.imtsrl.it)

[imtsrl@imtsrl.it](mailto:imtsrl@imtsrl.it)





# 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 Steering Antennas



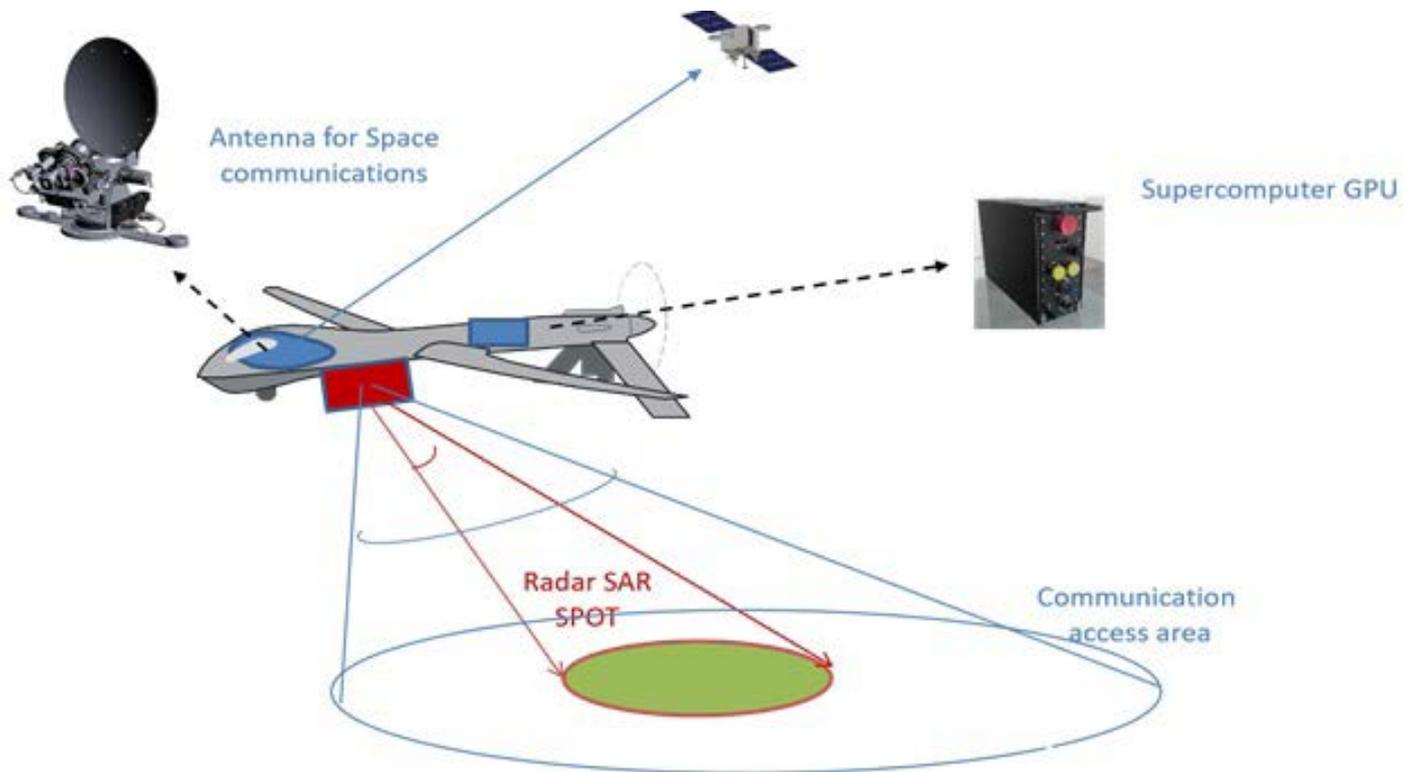
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# IngeniArs S.r.l.

## 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 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 Specially 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.

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.



## Contact

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**SME**

Luca Fanucci

CEO

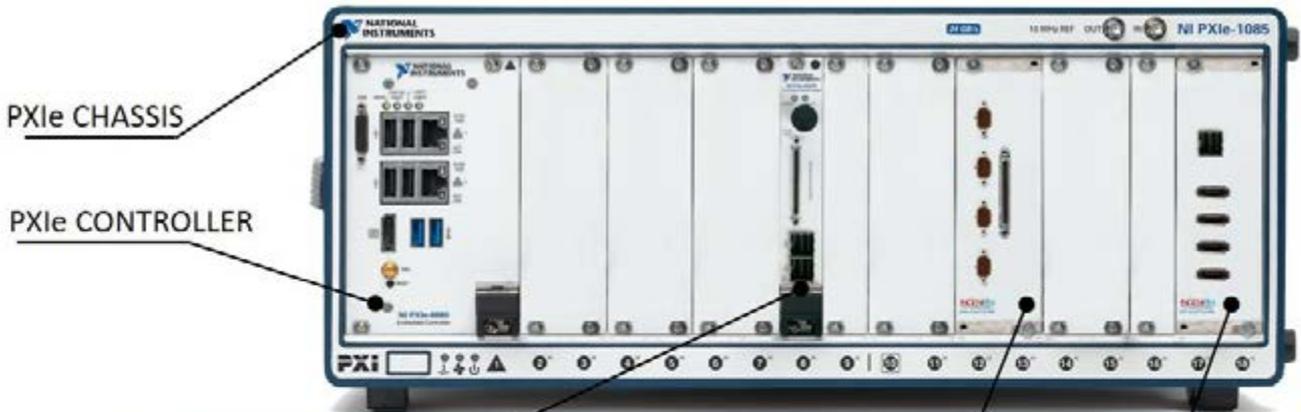
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PXIe CHASSIS

PXIe CONTROLLER

NI PXIe FPGA board

IngeniArs SpW Adapter PXI

IngeniArs SpFi Adapter PXI



NI PXIe-6591



NI PXIe-797x



# 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

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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 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.



## Contact

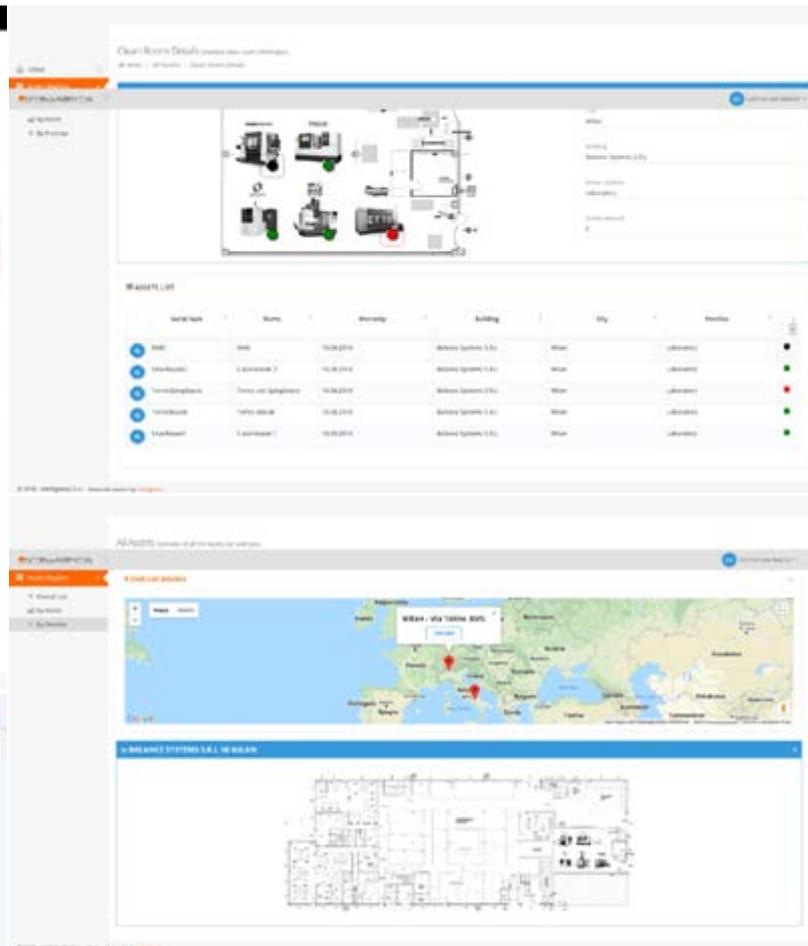
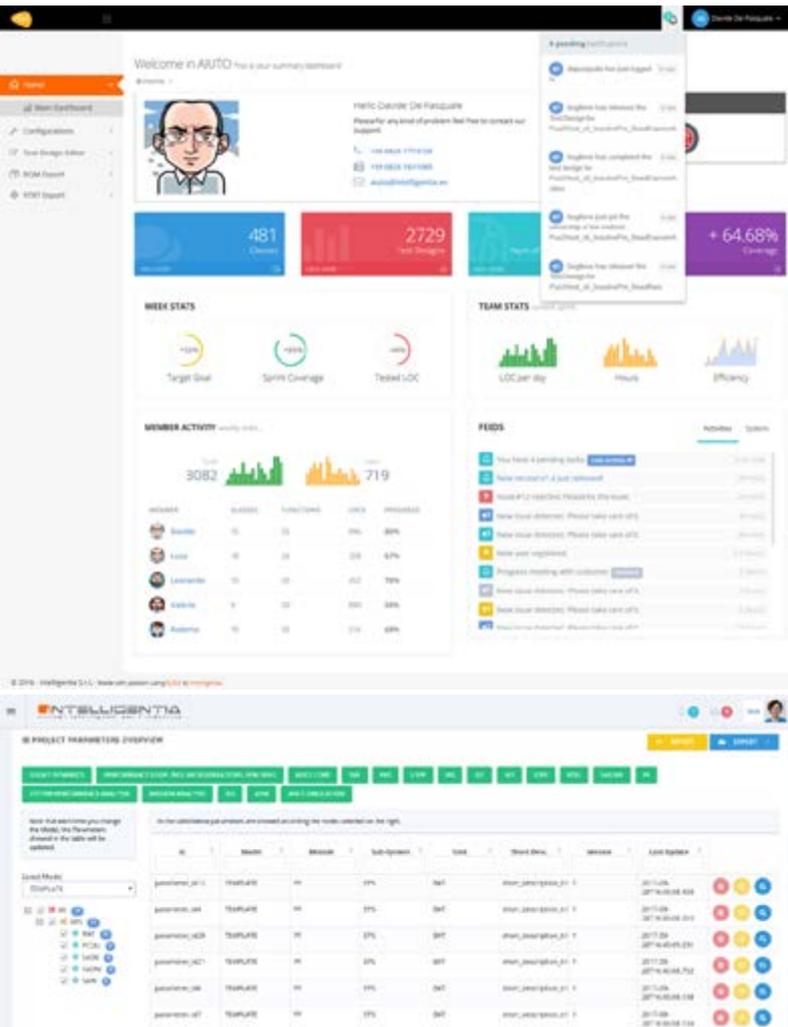
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- Industry 4.0 and IoT: Intelligenta develops and delivers fully integrated solutions and enabling technologies for the Industry 4.0 systems, such as Big Data, IoT, Cyber-security, Cloud Computing, and Simulation. Real-time processing of live data 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

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:**

- 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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# Dashboard



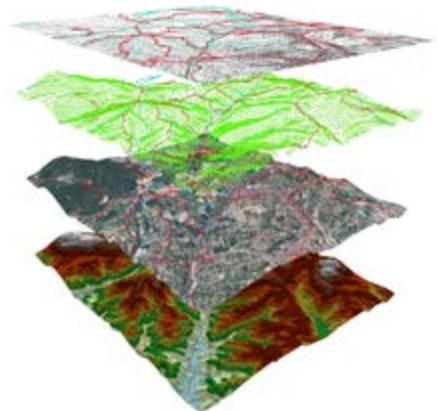
Search interface



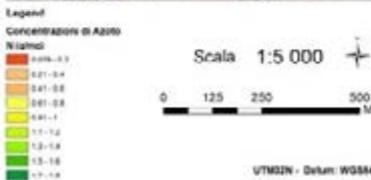
System check



Task management



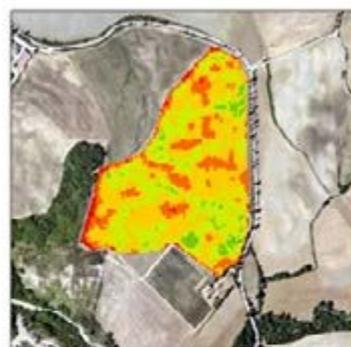
FERTILIZER MAP



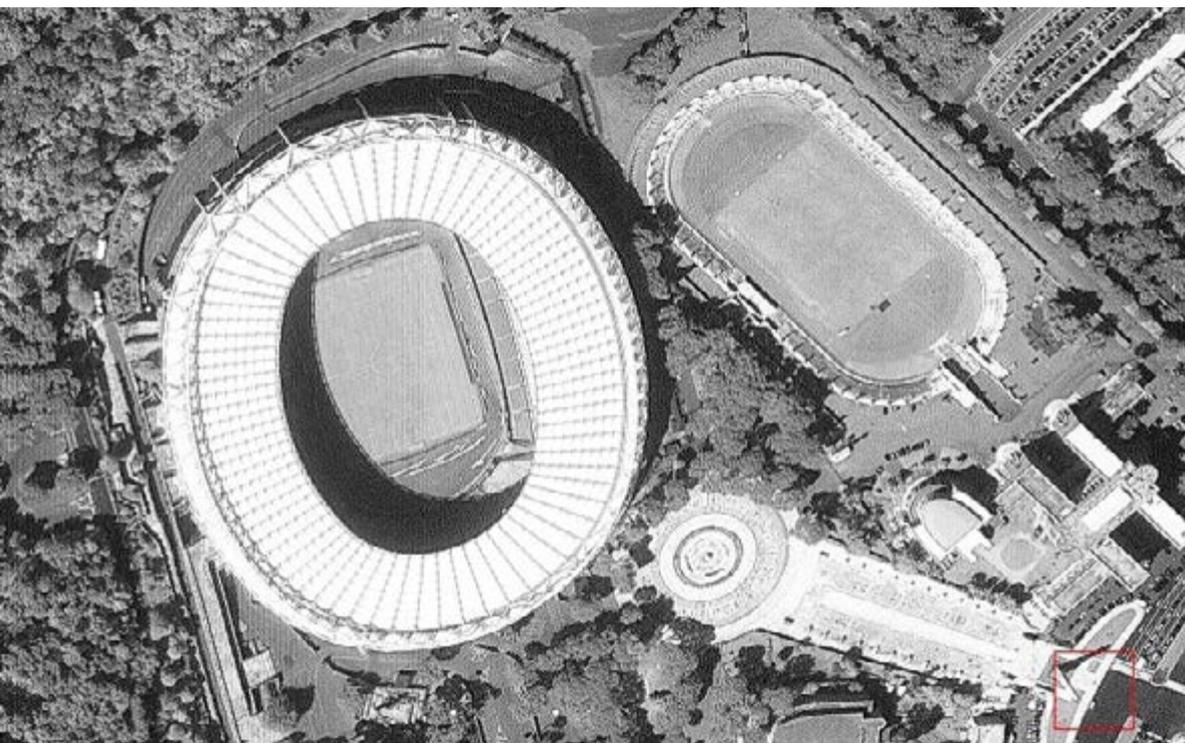
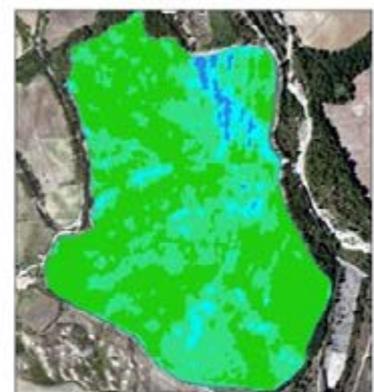
CHLOROPHYLL MAP



BIOMASS MAP



HYDRO MAP



# Issel Nord S.r.l.

## Company profile

ISSEL NORD S.r.l., a Fincantieri company, active in the market for more than 30 years, is specialized in providing a wide range of logistic engineering and product support services for companies involved in both civil and defence sectors.

ISSEL NORD S.r.l. is specialized in the Integrated Logistic Support (ILS), summarized in the collection, analysis and processing of all the information relative to the life cycle of any complex system, in order to increase the predictability of the deterioration times of each individual component and thereby 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 unique common source database, and it is already widely deployed in a number of national and international projects covering military and civil sectors.

ISSEL NORD's translation department can rely on a worldwide network of over 1000 qualified translators, reviewers and DTP experts, as well as a suite of innovative translation management software, such as CAT tools and translation memory/terminology applications.

ISSEL NORD S.r.l. is located in Follo, La Spezia (Italy), with premises covering a 2500 m<sup>2</sup> area.

ISSEL NORD S.r.l. currently has more than 180 employees, 70% of which are graduates. Our staff guarantees professional and high quality services.

ISSEL NORD S.r.l. has the following certifications:

- UNI EN ISO 9001:2015
- EN 9100:2018
- EN ISO 17100:2017
- UNI 10574:2007

## Products | Services | Applications | Technologies

Integrated Logistic Support Engineering

- Interactive Electronic Technical Publications (IETP) at S1000D, ATA, MIL standards
- Logistic Support Analysis (LSA) and LSA Records at 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
- Level of Repair Analysis (LORA)
- Reliability Centered Maintenance (RCM)
- Computerized Maintenance Management Systems (CMMS)
- Logistical calculation of spare parts, support tools and test equipment
- Initial Provisioning Lists (IPL) at S2000M standard
- Illustrated Parts Catalogues
- NATO codification activity
- Training Needs Analysis and Training Plans
- SCORM compliant Computer Based and Web Based Training Systems (CBT, WBT)

Technical Publications:

- Aviation 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



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**SME**

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# 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 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



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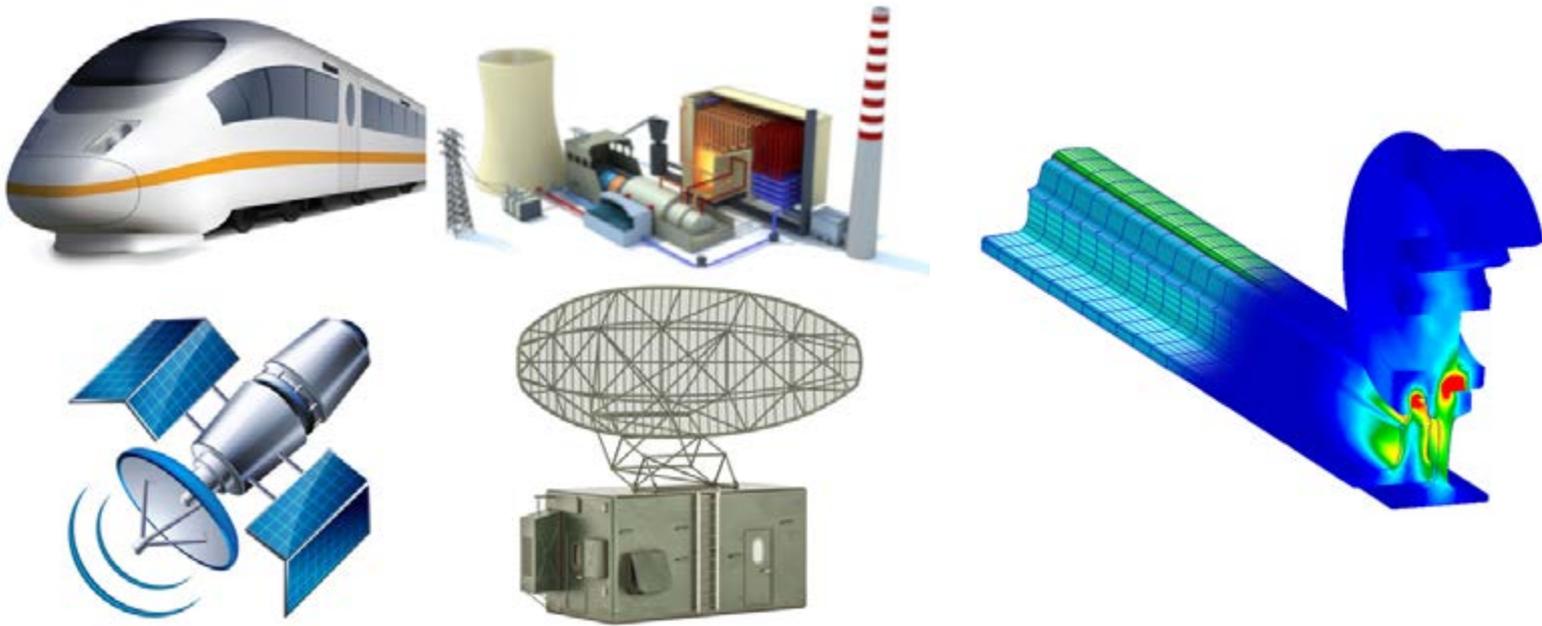
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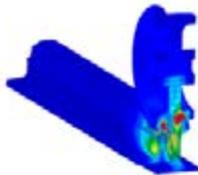


a Probabilistic Design, in order to:

- 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



$$y = \Psi(x) = \frac{x_1^{n_1} \cdot x_2^{n_2} \cdot \dots \cdot x_3^{n_3}}{x_3^{n_3} \cdot x_4^{n_4} \cdot \dots \cdot x_6^{n_6}} + \dots$$



Model:

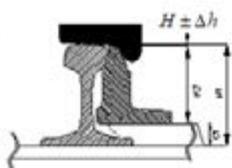
- Closed-Form Analytical Solution
- Finite Element Simulation
- Circuit Simulation
- ....

Input:

Component / System / Process Data

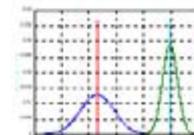
- rated value
- uncertainties about rated values (Tolerances)

$x_1, x_2 \begin{cases} \mu_z \\ \sigma_z \end{cases}$



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 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.



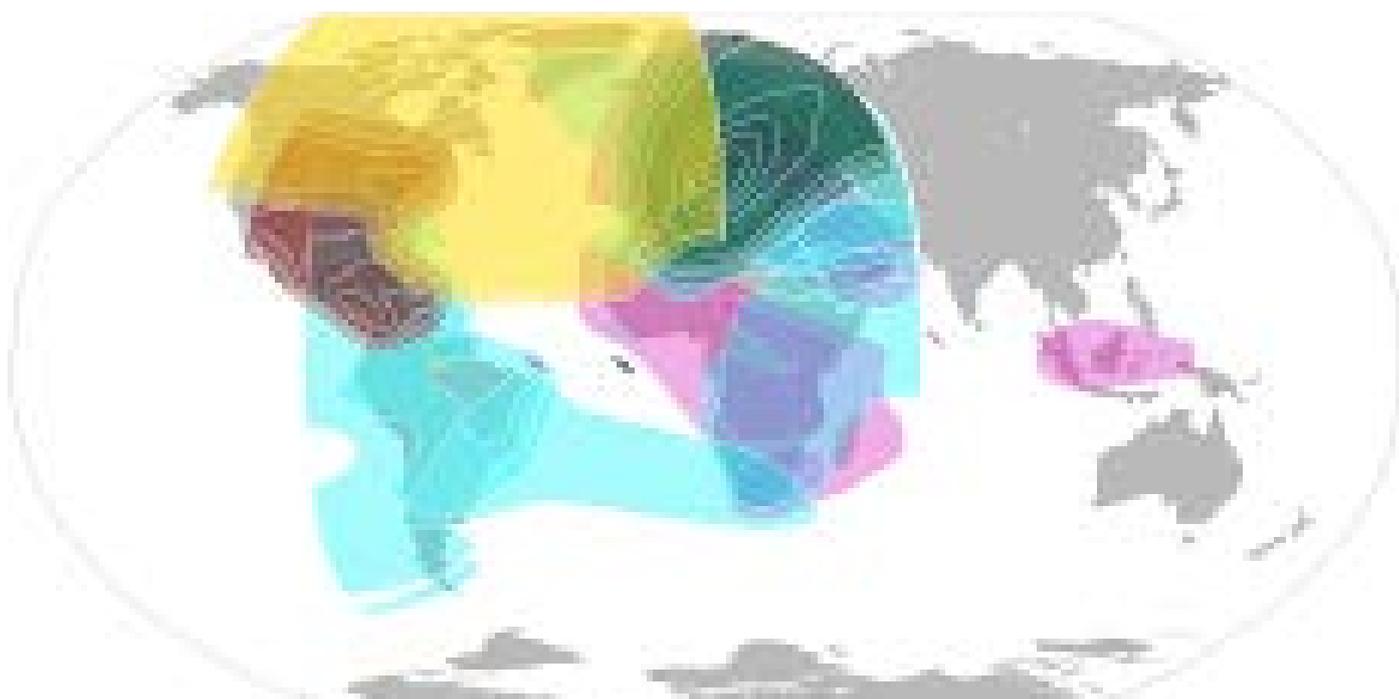
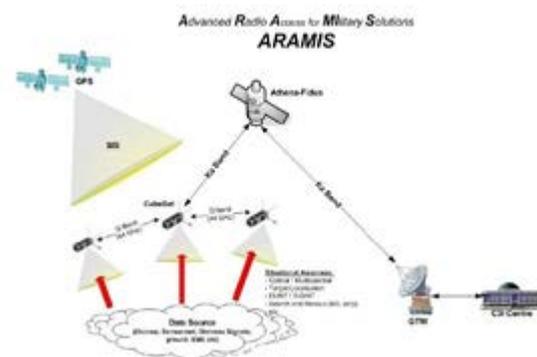
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## Company profile

ITSLAB is an Italian Company specialised in information system engineering, integration and development.

The quality of services and products represents the key features of its prestigious goals: high technology, staff growth and constant increase of Customers. A widespread and detailed internal system of quality control and ongoing research activities, in association with Universities and Research Institutes, allows ITSLAB to operate at forefront technical levels.

ITSLAB participates in many projects, providing innovative solutions in the field of broadband communication and localization for the following public bodies: European Space Agency (ESA), Italian Space Agency (ASI), Italian Ministry of Research (MIUR) and Italian Ministry of Economic Development (MISE).

ITSLAB R&D Competence Centre, is involved in innovation activities, mainly devoted in design, development and integration of Software component and Sub-systems, Integrated Application exploiting Satcom and Navigation space assets, Safety and Security. Main focus is on: Location & Business Intelligence, Service Oriented Architecture, Cloud computing, Semantic Interoperability.

Time-to-Market and Change Management are based on Agile/Scrum Programming paradigm. In the framework of Next Generation Network (NGN) for Future Internet, ITSLAB develops simulators and communication framework for an optimized content distribution and delivery over hybrid multi-channel networks, both public and private, for Secure Access and Data Integrity over IP, for Autonomic Maintenance, Wireless Sensor Networks, IoT.

ITSLAB development process is compliant with ISO 9001:2008 and Software Engineering ECSS standards.

By investing in a Software Production Center in Torre Annunziata (Napoli, Italia), ITSLAB meant to realize a technological pole with international relevance.

## Products | Services | Applications | Technologies

The SmartBOX is a Multichannel Communication Gateway providing automatic and manned channel switching according to a configurable policy based on a least cost routing algorithm. If installed on a mobile means of transport or relocatable sites where both terrestrial and satellite connectivity is available, the smartBOX shall help an effective, efficient and secure usage of available bandwidth. It was designed for maritime environment. Thanks to the smartBOX it shall be possible to remotely manage cyber security as a service.

AMICO is a software application platform implementing a Collaborative Health Care paradigm, focused on neuromotor and cognitive tele-rehabilitation at home. AMICO Health Station is the local component installed at home: it is based on low cost technologies for motion capture&detection and wearable sensor device. The capability to dynamically manage available communication services make it possible to benefit by the usage of Satellite ADSL services, even supporting 'bandwidth on-demand' feature.

SMILE Security Platform enhance trustiness of maritime service chain, making a Maritime Service Platform, such as a 'tracing and tracking' more accurate and reliable. SMILE core logic is based on a GNSS-based algorithm to be used in open-sky environment such as maritime navigation. GNSS multi-constellation raw data are received and filtered onboard of a vessel according to the SMILE algorithm, and a security challenge is issued to the SMILE Security Platform. In such a way a the vessel can be uniquely identified or not, so that it can enable the provisioning and commercialization of institutional and commercial Liability Services

The End-to-End Trial Management System (E2E TMS) è software component ready to be integrated in each test-bed environment thanks to a plug-in architecture and an object-based management system. An easy-to-use visual tool allows: to create 'objects' populating a simulation environment, building AIT/AIV scenarios and executing planned test campaigns, even for multiple missions a time. Results are collected, aggregated and make available (export) for statistical purpose.



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**AMICO**  
rehab

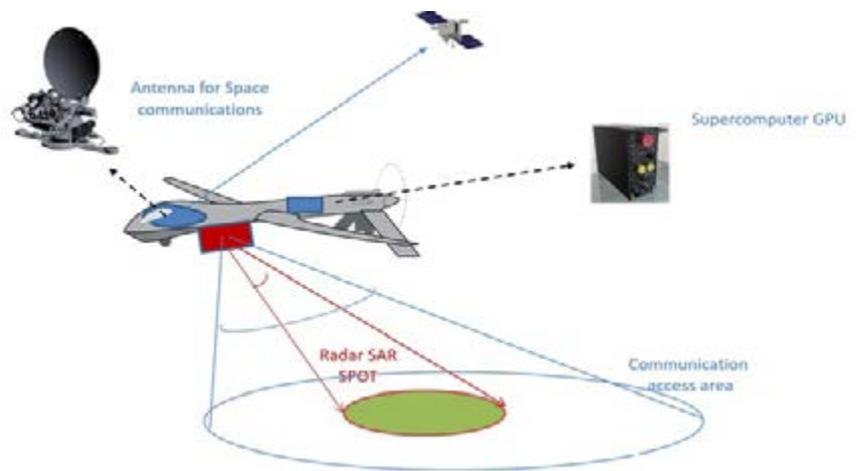
**is**

Information Technologies Services



**SMILE**

Satellite Multi-constellation  
Identification techniques  
for LiabE Enhanced applications



# Kayser Italia

## 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 2018, Kayser Italia has participated to 70 space missions with 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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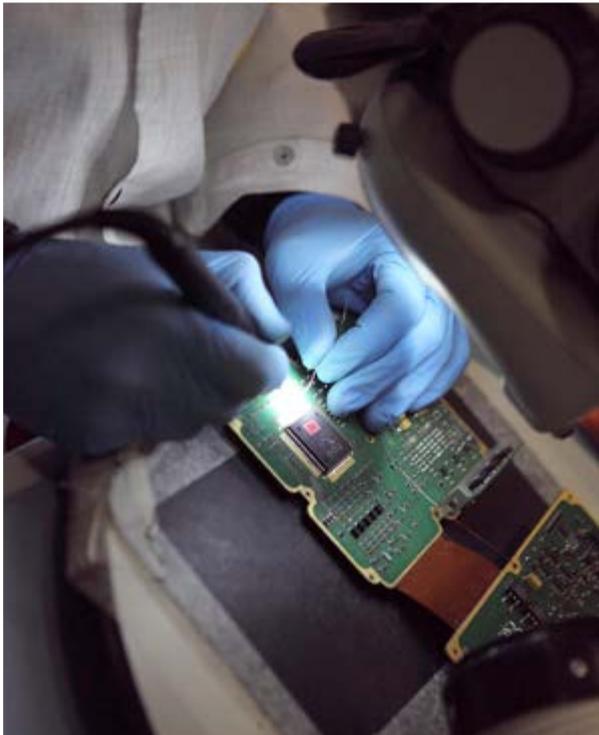
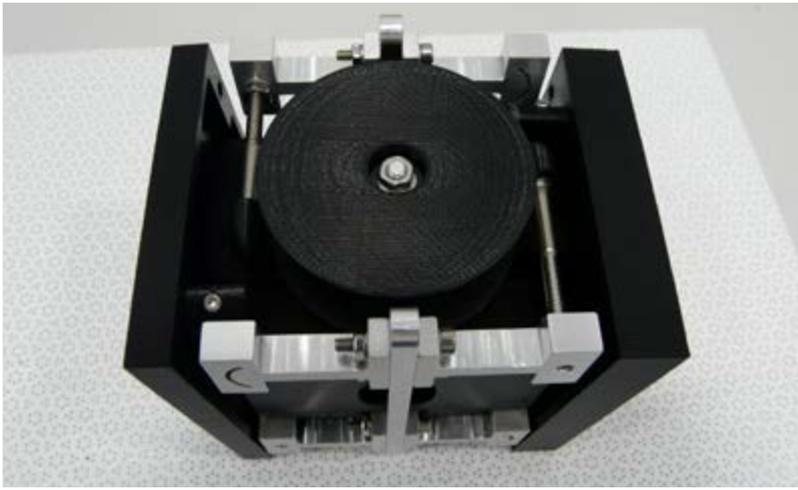
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## Company profile

KELL is an ICT Italian company operating for over twenty years in the Space and ICT sectors developing SW and ICT smart solutions in the following fields of application: e-health, telemedicine, e-government, Earth Observation, remote sensing, mobile applications. Our Vision "make everyday life easier with computing by making the technology easy, usable and available to everyone through continuous innovation." This objective is pursued through a process of continuous innovation that promotes the exploitation of research and its dissemination in the industry and market.

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 a young, dynamic and multidisciplinary group engaged in R&D activities performed for international and national Public Bodies and private organizations.

The main technologies and skills are: a) Information Technology: web platform and mobile solutions for e-Health applications; b) 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; c) Navigation

## Products | Services | Applications | Technologies

Satellite Telecom supports ICT / SW open source web platform, tested in healthcare organisations, 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.

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 is certified ISO 13485:2003 for the "design and development, implementation, technical installation and assistance of SW medical platforms and systems for the tele-medicine".

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),



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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.

Kell is certified ISO 9001:2008 for the "design, development, implementation, technical installation of SW platforms and systems for tele-medicine, Earth Observation and navigation for telecommunications".

# eHealth

La salute personale senza confini



# Osservazione della terra

Monitoraggio per l'ambiente e la sicurezza



## Company profile

With more than 48 years of commitment into the Aerospace Market, LMA is today a leading global supplier of integrated solutions for the most important players in the Space sectors.

A whole set of in-house capabilities gives LMA the ability to provide customers with any combination of services required - from the detailed-design, build-to-print manufacturing, to the assembly - and anything in between with flexibility and efficiency, meeting the highest quality requirements.

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.

INTERNATIONAL SPACE STATION

MULTI PURPOSE LOGISTIC MODULE (MPLM)

Liquid Nitrogen distributor to refuel the space station.

Manufacturing of key components, assembly and final control.

## Products | Services | Applications | Technologies

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.

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Machining (5 Axis) and final control.

INTERNATIONAL SPACE STATION

MULTI PURPOSE LOGISTIC MODULE (MPLM)

Front Door (Aluminum)

Front Door



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# Leaf Space

## Company profile

Leaf Space Srl is a high-tech company that offers a complete, unique and dedicated ground segment service for microsattellites. Born in 2014 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 in the ground segment field, to simplify the access to Space for commercial, scientific and exploratory purposes, by tackling the unmet needs of the 'micro and nanosatellites' sector. The management team of the company mainly consists of three personalities: Jonata Puglia Co-founder and CEO, he represents an effective link between the strictly technical sector and the administrative one; Michele Messina Co-founder and Operations Director; Giovanni Pandolfi Co-founder and Technical Director. The company has its roots in the management team but also in a heterogeneous team that currently counts 15 people formed in different areas. From a purely technical and engineering sector to the business sector, the structure of the company is organized not only to allow the practical realization of the products, but also to ensure their correct placement in the target market. Due to team's effort in November 2017, Leaf Space was granted with a Horizon 2020 SME Instrument Phase 2, with a prize of € 1.300.000. The Leaf Line project was the first in the European ranking, with a score of 14.8/15 and it consist of a shared Ground Station Network.

## Products | Services | Applications | Technologies

Leaf Space provides a complete Ground Segment service. Leaf Line is a multi-mission Ground Station network designed around the needs of the microsattellite market where we need flexibility, fast integration, scalability and low cost. The stations have been designed to minimize external needs in terms of land, electronics storage, human support. For these reasons, all the subsystems for nominal operations are integrated, the only external needs are the power line and the internet connection. The Leaf Key service is tailored on the mission needs both from the performance and operations point of view. The deployment of the customized ground stations network backbone, owned and operated by Leaf Space, follows the development plan of a unique customer mission, guaranteeing the right performance at the right time. This service is the perfect solution when customer mission requires the support of a high number of satellites saturating a network capacity or when an optimized ground segment is needed to reduce operational costs. We complete our offer with some additional services able to satisfy any request, also from the most demanding missions in the microsattellites environment: hardware, delivering customized ground stations and sub-systems; consultancy, in case of specific knowledge needs; scheduling service, a really powerful scheduling algorithm to efficiently manage the networks operations; LEOP Service, Launch and Early operations Phase; Back-up service in case of failure of primary ground segment and Boost service in case of more capacity needs.



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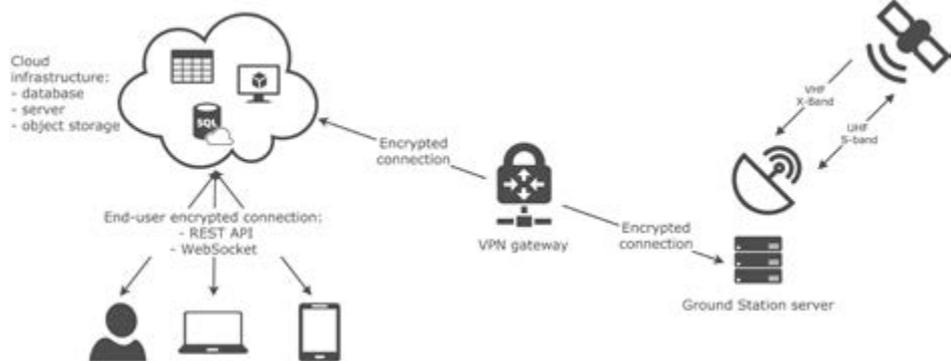
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# Mapsat srl

## 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 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),



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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 ...



## 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 MMIC.s 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 MMIC.s and microwave hybrids in their most critical line-ups, developed by MEC.

## Products | Services | Applications | Technologies

1. X-Band GaN Single Chip TR-Module
2. 27W X-band GaN HEMT HPA
3. 50W L-band, 45% PAE
4. 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.



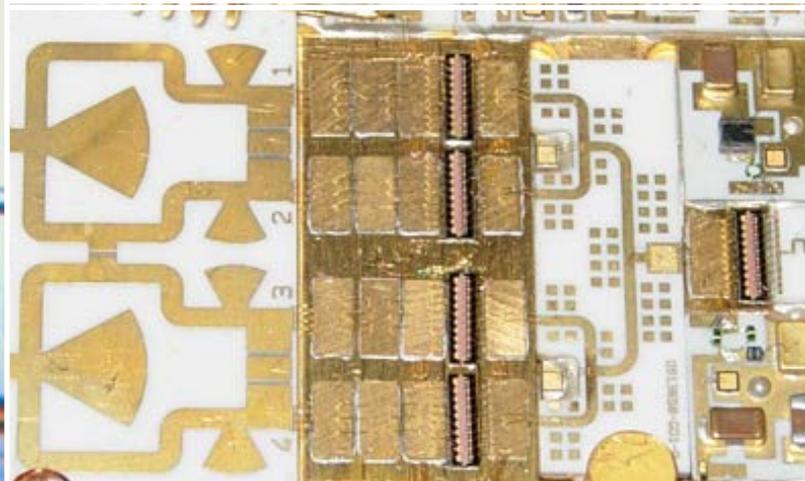
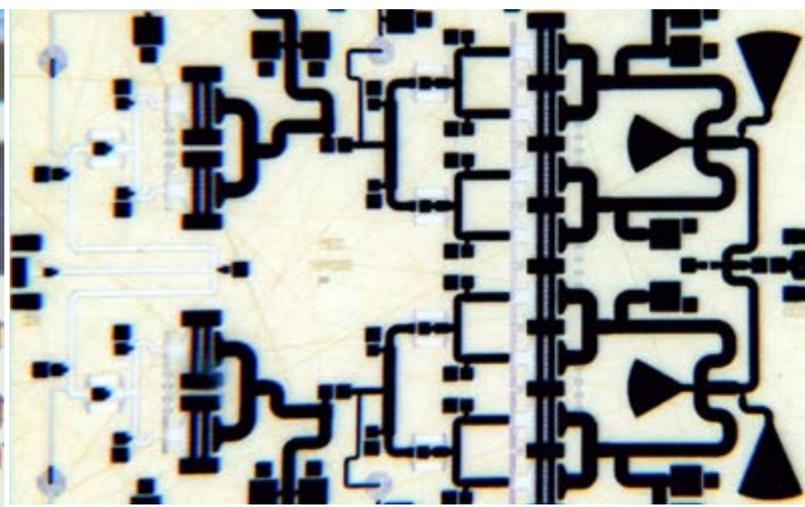
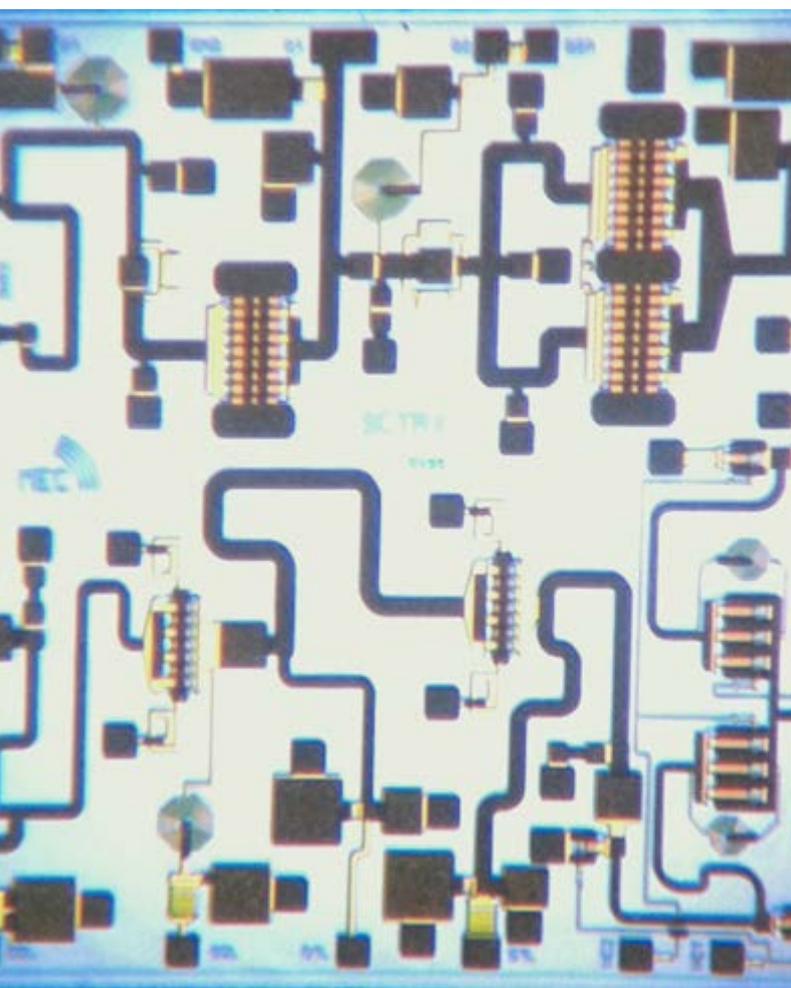
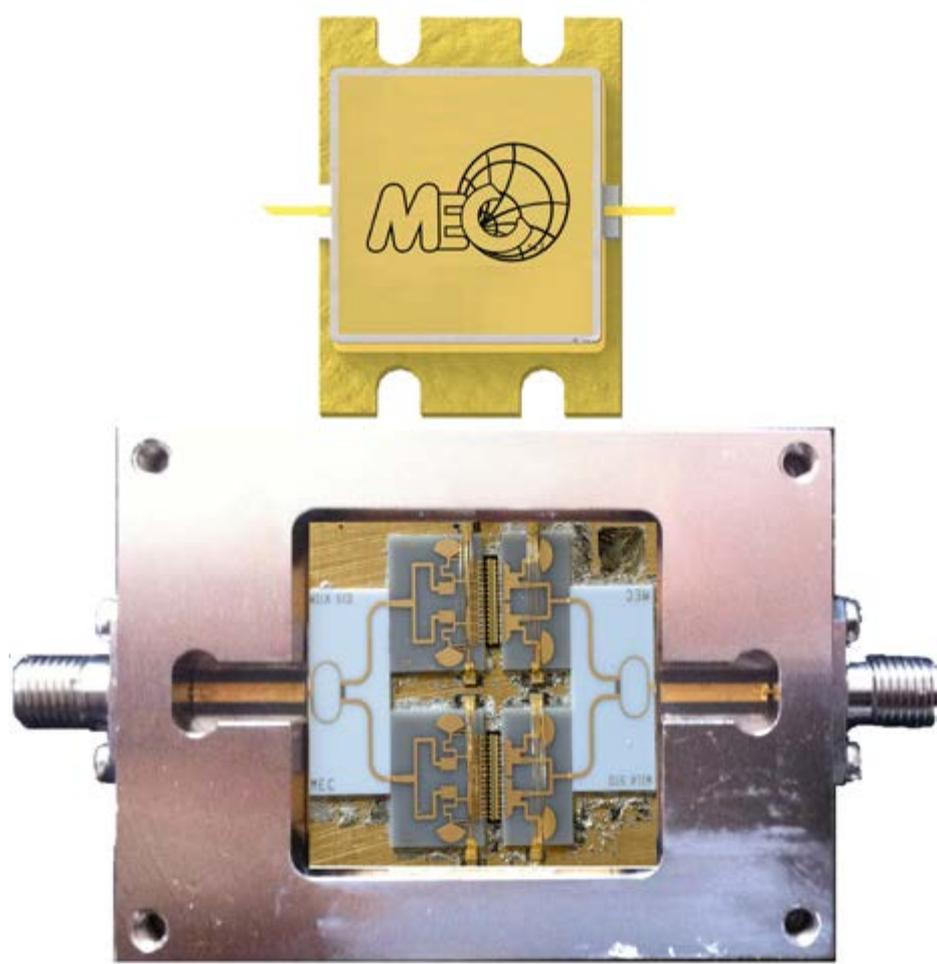
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# Media Lario S.r.l.

## Company profile

Media Lario S.r.l. is a dynamic and innovative technology-driven company supplying high specification optical components and optical systems.

We work with leading industrial companies as well as agency partners including Agenzia Spaziale Italiana - the Italian Space Agency - European Space Agency / ESA and NASA.

Our projects range from single / low volume components and systems designed to demanding performance requirements to volume produced optics and systems designed for repeatable high performance.

### OVER 25 YEARS EXPERIENCE OF HIGH PRECISION OPTICS IN SPACE

Media Lario optics have been utilized in space borne programs since company founding for large scale X-ray telescopes like Beppo-SAX, XMM-Newton, Swift, eROSITA, ATHENA

Ongoing programs include ATHENA, ARCUS, ARIEL, Einstein Probe, CHEOPS, FLEX, JUICE, PLATO

Media Lario has pioneered the development of Repli-Formed Optics™ for ground-breaking solution for high specification, high volume optical applications.

Media Lario's is also developing high performance optical communication terminals that meet the needs of small satellites constellations.

## Products | Services | Applications | Technologies

### 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, Ni-coated Alum, Stainless Steel substrates

### REPLI-FORMED OPTICS™

High Volume High Precision Optics

Fast production throughput - Suitable for cost-sensitive applications

Available with light-weighting, optical pass-through, and other custom features

### LASER COMMUNICATION TERMINAL OPTICS

Optical assemblies for inter-satellite and ground communication

Utilizing patented high-volume, low-cost manufacturing processes

### SATELLITE OPTICAL SYSTEMS

Hyperspectral Earth Observation Payload for Small Satellite. 9+ bands, 2.7 m resolution PAN, 5 m resolution RGB.

Custom high performance optical systems with less than 1 m GSD for small satellites constellations.

### X-RAY OPTICS

X-ray Optics for Astronomy, EUVL and Scientific Applications

Optical assemblies utilizing patented eforming 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. Weight  $\leq 15$  kg/m<sup>2</sup>.

Shape accuracy  $\leq 10$   $\mu$ m - spherical, aspheric, off-axis, freeform designs. Life tested to 20 years



## Contact

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### SME

Giovanni Bianucci

VP, Sales & Marketing

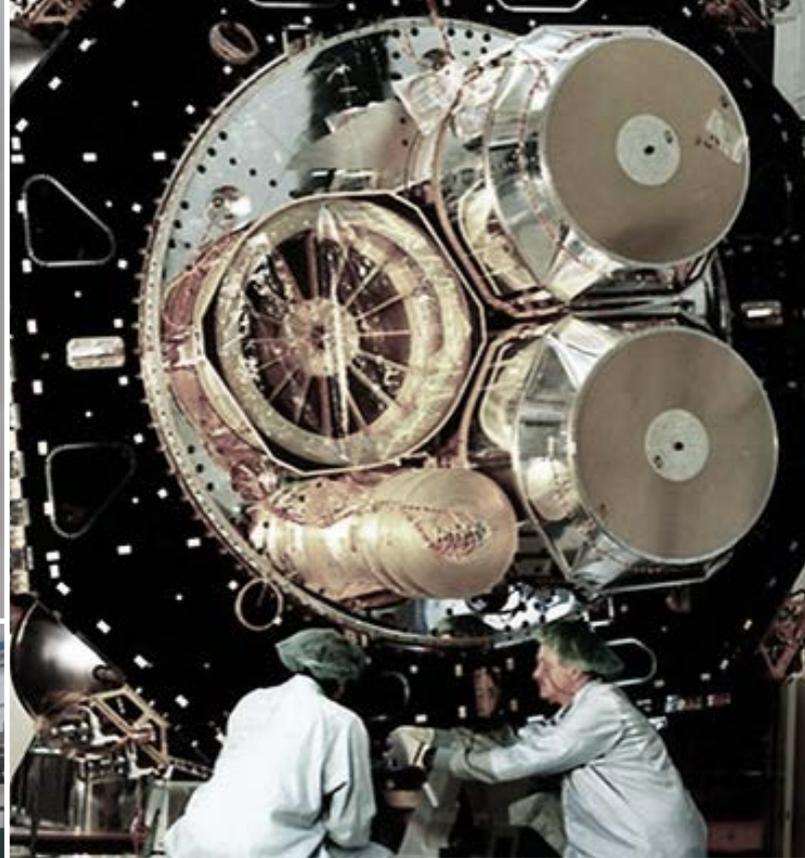
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# The Società Aerospaziale Mediterranea Scrl

## Company profile

The Società Aerospaziale Mediterranea Scrl 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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[sam@samaerospazio.it](mailto:sam@samaerospazio.it)





**SIGRI**

HOME PROGETTO PARTNER PRODOTTI RASSEGNA STAMPA DOWNLOAD

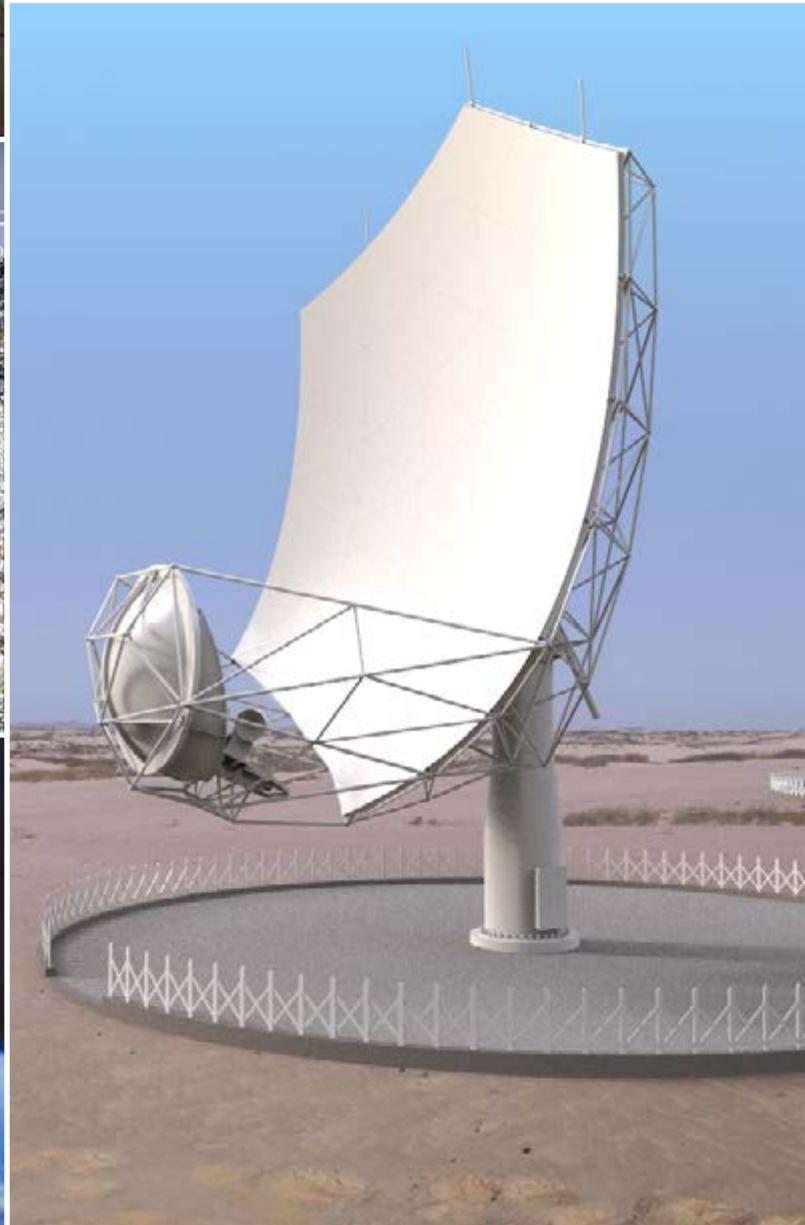
HOME

- HOME
- PROGETTO
- PARTNER
- PRODOTTI
- RASSEGNA STAMPA
- DOWNLOAD

NEWS

regionale Vigili del Fuoco della Calabria e l'università della Calabria, hanno organizzato un meeting il 25 maggio 2004 per la presentazione delle attività di sperimentazione realizzate dal 2001 ad oggi.

A 3D topographic map of a mountainous region, likely Calabria, showing terrain elevation and several red and green markers indicating specific locations or points of interest.



# 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 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



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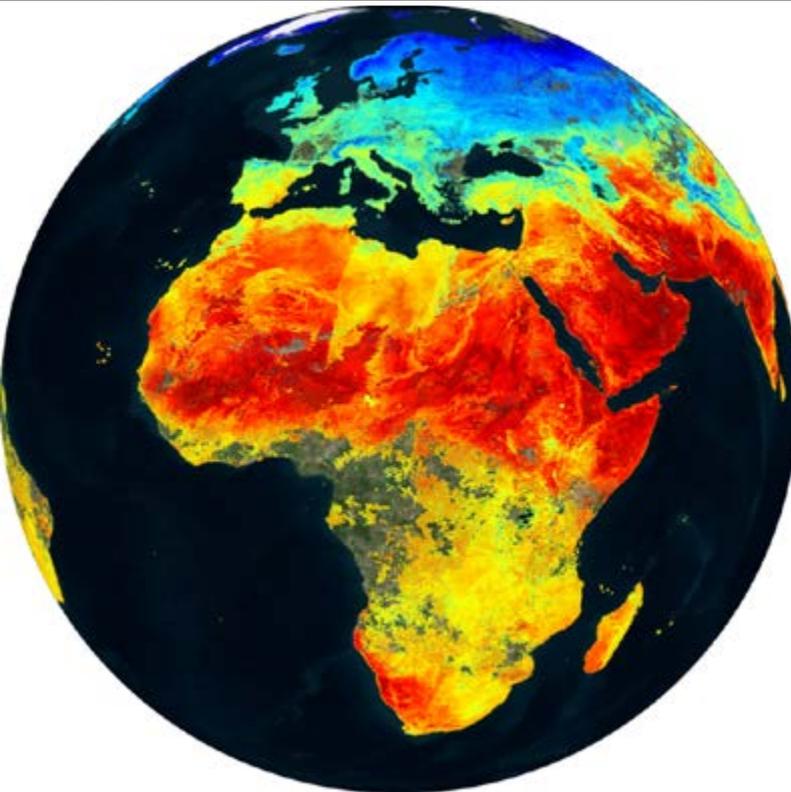
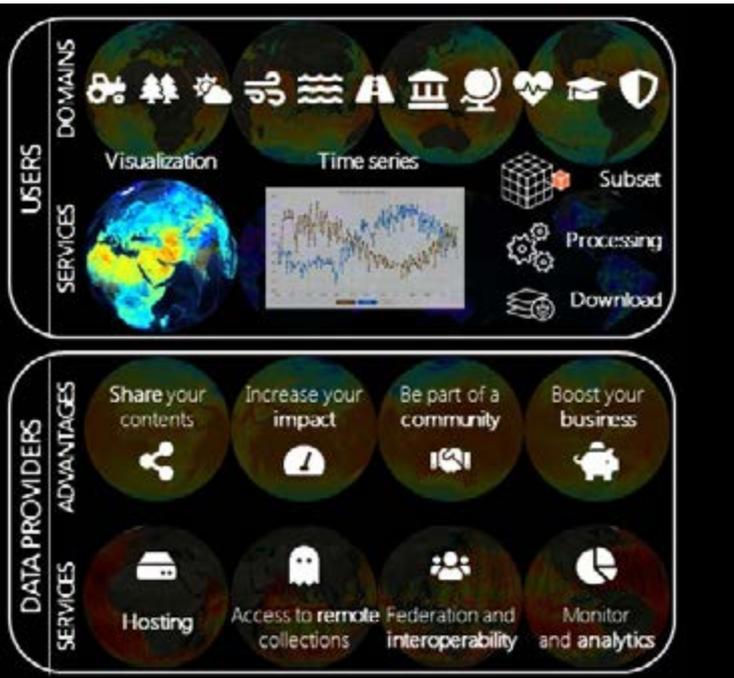
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to improve the level of automation and flexibility of the cloud-based data processors. ADAM can be linked to existing user environments by exposing backend data access services or it can be provided with user interfaces like a web data portal and jupyter 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.



# NADIR SRL

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## Company profile

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

## Products | Services | Applications | Technologies

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

Cleaning, Activation, Etching, Bonding, Adhesion, Polymerisation, Functionalisation; Nadir is also a supplier of custom polymer compounds for innovative polymer materials, blending a specific polymer with performance additives or other polymers to achieve properties specific to each application.



## Contact

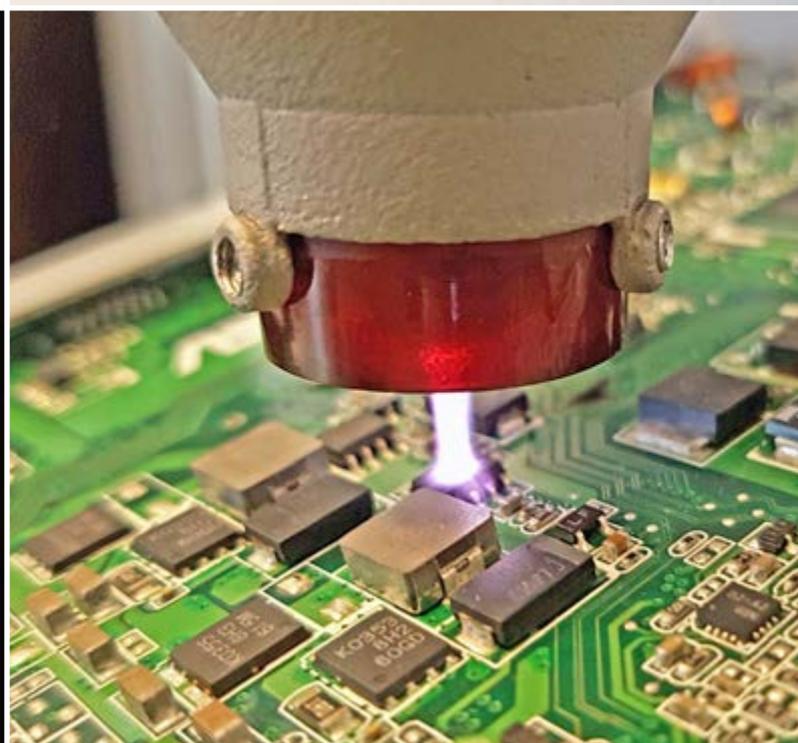
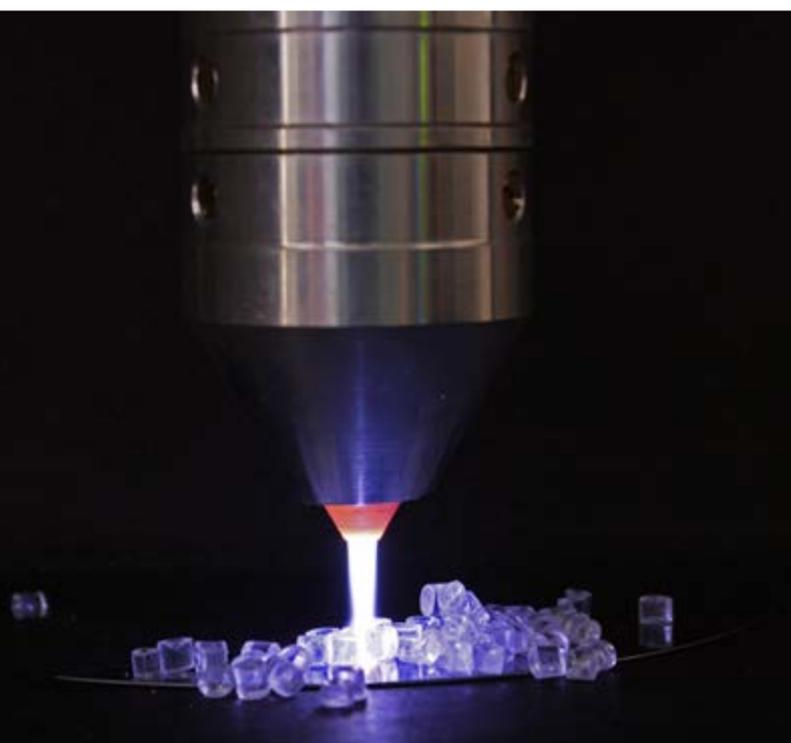
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# NAIS - Nextant Applications & Innovative Solutions

## 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



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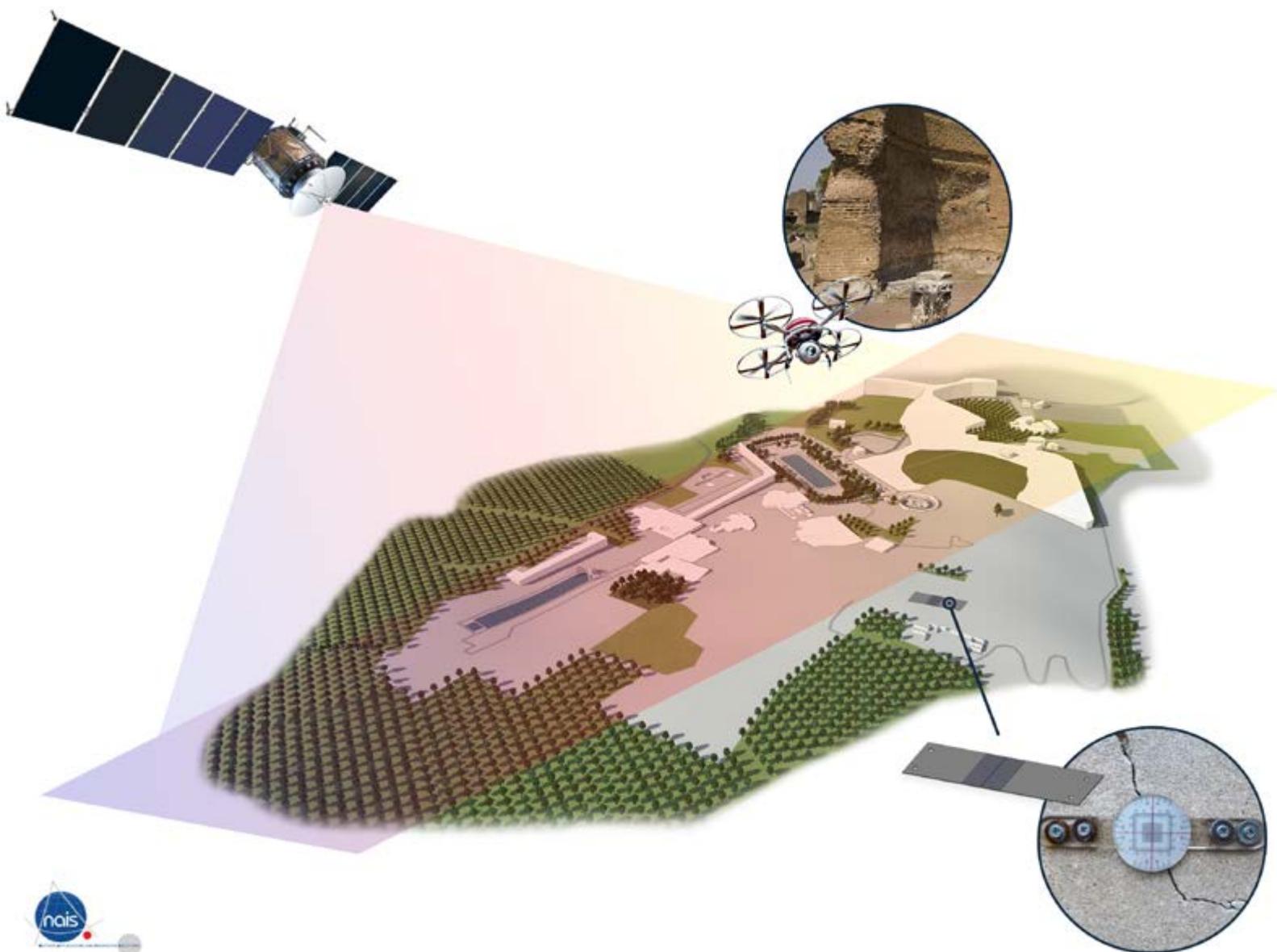


observation data analysis techniques (classification, change detection, interferometry); systems based on GNSS positioning; wireless communication systems; satellite and terrestrial data communication.

In the application domain of Cultural Heritage, NAIS offers:

- Solutions for monitoring and safeguarding the immovable cultural heritage and the natural heritage threatened by the impact: anthropic (human impact on the environment); meteorological (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).



# 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 detail 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. We are a young dynamical company and 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. 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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# NEXT Ingegneria dei Sistemi S.p.A.

## Company profile

NEXT Ingegneria Dei Sistemi S.p.A. is an Italian Company funded in 1999, with its Legal and primary operational premises located in Rome.

The Management of NEXT Ingegneria dei Sistemi S.p.A. have strong experience and extensive know-how in ICT, Defence and Space domains; the company employs 200 Professionals and experts, distributed among four premises located in Rome, Naples, Avezzano (L'Aquila) and Ronchi dei Legionari (Trieste), and it is specialised in the design, development and integration of complex systems based on high technology contents.

Its mission is has always been focused on a highly qualified growth of expertises, know how and professionals in the ICT domain, applied mainly to Defence, Space and Transport contexts.

The Company holds the Security Clearance up to NATO/UE Secret, the NOCS-NOSI as well as the NOSIS Security certification (first Italian Company to hold all of them).

NEXT ia certified UNI-EN-ISO9001:2008-14001:2015-18001:2007, MMI MaturatyLevel3, and works also following ISO12207, AQAP2110, AQAP160 Standards.

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:

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.

AEROSPACE (Ground Segment): Engineering, Mission Control, Mission Planning, Satellite Control, Flight Dynamic.

AEROSPACE (Space Segment): In Orbit Validation, Payloads Calibration and Validation

AEROSPACE (Big Programmes participation): GALILEO, COSMO SKYMED, GÖKTURK

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

## Products | Services | Applications | Technologies

"AR-Tower®"

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

It represents the solution proposed by NEXT for the very demanding and ever changing needs of the Airport Services in terms of both, Enhancement of Safety and Security as well as Services' Efficiency.

ARTower could be used either, as auxiliary/complementary system to the operational ATC/ATM system, or as Towers' Back-Up or as well as Remote Tower.

"SuSyAR®"

SuSyAR (Surveillance System based on Augmented Reality) places itself in the context



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of Situational Awareness ICTs systems and solutions, 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 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.

Supported by Augmented Reality and Computer Vision Technologies, SuSyAr is capable to interact with collaborative resources, such as humans, Drones and Robot.

“MIDAS”

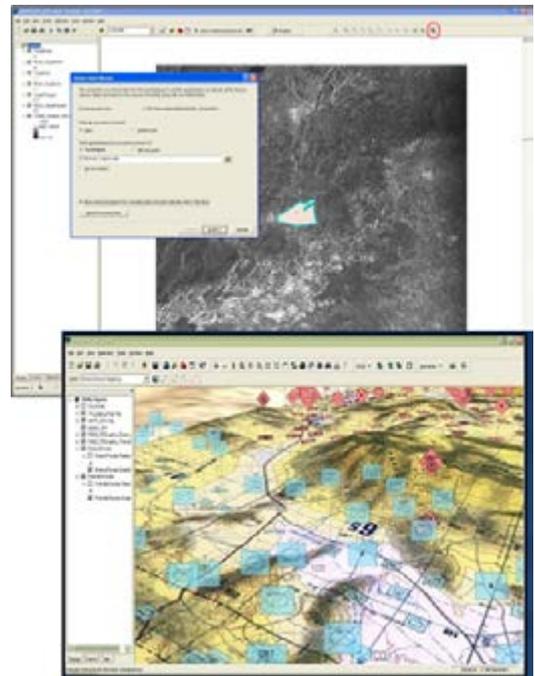
This is a co-owned product (with COBAM-CTS UK), focused on Military, Commercial as well as Humanitarian Demining. NEXT developed and own three of the main components: a Control Centre called “Command Management Tool” (CMT), a Mobile Control Centre called “Mobile Command Management Tools” (MCMT) and the 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.



# 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.).



## Contact

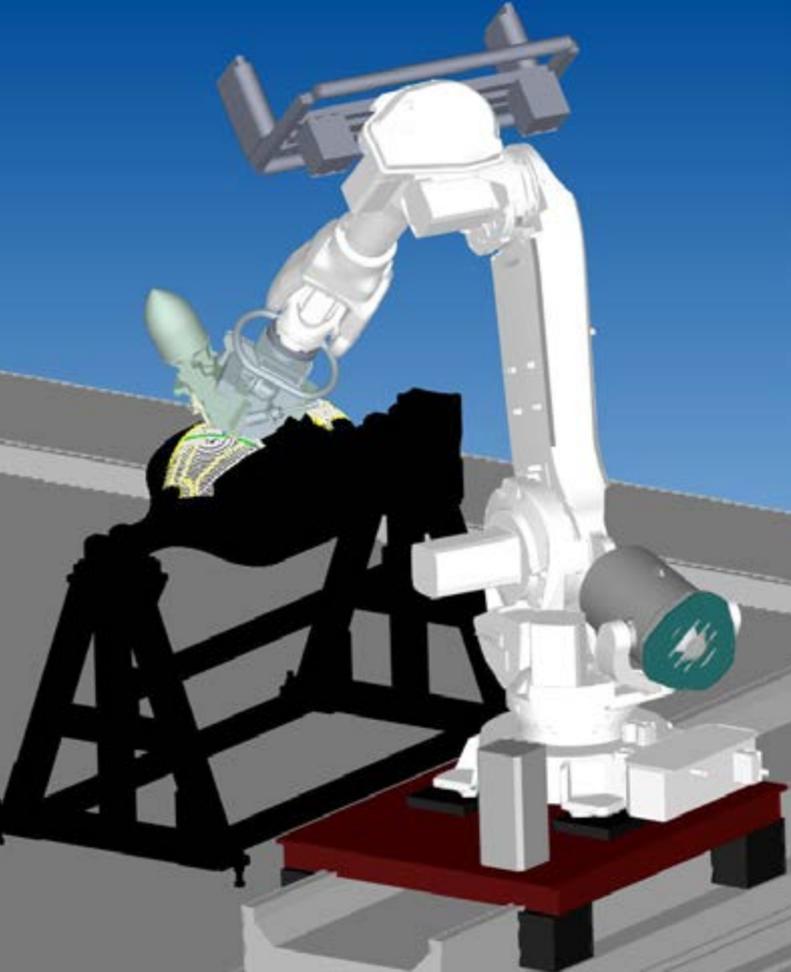
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# NURJANA TECHNOLOGIES

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## Company profile

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Nurjana Technologies provides systems and SW solutions for System Integration, Sensor Data Fusion and 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

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### Aerospace

- Command&Control Systems for Test and Evaluation
- Systems for Trajectory Tracking and Orbits Determination
- Remote Sensing Data Exploitation Systems
- Subsystems for Payload Data Ground Segment

### IT

- Applications for Real Time Expert Systems
- Image Processing and Scenario Analysis
- Mathematical Optimizations Tools for Test Data Processing

### Engineering

- Algorithms for Multi Sensor Data Fusion and Tracking
- Trajectory Simulations and Test Data Analysis
- Design and Development of Systems of Systems



## Contact

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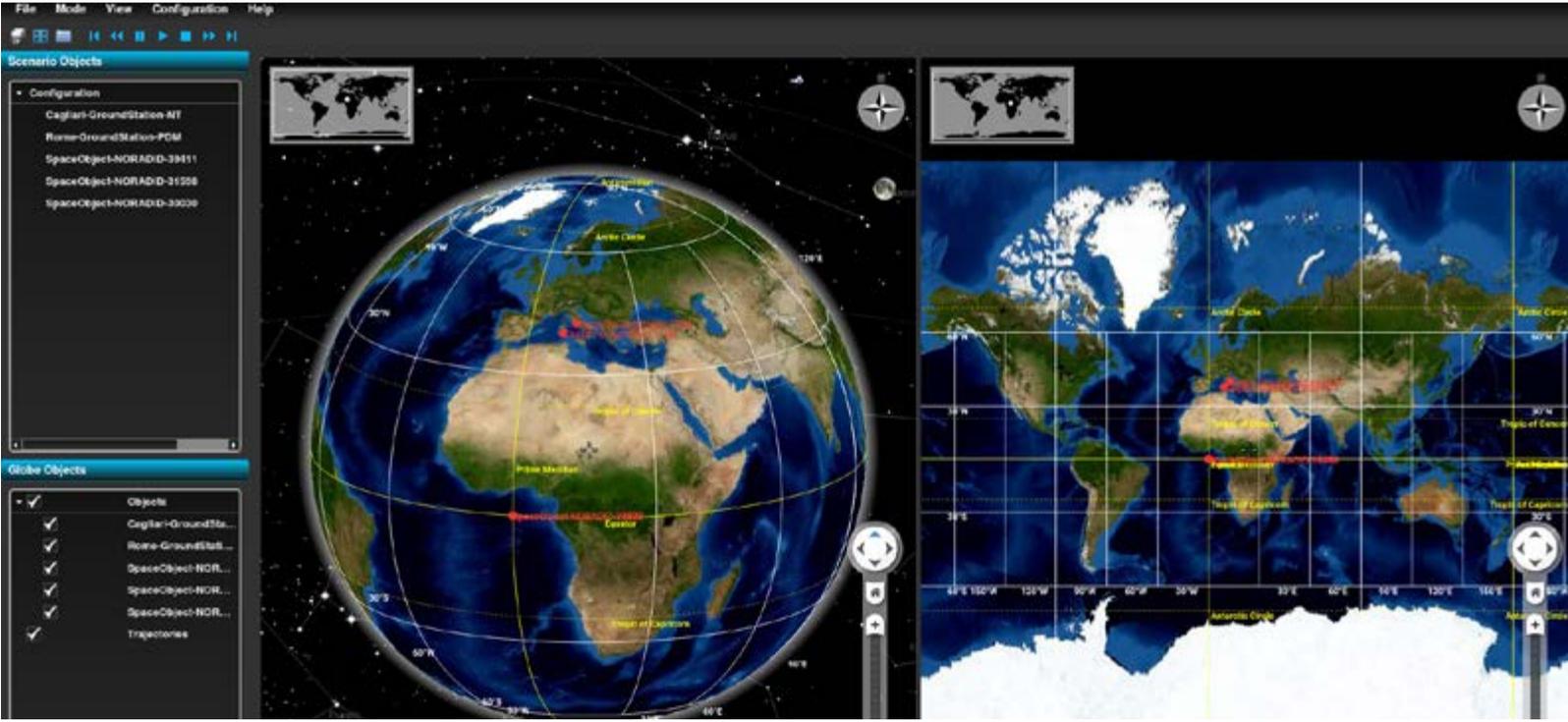
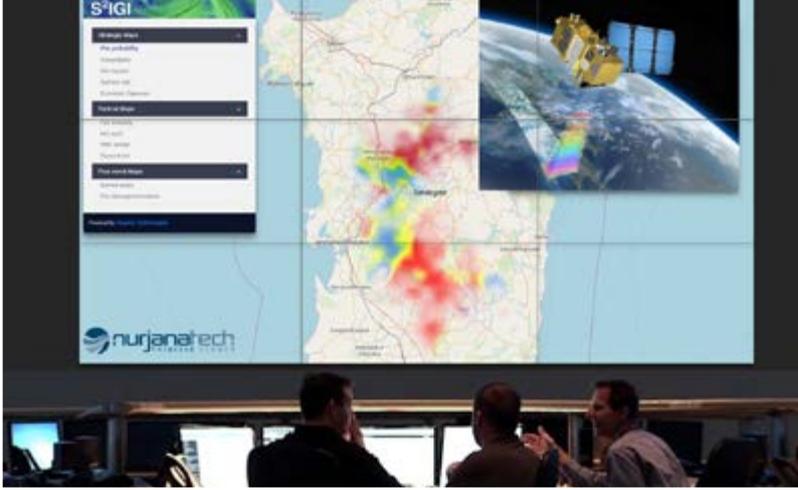
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# OFFICINA STELLARE SPA

## Company profile

Officina Stellare is an international engineering company, with a solid background in designing and manufacturing optomechanical system instrumentation for Ground based telescopes and Space applications.

We can easily be referenced worldwide for our expertise in managing complex engineering projects, delivering complete turn-key custom designed optical systems.

Flexibility, time to application, cost-effectiveness and a smart-thinking attitude of the organizational structure, are at the base of the success of Officina Stellare.

Thanks to an engineering team, an optical manufacturing lab, a skilled AIV team working with state-of-the-art technologies, the full production cycle is kept in-house with obvious cost savings for our final customers.

Headquarters are based in Sarcedo (Vicenza), while the optical lab is at present in Occhiobello (100km away), where optics up to 1mt diameter are manufactured.

Officina Stellare is an ISO 9001 certified company.

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Officina Stellare is an ISO 9001 certified company.

## Products | Services | Applications | Technologies

The in-house optical design and manufacturing lab can design and manufacture space and ground-based optical systems up to 1-m diameter aperture.

We are equipped with a deterministic optical polishing machine for high accuracy finishing of large diameter optical parts.

We are equipped with ISO 5/7 clean rooms, a metrology lab with interferometers (Zygo, 4D Technologies), Shack/Hartmann sensors, CMM, large optical benches, alignment telescopes and a centering machine for large optics.

Officina Stellare is also contributing with challenging projects in the field of Space Observations; from space-borne telescopes for a satellite constellation to space telescope design for multispectral Earth observation and Cubesat R&D projects.

In this field, Officina Stellare offers a TRL-9 expertise level on low cost, high performance, high replicability and reliability design space telescopes for Earth surface imaging, also thanks to the "space qualification" of some new materials we obtained, which guaranteed cost effective solutions and new opportunities.

Officina Stellare successfully completed some projects in the field of Earth Observation, like:

-Space-borne telescopes for a satellite constellation (hyperspectral Earth Imaging)

For this project we designed, manufactured, integrated, aligned and performed the final metrology on a 350-mm class aperture diameter high-resolution multispectral space telescope, with a working wavelength band from 400nm to 900 nm. A large 1°x1° field of view is provided, with <0.1% geometrical distortion.

The design process was developed internally starting from the challenging customer optical/imaging requirements, with a fast and proactive interaction between both companies. A small and efficient tiger team, mainly composed of optical and mechanical engineers, worked together in order to match all requirements in a very



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short time frame. Main drivers were: high optical performances (MTF, geometrical distortion), mechanical constraints, structural requirements to withstand dynamic loads during the launch, space working environment constraints.

On the ground segment, our capabilities allow us to provide:

- Custom, cost effective and reliable opto-mechanical system design and manufacturing of up to 1 meter fully automated telescopes, including very wide field optical systems,
- COTS products: up to 0,8 m, f/3 to f/8 complete telescopes and astrographs, including Ritchey- Chrétien telescopes, RiDK (Dall-Kirkham), RiFast and RH Veloce
- Athermal solutions for critical environments,
- High speed telescope mounts for astronomical, SSA, SST and fast slewing object observations
- Rugged Military and Industrial systems for harsh environments
- Design & manufacturing of laser communications / optical antennas systems
- Focal plane instrumentations including imaging cameras, spectrographs, or customized solutions.



# PICOSATS S.R.L.

## Company profile

PICOSATS is a limited liability company, duly registered in the Trade Register as an Innovative Start-Up dated 03/10/2014, 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 communication systems for small satellites, the RADIOSAT product, operating in the Ka band and providing very high data rates.

In order to diversify the company's portfolio of solutions, PICOSATS developed its own full small satellite model, the 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 mechanical structure of the satellite that will allow exploiting cross-selling opportunities (hardware & software). BRICSAT represents a new solution for building small satellites by using a promising plastic polymer and 3-D manufacturing technique. BRICSAT aims at providing the means to get independency in satellite mechanical 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 ad-hoc services (e.g. customer characterisation).
3. **Services.** Beyond services associated to the hardware products, PICOSATS is proposing engineering services and consultant services for End to End Scientific Mission simulations.

PICOSATS  
SPACE TECHNOLOGIES SOLUTIONS

## Contact

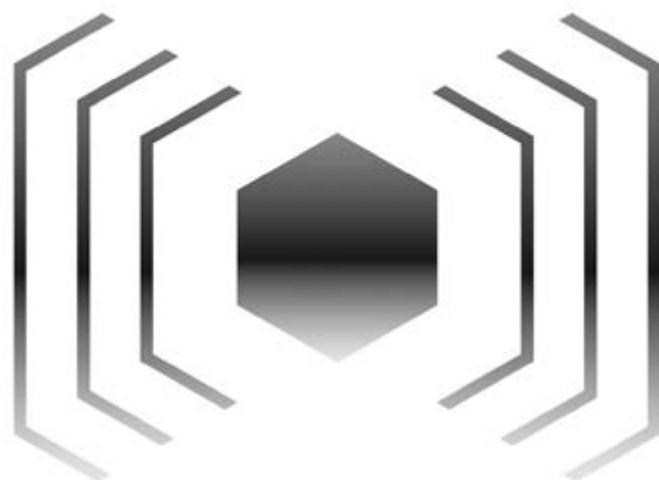
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BRICSAT RADIOSAT



# 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 Master Dealer in Italy for GIS, remote sensing, photogrammetry and geospatial solutions. 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 data, designed to provide cognitive frameworks that meet the specific needs of each application field. [https://www.planetek.it/prodotti/tutti\\_i\\_prodotti/preciso](https://www.planetek.it/prodotti/tutti_i_prodotti/preciso)



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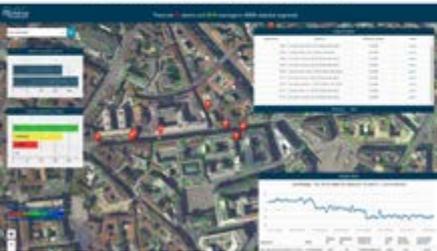
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3. Cart@net® : it is the WebGIS solution for the management and consultation of large raster and vector datasets, ideal to distribute on-line catalogues of cartographic data. [www.planetek.it/eng/cartanet](http://www.planetek.it/eng/cartanet)
4. LOD4SDI: 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. SpaceBIT: it is a software tool allows to create, configure and execute massively parallel processing of very big SAR and hyperspectral images together with image streams 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>

**Rheticus**  
monitoring the evolution of our Earth



# PROGEM Srl

## Company profile

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

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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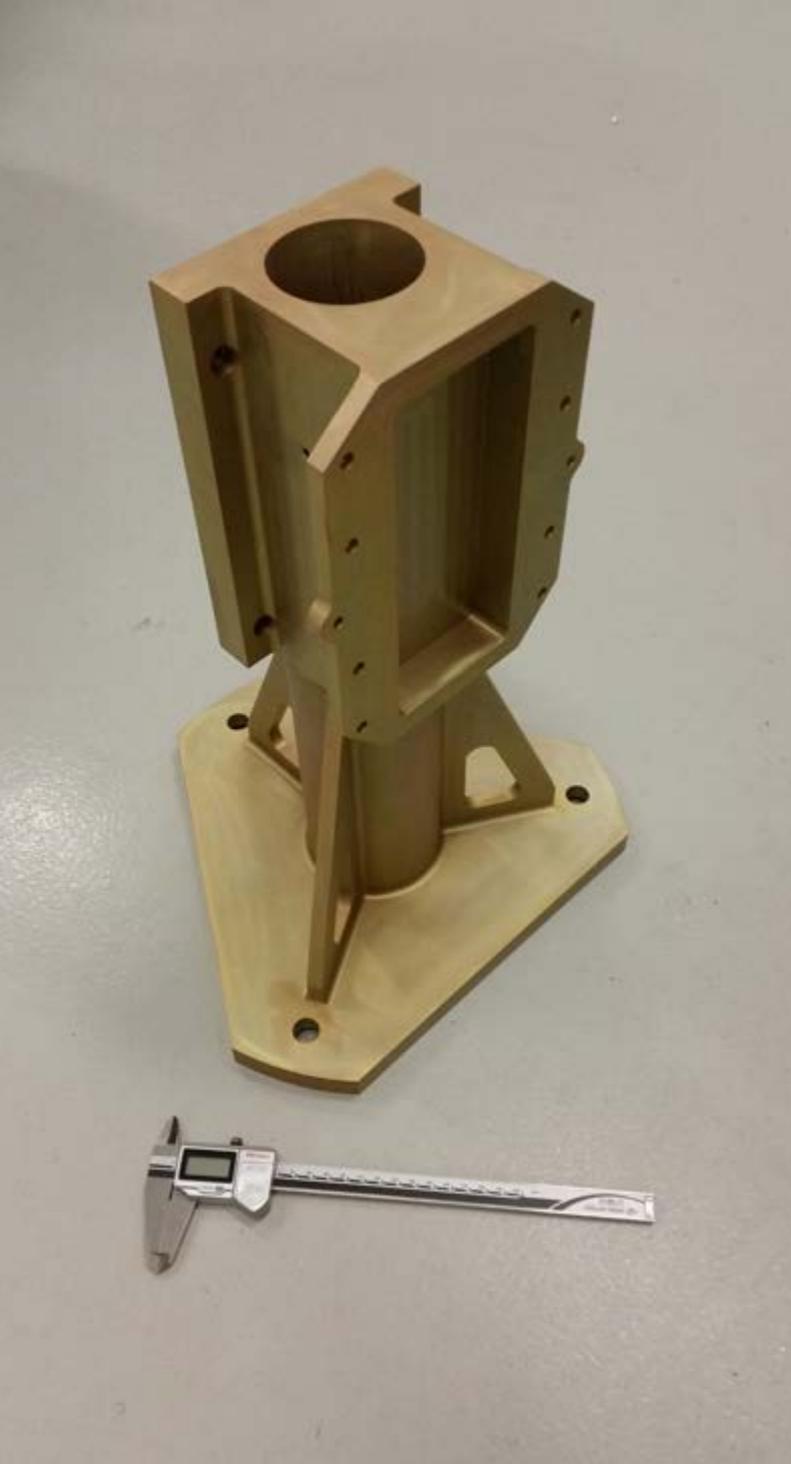
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# PROGETTI SPECIALI ITALIANI SRL

## 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:

- Nano an Microsatellite for Dual Use Application
- Elint and Optical Payload for Microsatellites
- Sensor Suite for UAV
- Ground TLC Satellite Stations



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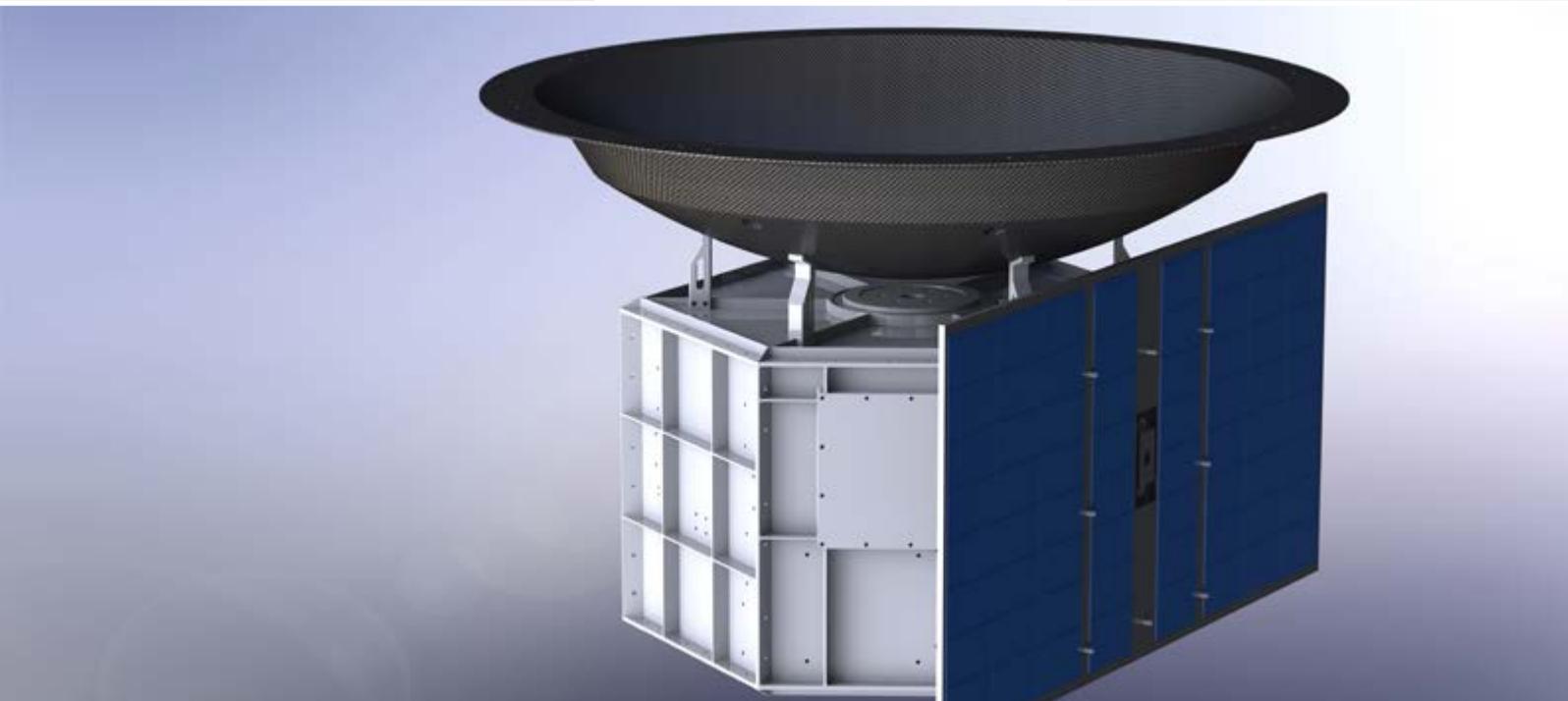
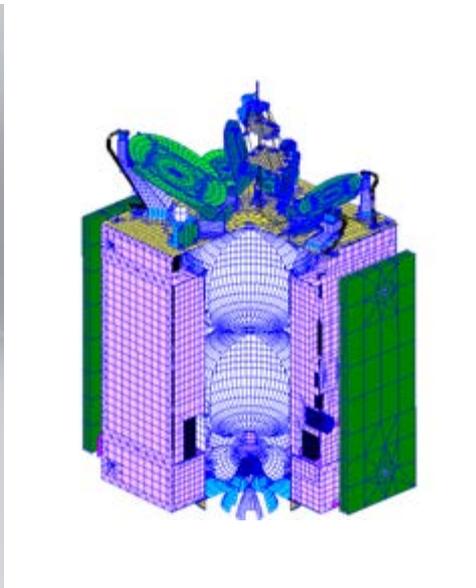
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- Large Thermal Vacuum Simulators

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



# Progressive Systems Srl

## Company profile

Progressive Systems delivers solutions to simplify Earth Observation data exploitation. Such solutions, based on the one hand on scientific knowledge and on the other hand on specific competence in EO data management, operations and cloud computing, as well as customer relationship management and continuous process improvement, ease the management of complex processes related to the exploitation of Earth Observation data. Progressive's research interests cover several areas of the Earth Observation domain, including environmental monitoring (e.g. land classification, agriculture and precision farming), early warning and risk management support (e.g. fire detection, flood detection, ground deformation). Progressive Systems competences are recognized to effectively cover several types of activities and/or services, spanning from the support to algorithms development, to their integration into processing environments; from the support to applications validation, to their transfer to operations; from the operations of Big EO data exploitation environments and distributed ICT systems to Education, Outreach and Communication support.

Progressive Systems has significant expertise and experience based on years of collaboration with ESA and on-site presence at ESRIN. The main benefits brought by Progressive include:

- Sound knowledge and understanding of ESRIN in general and particularly about the EOP-G processes, stakeholders and infrastructure;
- Deep involvement in the activities of the ESA RSS service, and related research and technology projects;
- Strong experience in EO data processing for scientific exploitation, as well as EO data user (scientists and service industry) support;
- Competence to effectively manage verification, validation and change management processes, and to support operations, maintenance and R&D projects.

Besides the support provided since many years to Research and Educational activities, Progressive Systems provides training and support as well to Universities, BICs Start-ups and SMEs interested in Big EO data exploitation.

## Products | Services | Applications | Technologies

Progressive's services cover several areas of the Earth Observation domain, including environmental monitoring and early warning and risk management support. Its activity lines are:

- Operational Services
- Testing, Verification and Validation
- Research Projects and Services

One or more examples for each activity line is listed below:

1. Operational Services: ESA Research and Service Support (RSS) Since 2006 Progressive is involved in the ideation, management and delivery of the ESA Research and Service Support ([rssportal.esa.int](http://rssportal.esa.int)) service. RSS has the mission to support the Earth Observation community in exploiting EO data, the researchers in developing new algorithms, and the service providers in generating and delivering value-added information. Topics: Users Support; EO data access and exploitation; ICT and data management; Distributed Computing; Education and training.
2. Testing, Verification and Validation: ESA Fast Prototyping Since 2014 Progressive is involved in the ESA Fast Prototyping project which has the purpose to develop mobile applications (e.g. see Sentinel App and PROBA-V App) and software prototypes. The main role of Progressive is to interact with the stakeholders to gather the requirements and to perform independent testing of the software deliveries released by the industrial consortium. Topics: Stakeholder interface; Requirements analysis; Testing, verification and validation.
3. Research Projects and Services: Fire and Burnt Areas Detection Progressive has developed a Fire Detection service, mainly based on Meteosat Second Generation (MSG) data, which provides in near real time information about fire detections and assess the derived burned areas.



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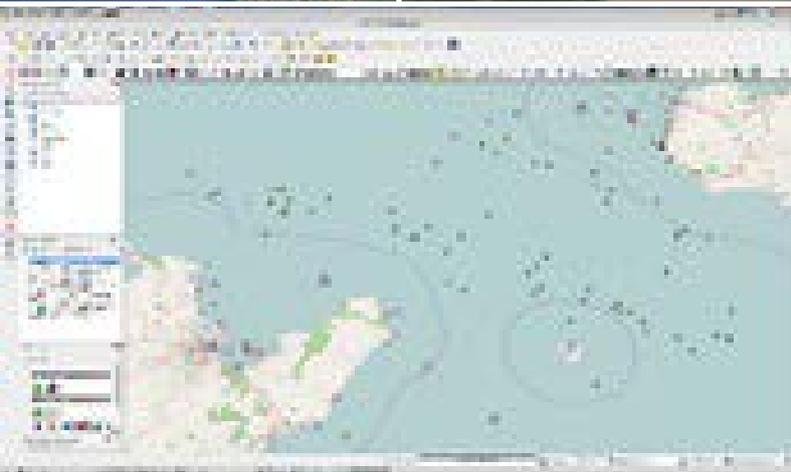
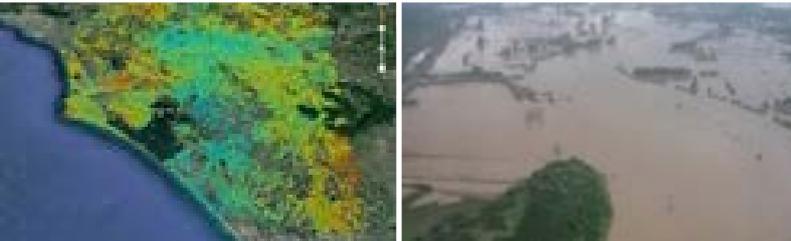
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Topics: Fire detection; Burned areas.

4. Research Projects and Services: Surface Deformation Monitoring By means of Interferometric Synthetic Aperture Radar (InSAR) applications, Progressive is able to study the earth surface deformation in order to monitor urban areas , landslides or also the effects caused by an earthquake. Topics: InSAR; Deformation monitoring.
5. Research Projects and Services: Flooded Areas Detection Progressive is capable to assess the flood extent from SAR acquisitions and to produce value-added maps in support to decision making and disasters response. Topics: Flood detection; Flood maps; Disasters response.
6. Research Projects and Services: Ship Detection Progressive has the capability to setup a ship detection chain based on SAR observations. In 2017, Progressive also supported the Italian Coast Guard in the development of a prototype chain. Topics: Ship detection chain (based on SAR data).



# 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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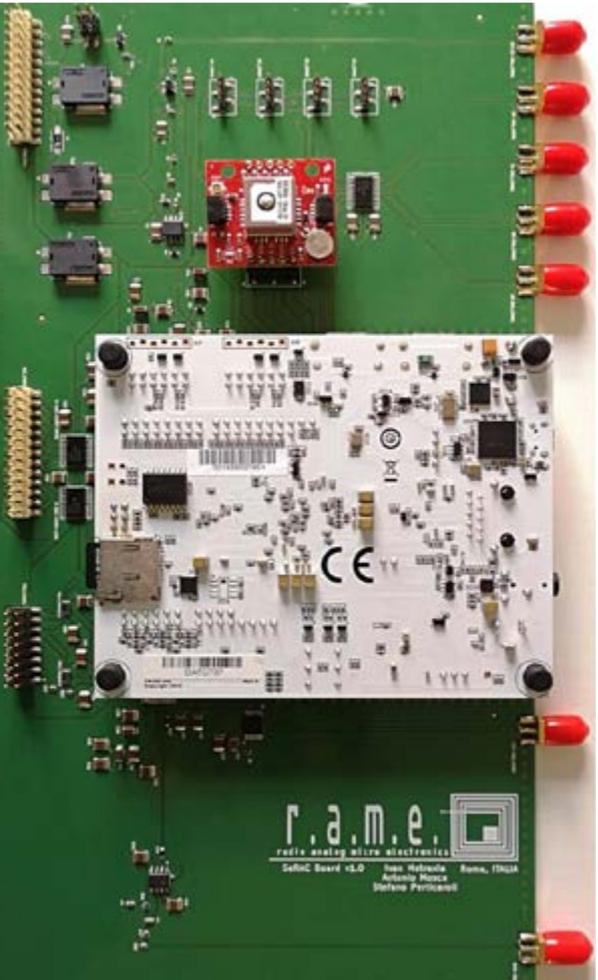
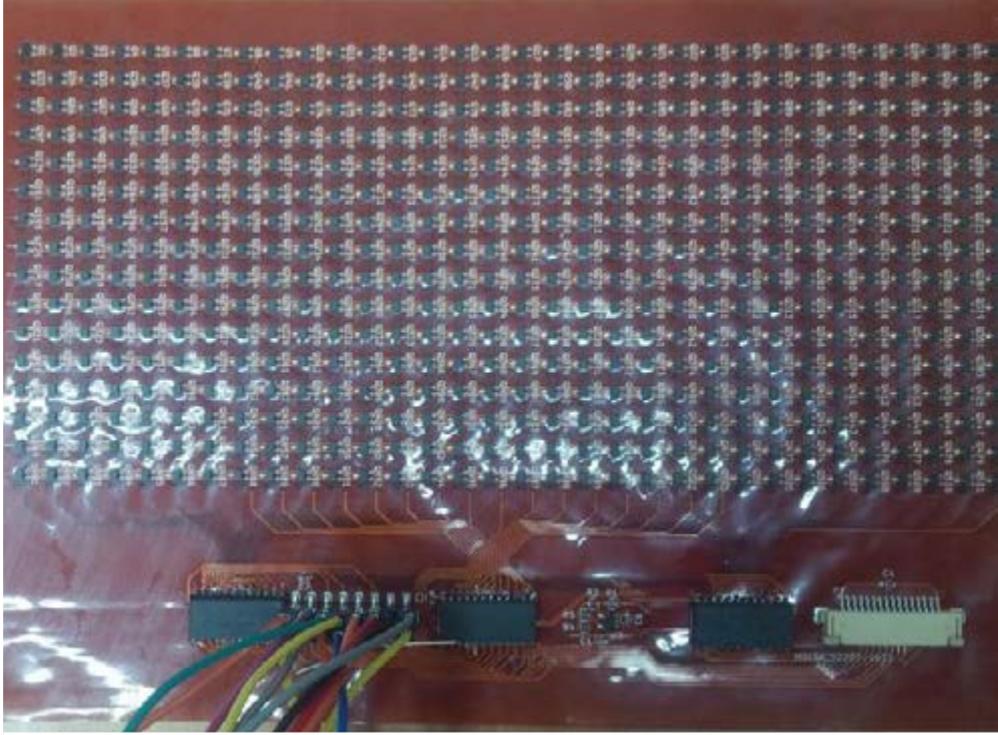
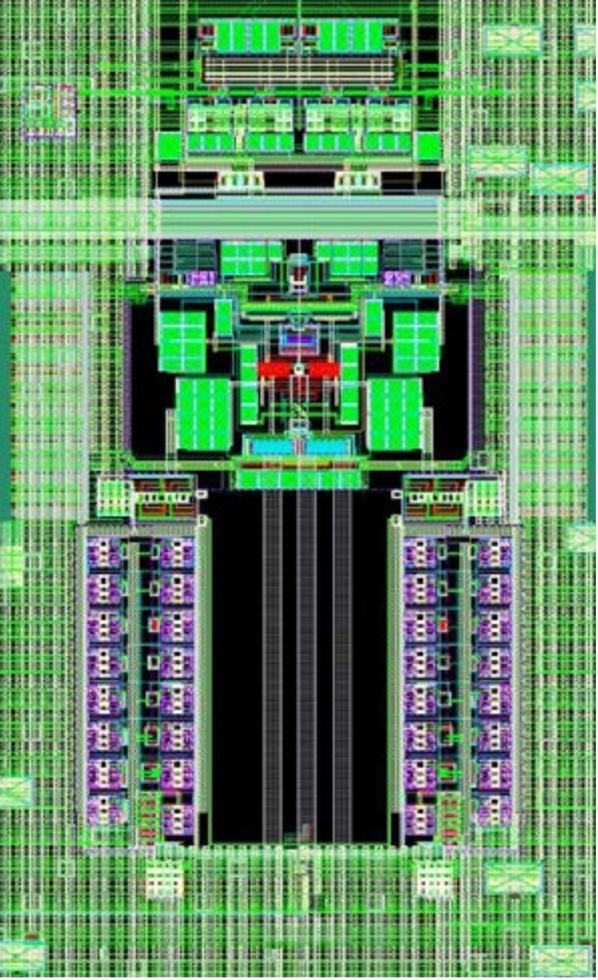
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# Radiolabs

## 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.



## Contact

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**SME**

Alessandro Neri

Presidente

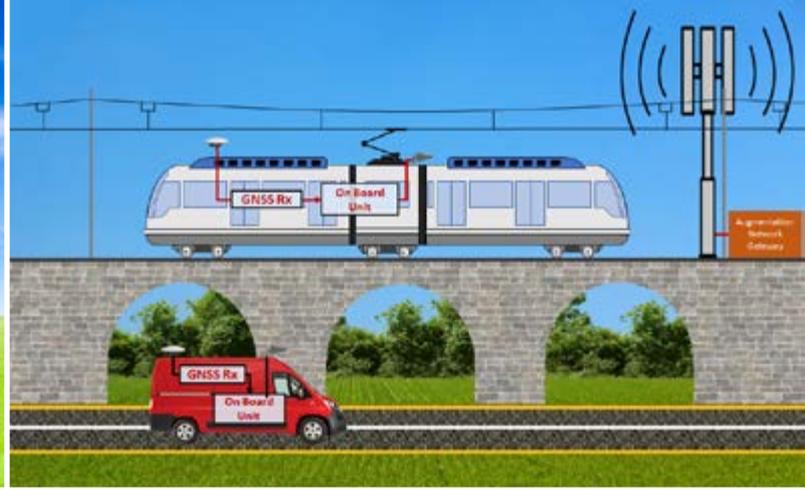
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## Main Research Areas

### **Connectivity**

Bearer-independent applications  
3/4/5G – Satellite  
Software Defined Networks

### **GEO Localization**

High Integrity applications  
Multi-constellation, dual frequency  
Multi sensors

### **Security**

Network security protocols  
Resilient GNSS signal processing

always connected, geo-localized, secure



# 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 suitable for the space environment to be implemented firstly on ARSULTRA on-board computers.

### Technological partners (Foundries)

X-FAB (Erfurt, Germany), TowerJazz (Israel), IHP (Frankfurt, Germany), LFoundry (Avezzano, Italy).

### Other partners

University of Jyväskylä (Jyväskylä, Finland), in particular with the RADiation Effects Facility, RADEF, an ESA-supported radiation effects test site.

### Resellers:

Tecnode Solutions Pvt. Ltd. (India) and Power Syntez CJSC (Russia Federation).

### Research and Innovation projects

#### Running project:

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

#### Past projects:

Title: Radiation Hard 16Mbit MCM SRAM for Space Applications (EuroSRAM4Space)

Funded under the European Union's Eureka Eurostars2 Programme.

Period: 01/05/2016 - 30/10/2018

Title: Radiation Hard Resistive Random-Access Memory (R2RAM )

Funded under the European Union's Horizon2020 Programme.

Period: 01/01/2015 -01/01/2017

Title: Development of Rad Hard Flash memories for space applications

Funded under the European Union's 7th Framework Programme Collaborative Project

Period: 09/01/2011 - 02/28/2014

### Sponsorship

- In April 2019, the company will be platinum sponsor for the 28th Workshop on Advanced in Analog Circuit Design (AACD 2019).
- Starting from Season 2017/2018 RedCat Devices supports as main sponsor La Torre Basket, an association counting more than 120 young talents playing basket in



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different championships. The main team runs in D Series at regional level.

## 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).

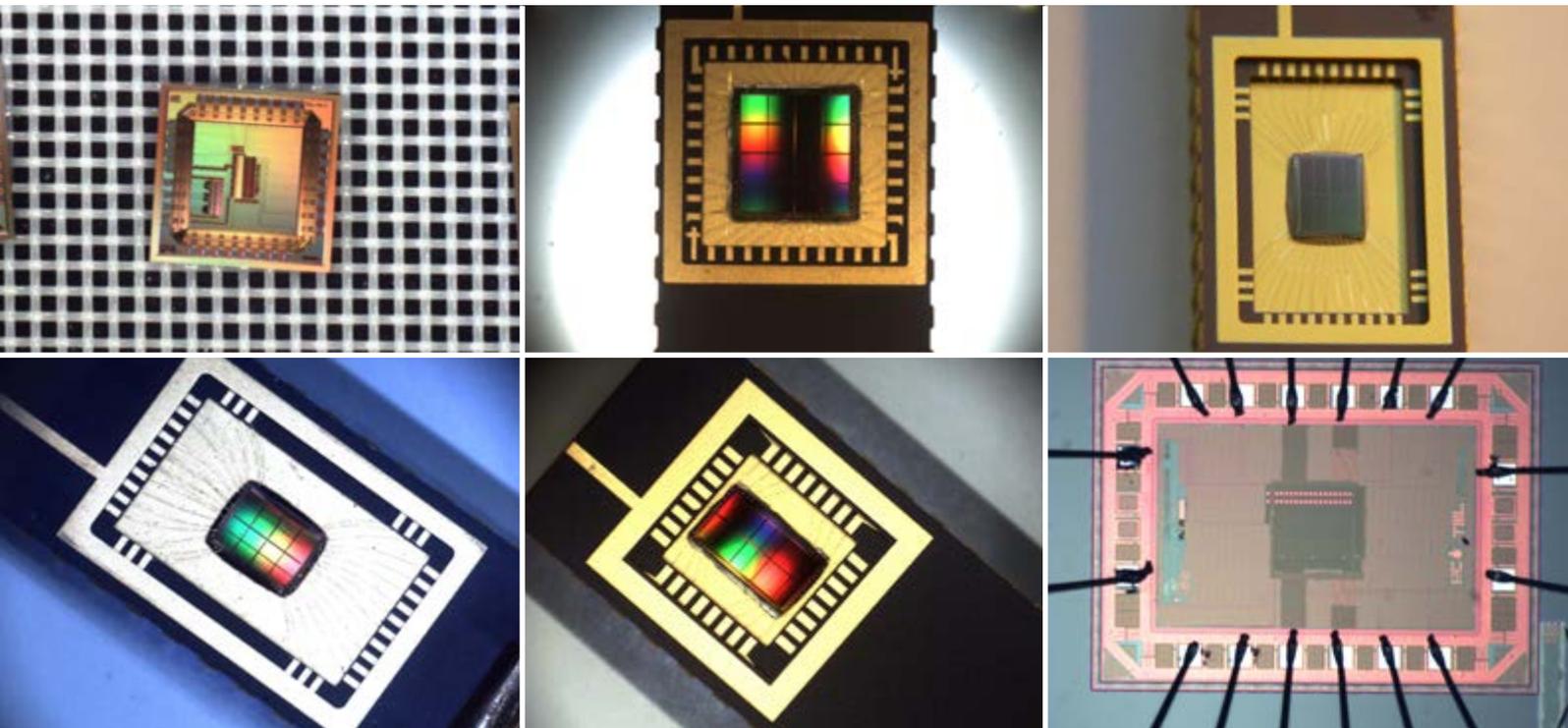
RadLib12I. Rad-hard standard cell library (1.2V) for IHP sg13s CMOS process.

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 20 employees and 4 external collaborators, most of them engineers with PhD. The company is involved in different H2020 programs and prime contractor in different European Space Agency projects and it is partner of international players such as Thales Alenia Space, SIAE Microelettronica, Elettronica and others.

Into 2017 the company moved to a larger premises, where a new and well-equipped laboratory for the assembly of phased array antennas has been set up, along with measurement facilities up to 67GHz for antenna and microwave equipment.

## 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



## Contact

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**SME**

Paola Farinelli  
Responsabile Marketing e  
Promozione

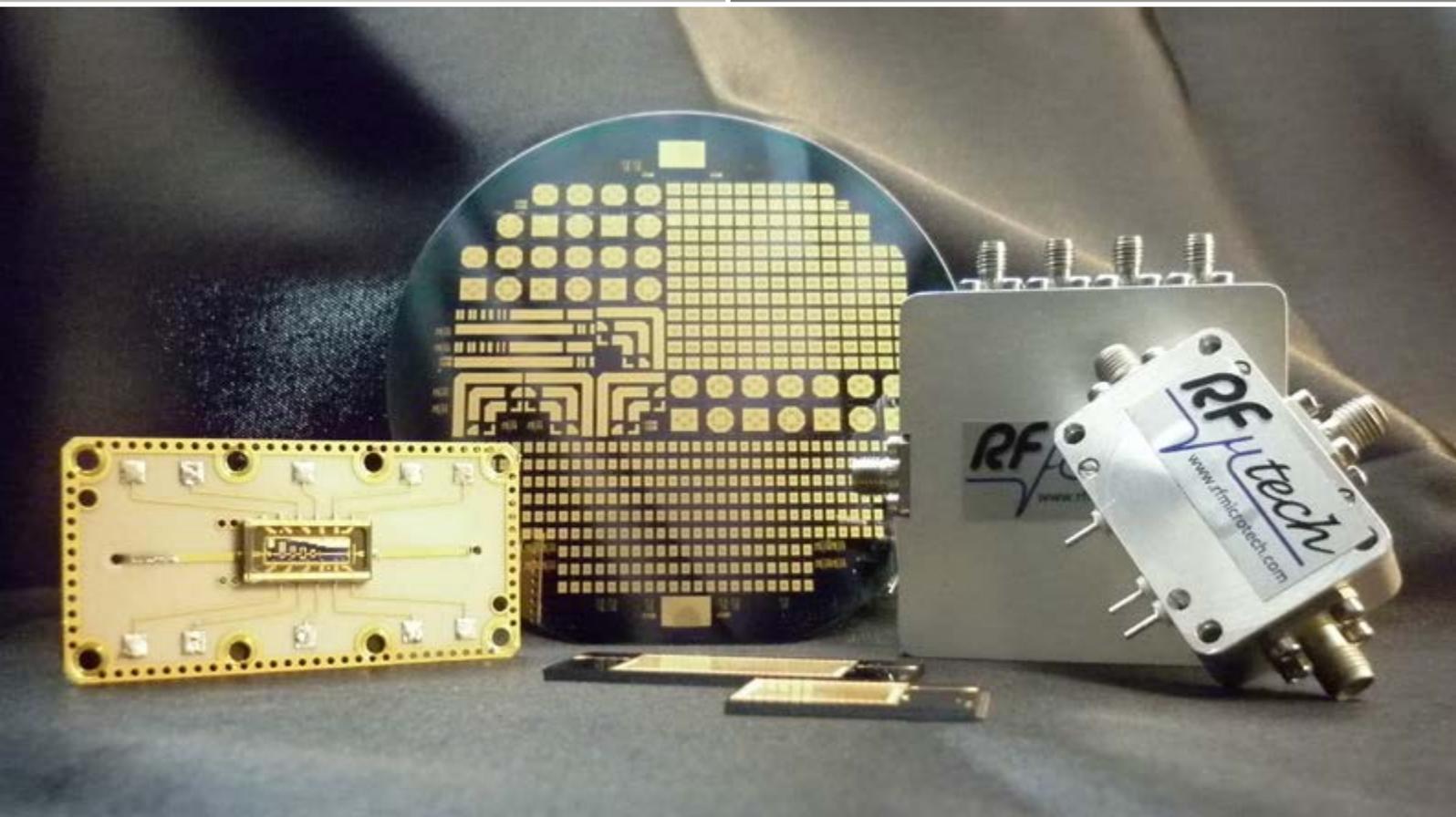
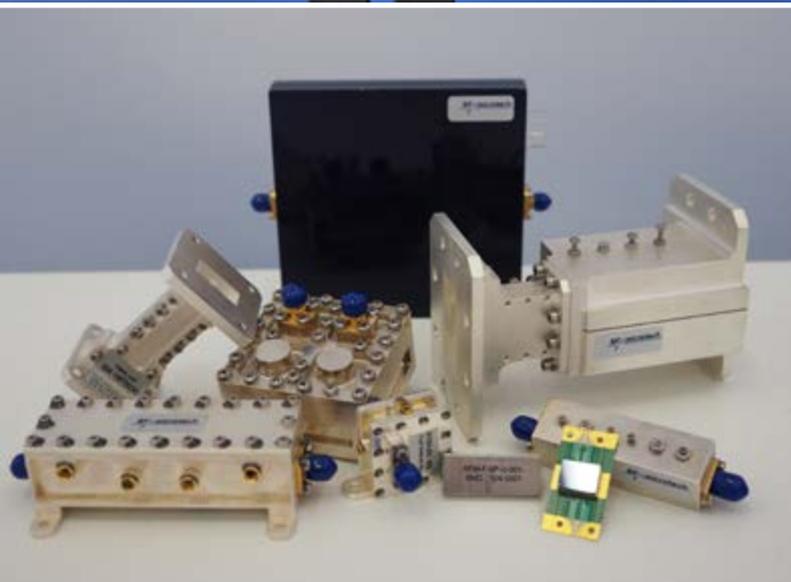
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## Company profile

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
- 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



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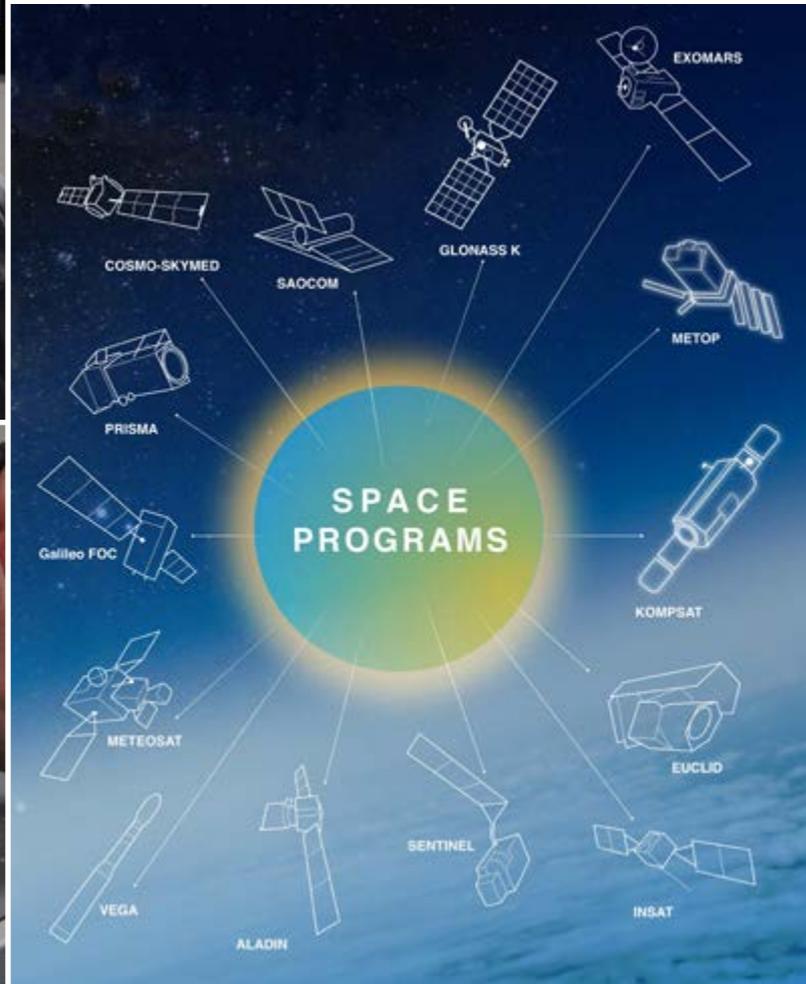
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### Incoming, Logging & Testing

- ❑ 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.B. 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). 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).
- **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:

**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);



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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.

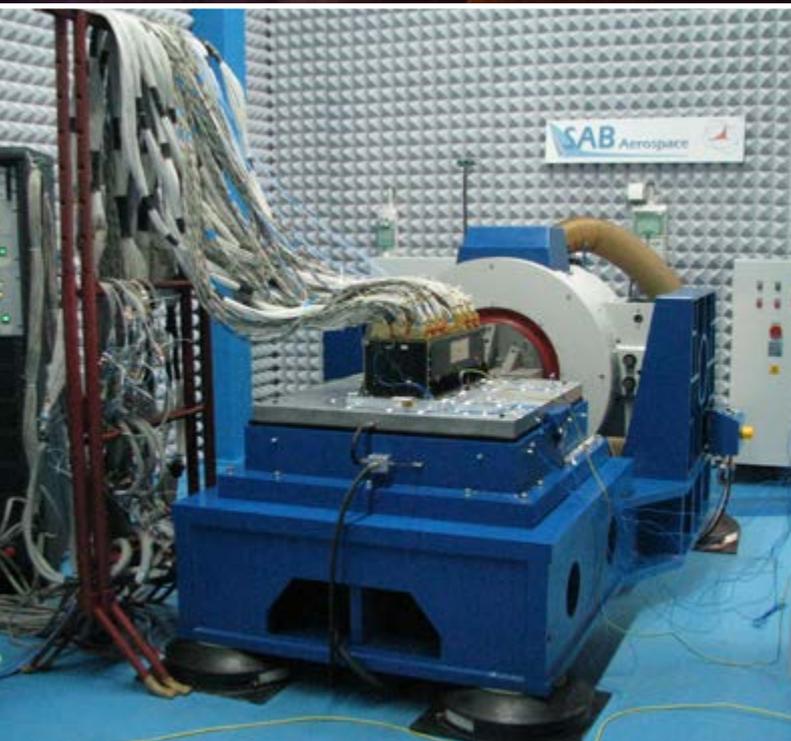
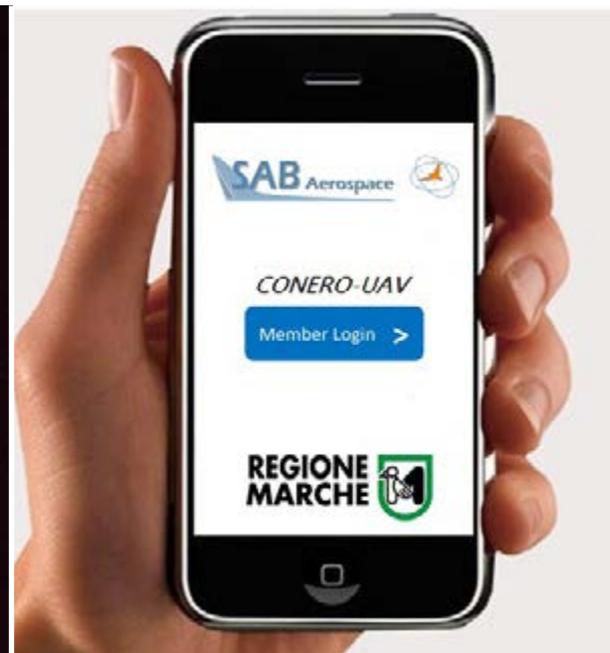
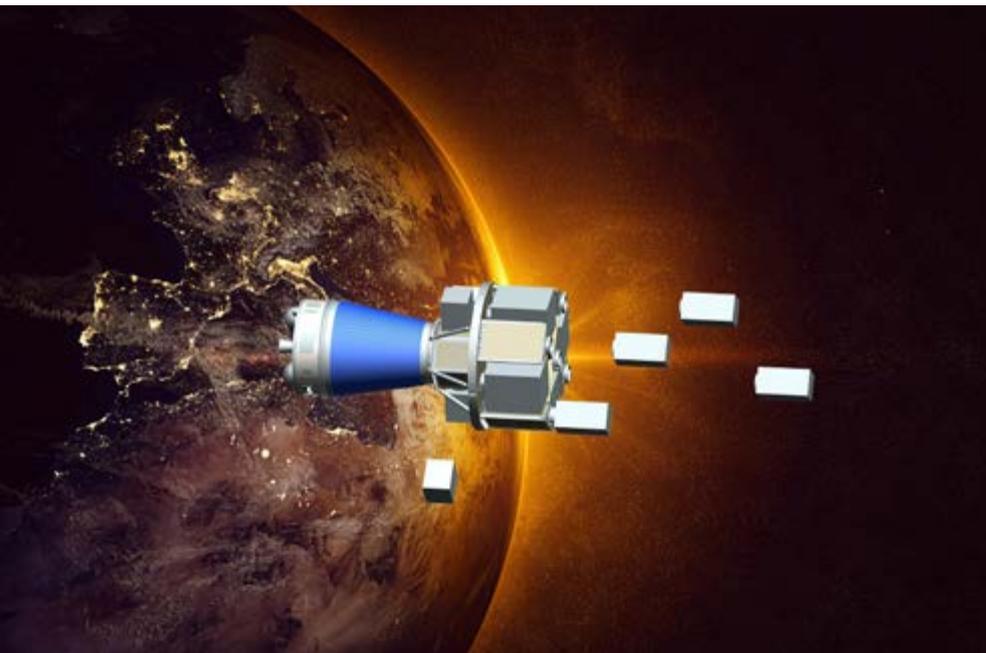
Development of Processes Technologies:

- 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.



# Sabelt

## 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.



## Contact

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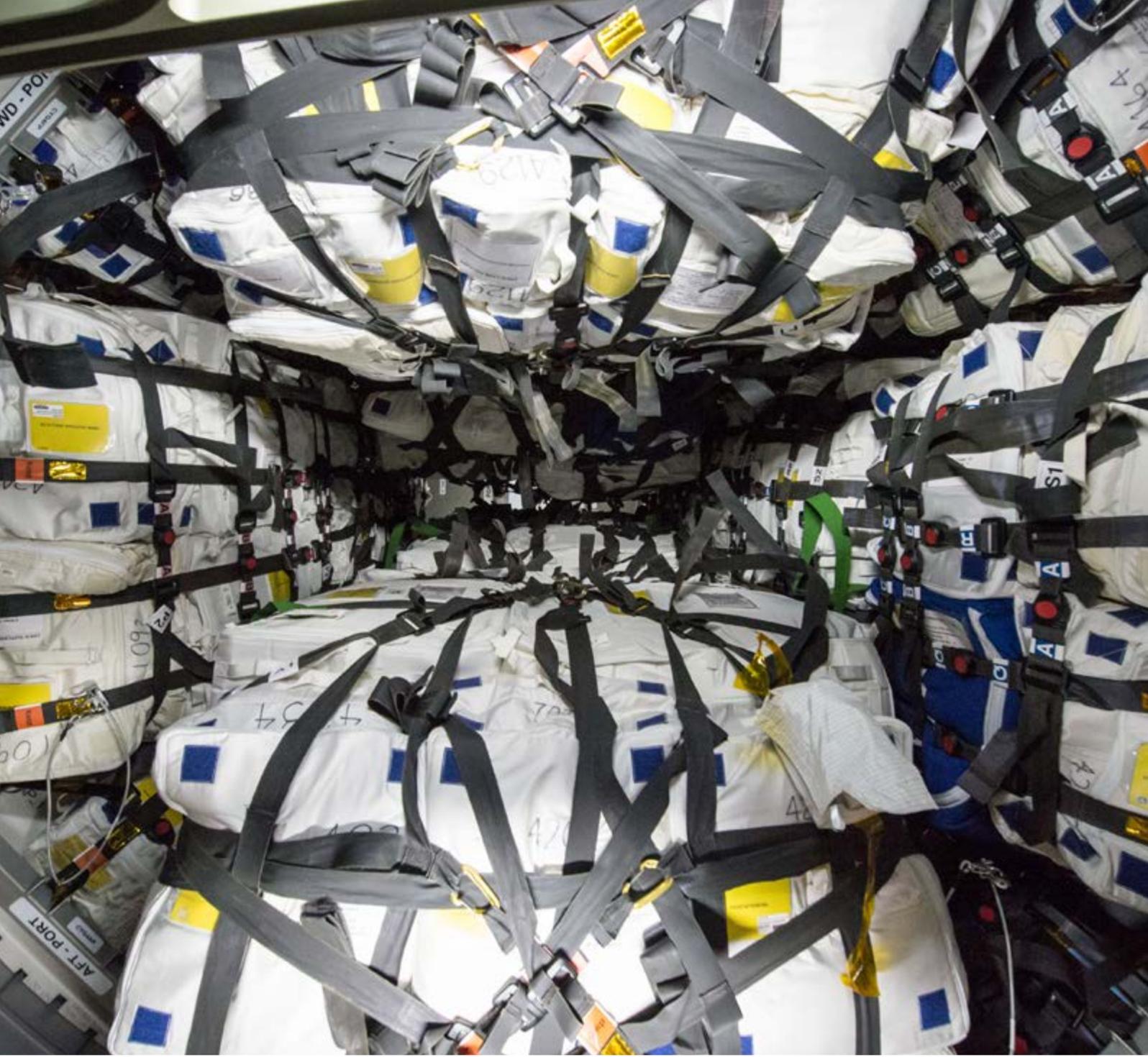
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# SAMET S.r.l.

## Company profile

Samet Srl is a company specialized in precision machining and construction of metallic products for the aerospace, industrial and automotive sectors. Samet srl has developed and maintains a Quality Management System in compliance with the UNI EN ISO 9001: 2015 and EN 9100: 2018 standards, certification body Kiwa UNAVIAcert.

## Products | Services | Applications | Technologies

- Oil&Gas: various components and supply of complete kits for centrifugal compressors, reciprocating compressors, gas turbines and steam turbines.
- Automotive: definition of oil pump prototypes for major car manufacturers.
- Aerospace: various components. We have a large CNC machine park and a metrology room renovated in recent years which includes a TESA3D XCELL coordinate measuring machine and a WENZEL model XO 10-7-1500 X3 coordinate measuring machine, as well as all the ordinary and basic instrumentation of calibers.



## Contact

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### SME

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Management  
representative for the  
Quality Management System

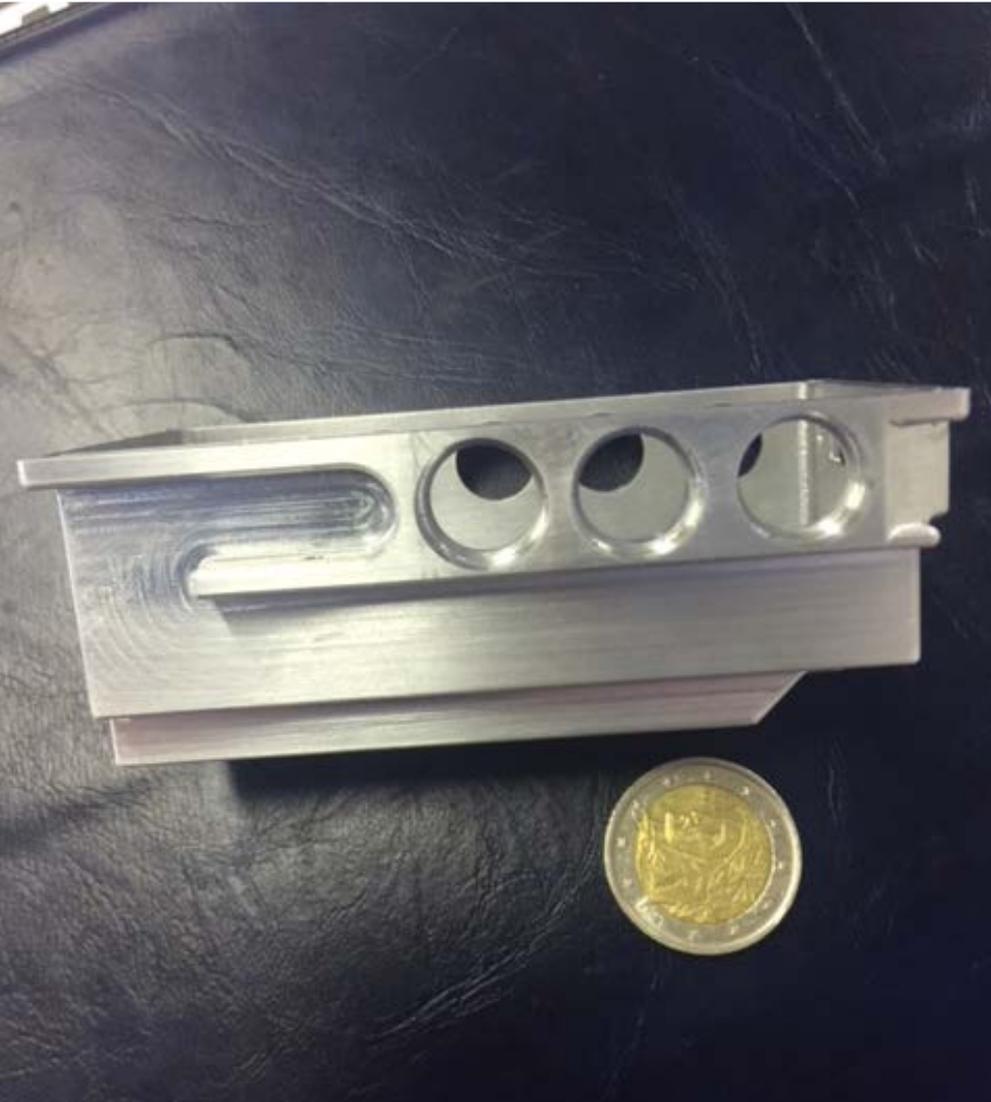
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# S.A.T.E. - Systems and Advanced Technologies Engineering S.r.l.

## Company profile

S.A.T.E. is an 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 marine and space industries.

S.A.T.E. specialises in the study and analysis of innovative systems, modelling and simulation, knowledge extraction and diagnostics 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.
- **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 normal system behaviour, identifying anomalies, detect incipient faults and identify possible causes, automatically.

SATE is a qualified supplier of ENI group (IT), BHGE-Nuovo Pignone SpA (intl.), DOOSAN Heavy Industries & Construction Lt. (KR), LINDE Engineering AG (DE), MOTOR OIL HELLAS SA (GR), SAIPEM SpA (IT), SAIPEM SA (FR), SARAS group (IT), STATOIL Petroleum AS (N), TECHNIP Italy SpA (IT), UHDE GmbH (ThyssenKrupp, DE), WÄRTSILÄ (FN), and others in the power and oil&gas sector.

SATE is a qualified consultant and supplier of BMW GmbH (DE), FCA SpA (IT), FPT-CNH Ind. SpA (IT), FERRARI SpA (IT), GENERAL MOTORS Group (intl.) and Sumitomo Riko Company Ltd (JP) in the automotive and motorcycle sectors and of the CERN, the ESA and OHB-CGS SpA 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 the dynamics of telescopes, 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 (AC brushless) and controls.

### DATA ANALYSIS AND DIAGNOSTICS SERVICES AND PRODUCTS

Systems diagnostics in a variety of solutions, including both model-based and data-based approaches. In the space field, S.A.T.E. performed five projects for the European Space Agency (ESA) for the study and implementation of data mining solutions for the analysis of large data sets, the extraction of relevant knowledge from data and the automatic detection of novelties or correlations. During these projects, the techniques developed were applied to the analysis of spacecraft telemetry data, with the purpose of monitoring the health state of the spacecraft and learn from data on its behaviour, and of medical data, with the purpose of defining solutions that may enable astronauts'



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medical autonomy in future missions.

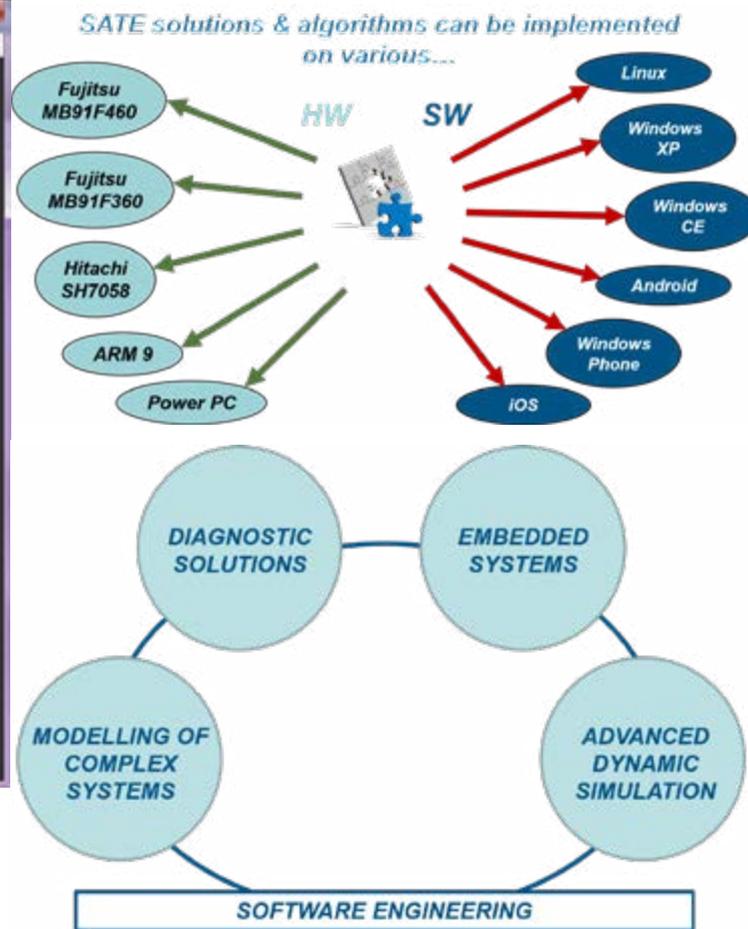
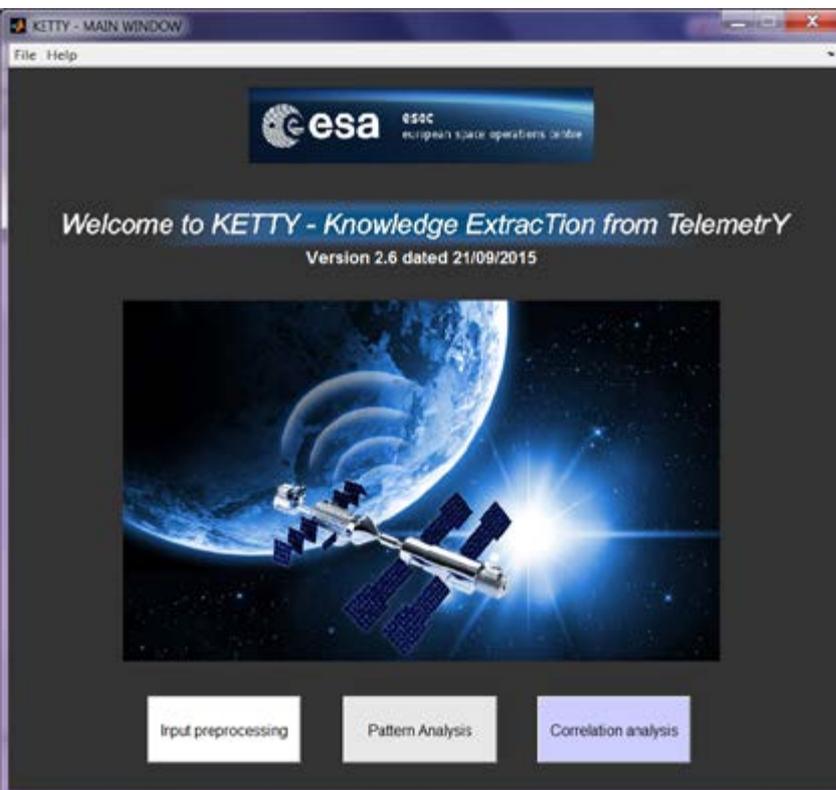
S.A.T.E. developed the software prototype KETTY (Knowledge ExtracTion from TelemetrY) that performs the automatic characterisation of the normal behaviour of the spacecraft, the detection of novelties, ordered by priority score, and identification of correlations among the monitored parameters. Some of the technologies developed under these projects were transferred also to other application domains, such as the automotive and the energy distribution fields.

**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/or 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 by data mining techniques.

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 the software satisfying the customer requirements and tailoring it to the specific programming languages and framework selected by the customer.



# 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.



## Contact

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**SME**

Concetto Squadrito

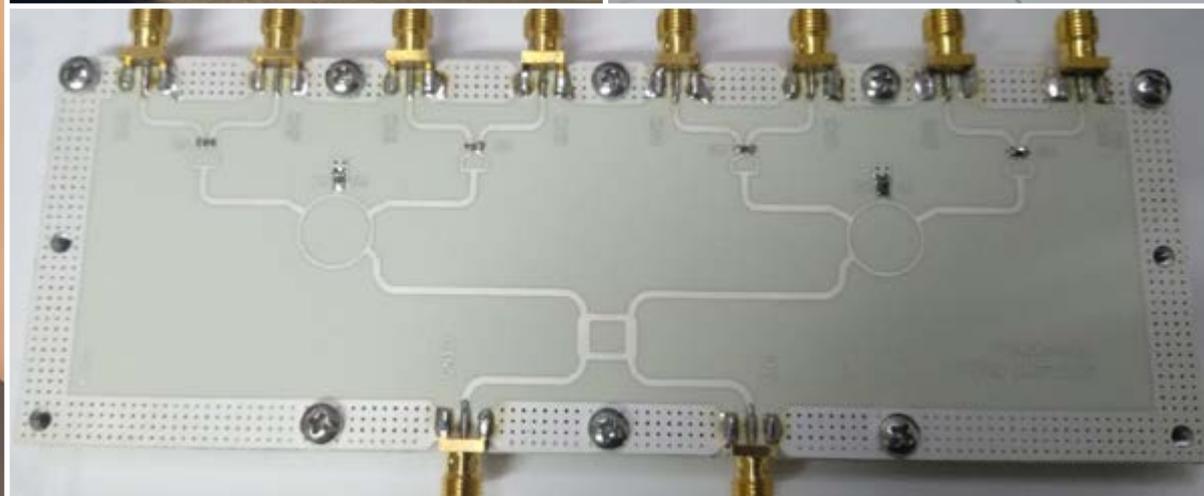
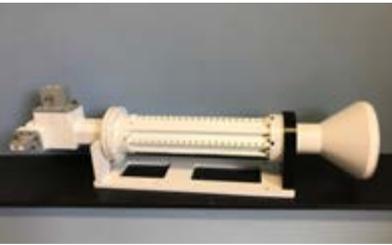
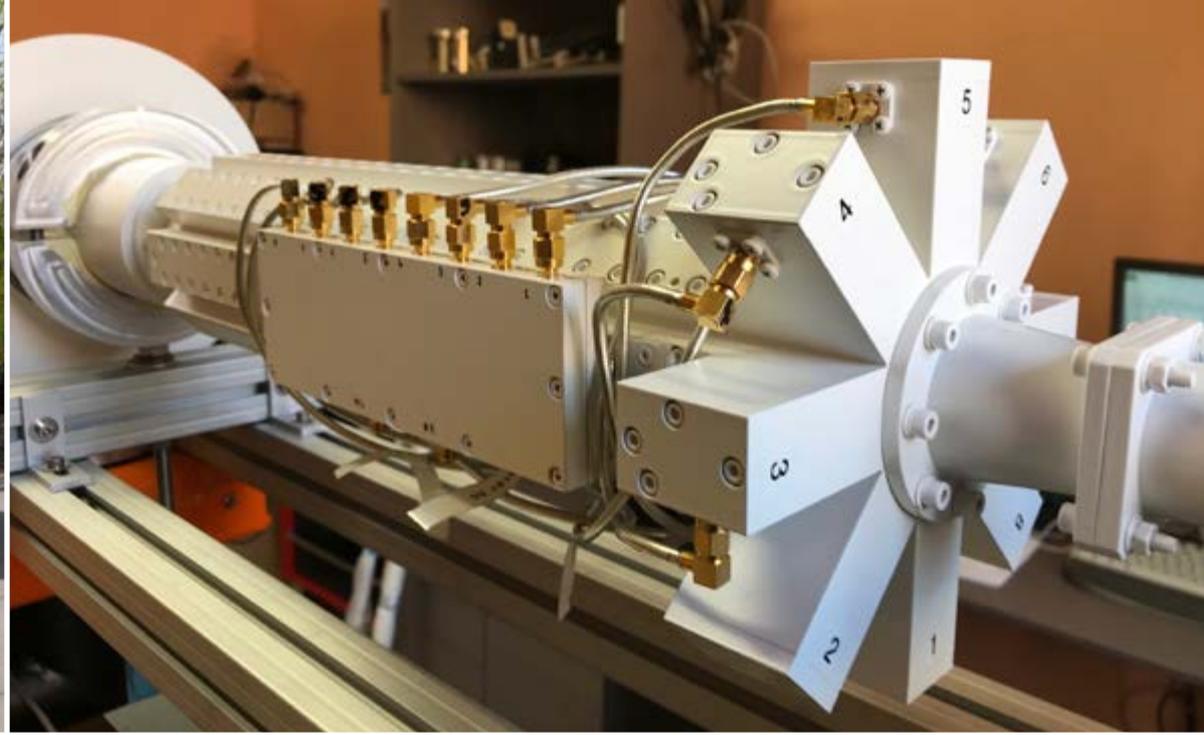
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# SO.MA.CI.S. SPA

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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



## Contact

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**SME**

Marco Galassi

EU Business Development

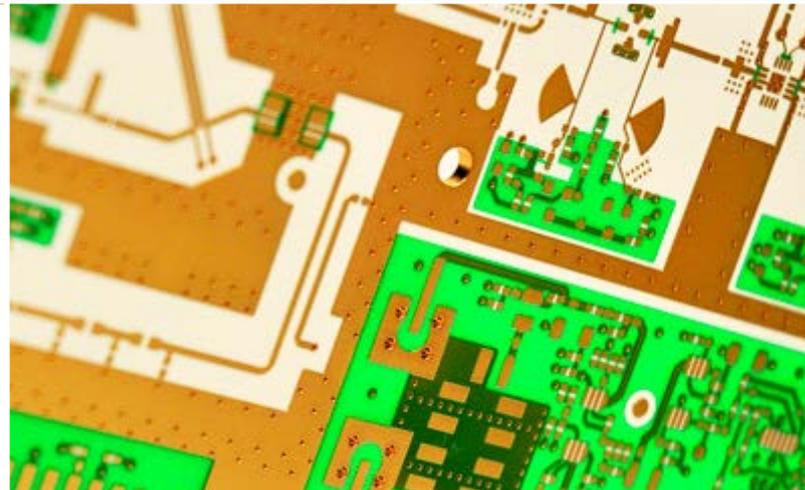
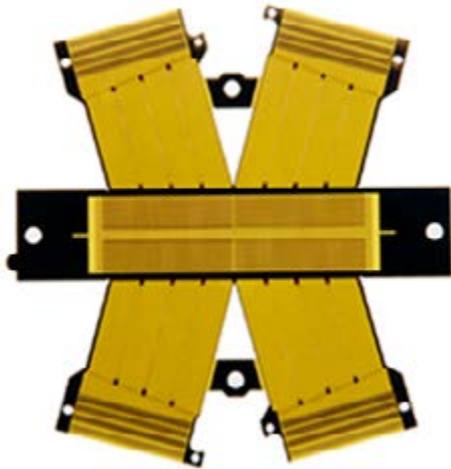
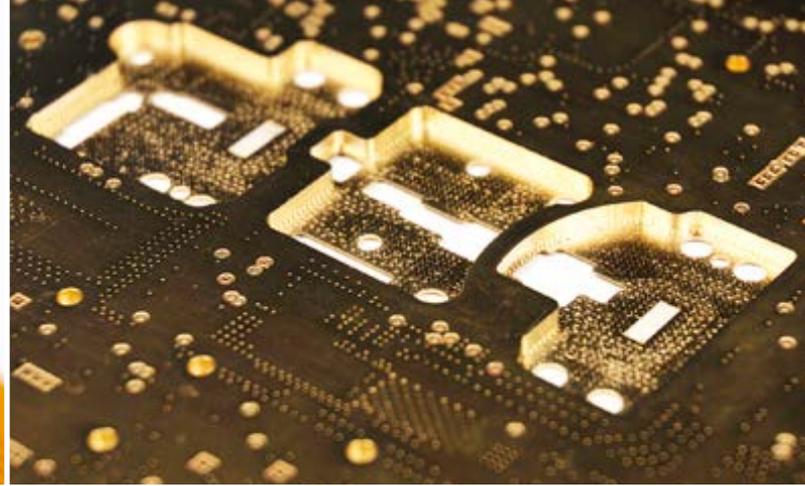
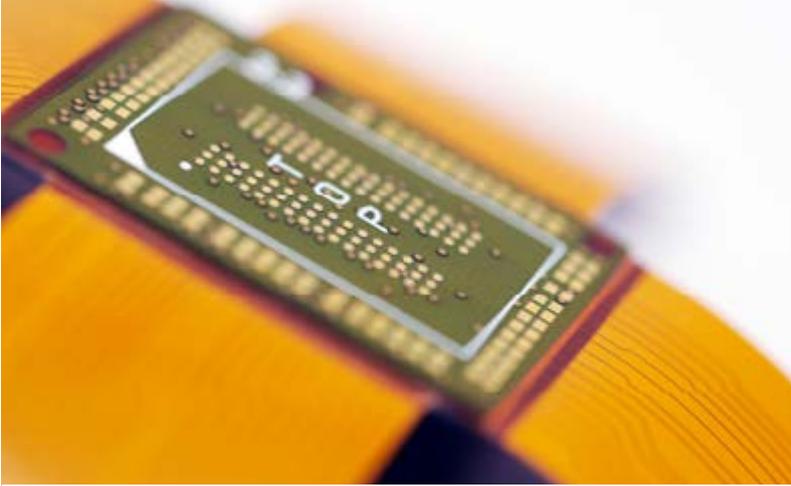
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# SpacEarth Technology

## 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

1. 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.
2. 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.
3. 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, 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.
4. 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.
5. 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



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**SME**

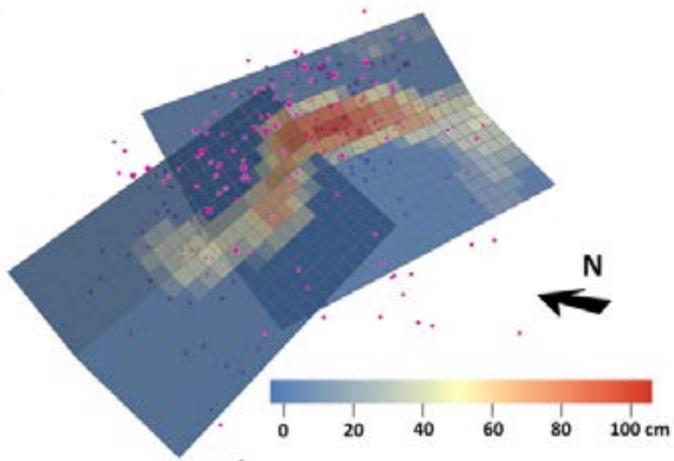
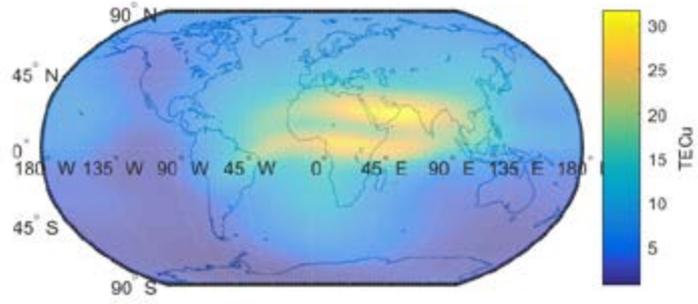
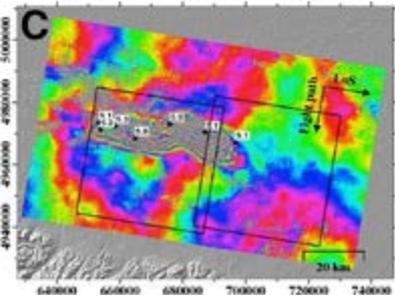
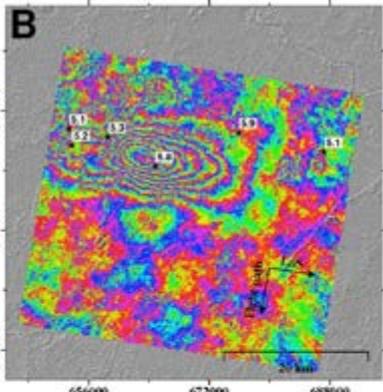
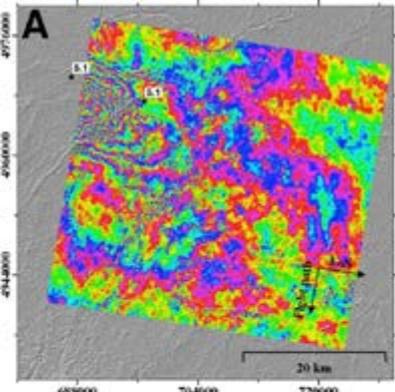
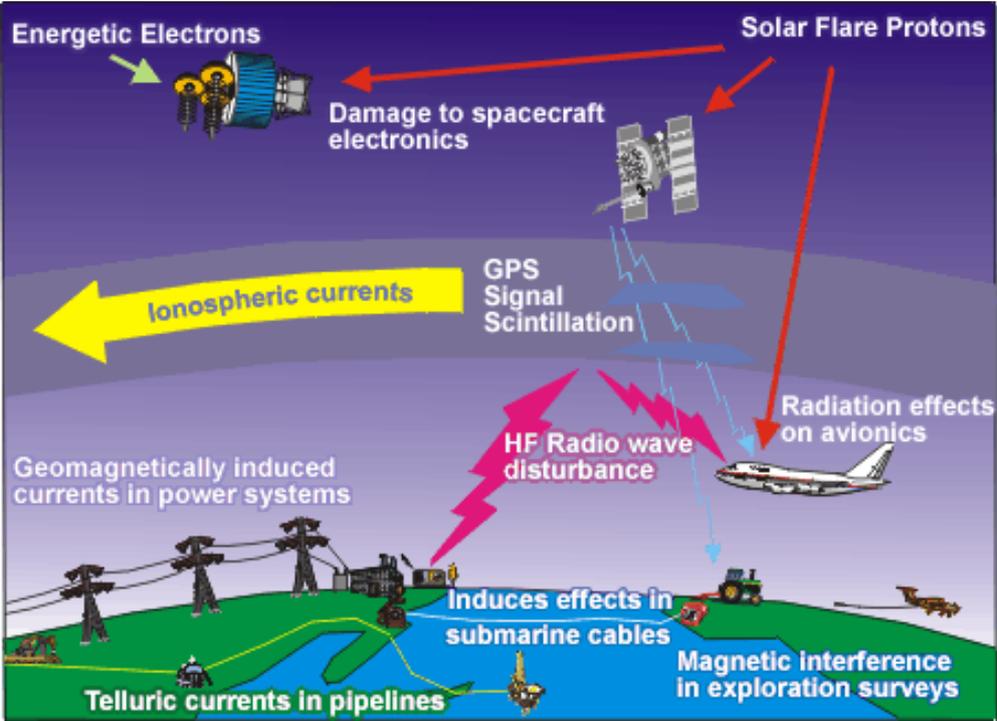
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mines collapse. The system is based on the innovative 4D LET algorithm (fourth dimension is time), able to analyze both natural and induced micro-seismicity (movements due to drilling or other mining operations).



# 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 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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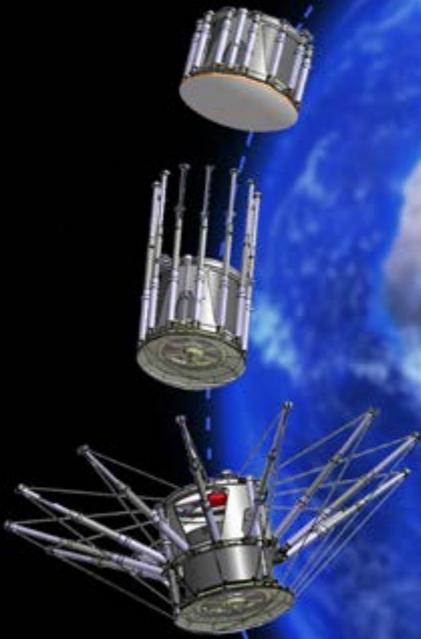
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SPACE  
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# Space Lab Spa

## 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.

The embedded SMEs presence permits ST4I 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 ideal 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.

In this respect, for several reasons, sometimes SMEs appear not synergized with the windows of opportunity and are still too much depending on products time development imposed and time cadenced by some others. The choice of the type of enabling technologies, where SMEs R&D investment is considered mandatory, is strongly depending on something not directly managed by the SME itself. The participation to the ESA world of opportunities - through the sharing of ASI - is considered by us 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



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**SME**

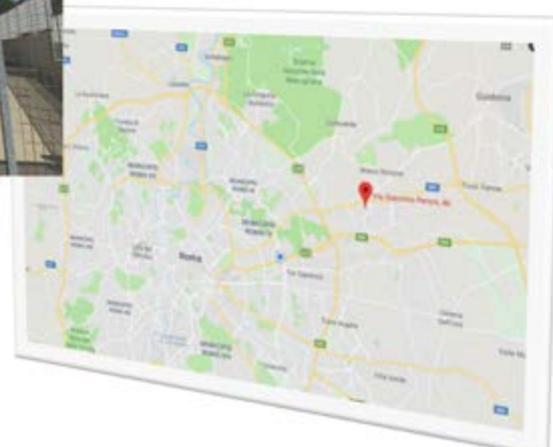
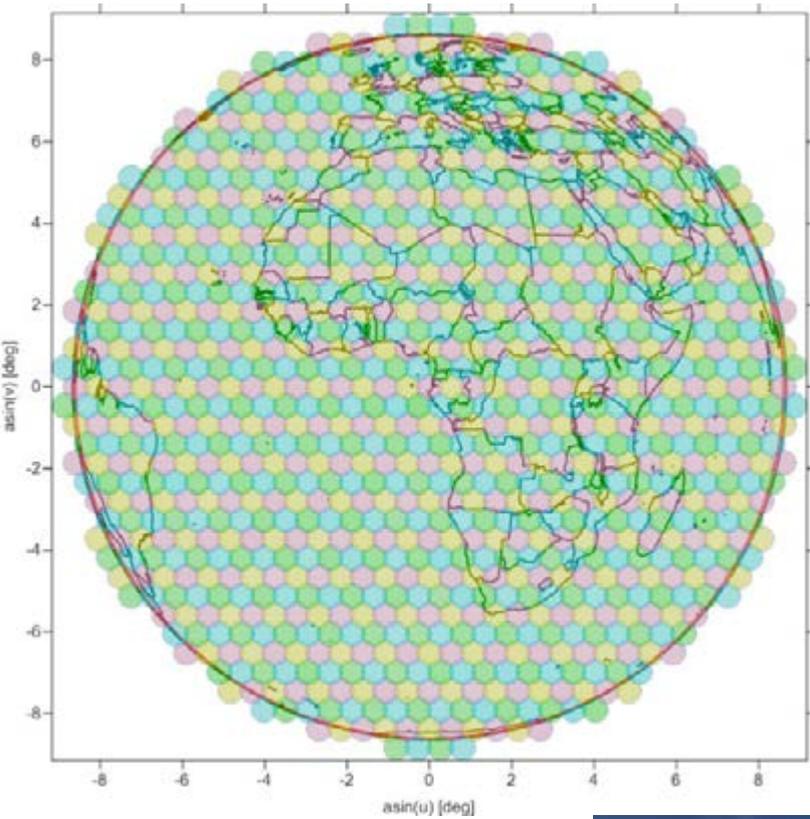
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use of dedicated small satellite (micro, nano, CubeSat). Once validated, the developed product could be usefully considered also for Institutional programs providing the right Return of Investments spent in such development.

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).



# 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 ADRINET "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 ADR1EN 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, GMV, OHB, Sonaca Space, Arescosmo, Leonardo, QinetiQ, Sonaca Space) and a number of research bodies (e.g. ASI, CNR, ENEA, CIRA, Politecnico of Milan, Politecnico of Turin, University of Rome Tor Vergata, Tecnalita, CEA).

## 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:

- IT2000SV00049 20001019 "Nutating bevel gears based gearbox".
- IT2006RM00609 20061110 "Equipment for product modelling, specifically for mouldable products that mainly extend on a plane, specifically textile products and control system of the equipment itself".
- Application GE2014A000068 20140717 "Planetary Gearbox based on Tilted Bevel Gears with Two Reduction Stages for Very High Gear Ratios".

Besides Stam owns a laboratory equipped with a test bench to measure the



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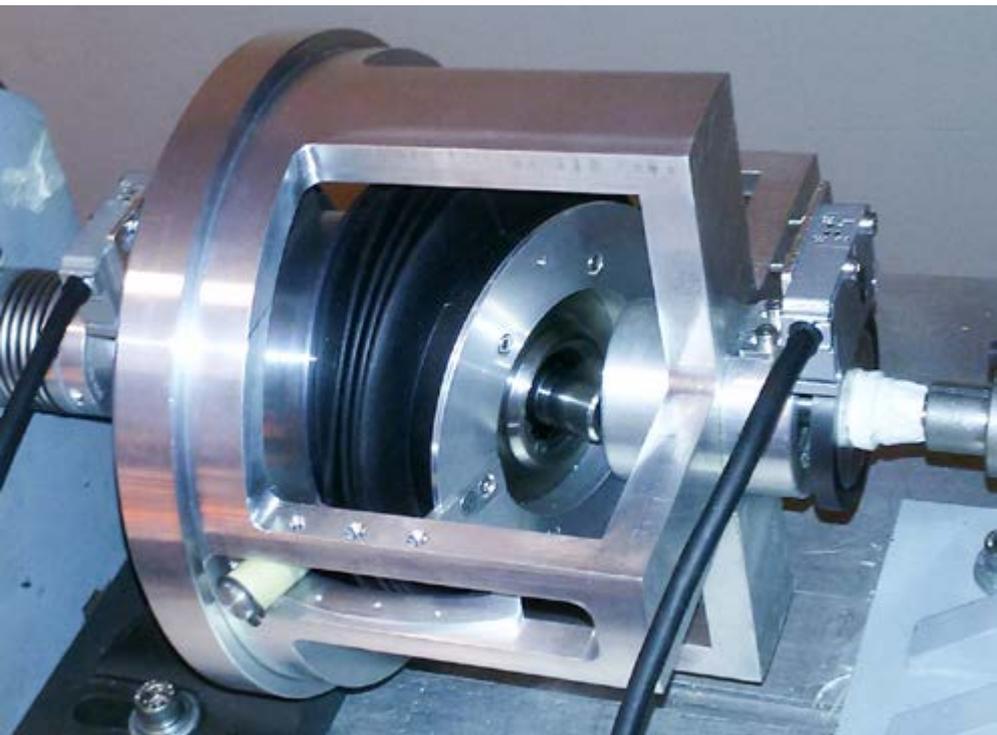
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performances of mechanical and mechatronic systems developed either by Stam or by third-parties. The laboratory is equipped with dedicated instrumentation and software for data acquisition and processing.



# Stellar Project srl

## Company profile

Stellar Project is a blend of leading edge technical research and prominent entrepreneurial skills. Stellar Project is an innovation-based startup and a spin-off of the University of Padova. It develops and offers 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

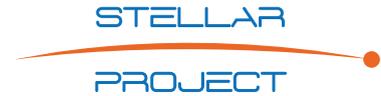
## Products | Services | Applications | Technologies

LaserCube is a laser communication terminal for nano, micro and mini satellites, and is compliant with the CubeSat standard. LaserCube 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. Nanosatellites already offer a unique mean to realize low-cost missions accessible to a large variety of operators and users, and LaserCube represents a special technical solution to revolutionize such low-cost missions. In fact, it will make possible to transmit and distribute unprecedented quantities of diversified space-borne data, contributing to further increase the business opportunities related to the employment of CubeSats, including Earth imagery, weather forecasting, global telecommunications and internet services.

Special risks analysis for spacecraft and constellations

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 and space weather. 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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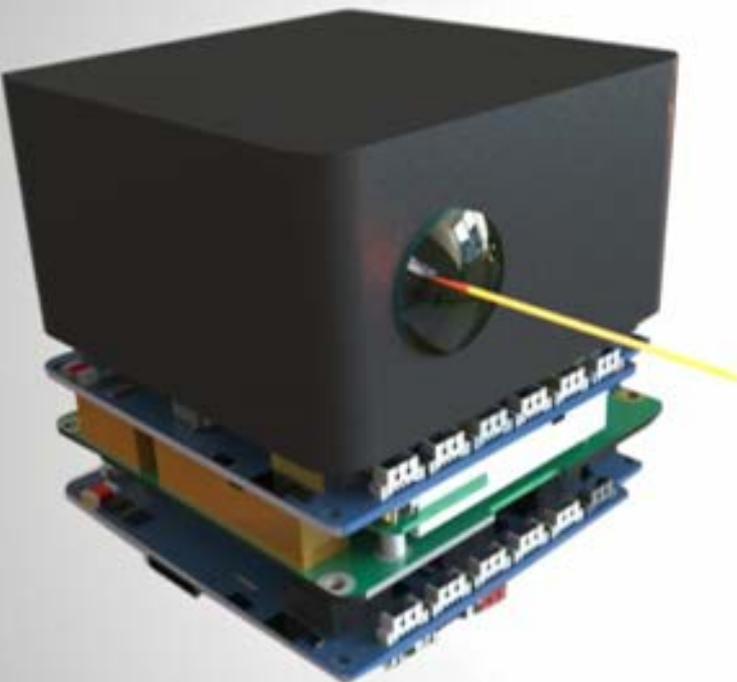
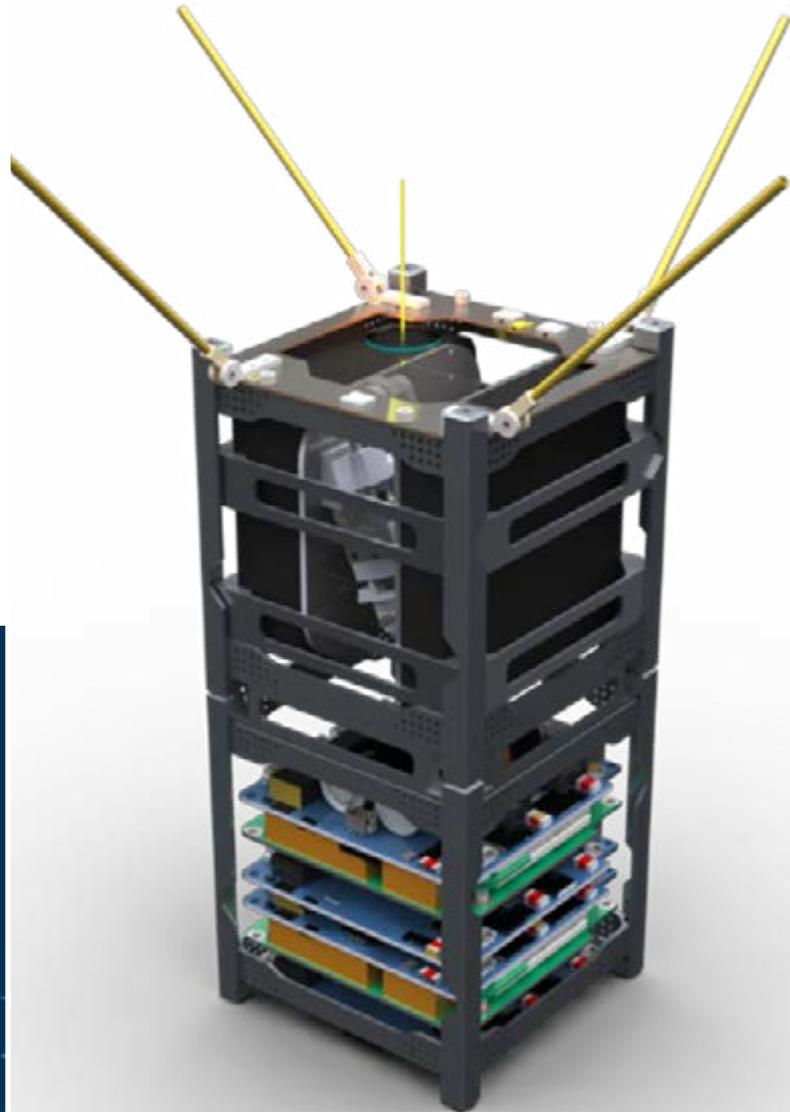
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# Down-link configuration



Lasercube  
creating the optical highway  
for nanosatellite communication

STELLAR

PROJECT

# Survey Lab

## Company profile

Survey Lab a spin-off of Sapienza University of Rome was started in 2008 by researchers of the Geodesy and Geomatic Section of the Civil, Environmental and Construction Engineering Department (DICEA).

Its main expertise is in the development of innovative approaches based on remote sensing and geomatic techniques to monitor land, structure and infrastructure.

In 2016, thanks to I.MODI, a H2020 Phase II- SME-Instrument Project, the company enforced its commercial approach with new experts and research and business partners.

### MISSION

- Develop and distribute innovative geomatic monitoring systems based on advanced surveying and mapping technologies with a specific focus satellite Earth Observation data.
- Promote the use of satellite technology to increase the capability of setting up preventive mitigation actions to protect land and urban areas.

## Products | Services | Applications | Technologies

Survey Lab provides monitoring services for built-up and natural hazard areas.

### I.MODI® - AN EARTH OBSERVATION DOWNSTREAM SERVICE

I.MODI (Implemented MONitoring system for structural DISplacement) is a value added service that integrates Earth Observation (EO) technologies, in-situ data and ICT to monitor the stability of buildings and critical civil infrastructures. It was developed thanks to a SME-Phase 2-H2020 grant.

Monitoring urban areas and infrastructure networks is a dominant socio-economical issue for the safety of the population. Structural deterioration with aging and due to natural and man-made subsidence processes poses a threat to structural strength.

To guarantee a systematic and comprehensive monitoring service over large areas EO data can be effectively adopted by means of the Differential Interferometry SAR (DInSAR) technology. I.MODI® exploits DInSAR displacement time series by designing monitoring solutions fully assimilating ground-based data.

Through a multi-level service I.MODI performs the analysis of the displacements suffered by a structure and sets up a damage assessment investigation. A WebGIS platform is adopted to distribute results to a wide range of users and advanced technical reports for specialists.

I.MODI service aims at encouraging mitigation and prevention actions enforcing the capability of performing back analysis using data archived since early 1990ies. Customized solutions can be implemented for different end-user needs.

### MAPPING AND GIS

Survey Lab uses GNSS surveying and EO data to setup georeferenced databases accessible in GIS platforms

### NATURAL HAZARDS

Multi-temporal analyses based on airborne lidar and satellite photogrammetry for controlling areas affected by natural hazards

### OTHER SERVICES

Training Courses

Research and Development Projects

WebGIS Platform

App development



## Contact

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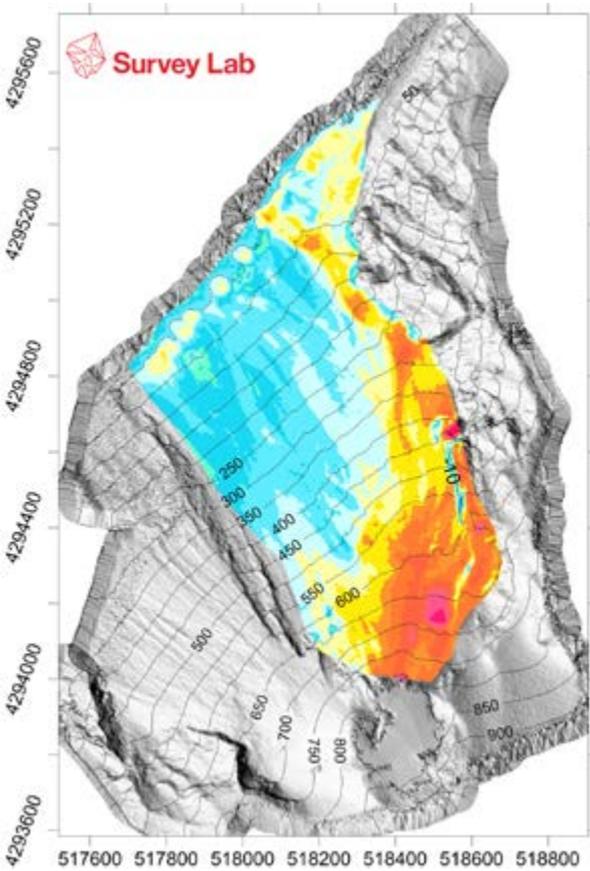
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# T4Innovation Srl

## Company profile

T4i Technology for Propulsion and Innovation is an Italian SME founded in 2014 by an entrepreneur and some researchers with international experience and several years of expertise in developing innovative systems.

T4i supports the aerospace industry by developing disruptive space technologies and provides the space market with innovative propulsion solutions and services. The company operates in the Newspace Economy, a field characterized by the growth of smaller and less expensive satellite platforms that are complementing the services offered by big satellites. The market requests are becoming more and more demanding in terms of micro/small satellite mobility and the need of smart and cost-effective solutions to enlarge their life-time period and efficiency has increased. T4i is working to respond to these needs by developing reliable and robust propulsion systems for micro/small satellites.

Main work Areas:

- Electric propulsion: development of cost-effective electric propulsion complete modules for the mobility in space of micro/small satellites
- Chemical propulsion: development of mono/bi-propellant thrusters and hybrid motors for in-space and access to space applications
- Telecommunication: design, development and testing of plasma-based antennas

## Products | Services | Applications | Technologies

T4i key products are electric and chemical propulsion systems. In the specific, the company develops two lines of products: REGULUS, an electric propulsion module suitable for micro/small satellites, and three chemical propulsion systems based on highly stabilized hydrogen peroxide for in-space and launcher applications.

Electric propulsion

T4i is developing REGULUS, an electrical propulsion system based on a Magnetically Enhanced RF Thruster technology.

- Compact electrical propulsion module (1.5U to 2U Cubesat)
- < 2 kg of weight
- Complete module ready for integration in satellite platforms that range from 6U up to 150 kg
- Suitable for orbit raising, orbit maintenance, disposal manoeuvres and drag compensation at Very Low Earth Orbit missions
- Simple architectural structure
- Suitable for industrial production
- Highly modulable thrust

Chemical propulsion

T4i offers three kinds of chemical propulsion solutions: mono-propellant and bi-propellant thrusters and hybrid rocket motors. All these chemical propulsion systems are based on highly stabilized hydrogen peroxide, making handling and transportation safer with respect to other commonly used propellants.

These chemical propulsion systems are targeted for small, low-cost satellite platforms and nanosatellite deployers and, being fully developed in T4i, can be easily reconfigured following the specific needs of the platform; moreover, the use of green combinations of propellants allows these systems to be compliant with space sustainability regulations.



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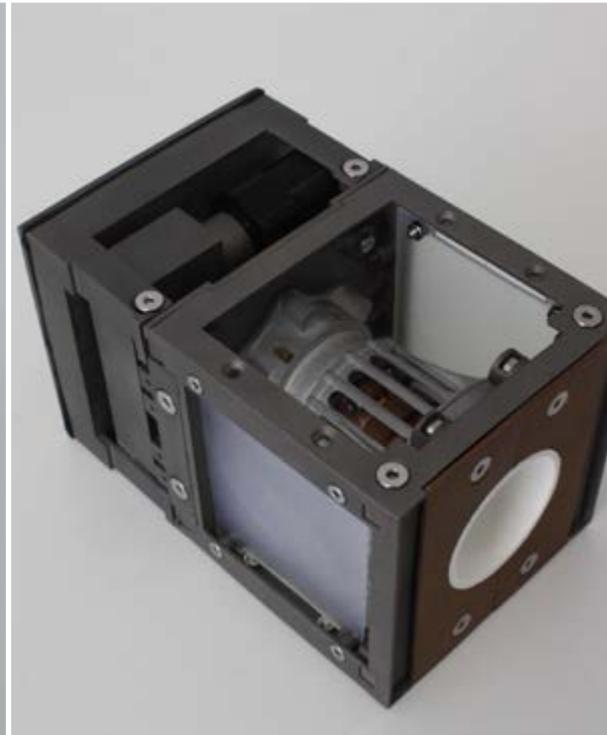
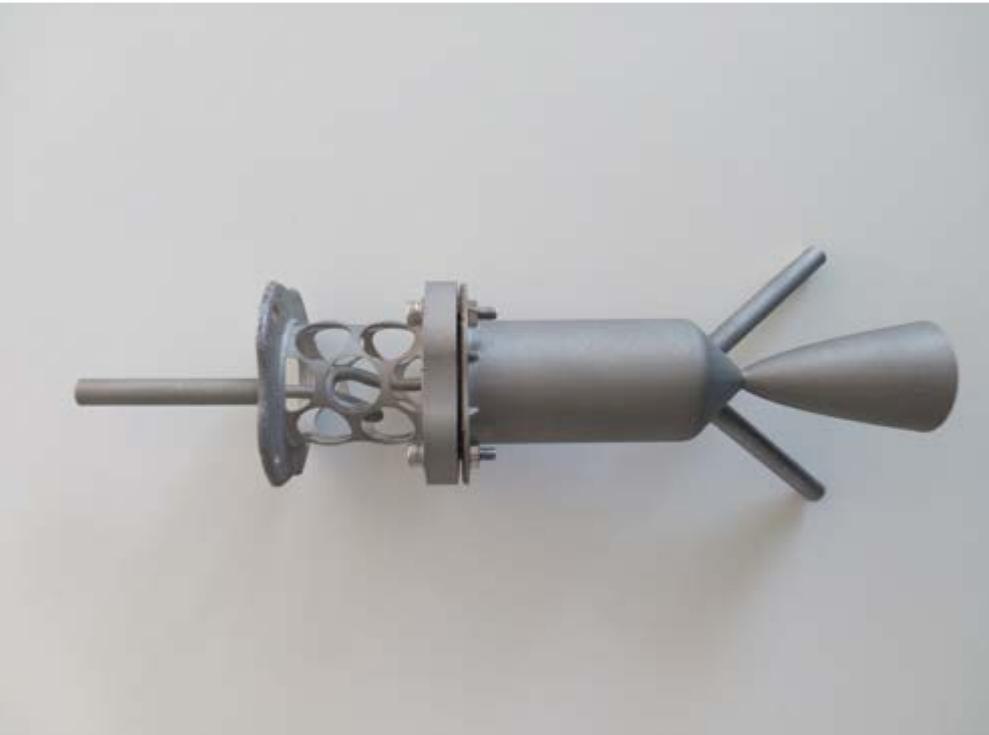
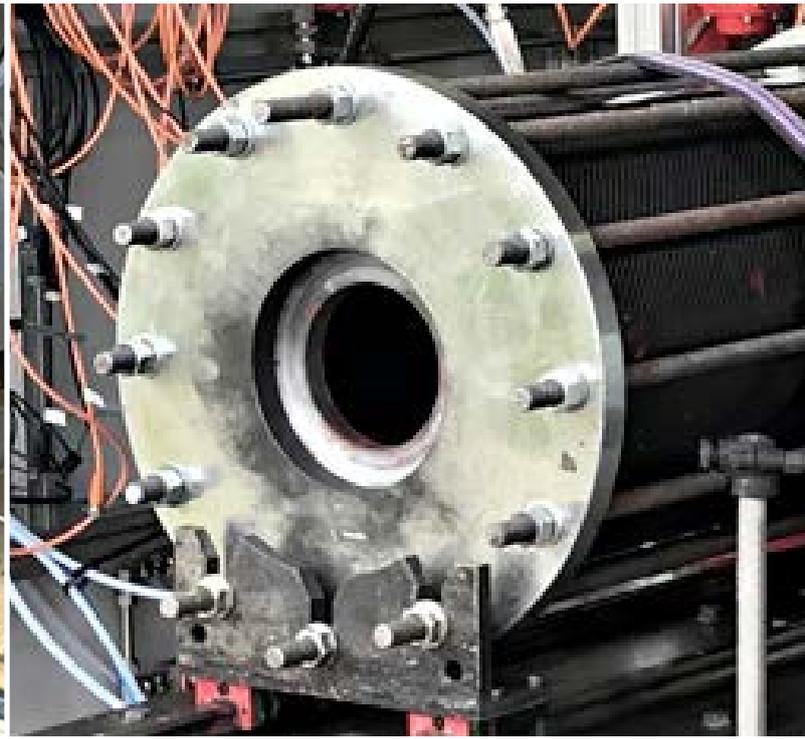
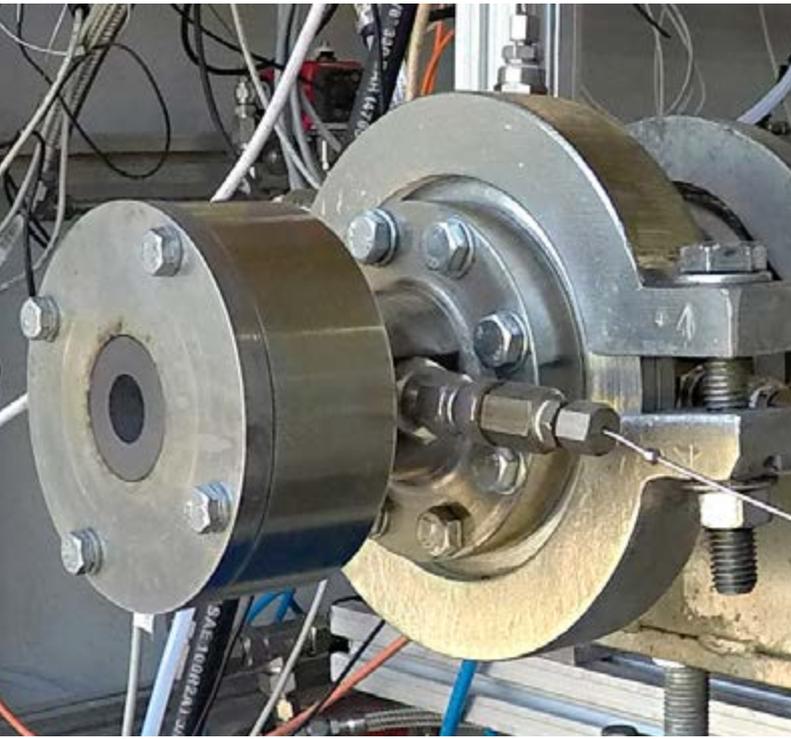
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Applications:

Mono/bi-propellant thrusters

- Satellites fast orbit insertion, re-positioning, station keeping, reaction control, collision avoidance, disposal manoeuvres.
- Hybrid motors
- Microsatellites access to space, satellites orbit insertion and re-positioning, space vehicles, landers, sounding rockets, suborbital flights.



# Taitus software Italia Srl

## Company profile

Since 2004, Taitus Software Italia is a software development company specialized in advanced mission analysis, planning and simulation tools for space applications, with particular focus in Earth Observation.

The company is a key software supplier to main space companies, its applications are used operationally in many running missions as well as entities like Copernicus and the International Charter of Space and Major Disasters.

Moreover, Taitus Software Italia is co-owner of a UK company providing Earth Observation data find and access services to multiple satellite data providers, acting as reseller, and it is a supplier of main space agencies, spanning 26 countries.

Taitus' main off-the-shelf 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).

Taitus Software Italia also participates in a project of the H2020 SME Instrument Program of the European Union called HERMES (High Efficiency Real-time Multithreading Engine for Space applications), now promoted and funded in Phase 2 (GA n. 783850).

During its lifetime, the company has gained the respect of all Space sector players and stakeholders, continuously improving its results as a consequence of our investments in R&D and specifically, we have built a reputation as technology leaders in the application of high performance computing applications for our market based on general purpose GPU programming, a technology adopted in important projects and missions from the most relevant actors in the Space sector, as is the case of the European Space Agency (ESA), European Maritime Safety Agency (EMSA), AIRBUS, DEIMOS Space, THALES ALENIA SPACE, TELESPAZIO, INDRA, GMV, PETROBRAS and KONGSBERG among others.

## Products | Services | Applications | Technologies

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. 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.



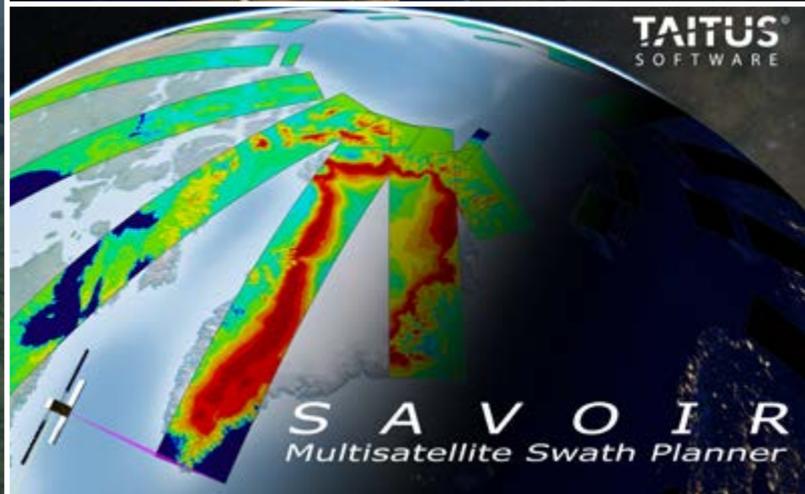
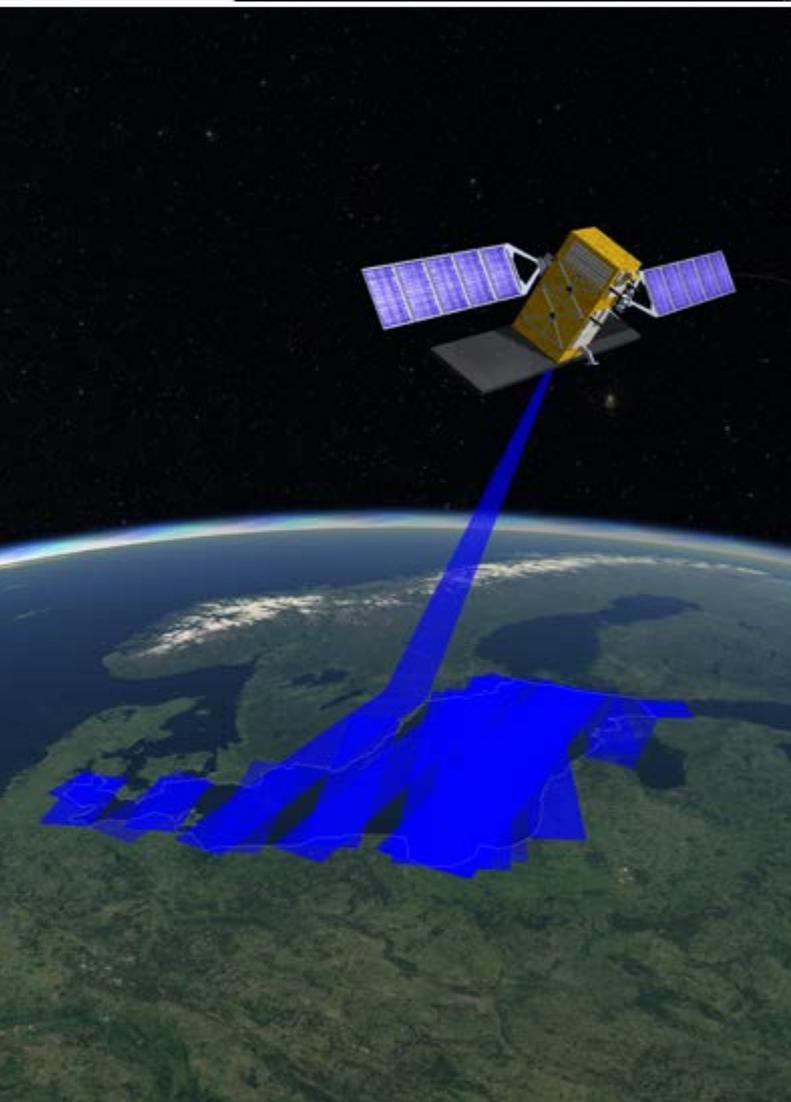
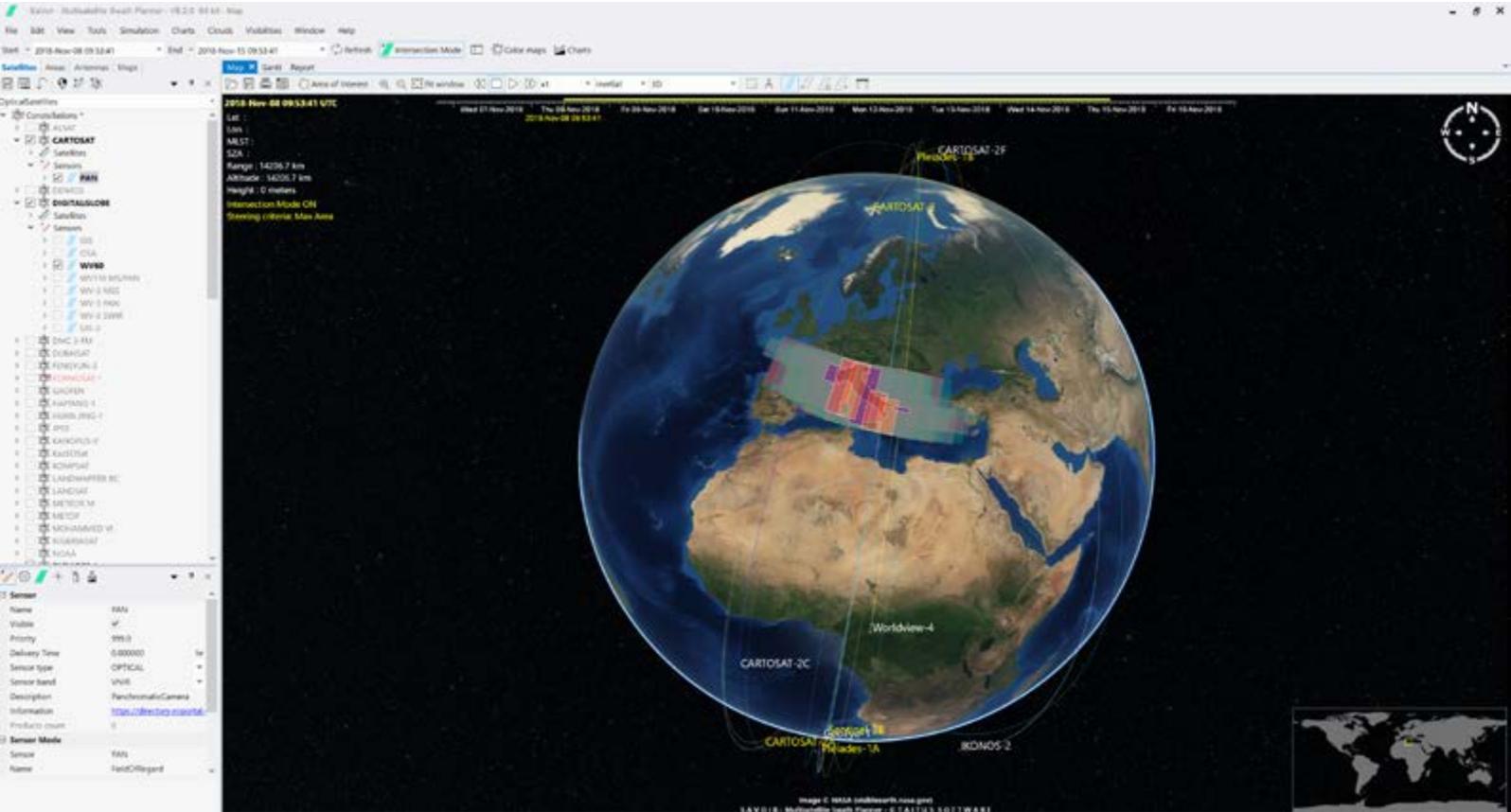
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# Techno System developments srl

## Company profile

High performance and cost effective solutions for Satellites, ISS, Capsules, Rockets, USV/UAV. 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

### GROUND EQUIPMENT

- EGSE
- SCOE
- TELEMETRY/TELECOMMAND STATION



## Contact

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# TECHSEMA Srl

## Company profile

TECHSEMA srl began to operate at end 2002 analyzing the Italian Space market with particular attention to the SME' role and expectations . It is an Italian SME owned by private managers previously acting at high level in the major Italian Space and Military Industries.

The main TECHSEMA mission is to analyze and exploit the development of available satellite technologies for social and commercial applications also supporting other SME not having a similar background of marketing experience. Joining its shareholders technical & marketing experience with external professionals TECHSEMA is in a position to offer:

- Competence and assistance in the field of satellite TLC applications for social and commercial services with institutional entities and private customers.
- Technical assistance in the field of analysis and management of synthetic scenarios, virtual reality models, E.O. images treatment and photo interpretation.
- Management of marketing, communication and data dissemination plans and actions related to technological products.

## Products | Services | Applications | Technologies

Most significant TECHSEMA activities, carried out or still running :

- Collaboration with OCI (today Rheimetall) in the program "VEGA Ground"
- Participation in ESA study contracts for "Start-up initiatives" and ARTES
- An ESA/ESRIN Study Contract for analyzing, modeling and managing the technological transfer
- Responsibility of market requirements analysis, investments return analysis and contacts with Institutions in the frame of the ASI telemedicine program "TELESAL"
- Participation in the ESA feasibility contract "EASY" (Easy And Safe Yachting) conceived by TECHSEMA itself.
- Collaboration with "Tor Vergata" University of Rome for the feasibility of an incubation and formation center.
- Responsibility of development and realization of a SatComBox for a maritime commercial application in the frame of the "SIMONA" contract with ESA



## Contact

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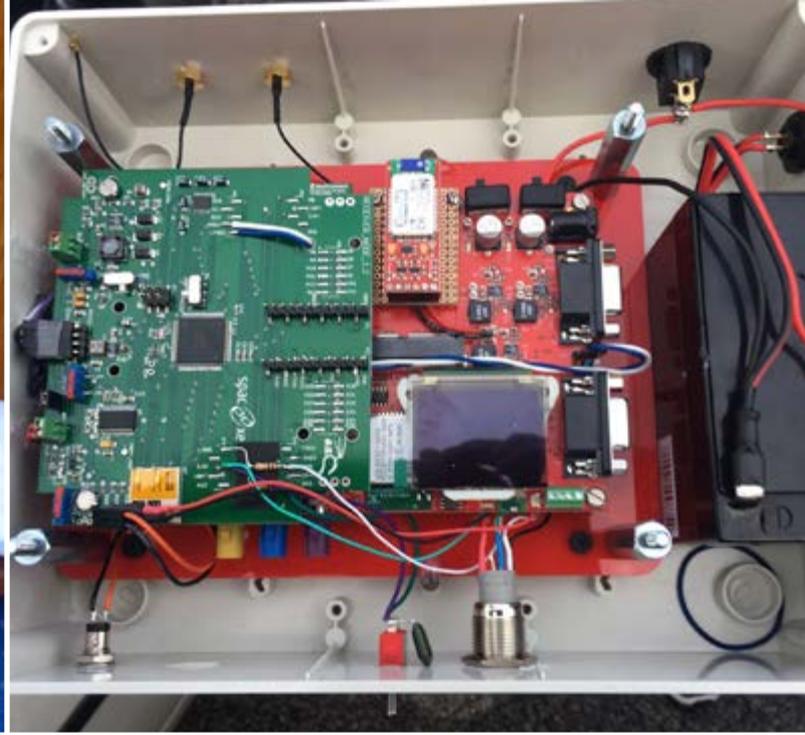
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# TEMIS SRL

## Company profile

TEMIS was founded in 2006 as an engineering company to study and develop electronic systems and products for the F1 & Motorsport sector.

In 2008 Temis started to transfer its know-how to space sector and it realized a telemetry system to be integrated in the Vega launcher for the acquisition of data and video acquired during the entire duration of the flight. (LARES A&H Sub system)

In the same year Temis also developed its first Satellite test equipment to simulate, control and test the on-board unit before launch.

During the following years Temis has increased its expertise in the space field thanks to participation both to Institutional and Industrial Programs, working together with leading space companies and European and Italian Space Agencies.

TEMIS has its 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.

It 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)
- Electromechanical actuators

### Other Facilities

TEMIS is owned by ART SpA, located in "Passignano sul Trasimeno" (PG), a medium sized company (130 resources) particularly proficient in advanced technological solutions mostly in the automotive and defense fields.

TEMIS premises in Umbria is equipped with state-of-the-art of the production tools in order to provide fast prototyping during design and high-quality production process.

Close to the Umbria facility there is "MATE", another company of the ART group, where tools for environmental tests are available to homologate and certificate electronic, mechanic and electromechanical equipment, as following:

- Thermal Chamber
- Thermal Shock Chamber
- Shaker

## Products | Services | Applications | Technologies

### Products

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.

#### 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 OHB group. 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 has developed an innovative telemetry system for space transportation. The system has been conceived as a self-standing and highly independent module to be embarked on launcher with negligible impacts on external interfaces.



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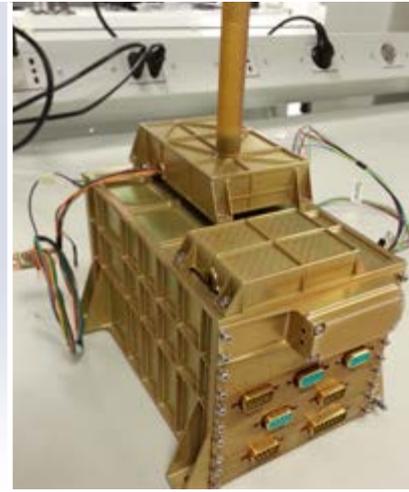
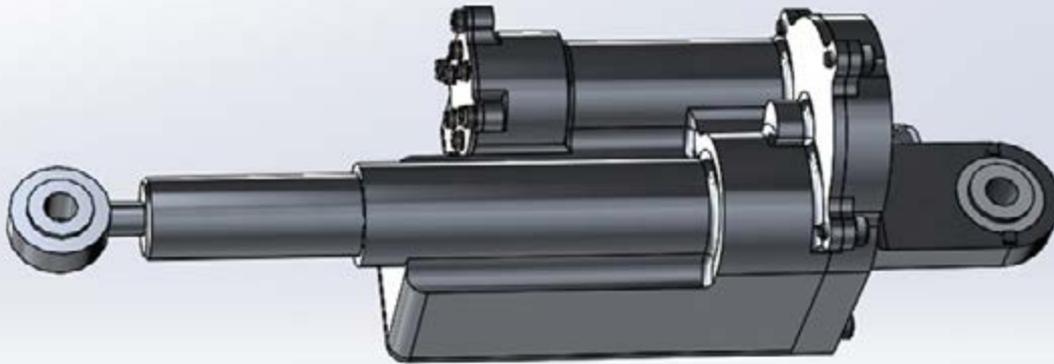


Scientific Payload Telemetry

TEMIS and CISAS have developed a CEU subsystem for DREAMS payload that is housed on Entry and Descent Module (EDM) and accomplished the role of data handling platform of the DREAMS payload

Electromechanical Actuators

TEMIS has added a line of electromechanical actuators to its portfolio; the products are addressed to military application



# 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/AlGaS and GaN/AlGaIn/InGaIn. Methods for parallelization of computationally heavy routines for atomistic calculations through Graphical Processing Units (GPU) and MPI techniques are implemented.



## Contact

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**SME**

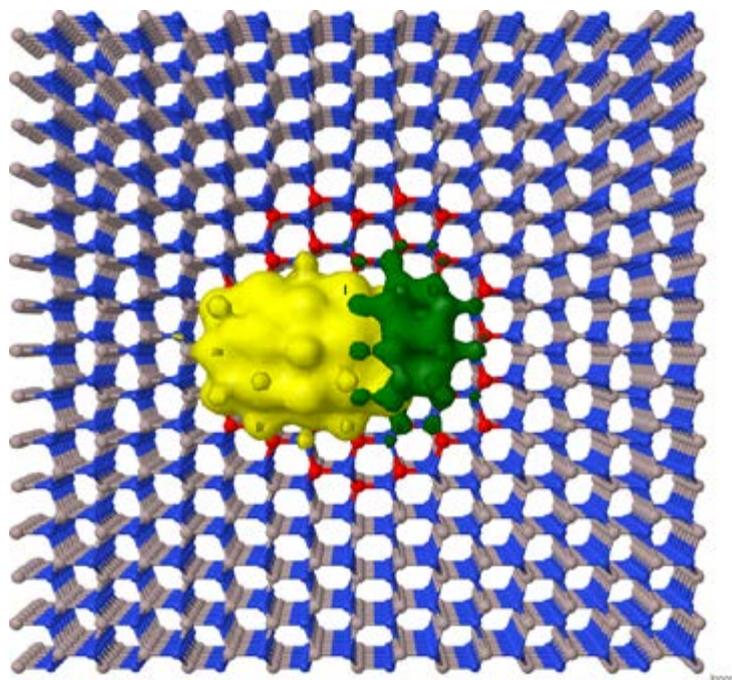
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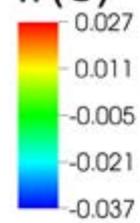
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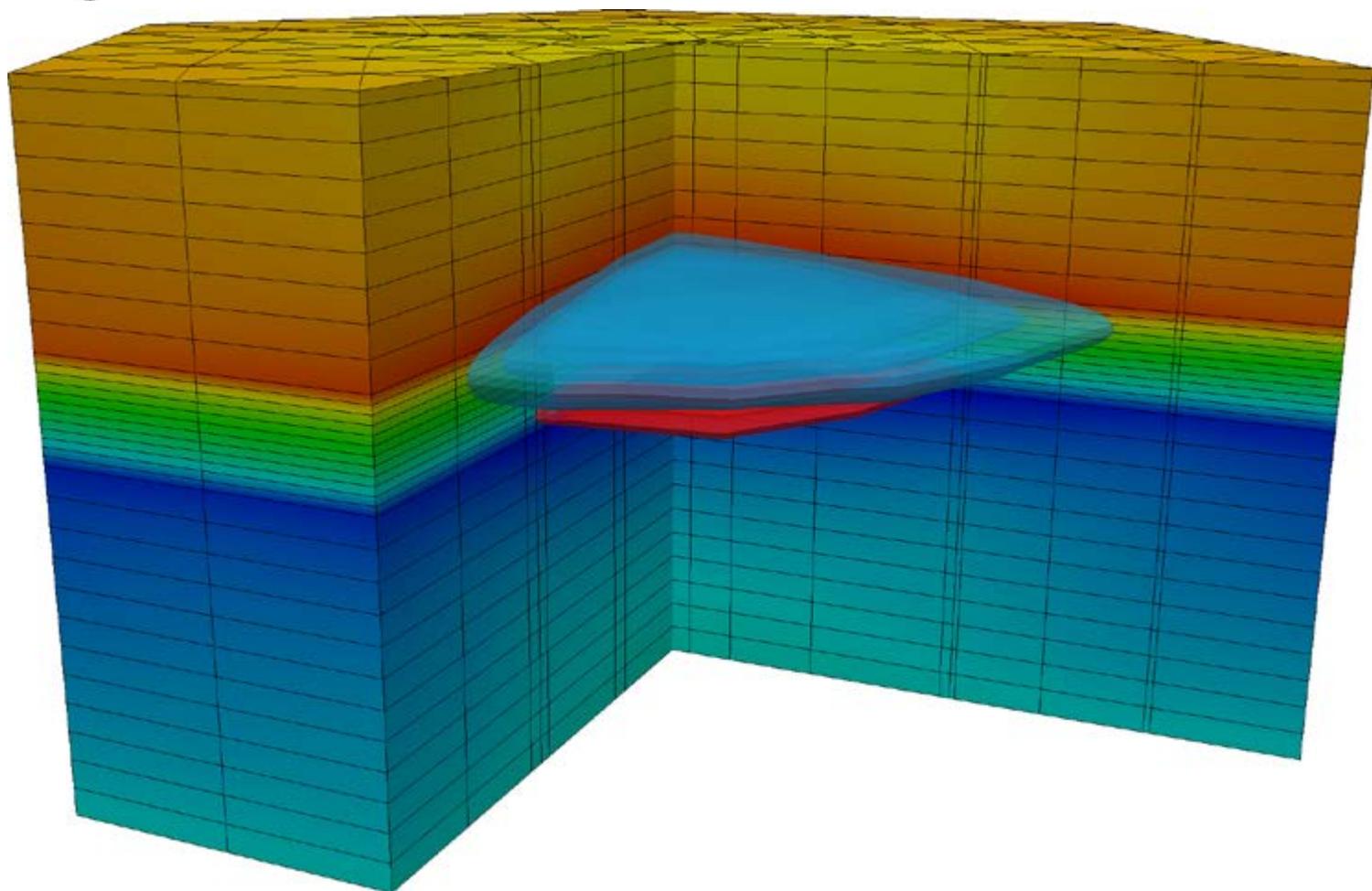
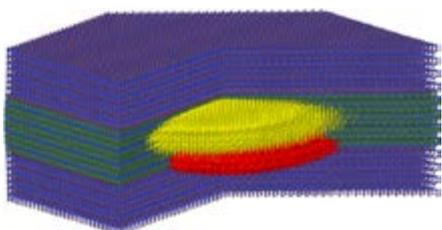
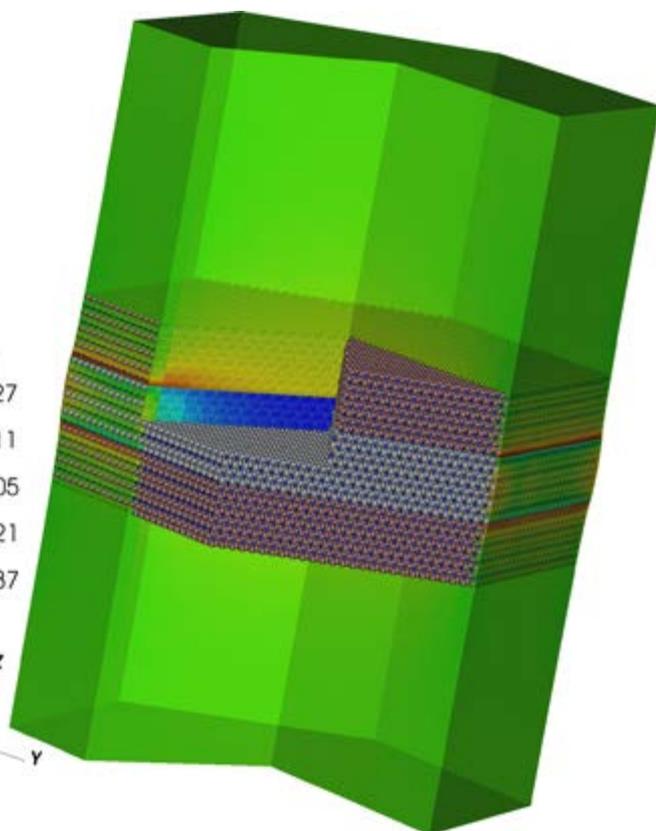


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# Trans-Tech srl

## 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 global 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.

The targeted and efficient integration of best resources and external companies, facilitated by the Open-Enterprise Business Model, allow Trans-Tech to create larger, flexible and competitive teams in terms of technical competence, quality of services, costs and delivery time.

Trans-Tech thus represent an advantageous option for customers which require development of highly tailored solutions, customized apparatus and innovative projects involving comprehensive and differentiated technical and managerial competencies.

What's more, Trans-Tech provides a SINGLE EXPERT INTERLOCUTOR able to intercept, understand e go forward customer needs translating them into an efficient and effective support especially in a context of international and multi-national programs and collaboration.

## Products | Services | Applications | Technologies

Trans-Tech srl develops customized applications, devices and products, such as the "cut to size" Autonomus Thermal Simulator (ATS) a Ground Support Equipment (GSE) developed for INAF-OAC in the framework of the development program of the Italian experiment "MicroMed", which be flown on board the forthcoming EXOMARS mission in 2020.

Trans-Tech also leads technological innovative projects such as the HYPLANE a "triple-use" jet for fast business travel, suborbital space tourism and mother aircraft for microsatellite orbital launch.

HYPLANE 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.

Trans-Tech also provides services such as:

- Advising for Technology Transfer, Concepts Feasibility and Products Innovation.
- Engineering services for systems design and development.
- Team organization and issuing of technical proposals for international and national funding opportunities.
- Support for Business Development
- Training & Education.

Technical and management services are provided with Work Packages and/or Time & Material modality. Such services are provided to the customer according to their actual technical needs and their economic capabilities, even by adopting a winwin strategy when necessary.

The targeted industrial sectors are : Space, Aeronautics, Defence, Railways, Automotive, Energy.



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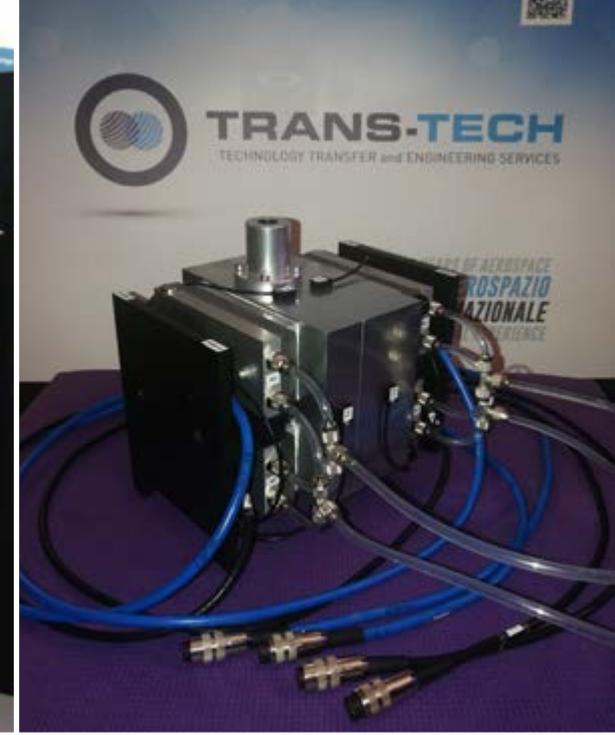
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**TECHNOLOGY TRANSFER**  
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**ADVANCED PROJECTS**  
**PROGETTI AVANZATI**



**TUTORING AND EDUCATION**  
**FORMAZIONE**



# 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 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,



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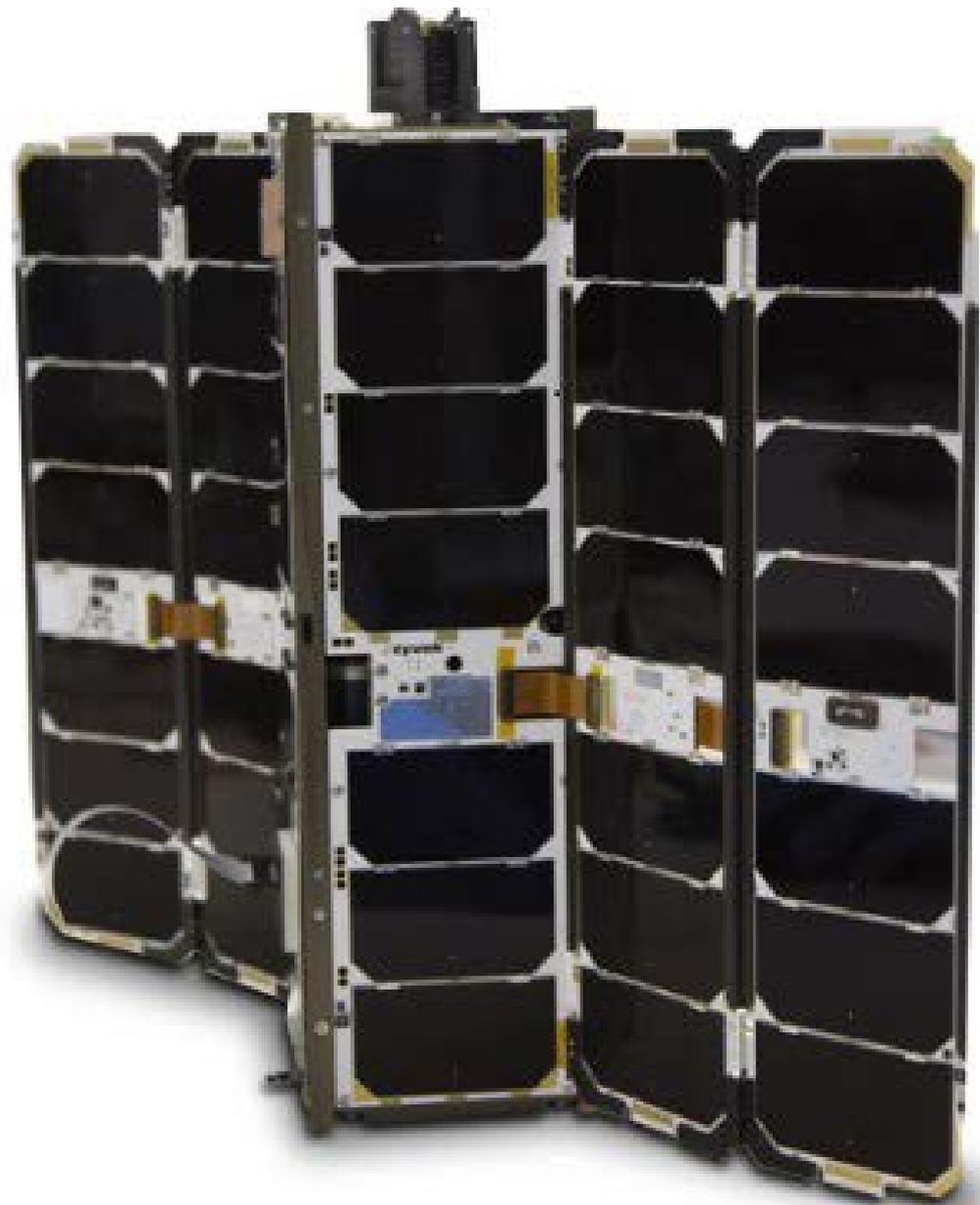
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s/c-to-deployer integration, launch vehicle integration; System Testing of s/c system performance (environmental, shock, vibration, thermal, thermal vacuum) by aerospace test standards tailoring; Launch coordination and operations including selection 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 of a snowy mountain landscape. A long, narrow wooden walkway or bridge runs vertically through the center of the image. The ground is covered in snow, with some patches of brown grass or rocks visible. Several strings of small red lights are strung across the scene, adding a festive or decorative touch. The overall color palette is dominated by blues, whites, and browns, with the red lights providing a sharp contrast.

Photo Credits: © Ekaterina Kondratova

# 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, 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 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:

- **Engineering Support Services:** ALTEC supports the activities of the Columbus Control Centre providing to its team a Flight Director, two station managers for the Columbus System and two other managers for DMS (Data Management System ) for the on-board computer management
- **Training Services:** ALTEC 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 by ALTEC instructors and are mainly performed at EAC, where the instructor team is located.

Special mention should be made of the Integrated Logistics Services for which ALTEC covers the role of "International Space Station European Logistics Center". In order to act on behalf of ESA, ALTEC is certified as Known Consignor (KC) and Authorized Economic Operator (AEO). 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

### Planetary Mission Exploration

ALTEC is responsible for the design, development and operations of the ESA EXOMARS Rover Operation Control Center (ROCC). The ExoMars-ROCC includes also the Science



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Operation Center (SOC) and the Mars Terrain Simulator (MTS).

The Mars Terrain Simulators facility supports engineering and AIV/AIT activities in performing the following tests and verifications: 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 on the basis of the ASDP (ALTEC Space Data Processing) proprietary tool, a multi-purpose reusable core to set up new automatic processing pipelines and software infrastructures.

#### 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, which constitute the basis of ALTEC participation to the National Space Surveillance & Tracking initiative in the frame of the European Union dedicated program.

#### 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. It provides infrastructures, systems, tools and applications to be used during the mission for Telemetry (TM) monitoring, storage, processing, displaying as well as detailed trajectory and splash-down/landing location support phase, offline management of Ground Stations operations, meteorological forecast data of the splash-down/landing area.

The available asset is ready to support operations control and data management of nano-satellite systems, a dedicated research and development effort are actually on-going to implement innovative approaches based on advanced mission planning systems.

#### Space Commercialization

ALTEC complete knowledge of the International Space Station processing and regulations enables the provision of specialized services to non-space customer willing to exploit the unique capabilities of the largest human out-posts in the Space.

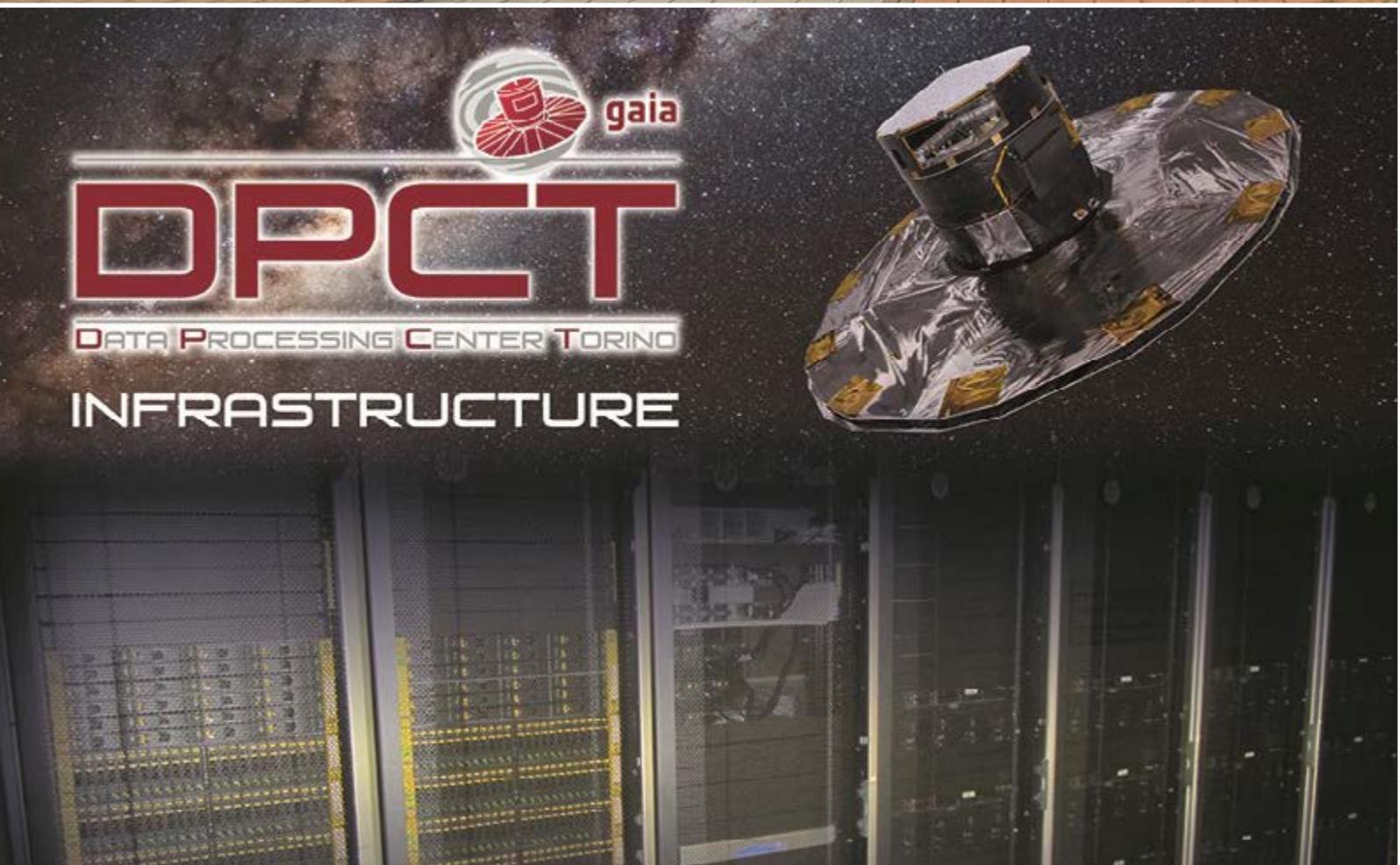
ALTEC provides engineering and technical service support performing on behalf of customer the required ISS testing, safety, paperwork, manifesting onto the launch vehicle, astronaut services, data retrieval. ALTEC is also able to provide legal support to customer interested in promoting terrestrial products through significant utilization on-board the ISS by the astronauts.

#### 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.
- ❑ Advances 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, rpa, 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.



gaia

**DPCT**

DATA PROCESSING CENTER TORINO

INFRASTRUCTURE





# Angelantoni Test Technologies S.r.l.

## Company profile

Angelantoni Test Technologies is a company with a turnover of around 42 million euro and 200 employees. The company is part of the Angelantoni Industrie Group, operating globally since 1932, with a turnover of around 80 million euro and 400 employees, and active also in the fields of Life Sciences and Renewable Energy. 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 50 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°C) according to ESA standard ECSS-Q-ST-70-02C
- Special shroud design to withstand the highest heat dissipations (>5 kW/m<sup>2</sup>)
- 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. With Vega, we have gained worldwide attention thanks to an unprecedented score of 13 successful launches out of 13 attempts into LEO.

AVIO is a public Company listed on the Milan Stock Exchange since April 2017 (68% of free floating, no controlling shareholder), we are more than 900 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 Oxigene1

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.

- MIRA Demonstrator Liquid Rocket Engine2

LM10-MIRA expander cycle engine was aimed for the concept design of the 10 tons/100 kN-class thrust L 10-MIRA flight engine propelled by liquid oxygen and liquid natural gas.

Avio designed and manufactured the injection head and the methane turbo-pump.

- 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 (under development)

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.

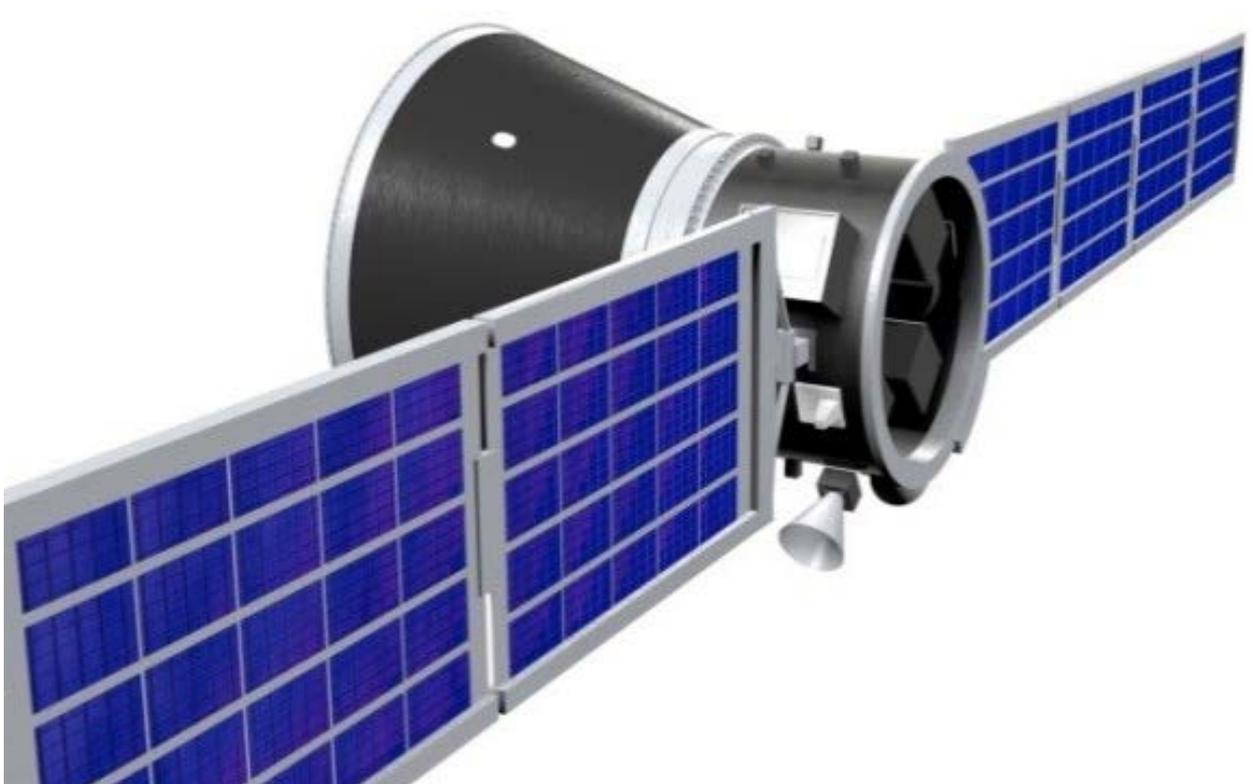
The Space Rider System is managed in co-premiership with TAS-I. It is made of the AVUM Orbital Module (AOM), designed and developed by AVIO, and a Re-entry Module (RM) integrated in a single stack-up.

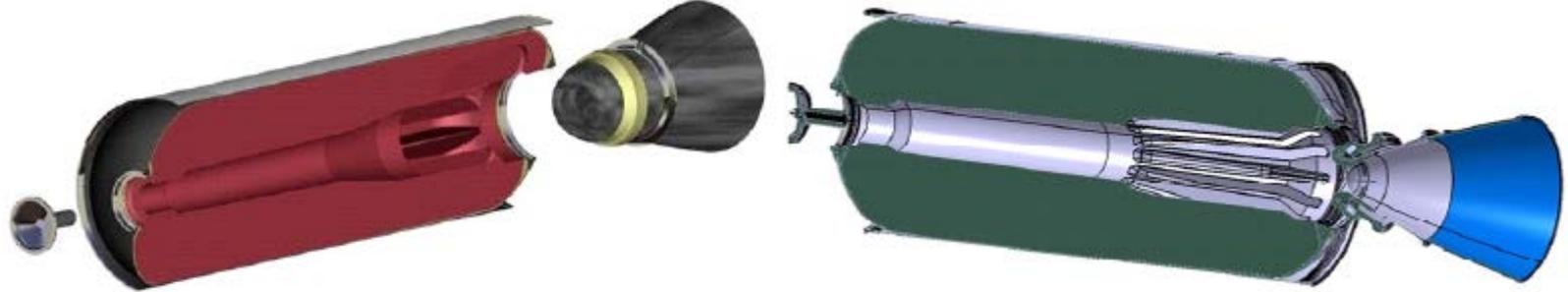
The AVUM Orbital Module is made by:

- 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





# BLUE Engineering Srl

## Company profile

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

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
- 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



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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.



Collaborative System Manager - testbench

Product Tree: 3D Model

Item Name: Trailer Car HCT, Trailer Bogie D1, Trailer Bogie D2, Trailer Bogie D3, Trailer Bogie D4, Trailer Bogie D5, Trailer Bogie D6, Trailer Bogie D7, Trailer Bogie D8, Trailer Bogie D9, Trailer Bogie D10, Trailer Bogie D11, Trailer Bogie D12, Trailer Bogie D13, Trailer Bogie D14, Trailer Bogie D15, Trailer Bogie D16, Trailer Bogie D17, Trailer Bogie D18, Trailer Bogie D19, Trailer Bogie D20, Trailer Bogie D21, Trailer Bogie D22, Trailer Bogie D23, Trailer Bogie D24, Trailer Bogie D25, Trailer Bogie D26, Trailer Bogie D27, Trailer Bogie D28, Trailer Bogie D29, Trailer Bogie D30, Trailer Bogie D31, Trailer Bogie D32, Trailer Bogie D33, Trailer Bogie D34, Trailer Bogie D35, Trailer Bogie D36, Trailer Bogie D37, Trailer Bogie D38, Trailer Bogie D39, Trailer Bogie D40, Trailer Bogie D41, Trailer Bogie D42, Trailer Bogie D43, Trailer Bogie D44, Trailer Bogie D45, Trailer Bogie D46, Trailer Bogie D47, Trailer Bogie D48, Trailer Bogie D49, Trailer Bogie D50, Trailer Bogie D51, Trailer Bogie D52, Trailer Bogie D53, Trailer Bogie D54, Trailer Bogie D55, Trailer Bogie D56, Trailer Bogie D57, Trailer Bogie D58, Trailer Bogie D59, Trailer Bogie D60, Trailer Bogie D61, Trailer Bogie D62, Trailer Bogie D63, Trailer Bogie D64, Trailer Bogie D65, Trailer Bogie D66, Trailer Bogie D67, Trailer Bogie D68, Trailer Bogie D69, Trailer Bogie D70, Trailer Bogie D71, Trailer Bogie D72, Trailer Bogie D73, Trailer Bogie D74, Trailer Bogie D75, Trailer Bogie D76, Trailer Bogie D77, Trailer Bogie D78, Trailer Bogie D79, Trailer Bogie D80, Trailer Bogie D81, Trailer Bogie D82, Trailer Bogie D83, Trailer Bogie D84, Trailer Bogie D85, Trailer Bogie D86, Trailer Bogie D87, Trailer Bogie D88, Trailer Bogie D89, Trailer Bogie D90, Trailer Bogie D91, Trailer Bogie D92, Trailer Bogie D93, Trailer Bogie D94, Trailer Bogie D95, Trailer Bogie D96, Trailer Bogie D97, Trailer Bogie D98, Trailer Bogie D99, Trailer Bogie D100.

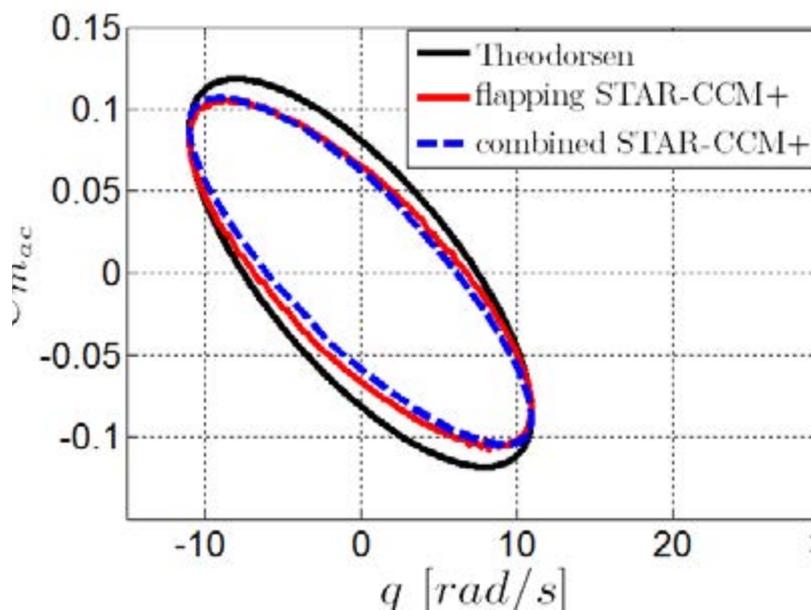
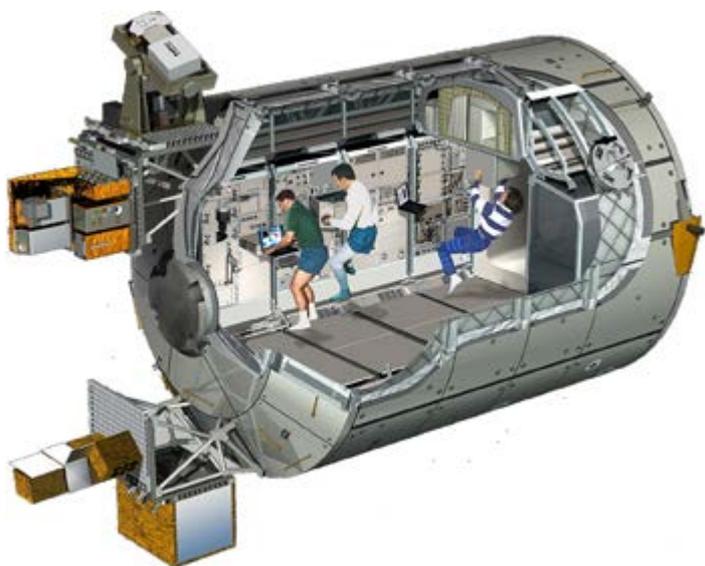
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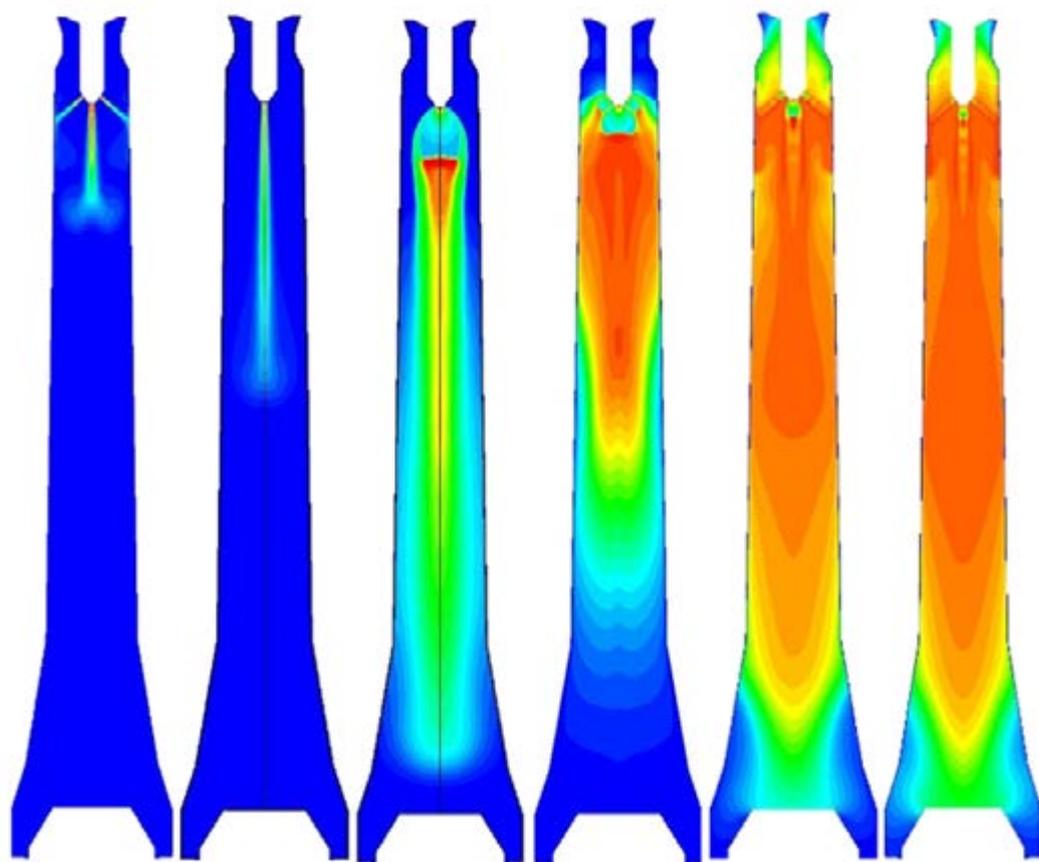
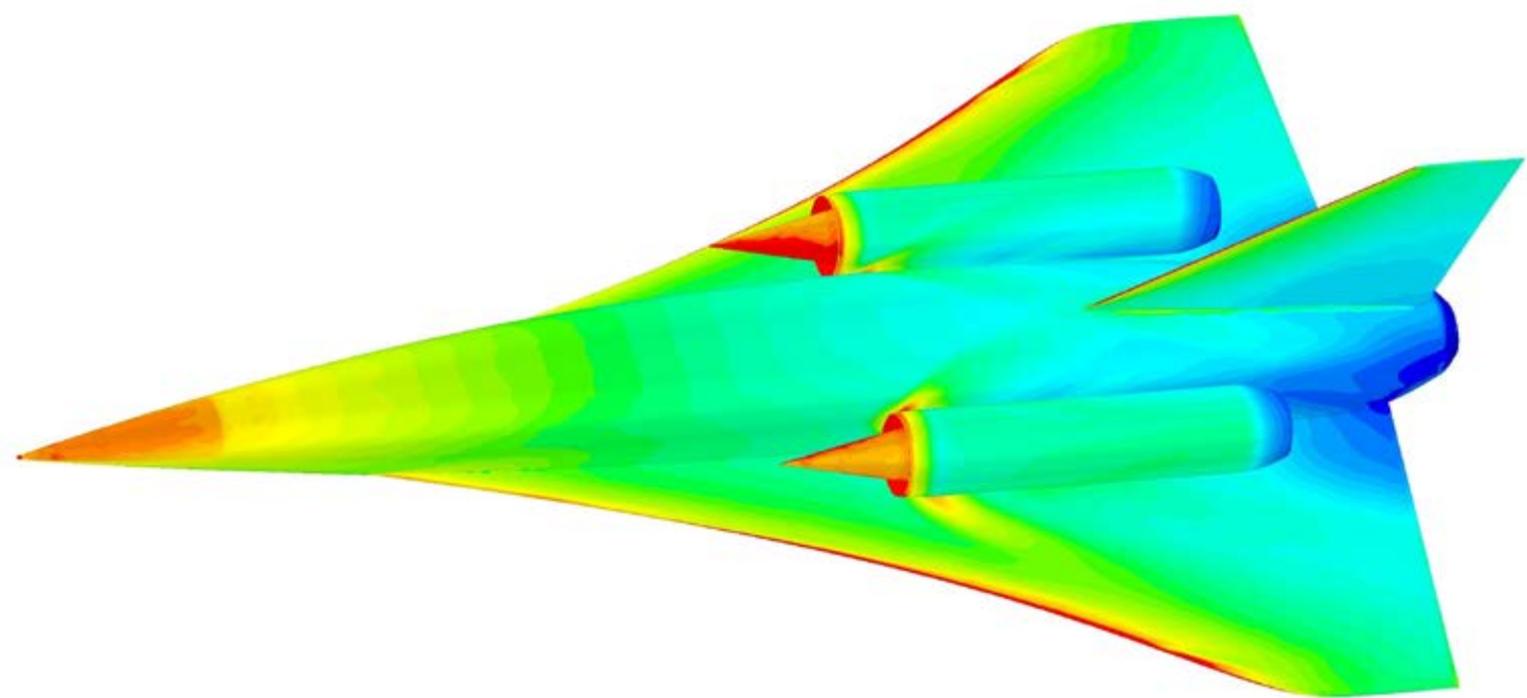
Name	Domain	Iteration #	Iteration Description
blue_trailer_bus_3d	System Engineering	2	Final Iteration
blue_trailer_bus_3rd	System Engineering	1	Initial set-up and es...
tbl_china_final_3d	System Engineering	1	Initial set-up and es...
testbench	System Engineering	1	Initial set-up and es...
MBS_concept	System Engineering	1	Initial set-up and es...
trailer_bus_3d	System Engineering	1	Initial set-up and es...
trailer_bus_3rd	System Engineering	1	Open Iteration
trailer_bus_3rd	System Engineering	1	Initial set-up and es...

Rollod Geometry

Rollod Geometry

CCM - OCCT





# 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 60 satellites of clients from over 25 countries.

Features & Characteristics (bare level)

- 29.5% efficiency at AM0
- Triple Junction Solar Cells InGaP/GaAs/Ge for Space Applications
- Very low solar cell mass (81-89 mg/cm<sup>2</sup>)
- Thickness 150  $\mu$ m
- Fully qualified according to ECSS E ST20-08C standard for LEO and GEO orbit



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- High Radiation Resistance

#### Thin Triple-Junction Solar Cell for Space Applications (CTJ30-thin)

The Thin triple junction solar cell named CTJ30-Thin (80  $\mu$ 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  $\mu$ 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 ongoing)

#### 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)

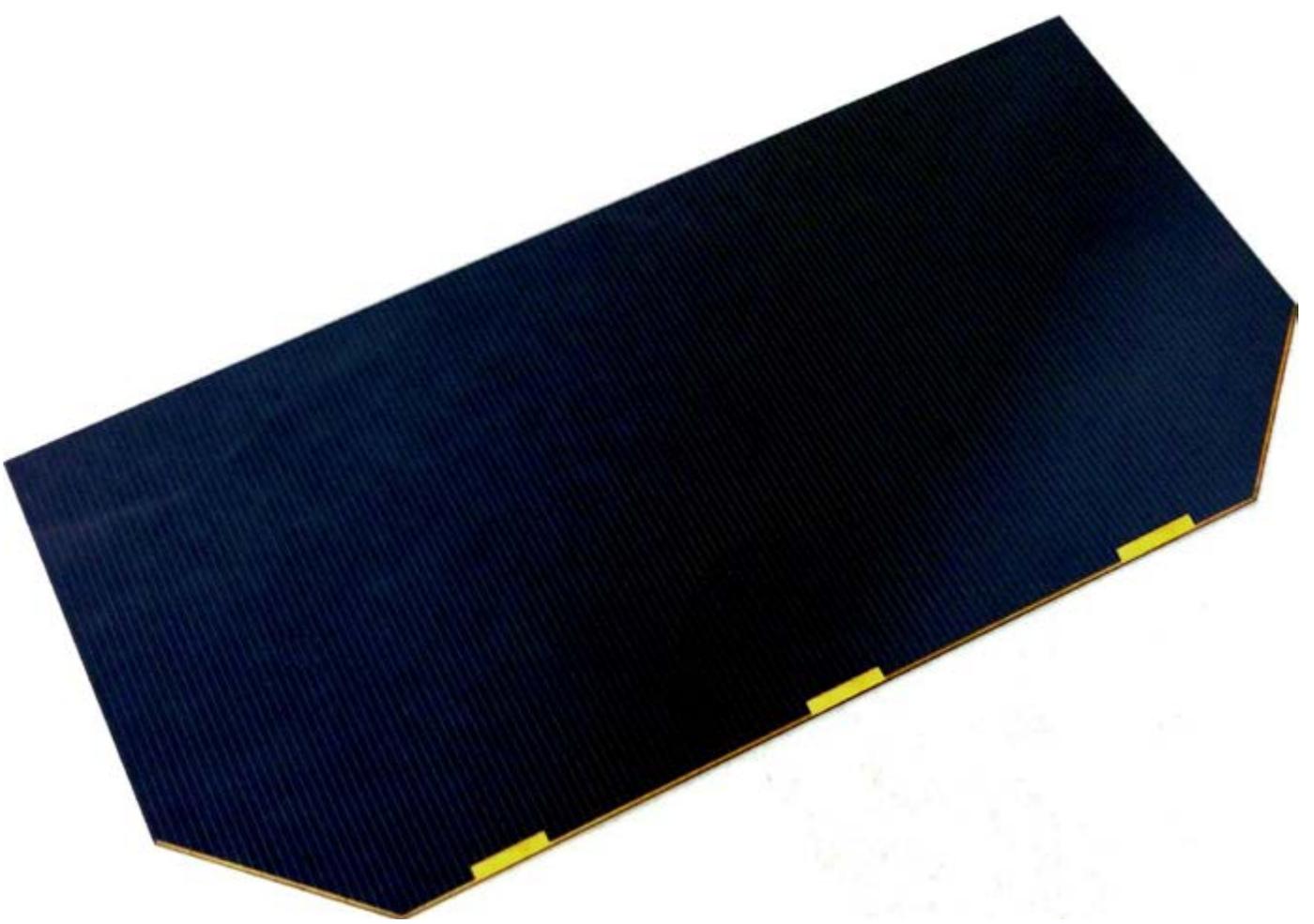
#### Large Area Triple-Junction Solar Cell for Space Applications (CTJ-LA)

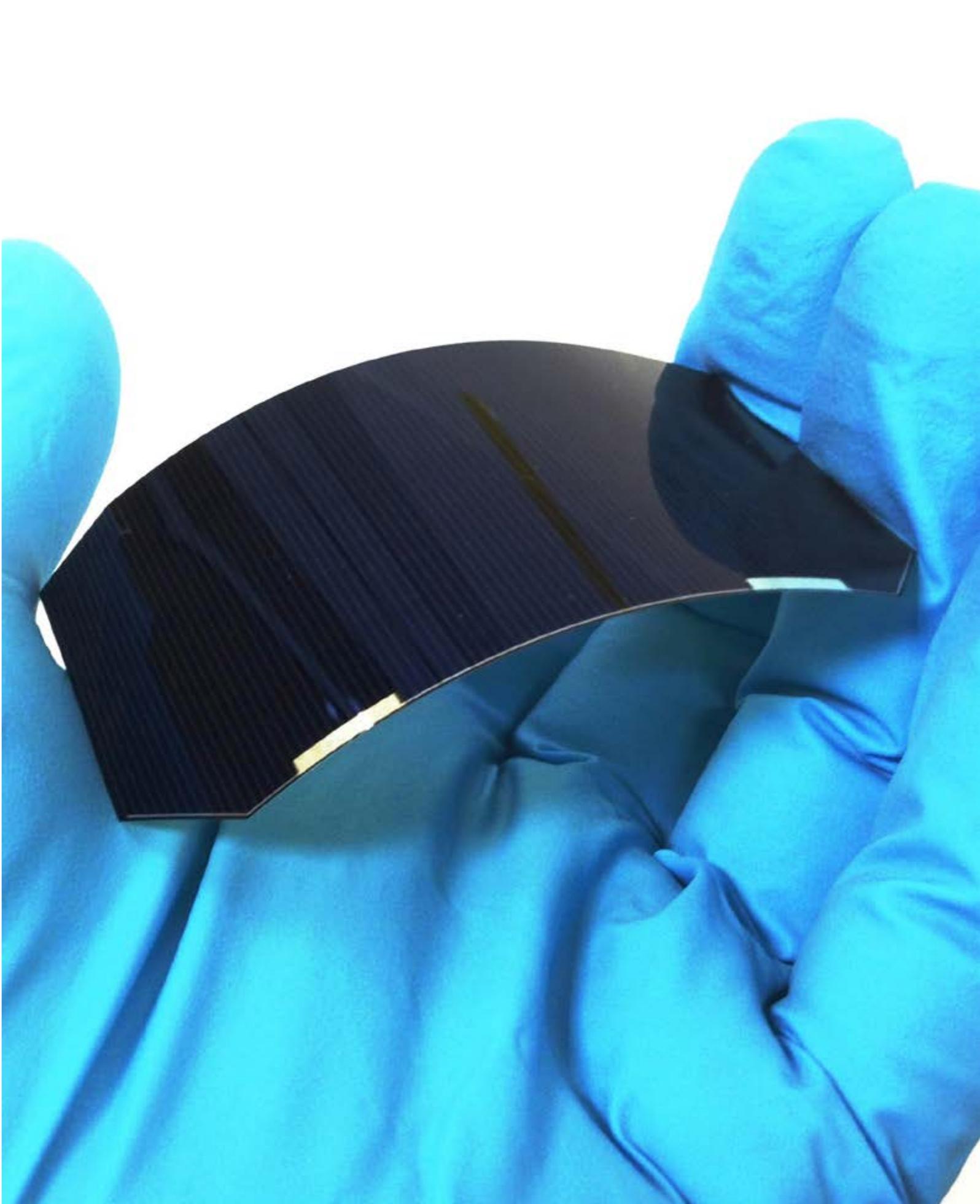
The Large Area solar cells named CTJ-LA (c.a. 69cm<sup>2</sup>) maintains the high quality features and the electrical performances of our standard cell with typical AMO efficiency 30%. This new class of solar cells is mainly devoted to the market of Telecom satellites and in general to the high power 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 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 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.



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### Large Companies

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## 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  $\mu$ m
- Finishes: Tin-Lead reflow; HASL with and without Lead; Enig (Al bondable); Chemical Tin & Chemical Ag; ENIPIG (Au bondable); Galvanic hard and soft gold

## SPACE SECTOR

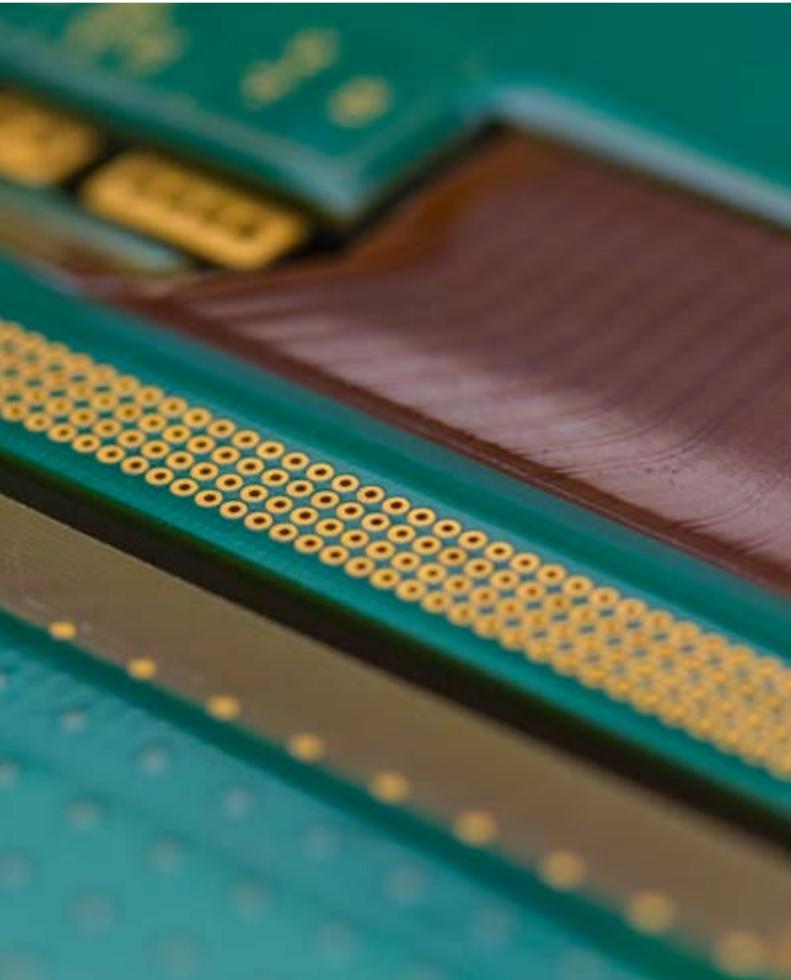
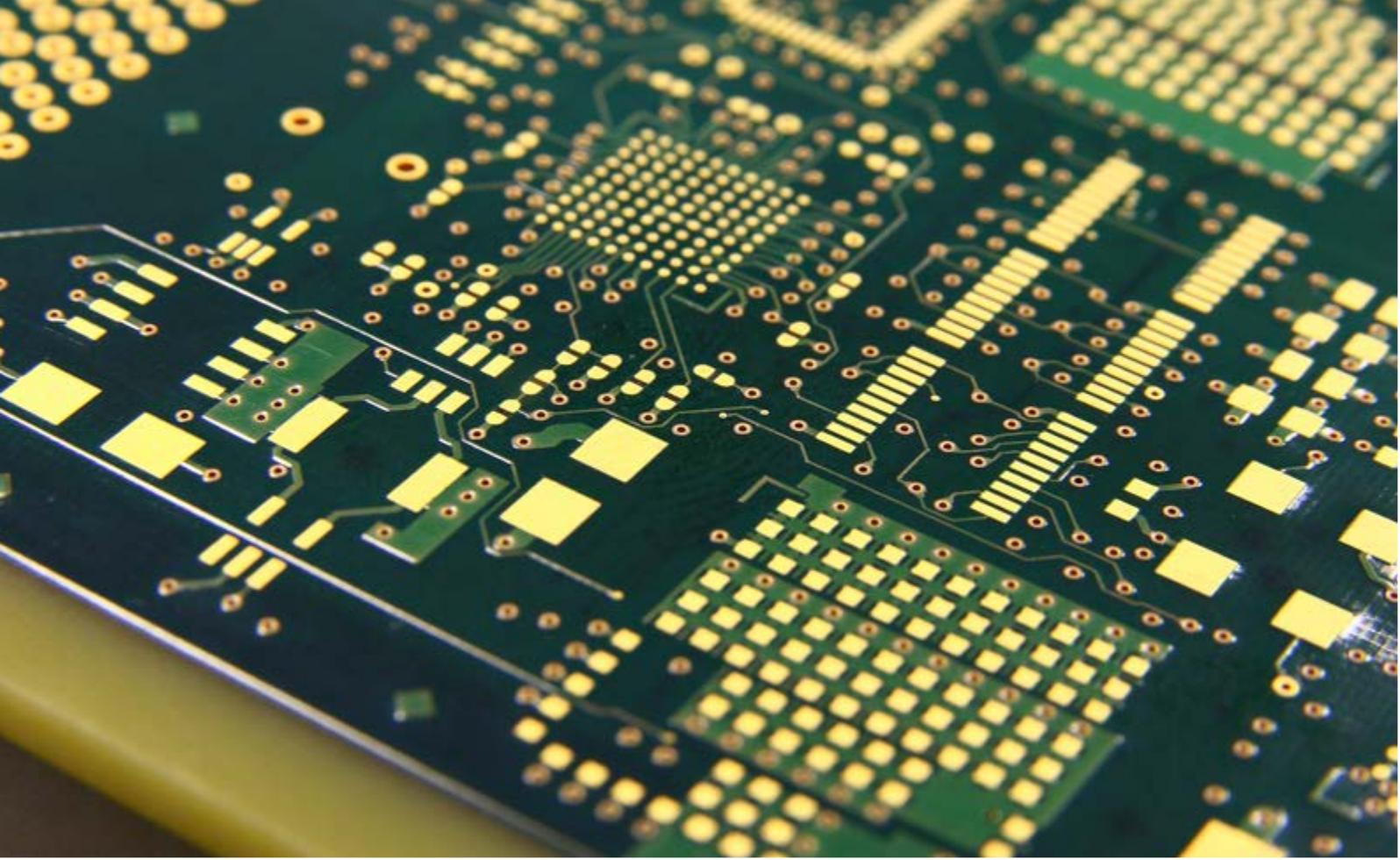
Even if is producing PCBs for Space applications since more than 10 years, Cistelaier S.p.A. is more and more focusing in Space sector since year 2013.

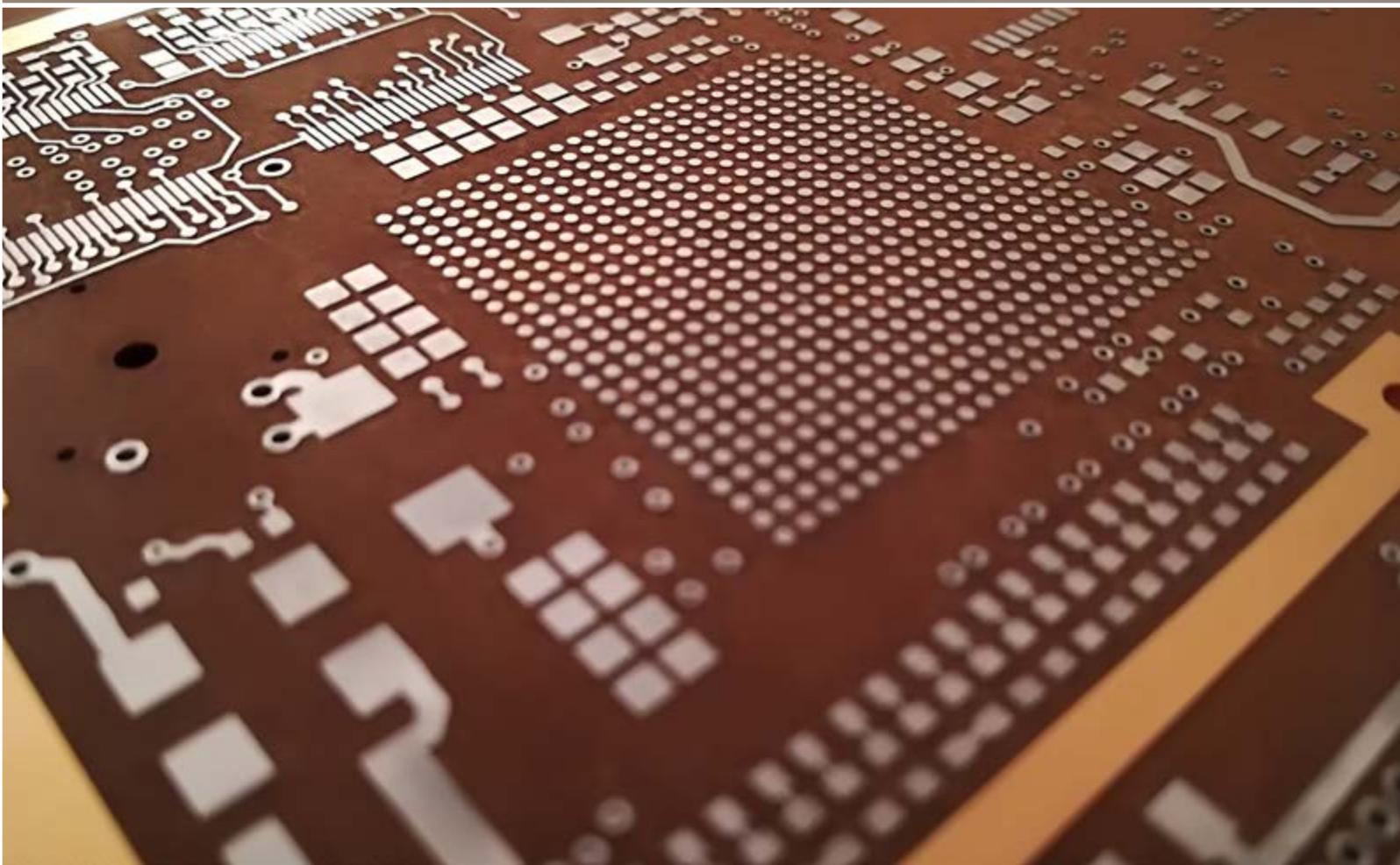
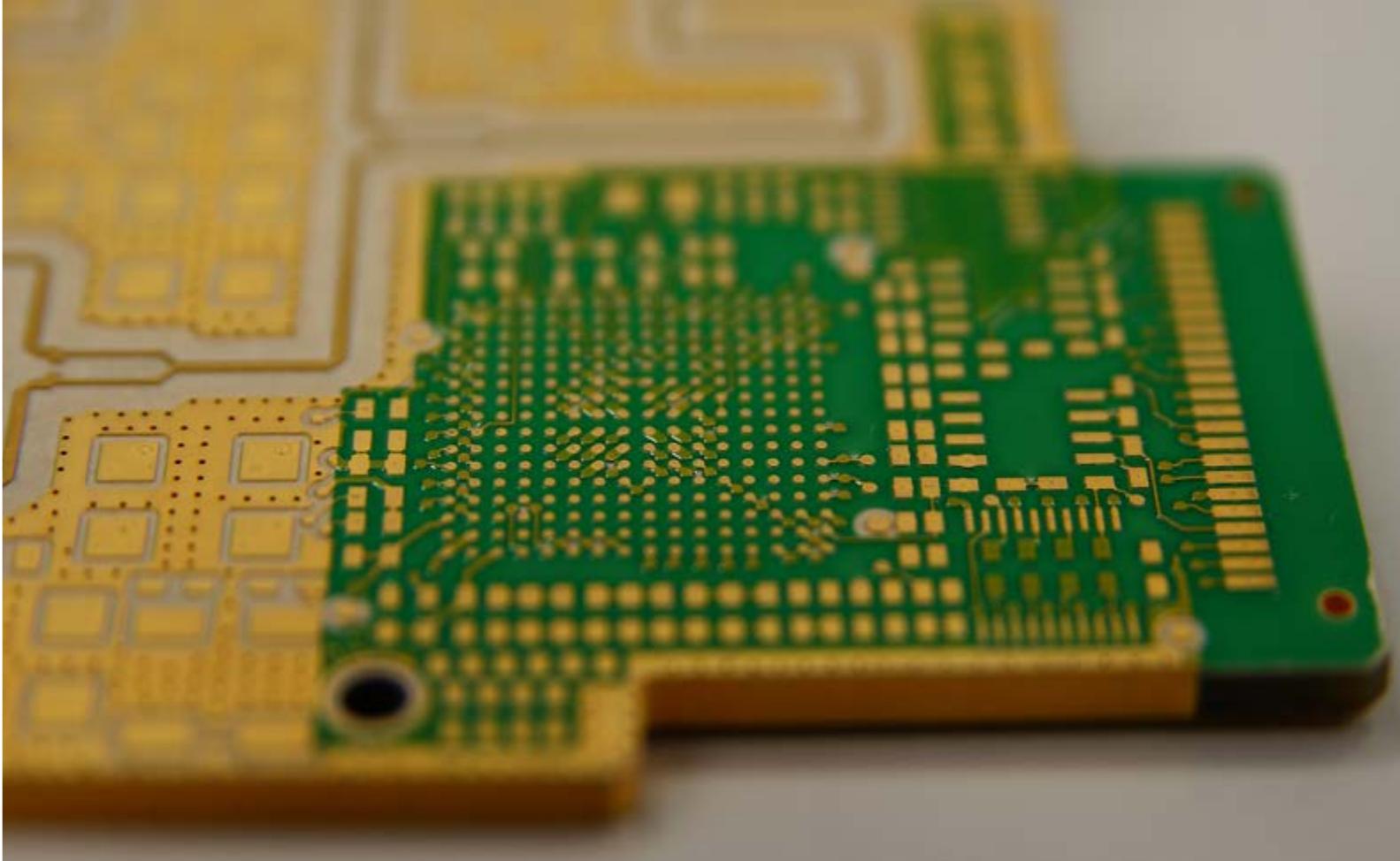
In the last 5 years Cistelaier manufactured according to ECSS more than 50 part numbers and tested all PCBs manufactured for "fly purpose" through ECSS Group 6 qualification process.

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 global distributor for the COSMO-SkyMed data, the largest and most advanced 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 geoinformation service and cloud platforms dedicated to different markets:

- Land management
- Defence & Intelligence
- Maritime Surveillance
- Environmental monitoring and Ice monitoring
- Infrastructure and City monitoring.
- Agriculture
- Emergency support

Our 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

e-GEOS offers a unique portfolio of application services, thanks to the superior monitoring capabilities of COSMO-SkyMed constellation and the fusion with a broad range of EO and non EO data. It has acquired a leading position within European Copernicus Program.

Covering the whole value chain, from data acquisition to the generation of analytics and insight reports, e-GEOS, thanks to proprietary assets and algorithms, 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.

### AWARE

Aware is the platform designed by e-GEOS to support both Public Administrations and private companies along the whole lifecycle of an infrastructure. From the planning phase to the management and maintenance using both PSP interferometric analysis merged with IoT data and GIS layers.

### 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.

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## 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 next-generation imagery based actionable intelligence analysis. It is a modular environment for IMINT analysis and report generation. Based on a blended integration of proprietary algorithms and “best in class” software packages, 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.

## AGRIGEO

From precision farming to crop yield and damage estimation, the combined use of Earth observation data, Deep Learning and the supervision of photointerpreter create the usable feed for AGRIGEO the platform dedicated to the agricultural market segment. The innovation activities is an important asset of e-GEOS. Indeed, in this field, where Drones, small-sat and Sentinel are giving food for in-cloud processing and new algorithms allow unexpected analysis and new indicators suitable to support both public administration and farmers to better manage their own resources.

## IceWatch

Thanks to the integrated capabilities of COSMO-SkyMed and SEonSE Engine algorithms, e-GEOS is able to support different monitoring activities specifically tailored for the Arctic region and the Pole. From safe navigation, based on the revisit time of COSMO integrated with the wider swat of Sentinel and in the future through the integration of new small-sat constellation, to the Iceberg monitoring and pollution at sea.

COSMO-SkyMed Constellation combined with the new COSMO-SkyMed 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.





# 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. 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



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### Large Companies

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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 SpA

## Company profile

Intecs is an Italian private hi-tech company design, developing and integrating complex electronic systems and solutions. Intecs employs around 500 professionals. More than 80% of the Intecs's staff has a university degree, in Engineering, Computer Science or other scientific disciplines. The business area of the Company is in the Information Technology field applied to the Transport, Telecommunication, Automotive, Space and Defence Domains. It provides big national and international organizations with consultancy services on high-tech systems, as well as prototype, product and "turn-key" software systems developments. 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 dedicates over 15% of its annual budget to R&D activities. Intecs experiences on the Space market cover the following areas:

- Earth Observation Infrastructures and Applications;
- Geographic Information Systems;
- Satellite Navigation Applications;
- Software Engineering and Software Quality;
- On-Board Software Systems;
- Embedded and Control Systems;
- Communications Software;
- Operating Systems and Software Architectures;
- Check-out Systems.

## Products | Services | Applications | Technologies

### User Ground Segment

User Ground Segment systems are in charge to handle, overall, the Satellite Payload Data acquires according to User Request. Accessing the UGS user can consult catalogues, requests new acquisitions or specific processing on data. Starting from these generic requests the UGS typically split them in single acquisitions and handle the complete acquisition request life cycle from the sensing up to the delivery to the user. In this context our experience in service-oriented architectures, interoperability, OGC services and Web services allow us to design and put in operation services provisioning infrastructures and spatial data infrastructures. We develop systems that includes multi-mission cross-catalogues, processing services, ordering services and sensor web services orchestrated via standard workflow and protected via standard user management and single-sign-on technologies

We have applied our experience in several National (Cosmo Sky-Med) and international (SSE, ngEO, DREAM, HMA related projects) projects supporting big organizations (ESA, JRC, ASI and many industrial organization) in developing their solutions.

In the Earth Observation Domain, we are also specialized in Integration, Verification and Validation activities. The tasks we usually carry on aim to ensure reliability of applications and systems deployed into operations, allowing to increase MTBF of applications and to reduce the operational costs. Flexibility of the approach and clear understanding of Earth Observation scenarios support the effectiveness of the activity. We have applied our experience in many ESA User Services related projects and for the Copernicus Data Access Systems.

### Onboard software

INTECS has a large experience in developing and validating onboard software for satellites and space vehicles software (e.g. Application and Basic SW for OBC, avionics, control Units, Data Handling, Mass Memory, payload subsystems SW applications, Time and Space partitioning Applications, etc). Our software engineers can support organizations in the whole flight software life cycle starting from the requirement collection, the architecture definition, the design and the development up to the validation and the final integration of mission-critical software systems. In this context we can provide services for support to system/software engineering, integration and tests engineering, integration of third party software and On-site software integration.



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INTECS also gained expertise in the development of the SW simulators of the on-board equipments, using both custom and SMP approach. In the last few years, INTECS supported the main European space companies for the development and integration of software subsystems in the frame of the main ESA and ASI programs

- Galileo IOV and FOC: NSGU On-Board SW, NSGU SW Simulator
- Sentinel1: SMU Basic SW, DSHA On-Board SW, SMU Test SW
- COSMO Second Generation: SMU Basic SW, DSHA On-Board SW, SMU Test SW, SMU Simulator
- Exomars 2016: CTPU Basic SW, CTPU Test SW, CTPU Simulator
- Exomars 2020: NCMM Basic SW, NCMM Test SW
- SARAH: PDS Application SW
- SOLAR Orbiter: SSMM On-Board SW
- BepiColombo: SSMM On-Board SW

#### GNSS

INTECS is active in the field of GNSS signal exploitation since 2004 looking for solutions based on SW design and high value added applications. The key technology we use in our solutions is based on Software Defined Radio (SDR) approach getting code routines as close to the antenna as possible, basically turning radio hardware problems into software problems. Such a design allows producing smaller, lighter and less expensive receivers with a high level of configurability, which was not attainable with traditional hardware receivers. The resulting solutions are more flexible and hardware independent, so that the terminals can be deeply configured via software, providing a range of solution from “fully Software Receiver” to “signal analysis stations” where the impact of hardware is extremely reduced and flexibility and evolution are drastically improved. INTECS has been involved in several European and National Research projects in close contact with the leading technological reality as ESTEC, ASI, GSA, Thales Alenia Space, Telespazio, etc, and has collaborated with private enterprises. In 2010 INTECS has been awarded with 3rd place Lombardy prize at the EUROPEAN SATELLITE NAVIGATION COMPETITION 2010. The subjected idea is SyCerto (SYstem for CERTified pOosition); system aims to cope with the lack of certified positioning system in the field of LBS applications. (see <http://www.asi.it/it/news/european-satellite-navigation-competition-le-idee-vincenti>)

#### PRODUCTS

INTECS uses the experience gained in the Space domain also in different markets (automotive, transportation, defense) and in its products. In particular, we are the first Italian company that has integrated a satellite Broad Band link with an innovative obstacle detection system for the safety of active level crossings: EMUSER. The product is an extension based on the existing MUSER system developed by Intecs for the detection of unexpected obstacles at level crossings and for the transmission of the related alarms and diagnostics to central control stations, certified by RFI (Italian Railway Infrastructure Manager) and CENELEC SIL-4 compliant. The new product, thanks to the integration with the satellite telecommunication asset, provides increased resilience in case of natural disasters or damages to the rail infrastructure. It can be installed in areas that are uncovered by conventional communication networks.

Whereas MUSER relies on conventional communication channels, EMUSER relies on the introduction of the broadband satellite datalink that replaces (in locations where the terrestrial communication is not available) or complements (redundancy) the legacy communication link traditionally used in the railway infrastructure.

EMUSER is designed and developed relying on Intecs extensive expertise in the railway domain, deep knowledge of safety regulations/standards and solid technological background.

Technically, the main advantages of using a satellite Broad Band link with respect to more traditional approaches (either based on conventional communication channels, or more drastically based on the substitution of level crossings with underpasses or overpasses) are:

- Increased resilience and availability of the whole system in situations where conventional communication systems are unavailable due to natural disasters (e.g. floods or earthquakes) or unforeseen damages to the rail infrastructure (e.g. derailment or copper theft);
- Possibility to install and operate the system also in areas that are uncovered or poorly covered by conventional communication networks: in such areas (for instance in the Middle East or in remote regions of Australia) wired connection with the central station may be unavailable and wireless connection may offer insufficient bandwidth for the transmission of real-time video sequences;
- Limited investment and socio-technical impact if compared to the invasive solution of building an underpass or an overpass in substitution of a level crossing.



# Leonardo S.p.A.

## Company profile

Leonardo is a global player in the high-tech sectors and a major operator worldwide in the Aerospace, Defence and Security sectors. Leonardo is based in Italy, has more than 45,000 employees (latest update 31/12/2017), of whom about 40% abroad, and in 2017 recorded 11.5 billion euro in revenues and received orders in the amount of 11.6 billion. Based on the dual application of technologies, Leonardo designs and creates products, systems, services and integrated solutions both for the defence sector and for public and private customers of the civil sector, both in Italy and abroad. With the first equipment provided in the 1960s, the Space Line of Business holds a primary position in the space market. Since then, it 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)
- 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).
- 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 TWTA 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.

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- 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

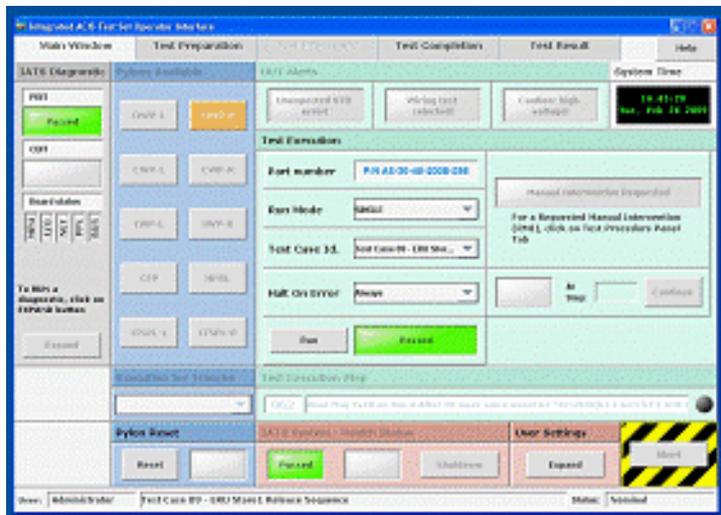
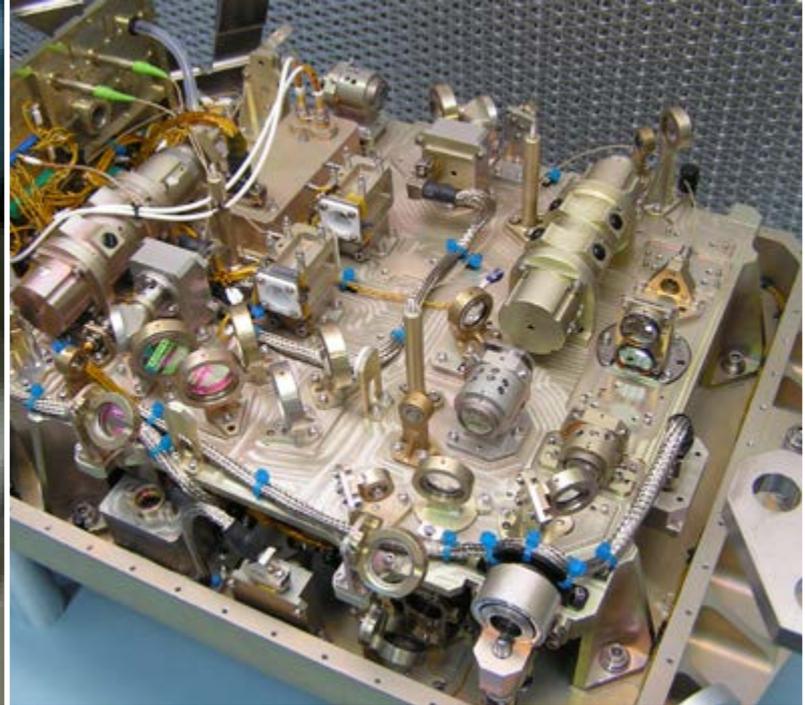
- Center of Excellence for Thin Film Coatings (optical and functional) for space, aeronautics, defense and industrial applications.
- Coating systems: n.6 EB-PVD, n. 1 new Plasma and Ion Assisted Deposition (PIAD), n.5 Sputtering, n.3 PE-CVD.
- Testing: Spectrophotometers and Climatic chambers. Clean room area class 1000 (class 100 in loading zones). 20k coated surfaces per year, over 70 qualified optical coatings.

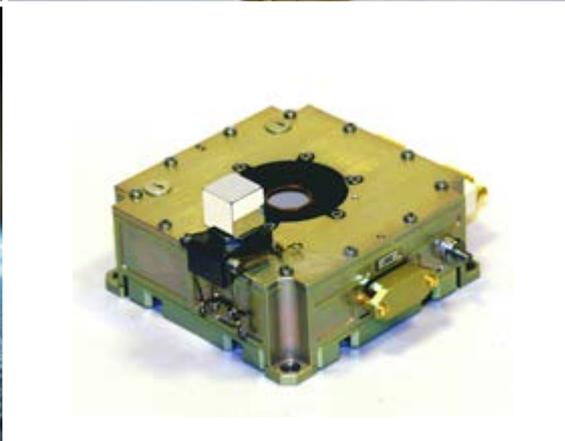
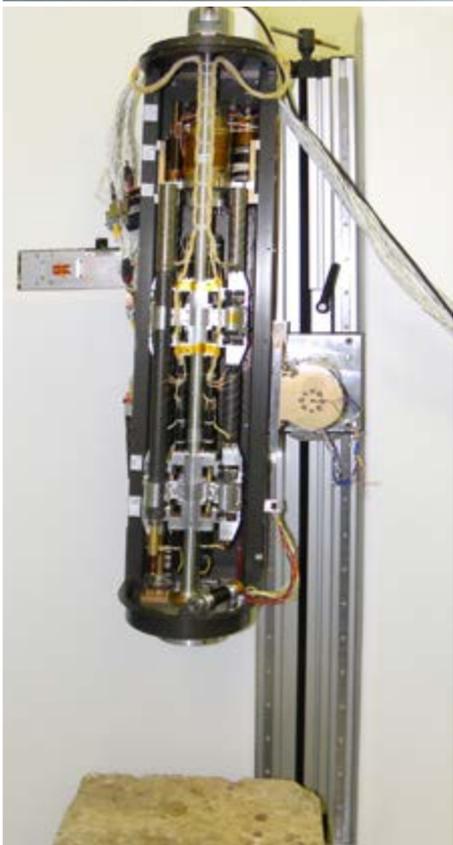
#### GaAs/GaN foundry

- 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 sectors ranging from assembly and delivery of complex mechatronic machines and groups in the field of automation towards the design and realization of space systems and astronomical professional instrumentation. Nowadays NPC can count on 35 employees with more than 6000m<sup>2</sup> 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 strength of the company at the basis of the business idea is to offer qualified space engineering know-how combined with more than 15 years experience in assembling complex automatic machines. Nevertheless, thanks to its 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. Its 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 levels 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;
  - 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 of 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 user needs.



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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.

- 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 missions 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 nano-satellite 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, designing and integrator and supplier of structural subsystem.

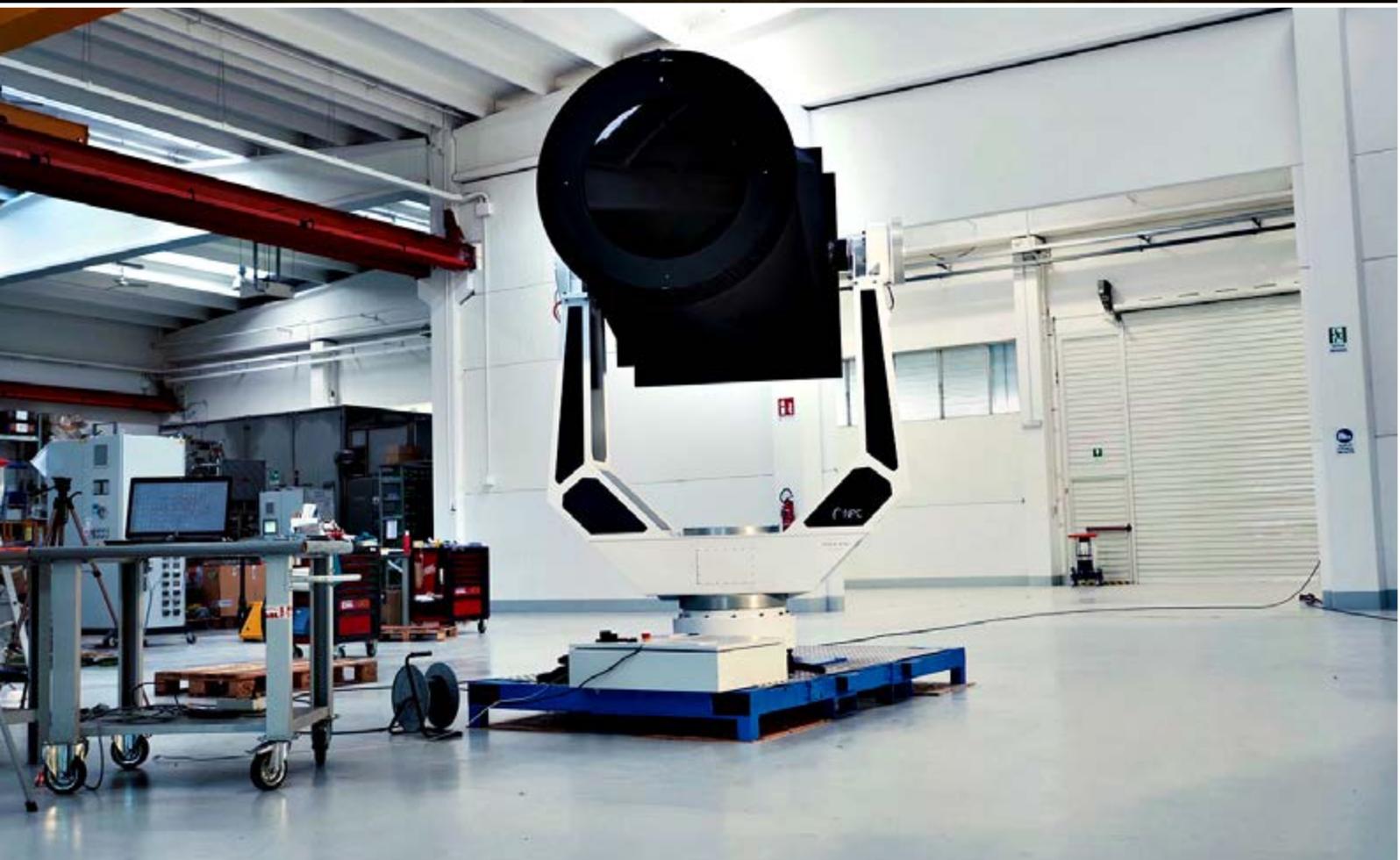
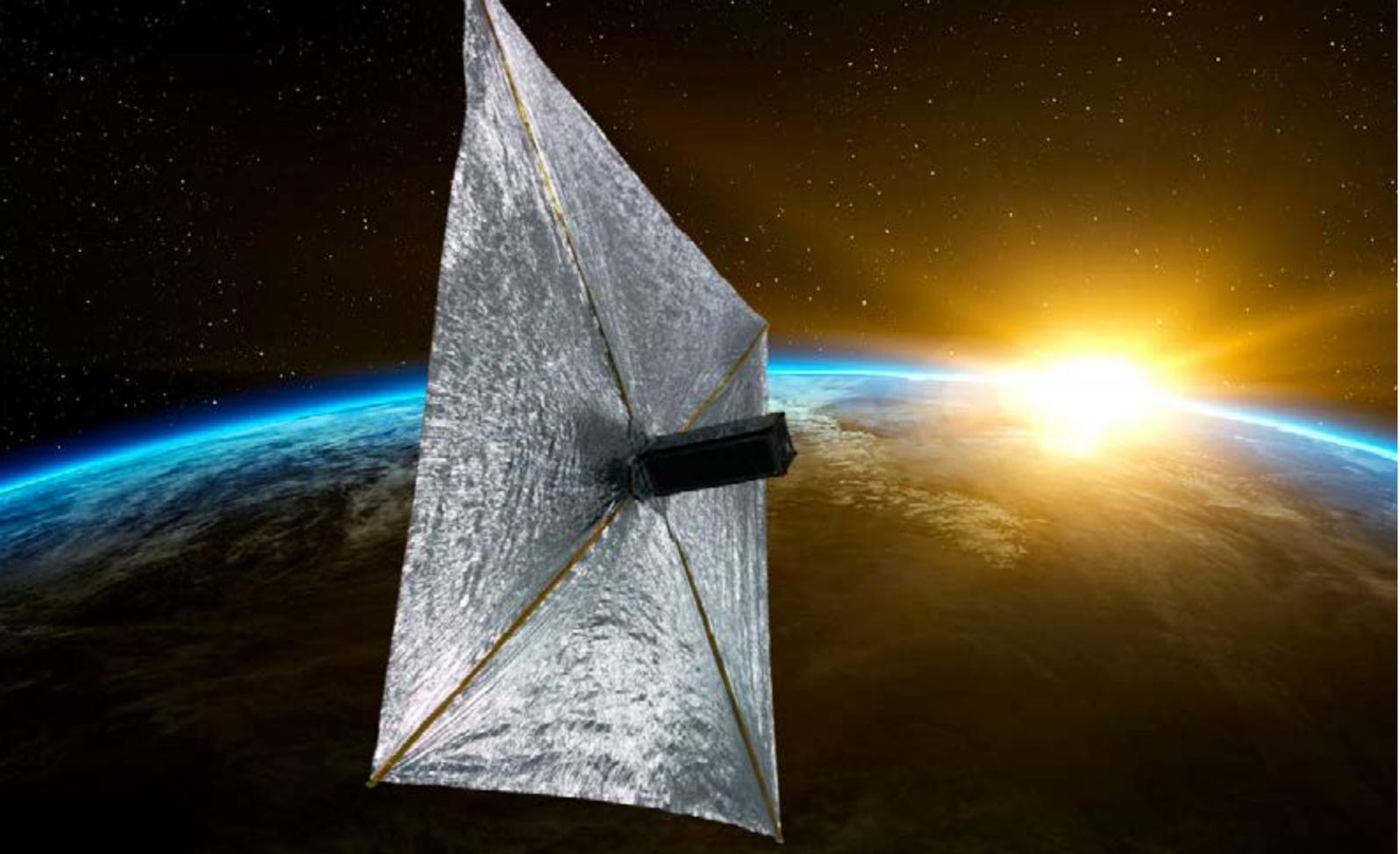
- NPC Spacemind has developed a family of high performance ground based systems with features suitable for SSA, SST and aerial tracking applications. The systems are compatible with a wide range of optical instruments, ranging from 300 mm to 1000 mm in diameter.

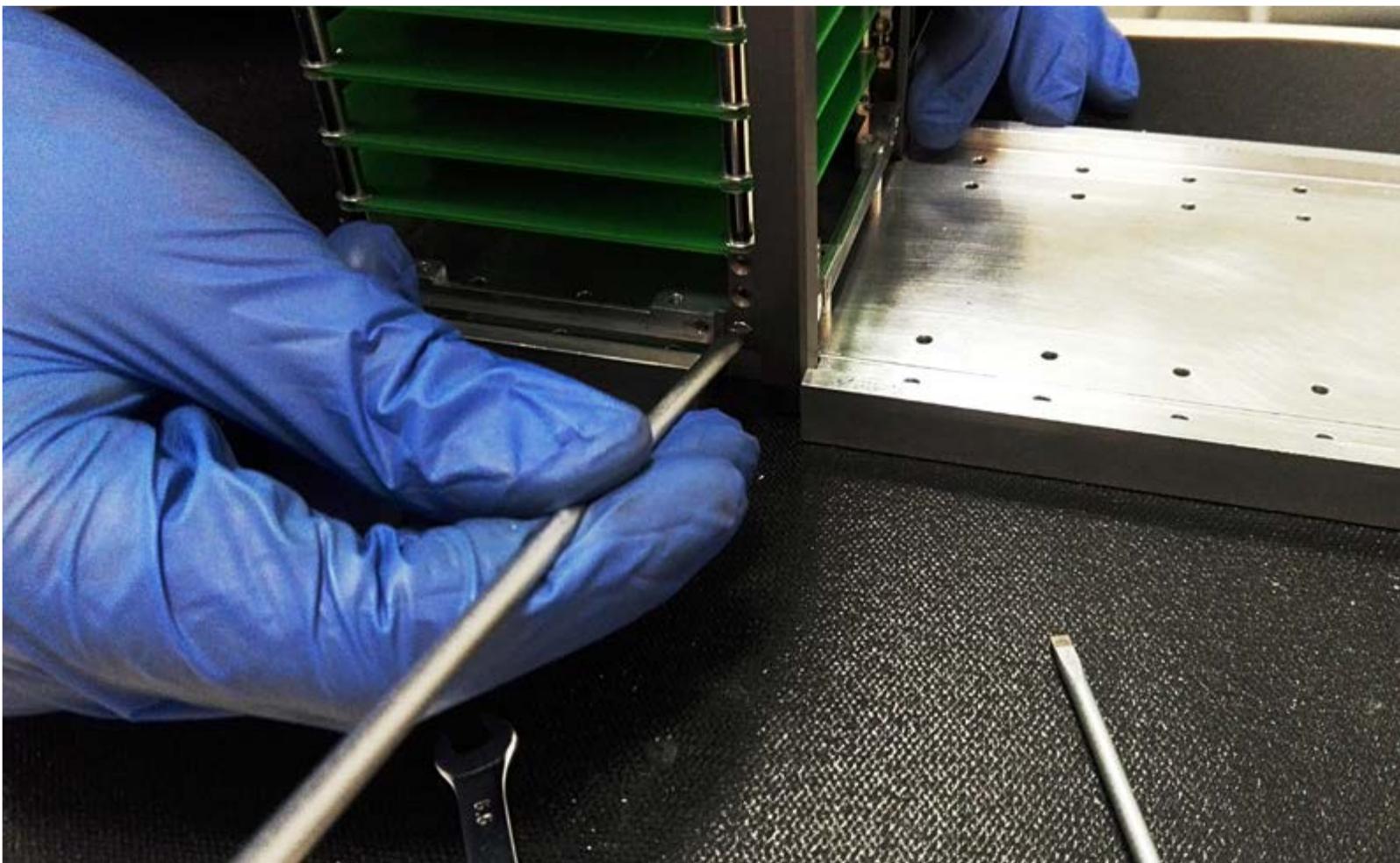
Different aspects have been optimized during the project in order to achieve the desired level of performance in terms of accuracy, precision, slew rate acceleration.

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

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## Company profile

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OHB Italia SpA is a leading company in Italy in the field of space systems design, development and integration. The company is a subsidiary of OHB SE, a European Space and Technology group that currently employs 2700 people in two Business Units: "Space Systems" and "Aerospace & Industrial products". OHB Italia core business is the design, the development and integration of satellites, payloads for scientific and application missions, space station facilities and Space Surveillance Awareness Telescopes. The company, founded in 1981, has headquarters in Milan and offices in Rome and Benevento. Thanks to a consolidated technical expertise, advanced technologies and highly qualified human resources, OHB Italia acts as prime contractor at system level and as supplier of subsystems, instruments and equipment for the space segment.

## Products | Services | Applications | Technologies

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Turn-key satellite systems for Scientific, Earth Observation and Application missions; scientific payloads for experiments in microgravity conditions, deep space and planetary exploration; meteorological payloads; planetary exploration missions and system studies for precision landing systems, surface mobility vehicles and in-situ science; Space Surveillance Awareness Telescopes development.



## Contact

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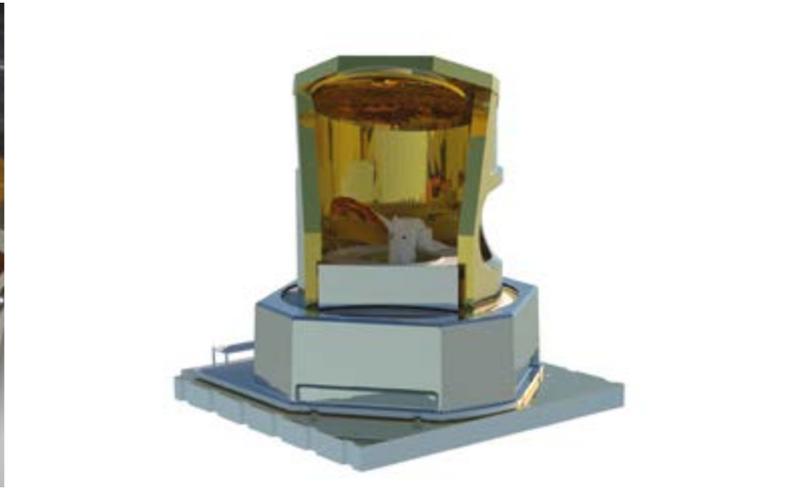
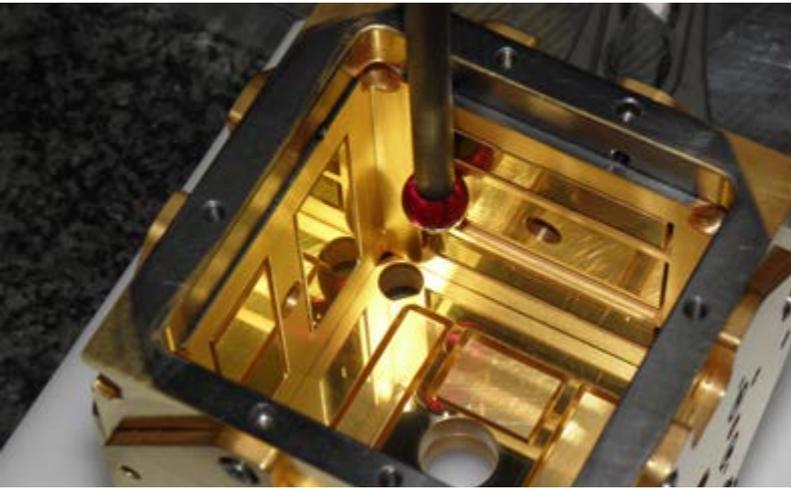
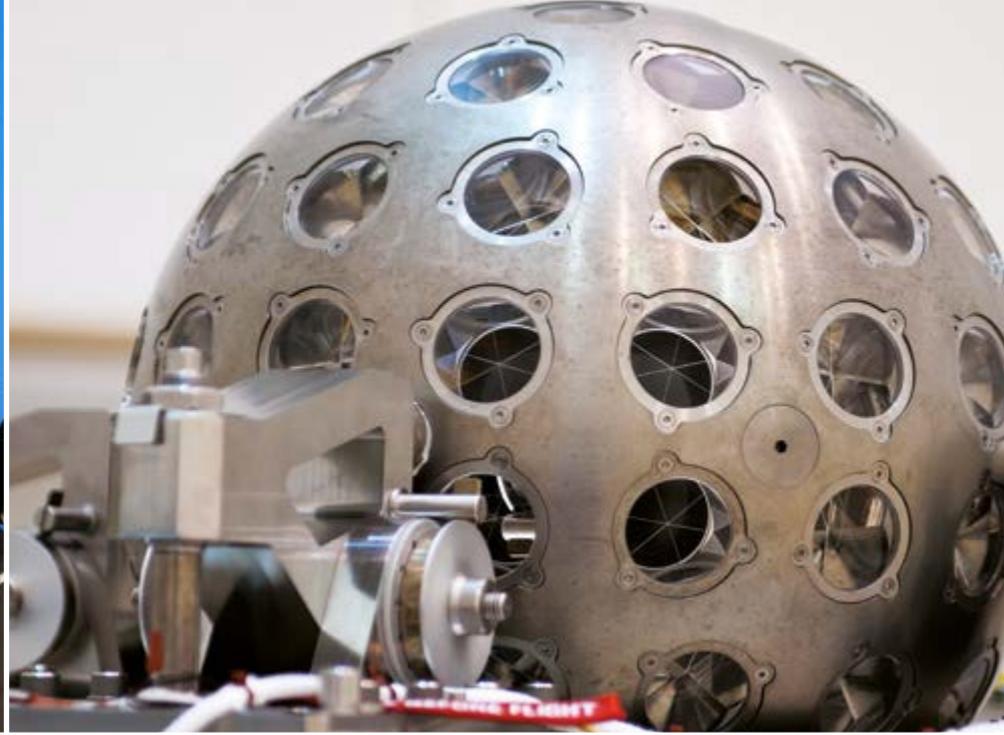
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# RIBA COMPOSITES S.r.l.

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## Company profile

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Since 1988 RIBA has been manufacturing structural & aesthetic components made of advanced composite material such as: carbon fibers, aramidic fibers, glass fibers and other types of fiber.

With the entry into the group Bucci, RIBA has become your ideal partner for the design, develop and production of medium and large series.

RIBA operates in various fields of the Aerospace industry and it's qualified as supplier of major aerospace players, thanks to an accurate analysis of customer needs and to the quality of delivered products.

## Products | Services | Applications | Technologies

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Riba manufactures carbon fiber structural and non structural parts for different purposes, from complex space systems (i.e. CFRP propulsion platforms for GEO satellites) and CFRP sandwich panels for the Space Industry to structures and engine covers for aircraft and helicopters, UAV and drones, and aircraft interiors.

Materials and Technologies:

- carbon, glass and aramidic fibers
- monolithic, sandwich mechanical embedded parts
- hand layup of pre-impregnated fabrics
- Resin transfer molding (RTM), High pressure RTM
- autoclave curing, post curing, bonding and painting

Certifications: UNI EN ISO 9001, UNI EN 9100, UNI EN ISO 14001

Facilities and Equipments:

- 16,000 sqm of production area in 2 sites
- 800 sqm ISO 8 class Clean Room
- n.3 plotters for fabric cutting
- n.6 Autoclaves (i.e 6m x 2,5m ; 17m x 1,5m)
- n.1 HP RTM press 2500 tons.
- n.3 CNC machining center
- n.6 post curing oven
- Quality control area with CMM 3D DEA machine for dimensional control, 3D laser, Olympus machine for ultrasonic nondestructive testing

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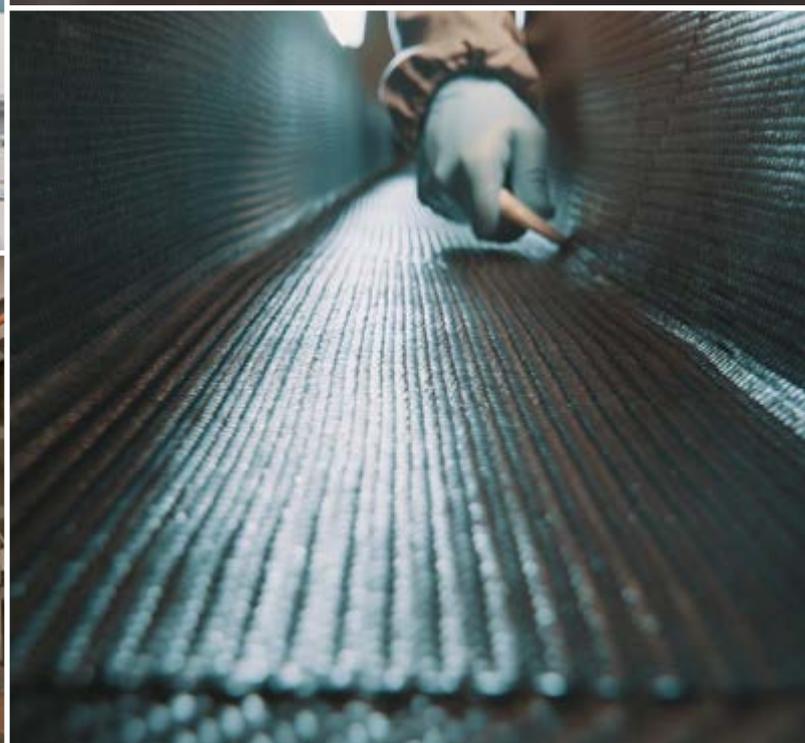
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# SITAE S.p.a.

## 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 300 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.

### 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, SITAE offers affordable and effective access to space for IoD/IoV missions to both private and public entities that want to validate their technologies. STRIVING, SITAE's innovative IoD/IoV Service, 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 integrated service including small satellite platforms from 1 to 200kg, AIT/AIV, ground segment and launch.

### ADVANCED PROPULSION

Since the early '80s, SITAE is involved in development of Advanced Propulsion Systems based on innovative proprietary technologies. Electric Propulsion Products ranges from High and Low Power Hall Effect Thrusters to Electrothermal Thrusters, from micro-Newton Field Emission Electric Propulsion Systems up to hundreds of kilowatt Magneto Plasma Dynamic Thrusters. SITAE is today one of the few companies worldwide with development and qualification capabilities of complete Electric Propulsion Systems.

### SPACE AVIONICS

SITAE 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, SITAE portfolio includes small satellite specific products based on COTS components, such as OBC, TT&C, PCPU, Solar Arrays, Battery Packs and AOCS, but also several reliable and high efficiency space-born electronics products, ranging from power supplies, drive and control equipments to satellite data processing, handling, storage and communications. Moreover, SITAE Microelectronics Design Center has been pioneering radiation hardening techniques for the design of Integrated Circuits suitable for space environment.



## Contact

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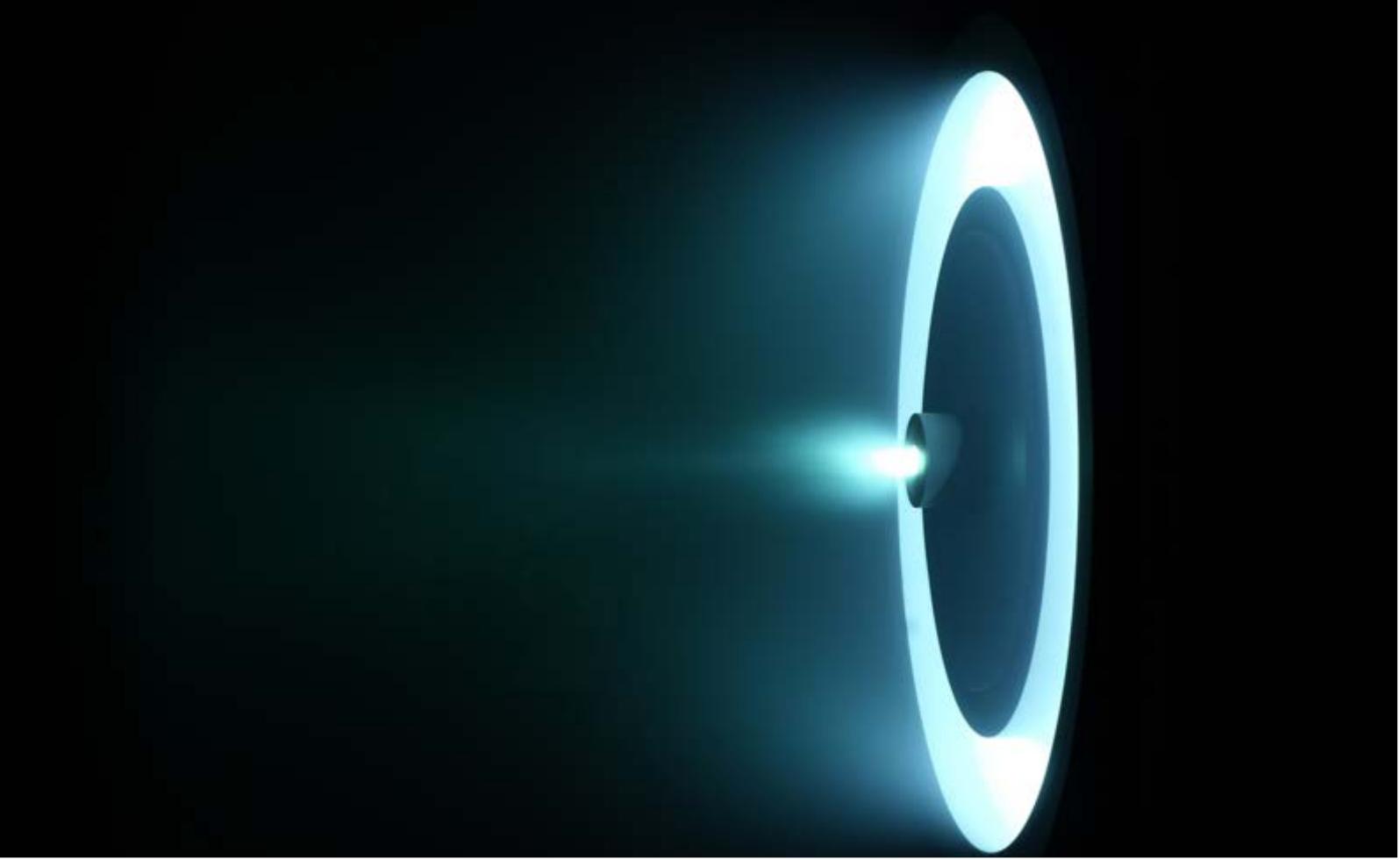
### Large Companies

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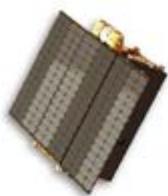
## TEST SERVICES AND PRODUCTS

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.





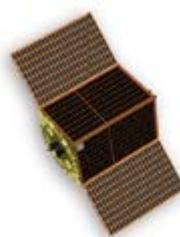
■ 50 kg



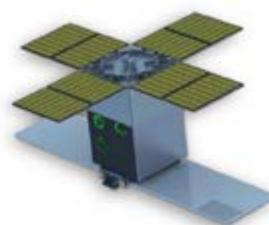
■ 75 kg



■ 100 kg



■ 200 kg



■ 300 kg

IoD / IoV

IoT / M2M

Earth Observation

Telecom HTS / Science

# Space Engineering S.p.A.

## Company profile

Space Engineering is an innovative company with 30 years of experience in space technologies. Since 2015 it is 100% part of the world leading Airbus Defence and Space, Space Systems, Telecom division. Space Engineering stands as a reliable partner for space agencies, satellite operators and leading companies in the space domain. The Company has a significant expertise in design, engineering, simulation, prototyping, integration, testing, for Space & Ground, owning several international patents on antennas, radars, scientific software and Digital Signal Processing. Since its foundation, Space Engineering has actively worked with customers and partners in Europe, Israel, Russia, Turkey, United Arab Emirates, Argentina, China and others and has attained exceptional know-how and strong international reputation thanks to the participation to major programs (more than 30 programs, including Artemis, Globalstar, Meteosat, Sicral, Galileo, Cosmo SkyMed, Alphasat, Metop SG, Quantum, Saocom). Among its main customers and partners there are ESA, ASI, Italian MoD, CONAE, Yahsat, Eutelsat, Inmarsat, OHB-CGS, Leonardo, Siemens, Thales CS, Thales Alenia Space Italy, Telespazio.

Space Engineering employs about 110 technical staff members, the large majority of which are university-graduated engineers. The Company has ISO 9001:2015 and EN 9100:2016 certifications. Since August 2017, Space Engineering 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 industrial plant is equipped with several facilities for Assembly, Integration and Test, including Clean Room, Anechoic Chamber, Thermal-Vacuum Chamber, attitude simulator for SatCom testing, Mechanical & RF labs.

## Products | Services | Applications | Technologies

Over the last four years, Space Engineering has undertaken a deep renovation process, steadily evolving from a study-oriented company to a Program/Product oriented industry. Our product portfolio is being further consolidated to successfully meet our ambition of being a recognized industrial leader for selected products. We innovate in 5G and Earth Observation through flexible antennas and payloads, multiband ground terminals, Machine-to-machine gateways, smart modems, Inter-Satellite Link solutions. Space Engineering is able to provide distinctive solutions for a wide range of applications in the Telecom & Earth Observation domains, keeping focus on product innovation. Leveraging on our distinctive heritage in Antennas, RF and Digital Equipment, Communication Protocol and System Design, we can offer a qualified portfolio of products and solutions:

- Mobile multiband SatCom antennas for airborne applications. We 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 Space Engineering (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.
- 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.
- 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
- 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.
- Ground Transponders and Calibrators for EO Optical and SAR satellites



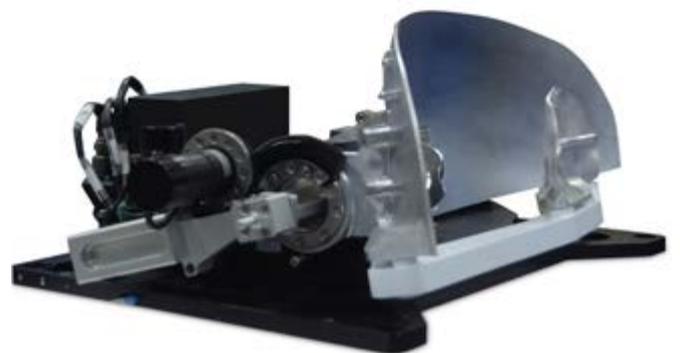
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# STMicroelectronics S.r.l.

## 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: -7,400 people working in R&D, -17,000 patents, -9,500 patent families and ~ 500 new patent filings in 2017
- ❑ An unwavering commitment to sustainability
- ❑ Corporate Headquarters: Geneva, Switzerland
- ❑ President and CEO: Jean-Marc Chery
- ❑ 2017 revenue: \$8.35 billion
- ❑ ~45,500 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 so they comply with the standards for aerospace defined by the qualifying agencies.

ST has supported European space applications since 1977, being qualified by the ESA (European Space Agency) since the agency's inception. Today, ST has broadened its efforts by qualifying products according to the American QML-V standard (of the US DLA - Defense Logistics Agency), and in accordance with RHA certification (Radiation Hardness Assurance).

ST offers a wide space product range, from Diodes and Transistors to A/D converters and Voltage Regulators, through its traditional Logic circuits range. It is actively working on further expanding this offer.



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# TELEMATIC SOLUTIONS SRL

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## Company profile

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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

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### 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



## Contact

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### Large Companies

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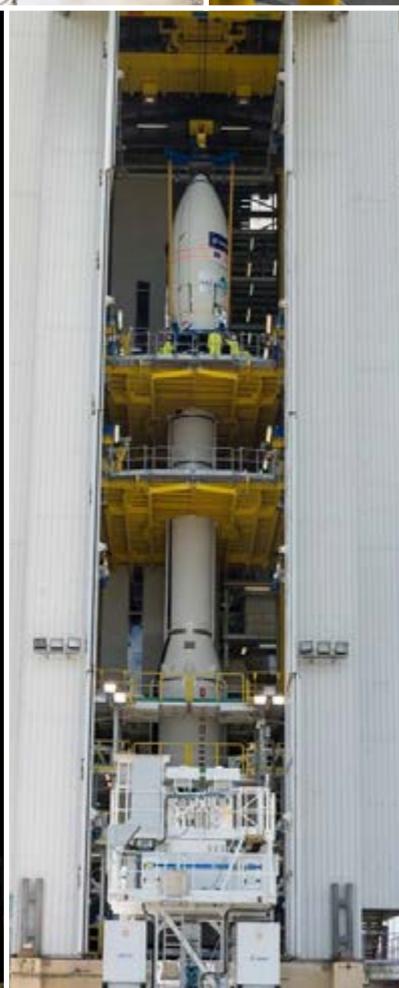
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# Telespazio Spa

## 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 2500 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). **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 developing and selling 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



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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.





# 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, Roscomos. 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 feature a perforator, capable of drilling two meters deep into the Martian soil and removing samples.

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.



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# Products | Services | Applications | Technologies

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ATHENA-FIDUS: telecommunications system based on a geostationary satellite for dual use broadband communications services. It 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.

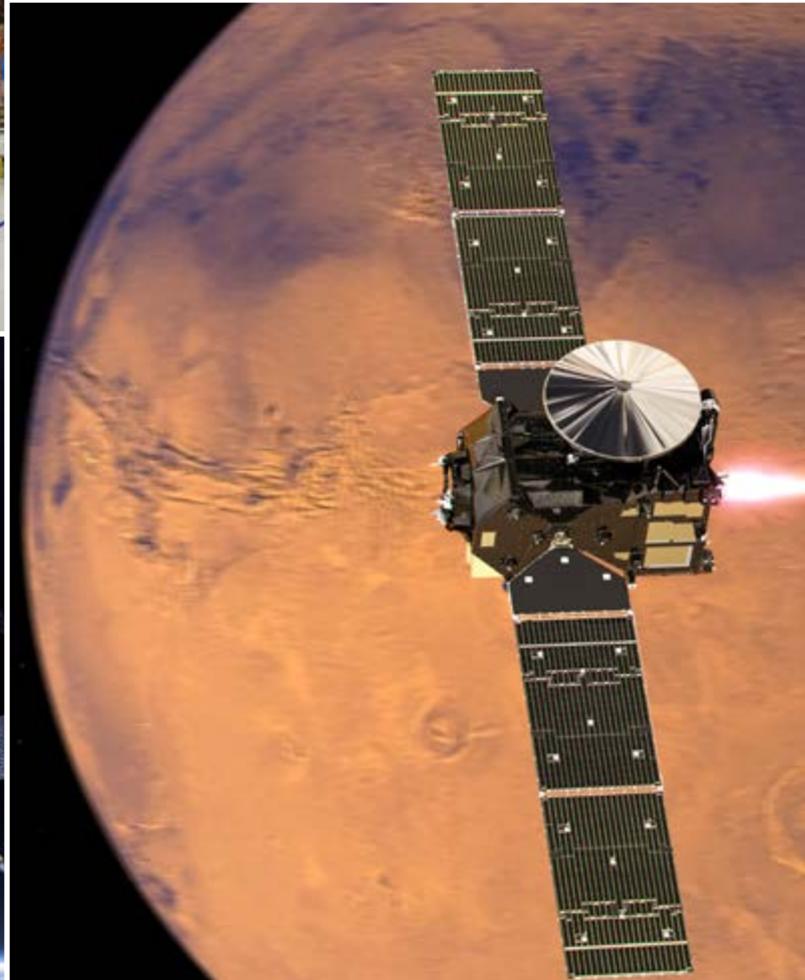
HR-R microsattelites solution for global coverage and high revisit (PLATINO is developing a very low cost multi-mission platform) exploiting innovative technologies as mini-CMG and IPAC (Integrated Processing, data-handling and AOCs Controller).

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 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 Infomobility, from systems for Information Communication & Multimedia Technology to those for the Environment.

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

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 cineteodolite 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.

Extending the perimeter from VEGA also to Ariane 5 and Soyuz launchers, VITROCISSET 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



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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 -VITROCISSET 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, VITROCISSET 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, VITROCISSET 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.

VITROCISSET is also supporting the Italian Consortium for the implementation of SST operations based on radar technologies. UHF transmitter has been provided and installed by VITROCISSET and it is currently operated with the support of VITROCISSET 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, VITROCISSET 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, VITROCISSET 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, VITROCISSET works on different international projects, supporting the implementation of large experimental physical facilities, providing highly specialized systems engineering services and developing ad-hoc systems.

VITROCISSET 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. VITROCISSET 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, VITROCISSET has been awarded with three framework contracts for electronics, SW development and mechanical consultancies 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.



