STARION

Confidential

Agenda

1 – Introduction to Starion

2 – Starion Space Weather

3 – Other activities

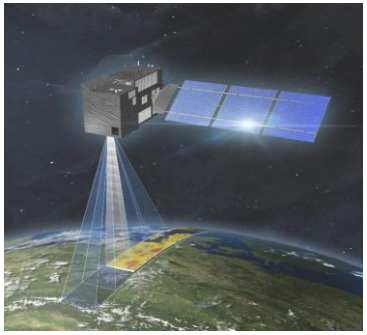
01

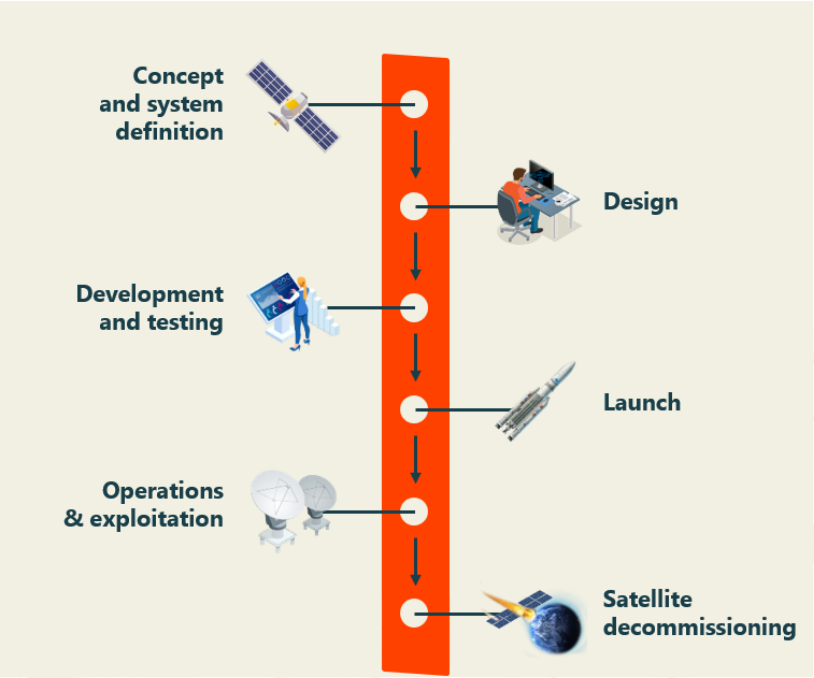
Introduction to Starion

Who We Are

Specialist in system engineering for space, defence and critical infrastructures:

- A trusted Tier 1 partner with 30 years' heritage
- A pioneer in the field of cybersecurity for space





We have supported **over 120 satellite missions**, for both **national agencies** and **commercial organisations**

Starion Group: +30 Years
Space

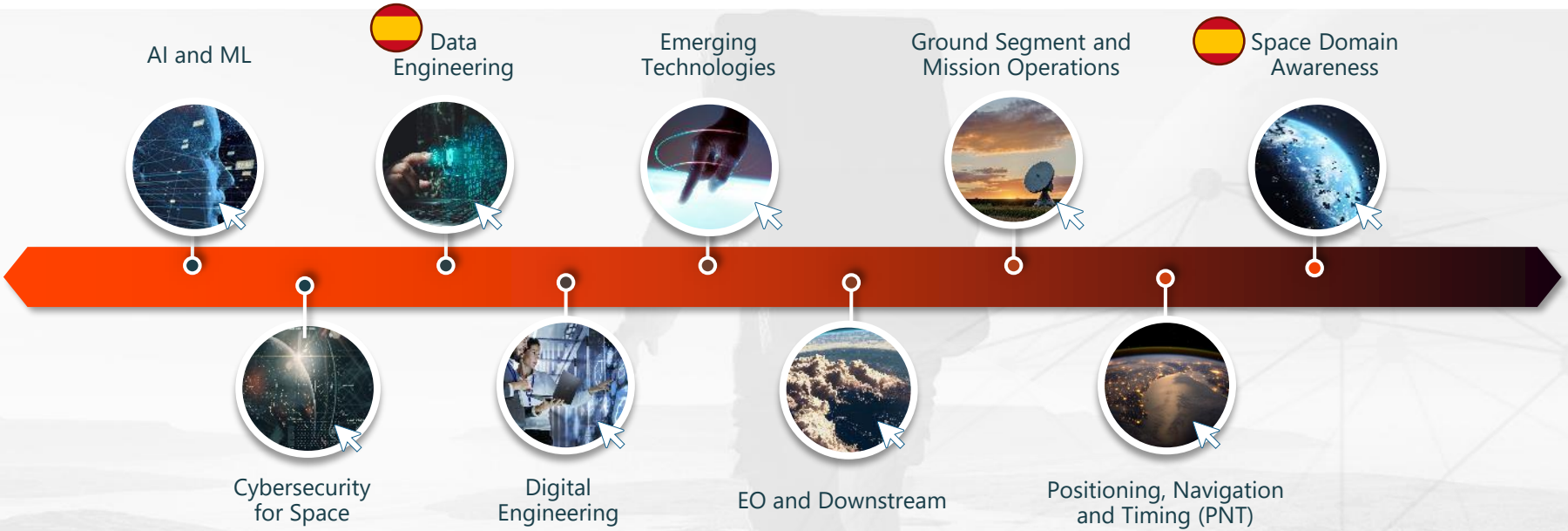
Presence and Influence in Europe

- More than 800 experts
- Activity in 9 european countries
- Diversity of culture, more than 30 nationalities
- Operative since 1992

Starion España
~100
Las Rozas, Madrid

Now part of CS Group (SOPRA-STERIA)

Competence Areas



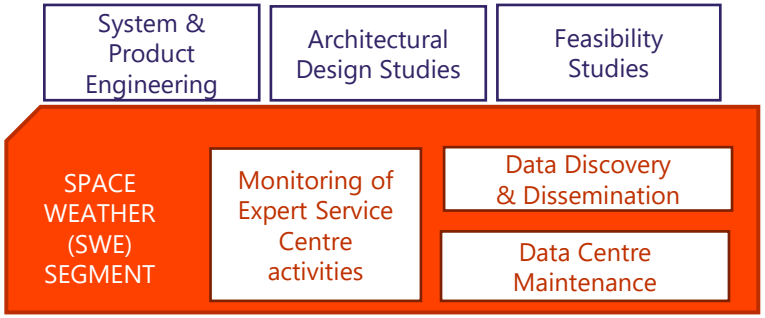
02

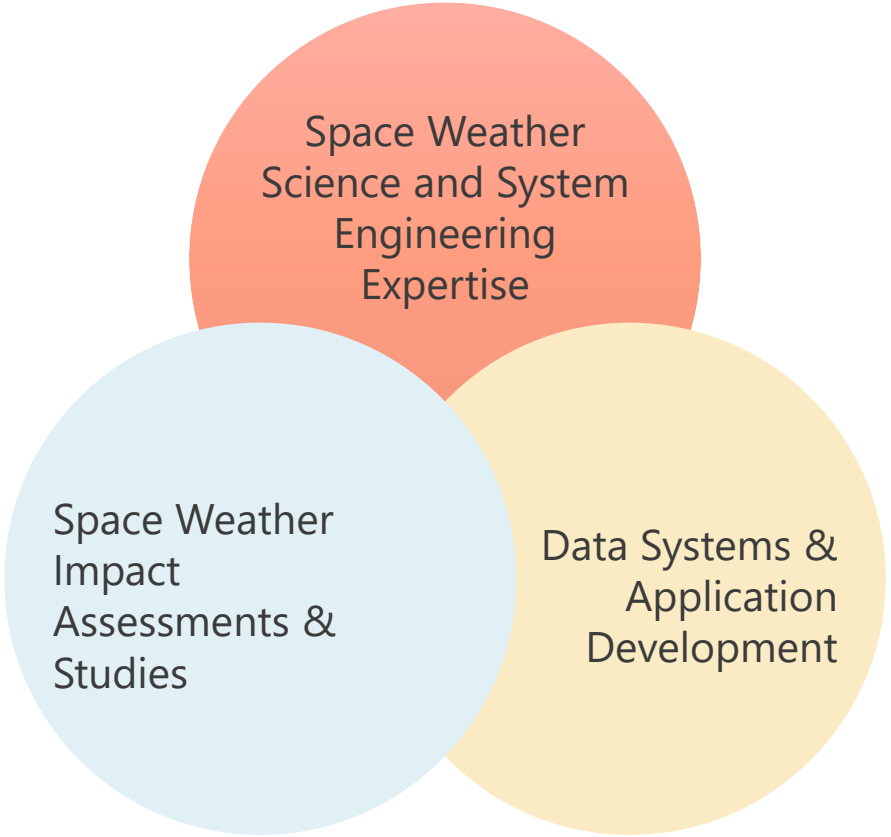
Starion Space Weather Activities

Starion Space Weather Capabilities

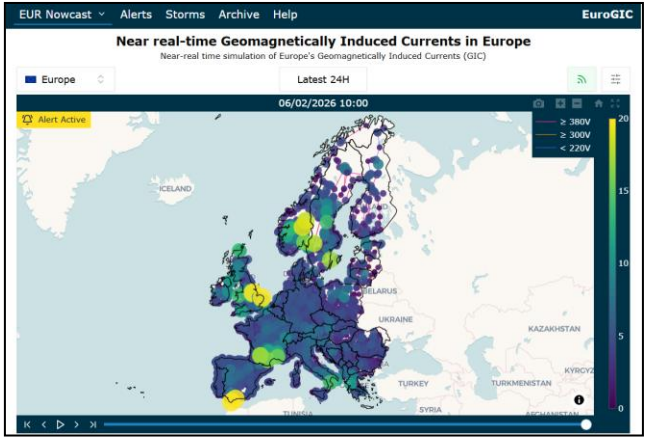
Starion has contributed to ESA and other Space Weather (SWE) activities **for over a decade**.

Our dedicated team of SWE experts operates both at ESA (onsite) and offsite, **ensuring mission readiness**





Space Weather Starion Projects Summary



Space Weather Frame Contract

Space Safety Test and Validation Support Contract (ESOC)

Space Weather ESA projects

- Space Weather Payload Data Centre
- Space Weather Services Architecture
- Space Weather Portal
- Space Weather Toolkit development
- Space Weather Precursor Services

Space Weather for Users Projects

- SWIMMR S6: Space Weather Impacts Report
- Space Weather Impacts on Autonomous Vehicles (SWAVE)
- Space Weather impacts on Electricity Grids

  Socio-economic Impact Assessment of European Space Weather Service (SeIA)

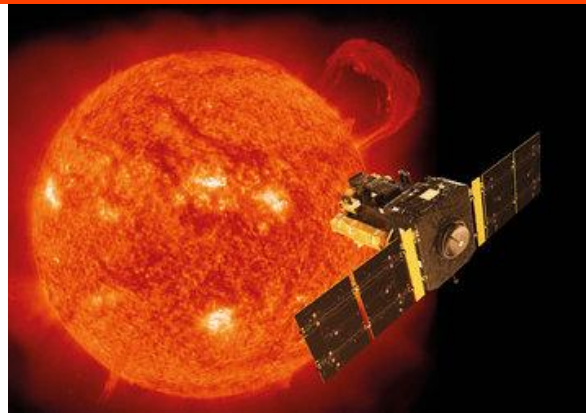
ESOC
Space Safety Test and Validation Support Contract

- **Description**: To provide technical experts to support monitoring of the industrial development activities and verification and acceptance testing of the deliverables from the industrial contracts:
  - Space Weather Product Engineering and Applied Scientific Support
  - Space Weather Space Segment Engineering
  - DevOps Engineering Services
  - CleanSpace Test and Validation Engineers
  - Space Debris Test and Validation Engineers

- **Starion role**:
  - Starion is **Prime** with GMV as subcontractor.
  - 18x FTEs (13x Starion + 5x GMV) & 1x Service Delivery Manager

- **Contract Duration**: Contract started on 1 Jan 2021 and is ongoing → extended to end 2026

Space Weather Payload Data Centre



Context

- Provides a cloud-based, scalable, operational platform to process and disseminate space weather data from ESA and third-party satellites. Adopts a zero-trust architecture to enhance security of the system.

Objectives

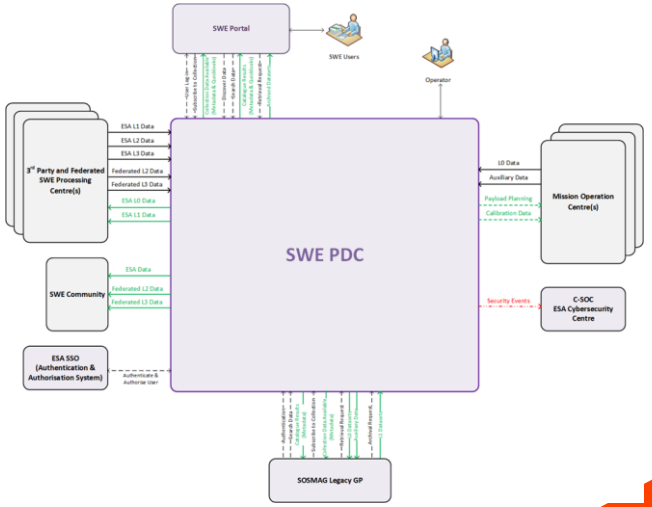
- Phase 1 (2024-2027) will support radiation monitoring payloads on ESA, EUMETSAT and third-party spacecraft.
- Phase 2 (2027) will support the Vigil spacecraft to be launched to L5.

Approach

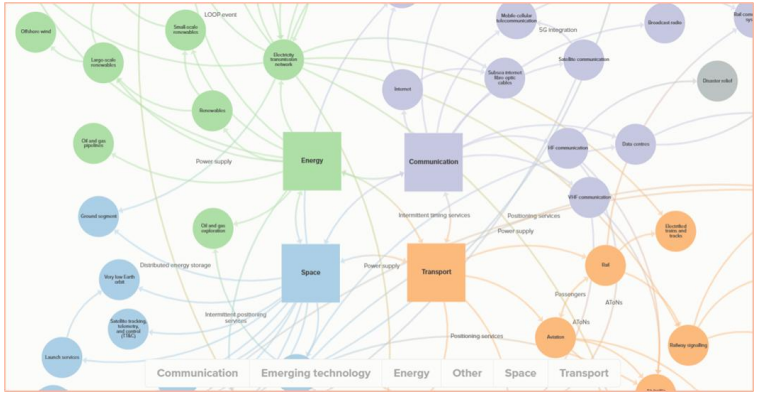
- Collaboration between Starion (BE, DE, IT, UK), Solenix (CH, DE), RAL Space (UK) , theServerLabs (UK), and SpaceIT (Estonia).

Timescales

- Project started in 2024 and Phase 1 due to finish 2027, Phase 2 expected to extend to 2030+.



SWIMMR S6: Space Weather Impacts Report



Context

- The Royal Academy of Engineering report: "Extreme space weather: impacts on engineered systems and infrastructure", published in 2013, is one of the definitive studies on worst case scenario impact.

Objectives

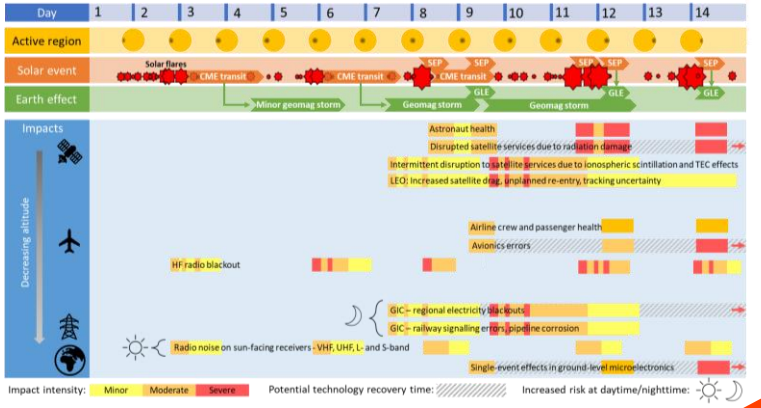
- Update the scientific context and identify new areas of potential scientific impact for which socio-economic studies should be performed.
- Identify the strategic drivers for continued UK investment in space weather activities.

Approach

- Starion-led team with know.space and University of Northumbria
- Identified impacts and inter-sector dependencies.
- Produced a comprehensive report covering Energy, Communications, Transport, Space and Emerging Technologies

Timescales

- Public final report completed 2025



Space Weather Impacts on Autonomous Vehicles (SWAVE)

Context

- ESA study to example the impacts of space weather on autonomous vehicles (land, sea and air) in Northern, Central and Southern Europe.

Objectives

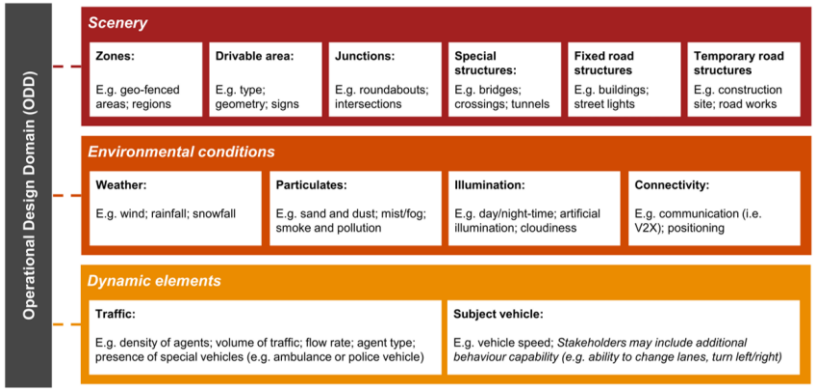
- Assess the potential impacts of space weather on autonomous vehicles themselves and the services they depend on.
- Assess the different impacts due to different phenomena in different regions of Europe.
- Assess the potential economic impacts of different severities of event.
- Assess commercial opportunities.
- Space weather should be part of vehicle Operational Design Domain (ODD) considerations.

Approach

- Starion-led collaboration with the Warwick Motor Group and know.space

Timescales

- Completing early 2026



Space Weather impacts on Electricity Grids

Context

- Space weather can cause strong DC currents in transformers in electricity grids causing damage and in extreme cases destroying them. This ESA project aims to provide near-real time modelling of the currents in a grid based on magnetometer data.

Objectives

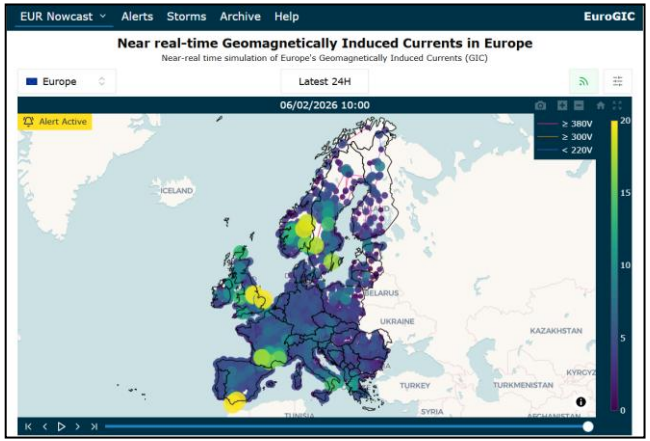
- Create models for Europe (coarse) and UK (accurate) electricity grids and link these to real-time magnetometer data.
- Develop and application that allows users to view real-time and historical data.
- Planned – update ability to include forecasting capability.

Approach

- Collaboration between Starion and the British Geological Survey.

Timescales

- Project started in 2025 and due to finish spring 2026.



Socio-economic Impact Assessment of European Space Weather Service (SeIA)

Context

- ESA study commissioned by the EC to assess the economic benefits of having a European infrastructure to mitigate space weather impacts.

Objectives

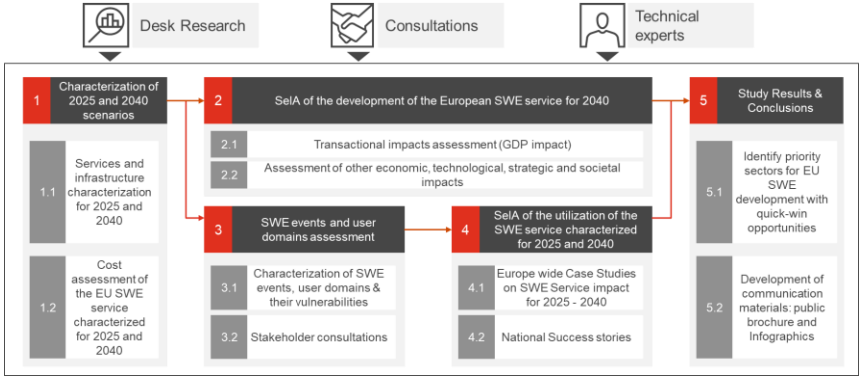
- Assess the impacts of doing nothing (using 2025 infrastructure) vs. comprehensive infrastructure should a severe event occur in 2040.
- Used by the EC to inform future EU space weather planning.

Approach

- PWC (FR) led project with Starion, know.space, Cambridge Economics, UK MetOffice…
- Starion responsible for the space weather impact assessment.

Timescales

- Project started in 2023 - completing early 2026



Space Weather Services Architecture - ESA

Context

- ESA operates a federated space weather network, with Export Groups comprising different European research organisation delivering pre-operational space weather products.

Objectives

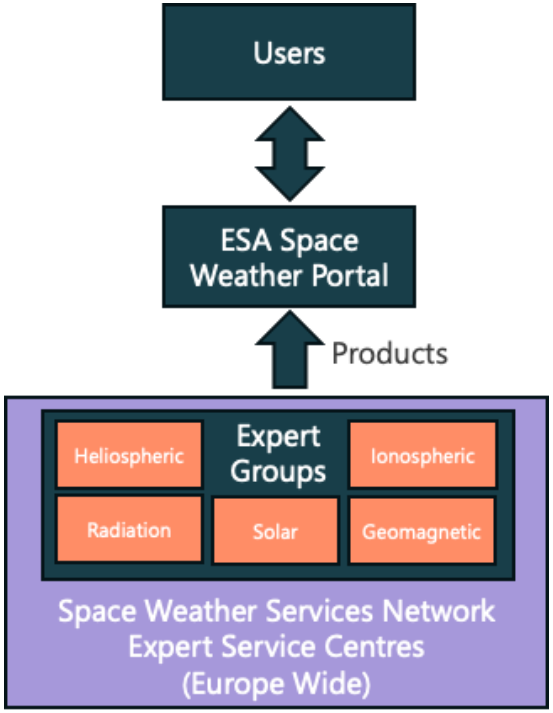
- Review of the existing ESA Space Weather services architecture, update of requirements (e.g. new products) after engagement with , defined

Approach

- Starion-led team with Deimos UK as subcontractor
- Introduced Concurrent Design methodology and tools to elicit requirements from stakeholders (i.e. ESA and Expert Groups).
- Simulated impact of requirements on the architecture
- Defined API-based interfaces between different elements, while retaining role of Expert Groups

Timescale

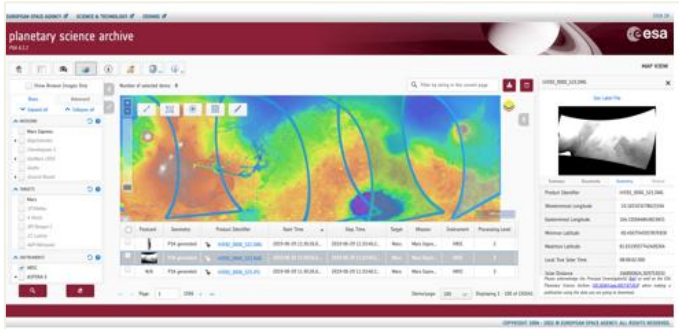
- Final Presentation February 2023

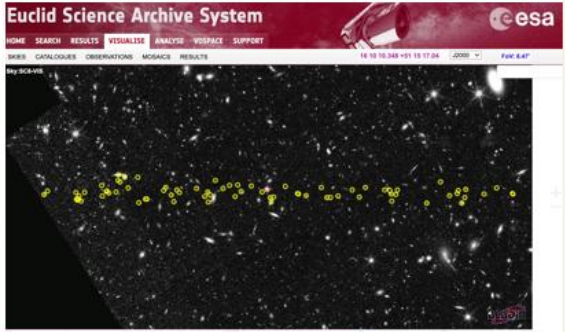


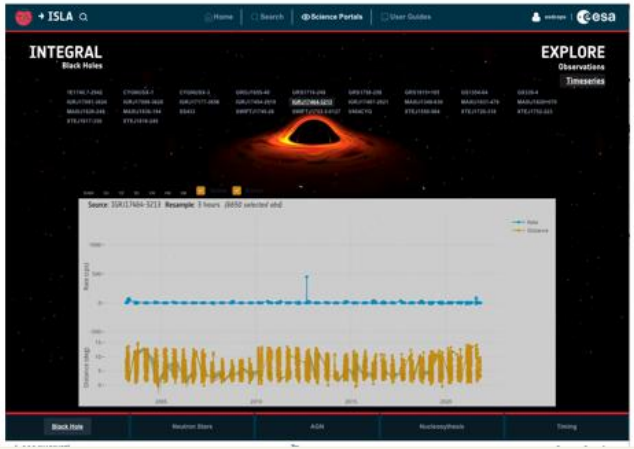
03

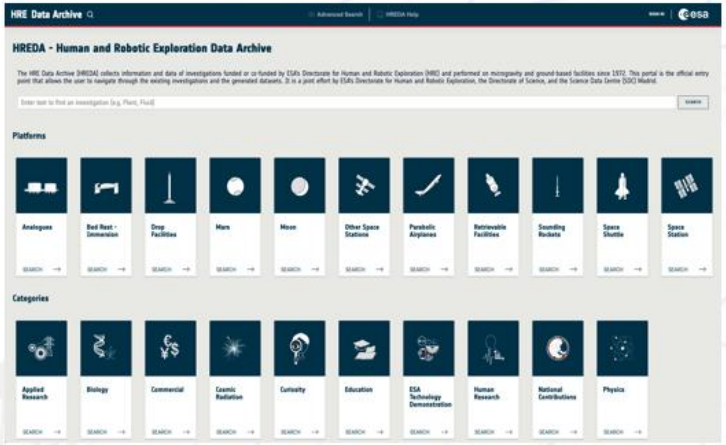
Starion Other Activities

Data Engineering– ESA Science Archives



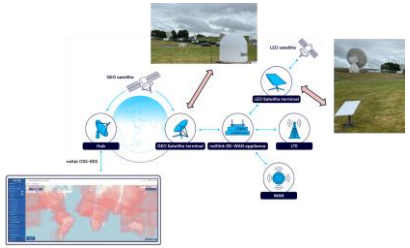




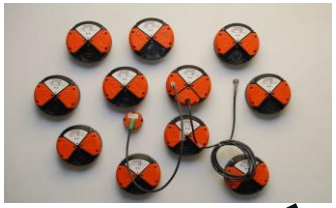


SAFEPLACE AI Solution

BE Secured - Secure Communication

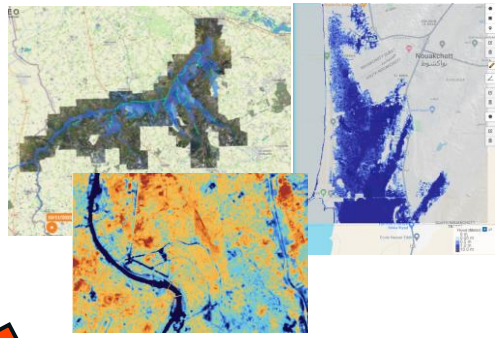


IoT Sensors

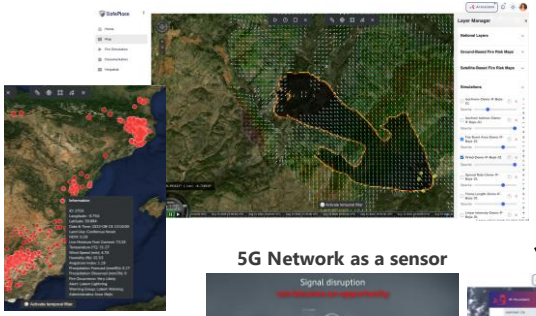


Wearable Sensors

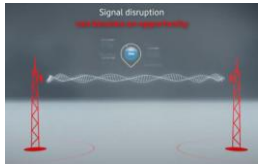
Satellite Imagery & Products

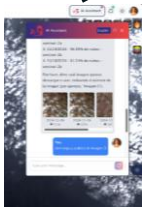


Weather, Flood & Fire forecast models



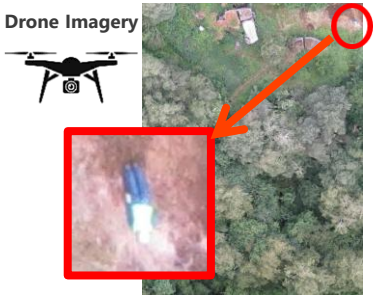
5G Network as a sensor





SafePlace

Drone Imagery



Crisis Assistant

Data Fusion, AI

S+EM AGÈNCIA DE SEGURETAT I EMERGÈNCIES

BOMBEROS Comunidad de Madrid

agents rurals

112 ASEM

BOMBERS Consorci Provincial de València

safe.brussels

Infocam Incendios Forestales Castilla-La Mancha

bombers

Civil Protection Organisations as final Users

Thank you!

Sara De La Fuente
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Space Domain Awareness Competence Area Lead
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