#EUSpaceResearch

SPACE SITUATIONAL AWARENESS:

MAKING SPACE ACTIVITIES SAFER AND MORE SUSTAINABLE

Horizon Europe,
a programme of the
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SSA – Europe's eyes on Space

Space Situational Awareness (SSA) is a component of the **EU Space Programme** and encompasses capacities that **monitor the space environment**. It aims to **better understand, define, and recognise potential threats** coming from outer space that could harm space infrastructure and humans.

The EU's SSA programme consists **of three subcomponents**:

- Space Surveillance and Tracking (SST)
- Space Weather Events (SWE)
- Near Earth Objects (NEO)

SST – Ensuring space safety and sustainability

Space Surveillance and Tracking (SST) enables the observation of satellites and space debris to **avoid collisions,** survey **uncontrolled re-entries** of space objects into the Earth's atmosphere, and **assess fragmentations** of objects in space.

Innovative sensor network

Currently[1] 15 Member States are gathered in the EU SST Partnership networking their national assets of more than 40 sensors to collect data on space objects. These radars, telescopes and lasers are distributed in different locations around the planet.

Keeping assets safe

The EU SST Front Desk at EUSPA together with the EU SST Partnership provide **SST services to more than 500[2] satellites and deliver collected data to over 200[2] organisations worldwide.**

Safeguarding space operations

EU SST constitutes the operational backbone of the EU approach to Space Traffic Management (STM). The EU STM approach[3] encompasses the means and the rules to access, conduct activities in, and return from outer space safely, sustainably, and securely, aiming at sustainable space activities.

Performant European industry

The Union's SST capabilities also rely on a cutting-edge and competitive SST industry. To that end, the EU Industry and Start-ups Forum (EISF)[4] on STM allows industry stakeholders, the EU SST Partnership, EUSPA and the European Commission to jointly define activities and R&D priorities supported by EU budget through public tender processes.

SWE – Monitoring space weather

Space Weather Events (SWE) can, amongst other ways, manifest themselves as solar flares and coronal mass ejections, impacting the environment in space and Earth. To improve our capabilities in SWE **now-and forecasting, the EU invests in research which may help reduce their impact**.

1 As of June 2024, number of MS can evolve over time
2 As of June 2024
3 https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52022JC0004
4 https://defence-industry-space.ec.europa.eu/eu-space/space-traffic-management_en

NEO – Observing space rocks

Near-Earth Objects (NEO) are space rocks (comets, asteroids, and meteors) that orbit near Earth or enter the Earth's atmosphere. **Better understanding what they are made of** helps **to reduce the risks they may pose**. The EU has mapped Member State capabilities to **detect, monitor, and respond to NEOs**, and organises a yearly conference to facilitate NEO cooperation.

Introducing EU-funded space R&I projects

SST

SST Sensors and Processing aims at strengthening capabilities of radiofrequency (e.g., radars) and optical (e.g., telescopes) ground-based sensors to adapt to new technologies and improve coverage area.

Space-based SST (mission, system, and sensors network) addresses the study of several technical solutions including non-dedicated sensors or hosted payloads for the development of a future European capability of SBSS.

SST&STM system architecture and evolutions supports the improvement of the European SST system to reach higher performance and better autonomy while developing higher levels of cooperation with other SST systems.

SST Networking, Security & Data sharing supports coordination, interoperability, and resilience of EU SST assets to achieve higher efficiency and undisrupted data provision; this requires enhancements of the EU SST Front Desk support and implementation of threat analysis e.g., on cybersecurity.

SWE

ARCAFF Solar flares and coronal mass ejections are some of the most powerful explosive Sun events. Better under- standing these events will help to improve forecasting abilities to reduce their impact on the environment.

T-FORS aims at gaining capabilities to protect the performance of space assets through forecasting travelling ionospheric disturbances which is a phenomenon that disturbs e.g., communication between space- and ground-based infrastructure.

NEO

NEOROCKS focuses on developing observational capacities to identify and characterise new NEOs and simulate their behaviour.

NEO-MAPP helps to better understand the dynamical and physical properties of astronomical objects and their reaction to external forces. This will help to better protect space infrastructures in case of an impact with an NEO.

Be part of the EU-funded space R&I

Horizon Europe is the EU's key funding programme for research and innovation, with a budget of around €95 billion over 2021-2027, of which close to €1.6 billion is dedicated to space research. The space R&I is managed by the Health and Digital Executive Agency (HaDEA), the EU Agency for the Space Programme (EUSPA), the European Space Agency (ESA) and the European Commission itself. Most calls are also published on the EC Funding and Tenders participant portal.