SITAEL
AN ANGEL COMPANY

PLATINO IN COSTELLAZIONE PER IL MONITORAGGIO DELLE INFRASTRUTTURE

FABRIZIO NOVALI –
SERVIZI DI OSSERVAZIONE DELLA TERRA

SISTEMI, SERVIZI E APPLICAZIONI SPAZIALI A SOSTEGNO DELLE GRANDI INFRASTRUTTURE NAZIONALI
ROMA, 04-11-2021

Agenda

- SITAEL
- PIATTAFORMA PLATINO
- PLATINO IN COSTELLAZIONE
- CONCLUSIONI

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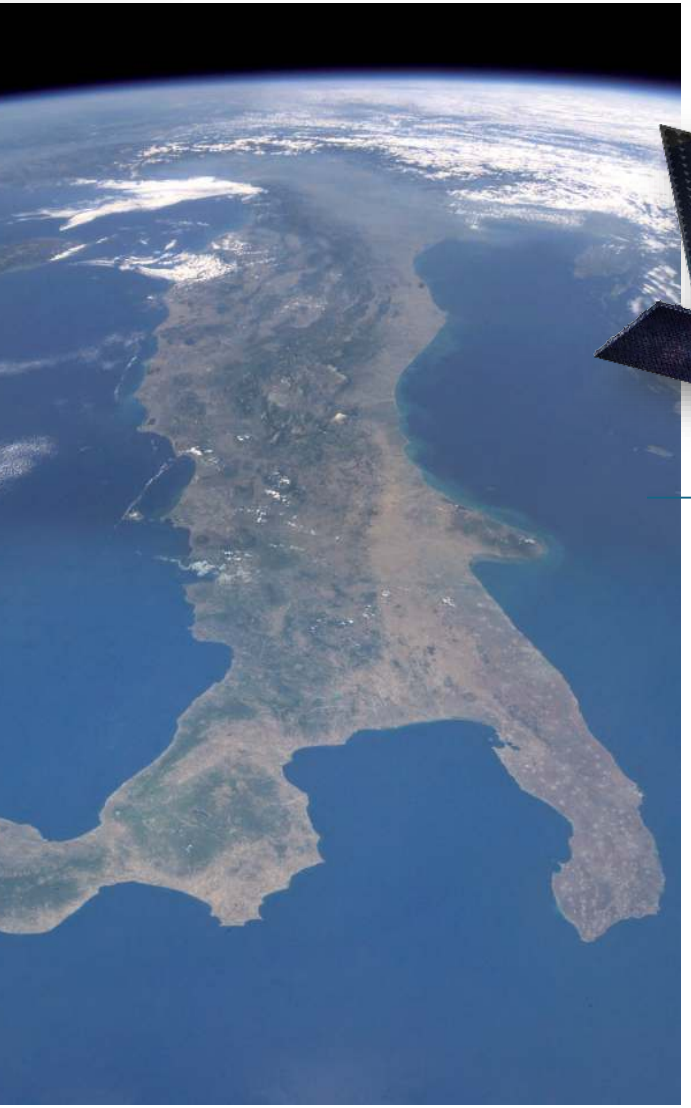
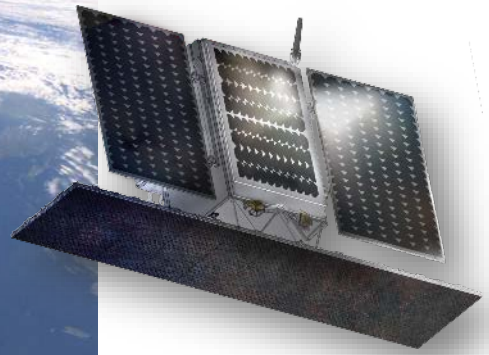
La più grande Space Company italiana privata





SMALL SATELLITES

ADVANCED PROPULSION

SPACE AVIONICS

SATCOM TERMINALS

~300 highly qualified employees

State-of-the-art facilities

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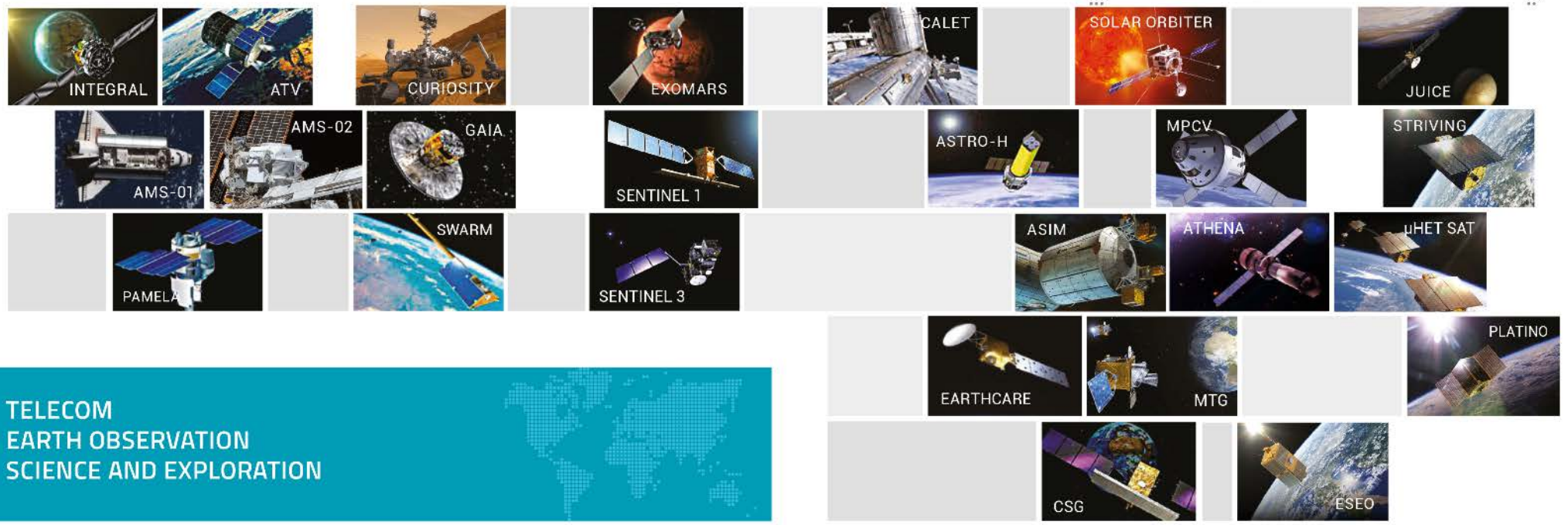
27 anni di storia

MORE THAN 20 YEARS IN SPACE

1994 2000 2004 2008 2010 2014 2018 2020



TELECOM
EARTH OBSERVATION
SCIENCE AND EXPLORATION

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- Veria, GREECE

- Adelaide, AUSTRALIA

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PLATINO

PLATINO: LA PIATTAFORMA PER MINI-SATELLITI

PLATiNO

Piattaforma allo stato dell'arte

- Innovazioni tecnologiche:
  - Propulsione all-elettric
  - Struttura compatta
  - Mini CGM
- Competitiva
- 5 anni di vita operativa

Multi-payload

- Fino a 100kg di carico utile
- Fino a 150W medi (1kW picco)
- Grande modularità

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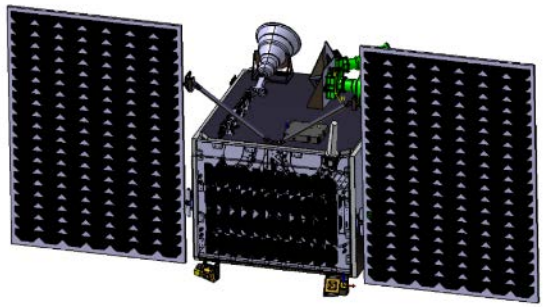
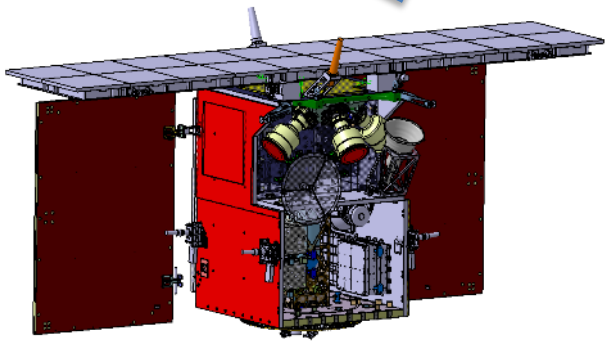
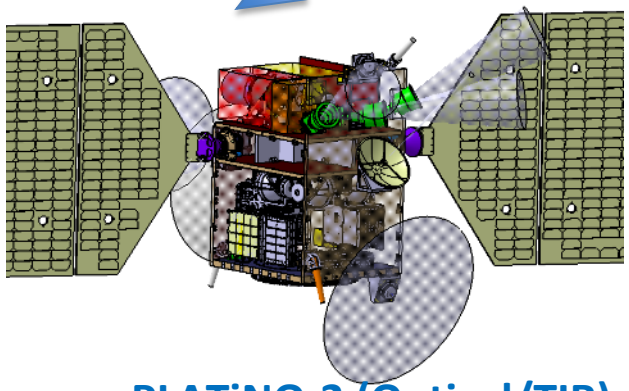
PIATTAFORMA MULTIFUNZIONALE PLATiNO



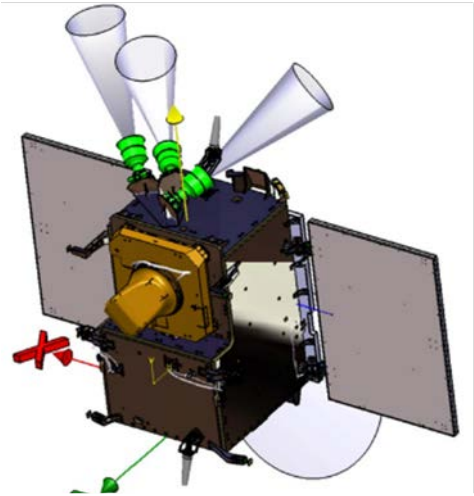
PLATiNO Multi-mission Platform



PLATiNO-1 (SAR)



PLATiNO-2 (Optical/TIR)



PLATiNO per Missioni Telecom

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PRODOTTO PIATTAFORMA PLATiNO ED ECOSISTEMA ITALIANO

SITAEL

-Struttura
-Controllo termico
-Propulsione elettrica
-Alimentazione Elettrica
-Payload I/F

THALES ALENIA SPACE-IT

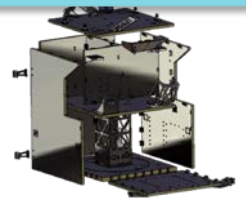
- Avionica
- Comunicazione
- Controllo d'assetto

LEONARDO

-Pannelli solari
-Star tracker
-Valvole propulsione

AIRBUS-IT

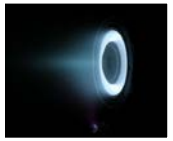
-Antenna banda X
-Antenna GPS
-Inter-satellite link Ka



Filiera tecnologica ITALIANA

SAB Aerospace: batterie
BERCELLA: struttura meccanica
BEAM IT: additive manufacturing
AVIOTEC: MLI (coperte termiche)
ECOR: serbatoio in titanio
IMT: componenti EEE e SADM
ORTEC-BRAIN: cablaggio
PLANETEK: Processori, pianificatore
EXPRIVIA: Ground

PIATTAFORMA MULTI-MISSIONE PLATiNO (SITAEL)



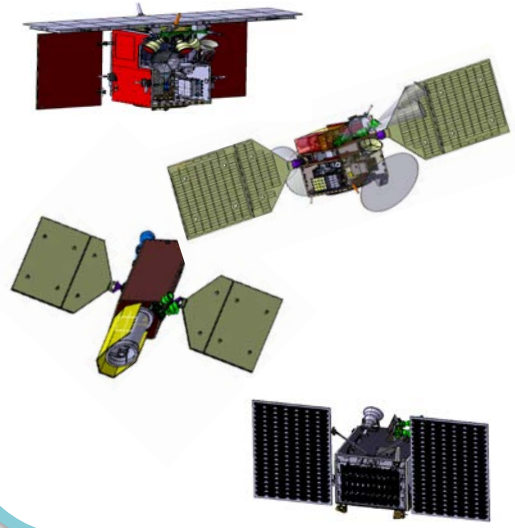
Payload SAR
(Synthetic Aperture Radar)
(Thales Alenia Space-IT)

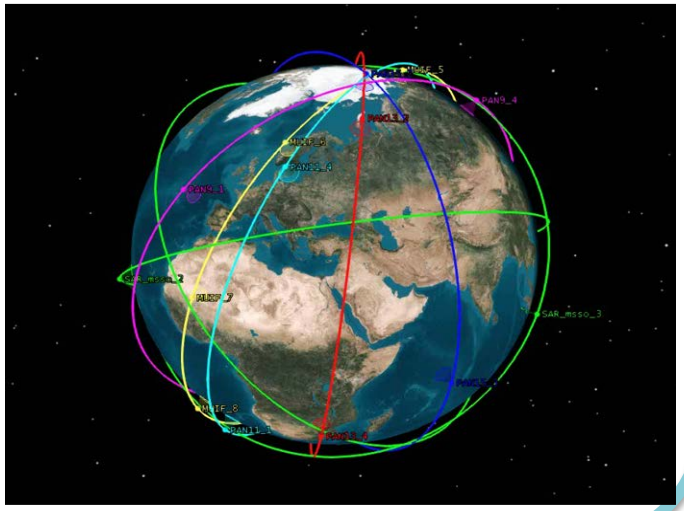
Payload Ottico TIR
(Thermal Infrared)
(Leonardo/SITAEL)

Payload Ottico VNIR
High Resolution

Payload Ottico Iperspettrale

MULTIAPPLICAZIONE





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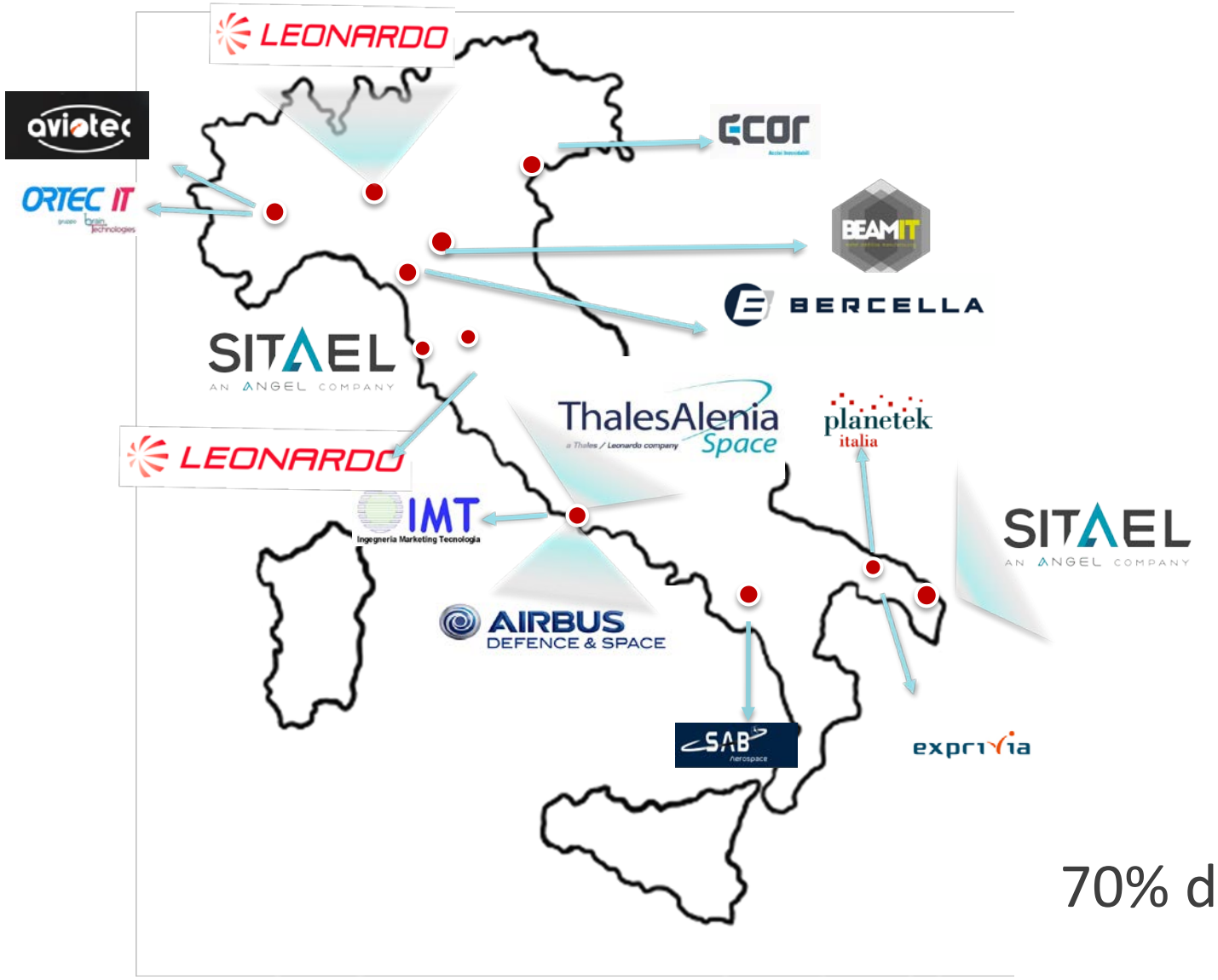
PLATiNO attiva un ecosistema italiano di Grandi Imprese e PMI



70% degli acquisti in Italia

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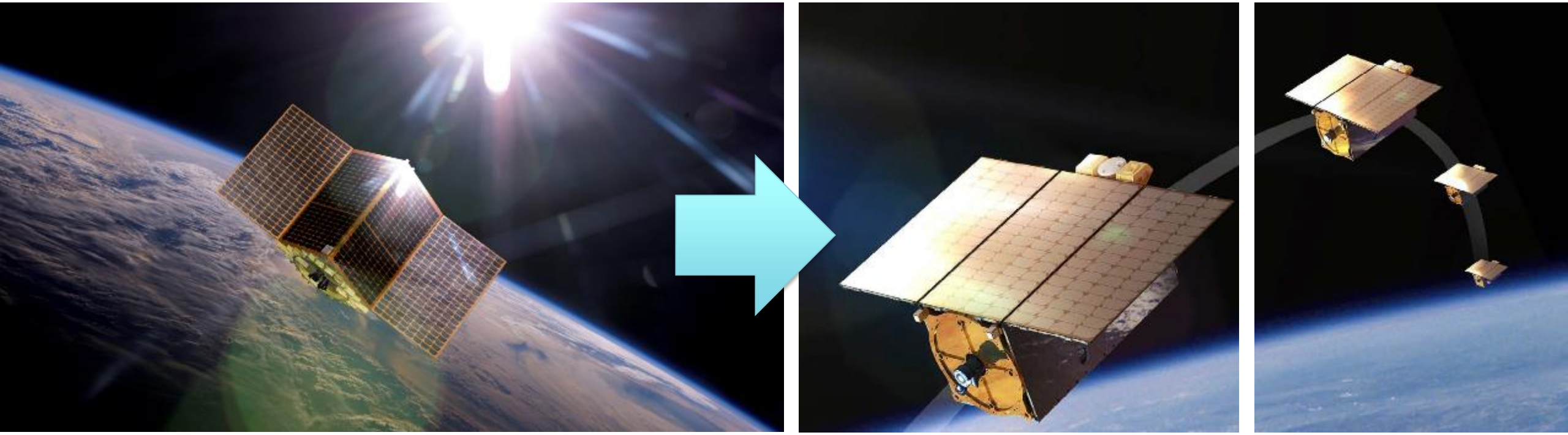
PLATINO IN COSTELLAZIONE

PICCOLI SATELLITI (PLATiNO) IN COSTELLAZIONE

- PLATiNO è la piattaforma ideale per osservare la Terra in orbita LEO (350-550 km).
- PLATiNO riesce a vedere dettagli con:
  - Risoluzione sub-metrica (SAR)
  - 0,4 m con strumenti ottici (telescopi)
- Il dispiegamento di PLATiNO in costellazione offre copertura completa del territorio nazionale **sistematica, frequente e** ad **alta risoluzione**



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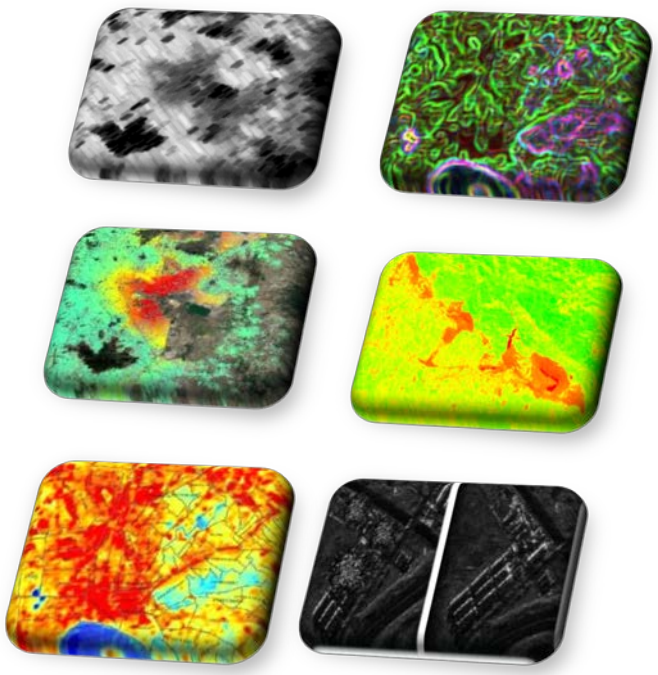
GENESI DI UNA COSTELLAZIONE (OLD SPACE ECONOMY)

Data Analytics



Technology Driven

Applications

Coast and marine monitoring

Tracking and prediction of **waves, coasts geo-morphology, natural habitat** and events affecting the marine environment

Air Quality

Mapping of **pollutants** and **dispersion of ash** and **other materials** due to natural and anthropic events

Hydro-meteorology climate service

Monitoring and forecast of greenhouse gases and other **Essential Climate Variables (ECV)**

Water resources

- **Hydromorphological** monitoring
- Modelling of hydrogeological and hydraulic modelling and **floods forecast**

Ground motion

Monitoring of ground motion due to **earthquakes, volcanic eruptions, landslides**

Monitoring of land cover and use

Mapping of **crops, forests, volcanic areas, soil consumption**

Emergency services

Identification of critical events such as **floods, wildfires, earthquakes and eruptions** and mapping of damages

Security services

Maritime surveillance and surveillance of **UE external borders**

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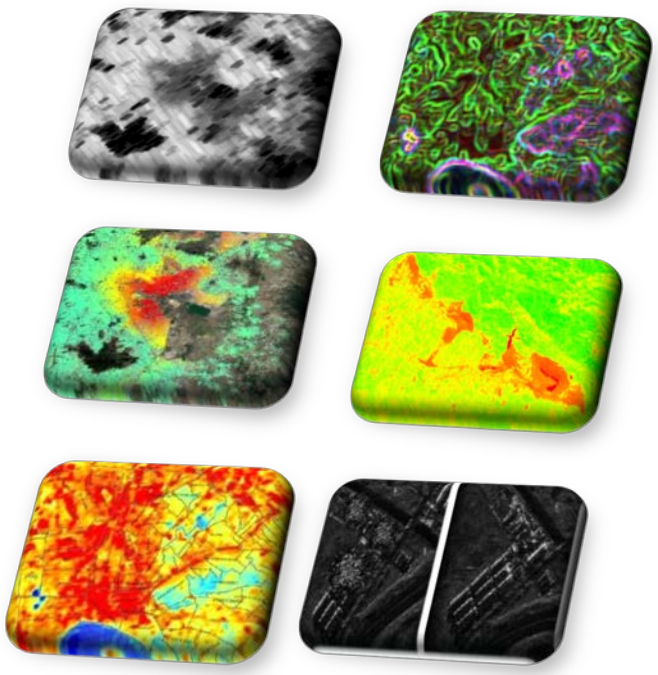

User Needs

- Aggiornamento Continuo
- Copertura Nazionale
- Acquisizioni Frequenti
- Alta Risoluzione
- Multi Sorgente

User Needs Driven

Applications

Coast and marine monitoring
Tracking and prediction of **waves, coasts geo-morphology, natural habitat** and events affecting the marine environment

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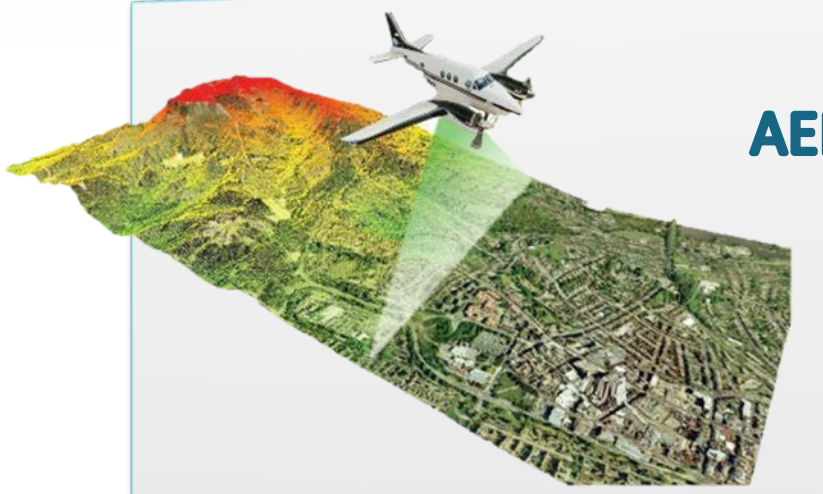
BUSINESS CASE - IL SETTORE FERROVIARIO : MUIF



AEREO

TRENO

TERRA

- Modello Unico Infrastruttura Ferroviaria
- Elevato dettaglio
- Creazione Digital Twin ~ 5 anni
- Prodotto «Statico»

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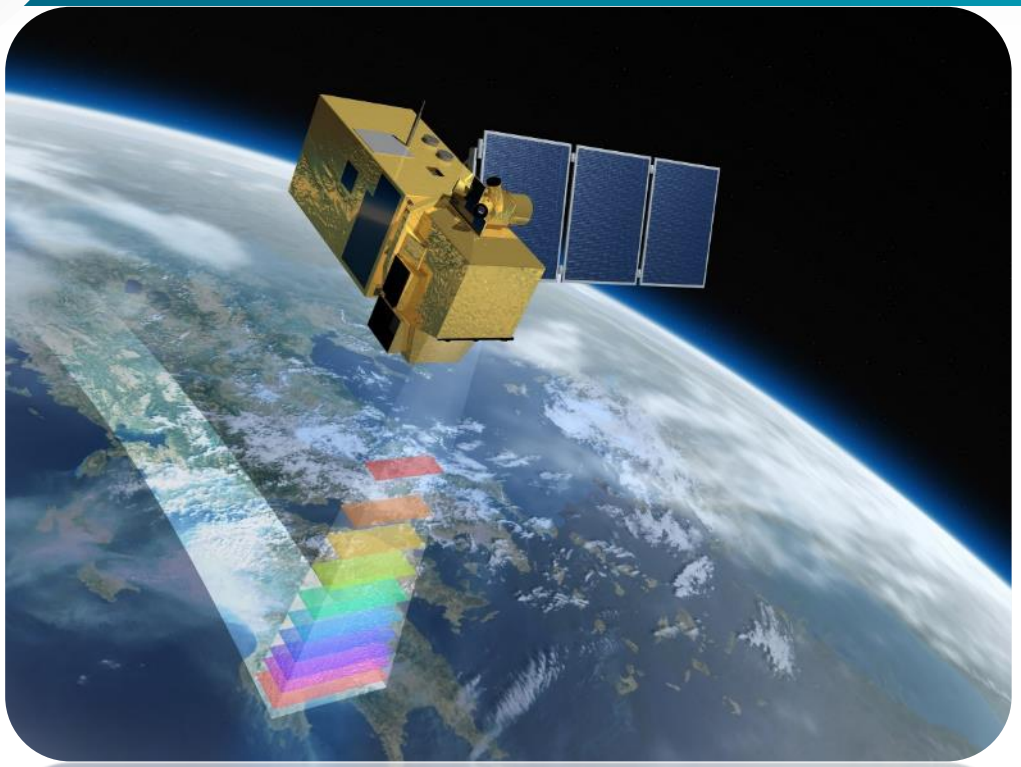
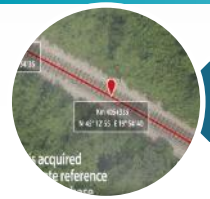
BUSINESS CASE: MUIF – SERVIZI DALLA COSTELLAZIONE PLATINO



- Aggiornamento Continuo
- Copertura Completa Rete
- Integrazione con in-situ measurement

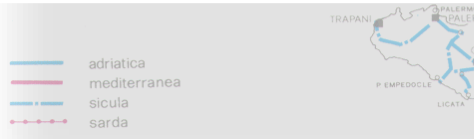


Mappatura Linea Mezzeria Binari

Controllo abusivismo Lungo Linea

Controllo vegetazione Lungo Linea

Monitoraggio stabilità assets



Monitoraggio rischio idrogeologico

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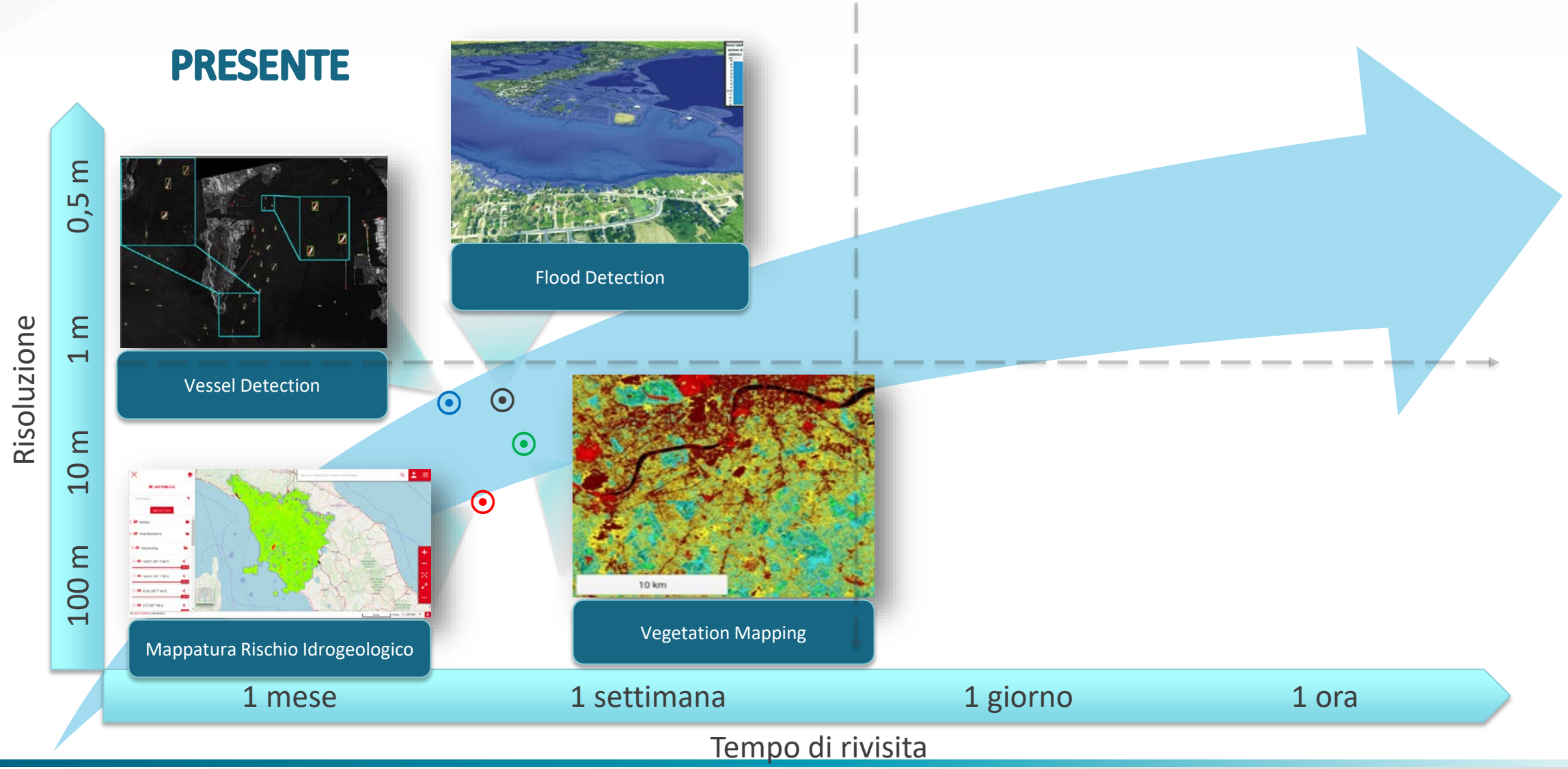
OSSERVAZIONE DELLA TERRA: PRESENTE



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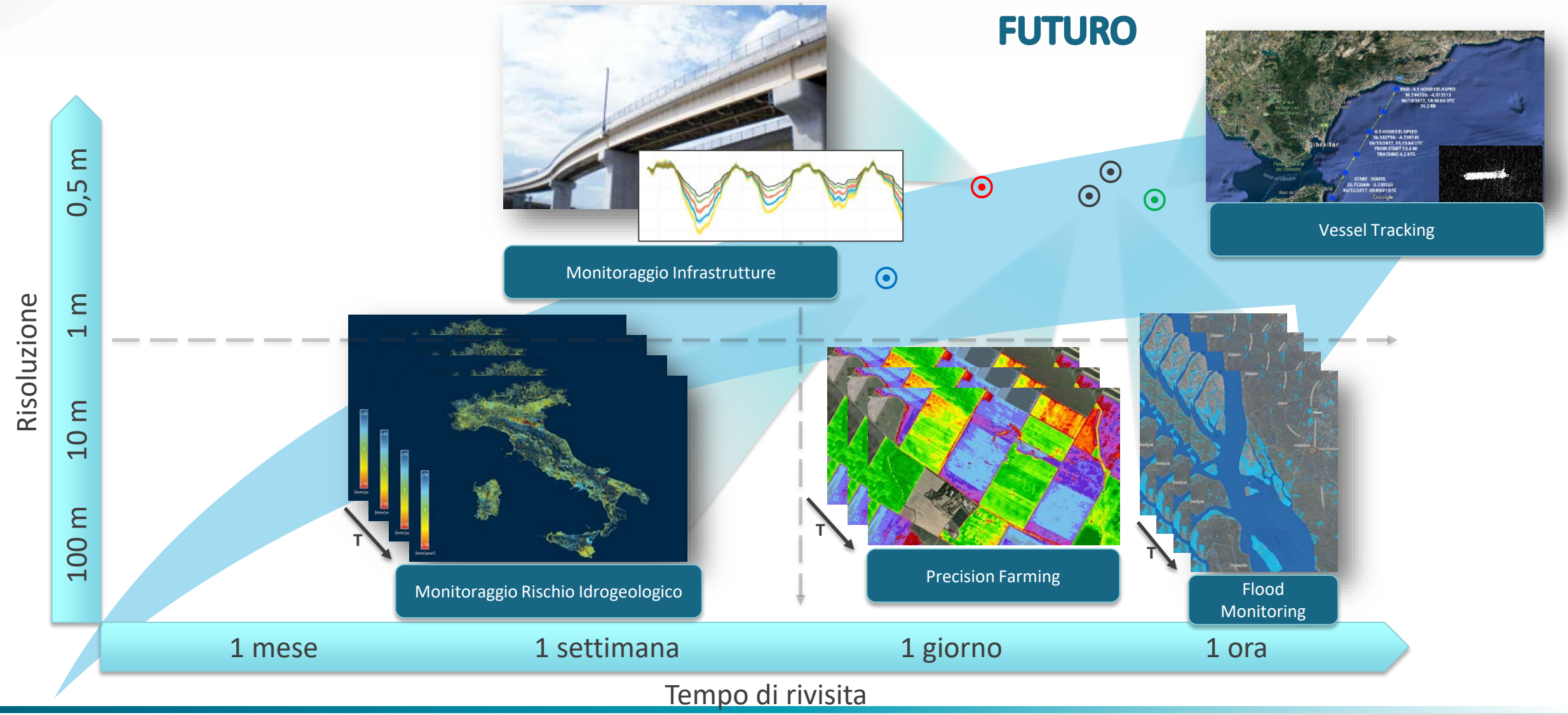
OSSERVAZIONE DELLA TERRA: FUTURO - PLATINO



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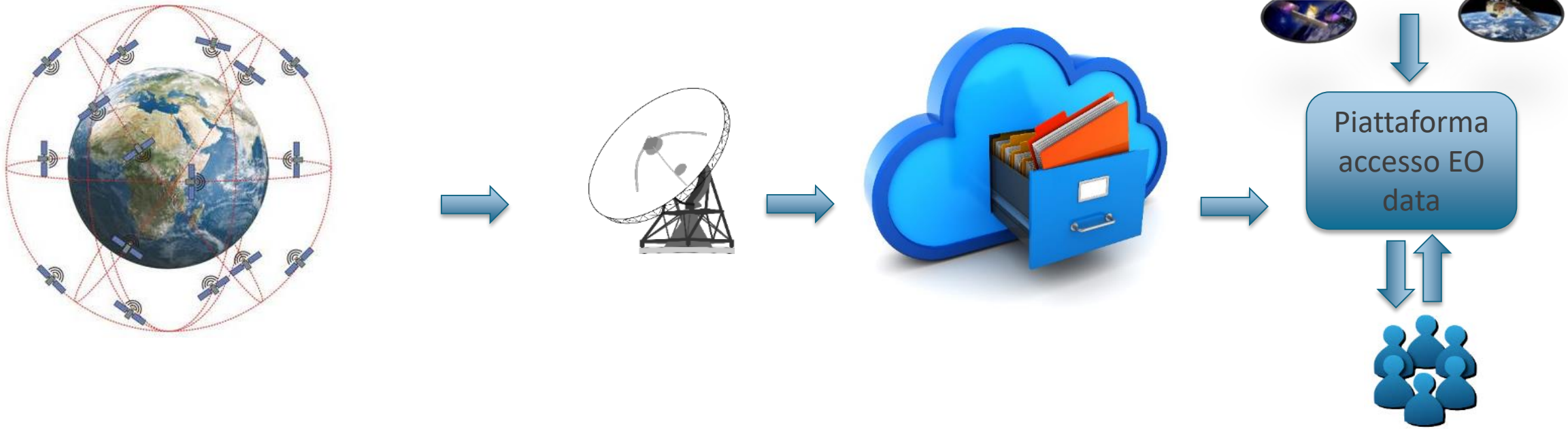
UNA COSTELLAZIONE INTEGRATA CON IL MONDO DIGITALE

- Dati archiviati nativamente in **ambiente cloud**
- Consultazione, ordine e tasking ➔ lesson learnt missioni precedenti
- Infrastruttura orientata all'**automazione**
- Il volume dati generato consente data analytics basate su **AI e Deep Learning**



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Conclusioni

- Platino è una mini piattaforma modulare di classe 200Kg completamente basata su tecnologie mature

- L'idea della costellazione Platino nasce per soddisfare le esigenze del settore *downstream*

- Una costellazione di satelliti Platino SAR/ottici consente la copertura completa, sistematica, frequente e ad alta risoluzione del territorio nazionale, **utile per il monitoraggio delle infrastrutture**, come dimostra l'esempio MUIF.

- Una costellazione Platino coinvolgerebbe tutto l'ecosistema italiano dell'Osservazione della Terra (sensori, piattaforma, lanciatori, ground segment, servizi)

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