

Importance of the Space Situational Awareness

Towards a bilateral and European Space cooperation between Latvia and Italy in the light of the emerging global challenges





KEY FIGURES

-  **3.000** employees
-  **~ 600 M€** revenues

BUSINESS OVERVIEW

Three areas of activities:

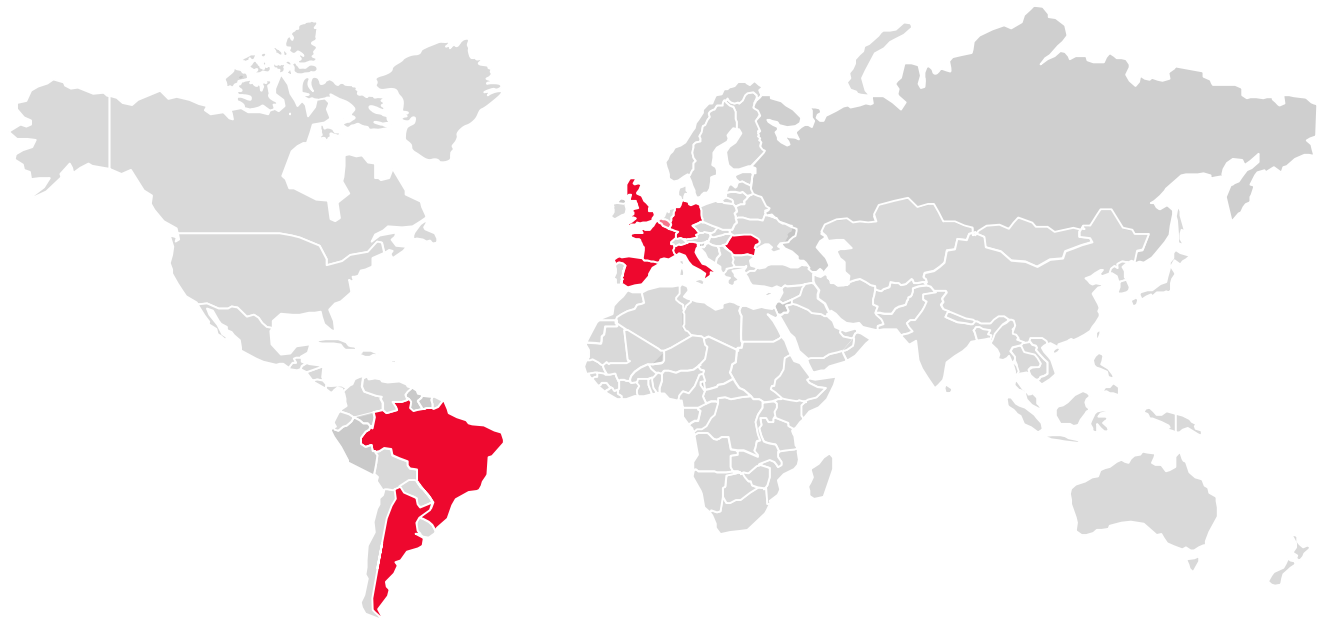
-  **Satellite Communication**
-  **Geo Information**
-  **Satellite Systems and Operations**

Worldwide leader in **space operations**, able to provide a wide array of services for different clients.



Space Situational Awareness represents a key enabling factor for Telespazio activities

GEOGRAPHICAL FOOTPRINT



KEY CUSTOMERS





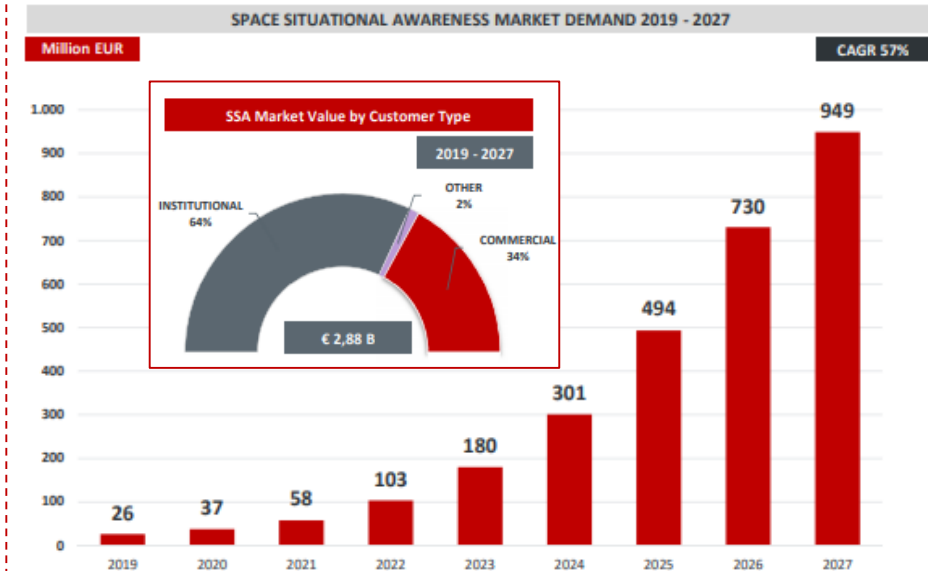
SSA Market Trends

- Space is becoming **Congested**, **Contested**, and **Competed**:
 - 4,857 satellites** in orbit as of March 2019 (+5% wrt 2017), booming number of satellite launches in the next years
 - Only 26.000 debris objects monitored** from earth in a population estimated at 128 million fragments (>1 mm) and 900.000 debris (1-10 cm)
 - Mega-constellations** will increase the risk of collision (+50%)
 - New players like **In-Orbit Servicing** operators ready to enter the market
 - Growing risk of **catastrophic event** (Kessler syndrome)
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- Increasing need of critical **space assets protection**
 - Raising requirements of **advance analytics** on space domain information
 - Current data pipeline not satisfying requirements for **transparency**, access and quality assurance



- More and higher quality SSA data** are needed to support object tracking and surveillance
- Additional Value Added Services** need to be developed
- Regulatory standards** need to be consolidated to enable market regulations

Space Situational Awareness Market Demand 2019 - 2027



Source: Telespazio elaborations on NSR, Euroconsult and specialized press



1 B€ Market in 2027 for SSA Services



Space Weather

- Impact on Satellite Drag
- Impact on GNSS
- Impact on Satellite Communications
- Impact on On-board Electronics

Main programs in the frame of:

ESA: for the **impact on GNSS** Telespazio developed as prime the ESA project IPS (Ionospheric Prediction Service) under evolution with Ionolab

TPZ value proposition is based on proprietary algorithms to deliver services.

Space Traffic Management

- Conjunction/Break-up/Re-entry
- Collision Avoidance (Maneuvers)
- Launch Support
- End-of-life and De-orbit
- In Orbit Services

Main programs in the frame of:

- **Collision avoidance** operations
 - In Orbit Control activities in the frame of Cosmo-Skymed
 - In Orbit Control activities for French MoD TLC satellites
- ISOC (Italian Space Surveillance and Tracking Operation Center) support
- Horizon 2020 **Spaceways**: *Assessment of capabilities, technology and regulatory gaps for the implementation of an European STM system (Horizon 2020 grant No 101004208)*

Space Intelligence

- Pattern of Life
- Spawning
- Object Tracking (Custody)
- Characterization (Optical, RF)
- Anomaly Detection

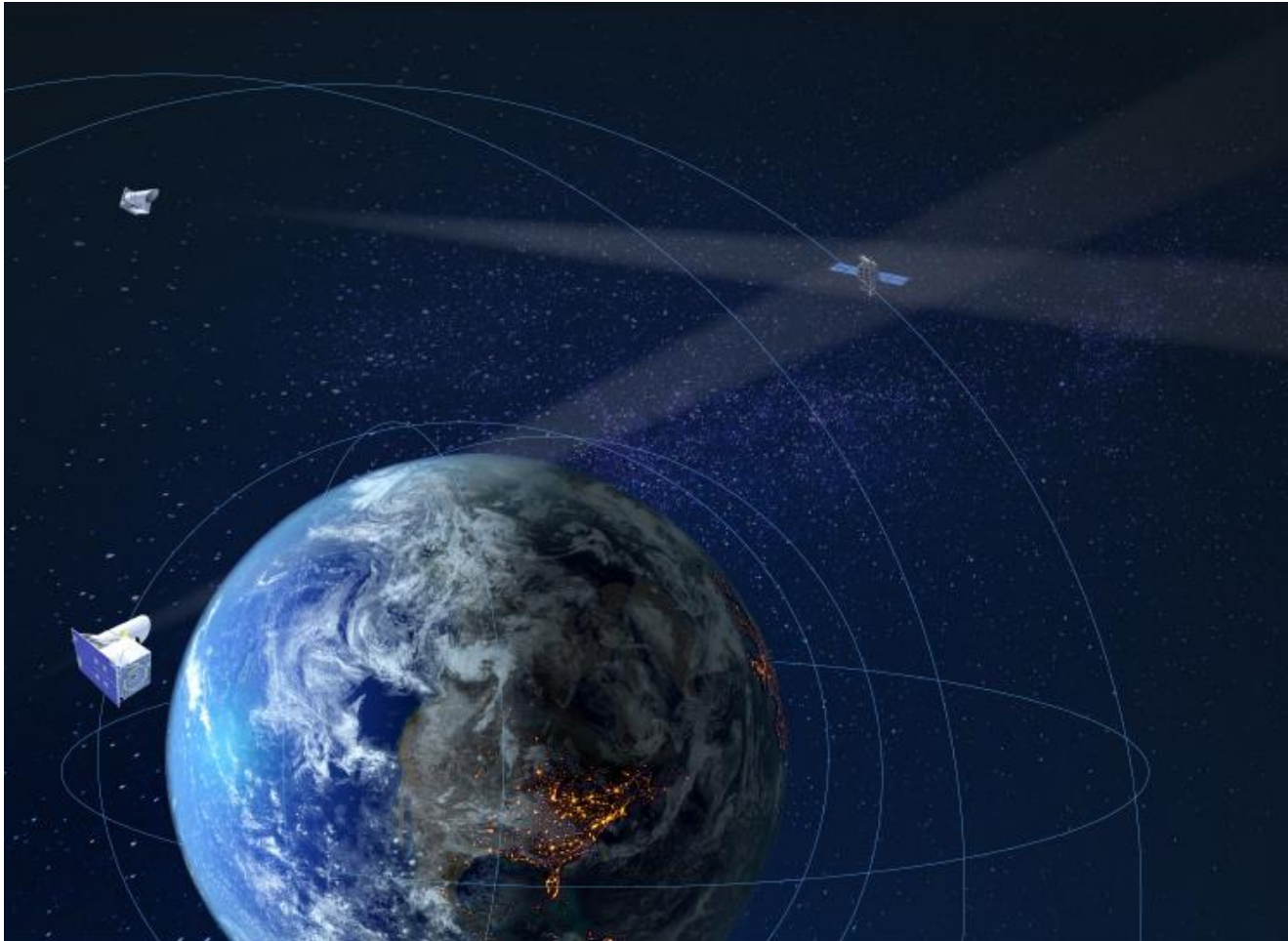
Main programs in the frame of:

- NorthStar (global information provider with a constellation of satellites) acting with an industrial and commercial role able to deliver **data and high value added services**.
- Internal development: Prototype of a Platform for C2 & Space Domain Awareness.
 - SI² Services (Maneuver Detection, Pattern of Life, Spawning, Warning)
 - Interface with external commercial services

Cooperation opportunities can be envisaged in the design of algorithms and value added service platforms in the above domains



NORTHSTAR EARTH & SPACE



Northstar Earth & Space

- Start-up established in Canada with two mission:
 - Space Information and Intelligence (**SI²**): provide space-based SSA information and services
 - Earth Information and Intelligence (**EI²**): provide hyperspectral and infrared data
- Space Alliance **invested** to support the initial de-risking phase (**Stage 1**)

Skylark

- Northstar **precursor** constellation of 12 small satellites
 - **SI²** sensor only (single mission)
 - **LEO** orbit
 - High RSO **revisit** and **custody**
- First launch (3 sats) in **2023** and full constellation (12 sats) in **2025**

Telespazio role

- **Value added services** provider, based on Northstar superior data and services
- **Industrial partner** for Ground Segment and Operations of Skylark constellation



THANK YOU FOR YOUR ATTENTION

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Andrea Bellini
Marketing and Sales
Head of Defence

Via Tiburtina, 965 - 00156 Rome - Italy
Ph: +39 06 4079 3110 | +39 3355903890 Fax: +39 06 4099-9229
andrea.bellini@telespazio.com