EU SST
Space Surveillance and Tracking

Ensuring space safety
and sustainability

EU SST – Opportunités 2023-2026

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#EUSpace

PROGRAMME OF THE
EUROPEAN UNION

Webinaire appels EU SST du 04 octobre 2024

EU SST
Space Surveillance and Tracking

1. Introduction sur EU SST
2. Les conditions pour répondre aux différents appels à propositions de EU SST
3. Bilan des calls publiés depuis octobre 2023
4. Les opportunités à venir

What is EU SST?

- **Fully-fledged security component** of the EU Space Programme 2021-2027
- **Inherently dual governance** structure in place in which civilian, military and security actors collaborate, which enables to operate effectively taking into account the **security** dimension of the SSA domain

EU SST Partnership

15 EU Member States:


Austria


Czech Republic


Denmark


Finland


France


Germany


Greece


Italy


Latvia


The Netherlands


Poland


Portugal


Romania


Spain


Sweden

EUSPA as Front Desk

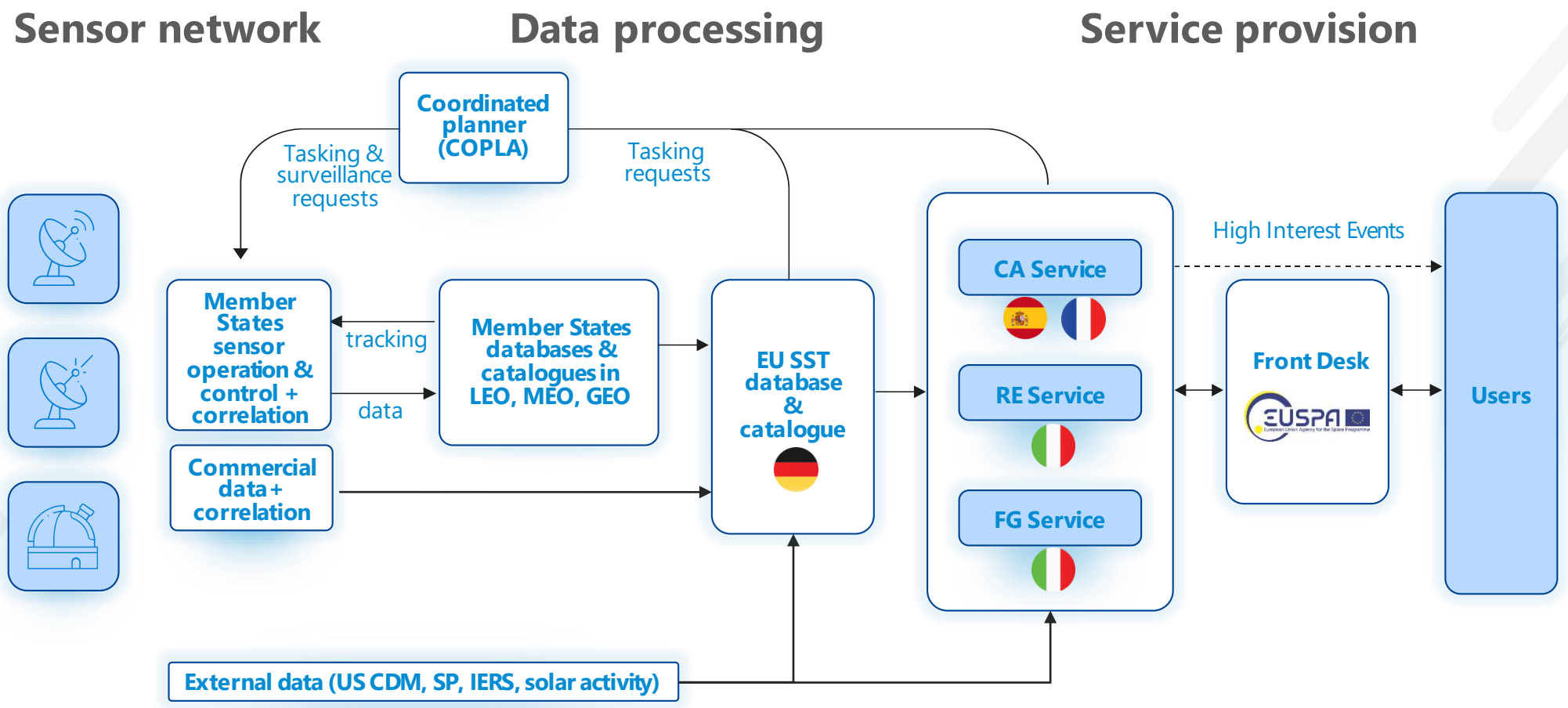
Overseen by **European Commission**

Strategy ▪ Five priorities

EU SST
Space Surveillance and Tracking

1. Build and run an **operational SSA system** 24/7 to provide public services in collision avoidance, reentry and fragmentation analysis to ensure a minimum level of space safety and sustainability
2. Perform research and development of SST capabilities to improve the level of performance and **strategic autonomy**
3. Foster innovation and **competitiveness** of the European industry and start-ups, we support the consolidation of a commercial ecosystem around SSA, strengthening strategic autonomy in Europe
4. Exploit **synergies between civil and defense**, avoid unnecessary duplications, and join forces in order to improve the level of European strategic autonomy
5. Engage with **international partners** and contribute to the global coordination between existing or developing SSA systems in the different regions of the world

EU SST – Operations



EU SST – Services

Collision Avoidance (CA)

Risk assessment of collision and generation of collision avoidance alerts

Fragmentation Analysis (FG)

Detection and characterisation of in-orbit fragmentations

Re-entry Analysis (RE)

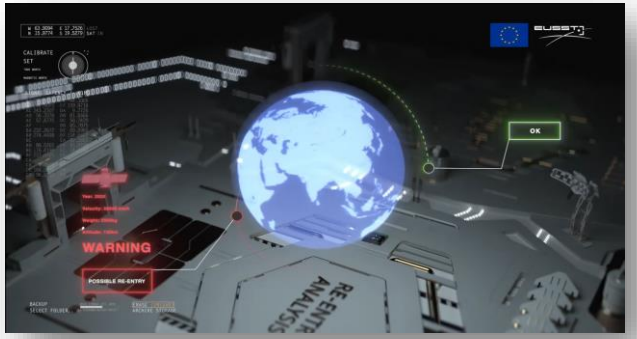
Risk assessment of space objects re-entry into the Earth's atmosphere

Key features

- **User-tailored** service (SCD)
- Hot redundancy scheme involving ES (S3TOC) and FR (FR-SSA) with harmonised service level and single service provider per registered user
- Enhanced **Analysis & Risk Mitigation** support (e.g. covariance estimations, HBR estimations, PoC sensitivity analysis, CAM support)

- Provided by IT (C-SSA)
- Short-term notification to **confirm quickly an FG event**
- Medium-term FG analysis based on the orbital parameters of the **catalogued fragments** e.g. Gabbard Diagram
- Long-term FG analysis (**with simulations with breakup model**)

- Provided by IT (C-SSA)
- Long-term (within 30 days) **re-entry predictions**
- Short-term (a few days) overflight predictions with **ground tracks over customisable areas of interest**



EU SST Financial framework 2023-2026 1/2

In 2023 6 grants were awarded to the EU SST Partnership :

EU Space Programme :

- EUSST2023-26 Provision of SST services and the upgrade of SST assets by the EU SST Partnership

Horizon Europe (Work Programme 2022) :

- HE_EUSST_MS_TOP1 New & improved EU SST Missions and Services
- HE_EUSST_AE_TOP2 SST & STM system architecture and evolutions
- HE_EUSST_SB_TOP3 Space-based SST (mission, system and sensors network)
- HE_EUSST_SP_TOP4 SST Sensors and Processing
- HE_EUSST_SD_TOP5 SST Networking, Security & Data sharing

These grants will be implemented by the partnership from **July 1st 2023 (M1) till June 30th 2026 (M36)**

Total EU Contribution of **173 MEuros**

Approx. **80%** will be redistributed through **subcontracting** or **cascading grants**

* Related subcontracts will not be presented.

EU SST Financial framework 2023-2026 2/2

EU SST
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Next year, in mid 2025, 5 new grants will be awarded to the EU SST Partnership :

Horizon Europe (Work Programme 2024) :

- HE_EUSST_MS_TOP1 New & improved EU SST Missions and Services
- HE_EUSST_AE_TOP2 SST & STM system architecture and evolutions
- HE_EUSST_SB_TOP3 Space-based SST (mission, system and sensors network)
- HE_EUSST_SP_TOP4 SST Sensors and Processing
- HE_EUSST_SD_TOP5 SST Networking, Security & Data sharing

These grants will be implemented from **mid 2025 (M1) to mid 2028 (M36)**

Total new EU Contribution of **56,5 MEuros**

Approx. **80%** will be redistributed through **subcontracting**

Horizon Europe (Work Programme 2025) :

- To be adopted in 2025
- ~19MEuros

* Related subcontracts will not be presented.

Opportunities under EU SST 2023-2026

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2 types of instruments :

1. Subcontracting (Subco)

- Implemented by EU SST Partnership
- Foreseen under Space Programme EUSST2023-26 and the Horizon Europe SST Actions
- Obey to general eligibility conditions : "best value for money"
- Comply with applicable national law on public procurement

2. Financial Support for Third Parties (FSTP) : Cascading Grants

- Implemented by CNES (FR) and ASI (IT)
- Under Space Programme EUSST2023-26 Action
- Budget 30 M€, financial contribution up to 45 % of total costs of action
- October 2024 : calls closed, evaluation & award process ongoing

Conditions of Participation (Art. 24 EU Space Reg)

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Application of eligibility & participation conditions

- To preserve the security, integrity and resilience of the operational UE systems
- Taking into account the objective to promote the EU strategic autonomy [...], while preserving an open autonomy

- **Conditions:**

  a) Legal entity shall be **established in a MS** and its executive management structures shall be established in that MS
  b) The legal entity commits to carry out all **relevant activities in one or more MS**, and
  c) The eligible legal entity is **not subject to control by a third country** or by a third country entity.

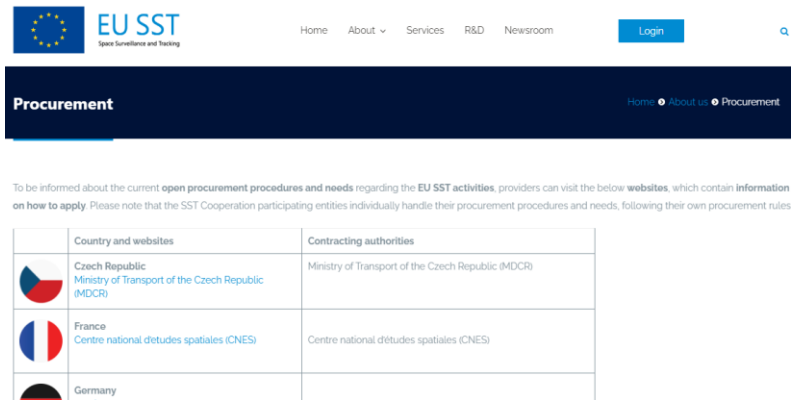
- **Scope :** sensitive activities → All (sub)contractors involved in
  - operation and maintenance of the SST service provision function
  - operation and maintenance of the SST processing function
  - operation and maintenance of the SST sensor function
  - development, operation and maintenance of the SST catalogue
  - development, operation and maintenance of new SST service provision functions

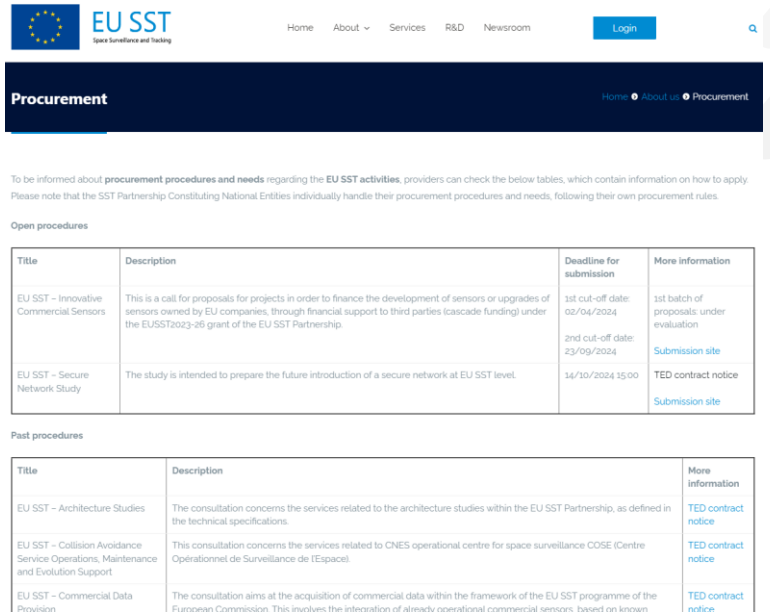
- **Complete subcontractor & supply-chain concerned**
- Assessment made by European Commission : compliance & waivers

Practicals : Publication of tenders

EU SST website [Procurement – EU SST]

- Links to the **procurement section of the websites of EU SST Cooperation participating entities**





- Reports on new open procedures (News)

Official Journal

[TED home - TED Tenders Electronic Daily (europa.eu)]

Open ITT & Calls for Proposals will be published in both MS and English language

Open calls under EU SST 2023-2026

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Work Breakdown Structure for the activities of the Partnership

- ~~WP 1 – Project Management~~
- WP 2 – Program Office / EISF
- WP 3 – Operation of sensors
- WP 4 – Services
- WP 5 – Performance Monitoring
- WP 6 – System Evolution

Programme Office / EISF (WP2)

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Objectives WP2

- Coordinating the execution of the programme
- Supervising the transversal activities of the project: dissemination, quality assurance, risk management, users, programmatic KPIs, standardisation, task force and reporting on sensor upgrades.
- Fostering the European Industry thanks to EISF;
- Defining the long-term evolution of the governance of EU SST

Open calls

Title	Subco / FSTP	Partner	MS	Call open	status	Start date	comments
Commercial data procurement (1st ITT)	Subco	CNES	FR	10/10/2023 - closed	Contractors selected	09/2024	7 contracts awarded (signature ongoing)
Commercial data procurement (2nd ITT)	Subco	CNES	FR	10/01/2025	Forthcoming	07/2025	
Innovative optical commercial sensors	FSTP	ASI	IT	13/02/2024 - closed	Projects selected	04/2024	EC assessment part. conditions ongoing
Batch#1 : Innovative radar and new technology commercial sensors	FSTP	CNES	FR	13/02/2024 - closed	Under evaluation	04/2024	Final selection
Batch#2 : Innovative radar and new technology commercial sensors	FSTP	CNES	FR	23/09/2024 - closed	Under evaluation	09/2024	Eligiblility selection

Programme Office / EISF (WP2) 1/2

COMMERCIAL DATA PROCUREMENT

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
ITT #1	Subco	CNES	Competitve procedure with negociation	10/10/2023	08/11/2023	10/2024 - Closed	15 M€	Several

7 companies selected : 6 Roads (PL), Aldoria (FR), ArianeGroup (FR), Deimos Engineering and Systems (ES), GMV Aerospace and Defence (ES), Safran Data System (FR) et Sybilla Technologies (PL)

Programme Office / EISF (WP2) 2/2

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COMMERCIAL DATA PROCUREMENT

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
ITT #2	Subco	CNES	Competive procedure with negociation	01/01/2025	01/02/2025	07/2025	3 M€	Several

Outcomes

- Increased detection capabilities, especially for small objects
- A higher worlwide region coverage using sensors outside of Europe
- An most reactive network
- An increased catalogue accuracy

Scope

WP1 : Surveillance data acquisition

Regular basis

Amount of data proposed by the contractor

WP2 : On-demand data acquisition

On request from EU SST depending on the need (Collision Avoidance, Fragmentation, Reentry, Catalogue)

In addition to surveillance data

Public object solely eligible

Operational Telescopes, SBSS, Radars (mono or bi-static) and Passive Ranging stations solely eligible

Programme Office / EISF (WP2)

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INNOVATIVE COMMERCIAL SENSORS (UPGRADE)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
Optical	FSTP	ASI	Call for proposals	03/2024	04/2024 - closed	10/2024	4 M€	Several
Other technologies	FSTP	CNES	Call for proposals	Batch #1 : 02/2024 Batch #2 : 07/2024	Batch #1 : 03/2024 Batch #2 : 09/2024 closed	Batch #1 : 11/2024 Batch #2 : 02/2025	26 M€	Several

Outcomes

- Sharing the burden related to the development of innovative solutions
- Promoting the European Industry to develop and deploy innovative solutions
- Increasing detection capabilities
- Decreasing the cost
- Increasing measurements accuracy
- Covering more regions of the world

Scope

Co-fund (45%) the development of new solutions implemented by the European industry by supporting :

- Already existing and operational sensors / network of sensors upgrades intending to improve performances (accuracy, detectioncapabilities, timeliness, …)
- Development of a new cross-technology based sensor
- Improving an already existing and operational sensor / network of sensors, thanks to cross-technology features
- Deployment of sensors outside European VLA
- Development of solutions to decrease the price of data

Call closed after 3 submission dates

Operation of sensors (WP3)

Objectives WP3

- Responsible for all operational activities related to general sensor coordination
- Sensor scheduling
- Connectivity
- Calibration and integration of new sensors in the network

Open calls

GA	Activities	Subco / FSTP	Partner	MS	Call open	Start
SpReg	Connectivity of sensors platform	Subco	POLSA	PL	Q4/2024	Q2/2025
SpReg	Development of background modules for the integrated tool to address the monitoring of sensors	Subco	AEE	ES	Q4/2024	Q1/2025
SpReg	Calibration and Monitoring of Sensor (*WP3 & WP5)*	Subco	AEE	ES	Q4/2024	Q1/2025
SpReg	Operational provision of optical data	Subco	POLSA	PL	Contract already on-going	

Provision of Services (WP4)

Objectives WP4

- Provide operational services according to the following definitions:
  - CA service
  - FG service
  - RE service
- Services will use orbital information and uncertainties generated by the EUSST Catalogue, once available, based on the measurements shared through the EUSST Database.

Open calls

	Activities	Subco / FSTP	Partner	MS	Open Call	Start
SpReg	Collision Avoidance service: Operations and maintenance of the S3TOC (2024-2026)	Subco	AEE	ES	Q4/2024	Q1/2025
SpReg	Collision Avoidance service : Operational activities french OC (2024-2026)	Subco	CNES	FR	10/2023 - closed	11/2024
SpReg	Integration of new services	Subco	AEE	ES	Q4/2024	Q1/2025
SpReg	Maintenance and operational Support Database	Subco	DLR	DE	Contract already on-going	
SpReg	Further Development & Integration related to the EUSST Catalogue Maintenance and operational Support related to the EUSST Catalogue	Subco	DLR	DE	Contract already on-going	

Provision of Services (WP4)

COLLISION AVOIDANCE SERVICE : OPERATIONS, MAINTENANCE & EVOLUTION SUPPORT (FR OC)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
CA service: Operations & maintenance	Subco	CNES	Competitve procedure with negociation	10/2023	24/11/2023	11/2024	Non-disclosed	3 contracts

Outcomes

- Support to the activities of the French SSA Center, linked to EUSST CA Service (funded by EUSST – main contributor) and FR national activities on Space Traffic Management (funded by CNES)
- CA Service opened to non EU operators since 01/2023, EUSST expects up to 2500 S/C registered by mid-2026
- High level of automation to be implemented, improvements of methods and processes

Scope

- WP1 – System administration
- WP2 – STM Operations and maintenance
- WP3 – Ground Segment maintenance & Evolutions
- WP4 – Studies and evolutions of CA algorithms

Status : Contractors selected

Performance Monitoring (WP5)

Objectives WP5

- Assessing the sensors in terms of measurement quality and contribution
- Assessing the services in terms of timely provision, service quality and consistency
- Security Monitoring of elements at EUSST level
- Compilation of the key parameters complemented by further metrics and statistics to allow an assessment on the evolution of EUSST
- Monitor the measures in place to assure a defined quality of the operational activities in EUSST

Open calls

	Activities	Subco / FSTP	Partner	MS	Open Call	Start
SpReg	Integrated Tool for the Expert Team Performance Monitoring	Subco	DLR	DE	Q3/2024	Q1/2025

Performance Monitoring (WP5)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
Integrated Tool for the Expert Team Performance Monitoring	Subco	DLR	Call for proposals	Q4/2024	Start + 1 Month	Q1/2025	Non-disclosed	Several

Outcomes

- Operational and technical assessment of the EU SST network
- Continuous monitoring software including supervision aspect

Scope

- Carry out the calibration campaigns as agreed in the calibration procedure
- Develop a tool for the continuous monitoring of the operational data provided by the sensors
- Adapt to the evolution of the EU SST DB.
- Implement supervision board for all member of the WP5

System Evolution (WP6)

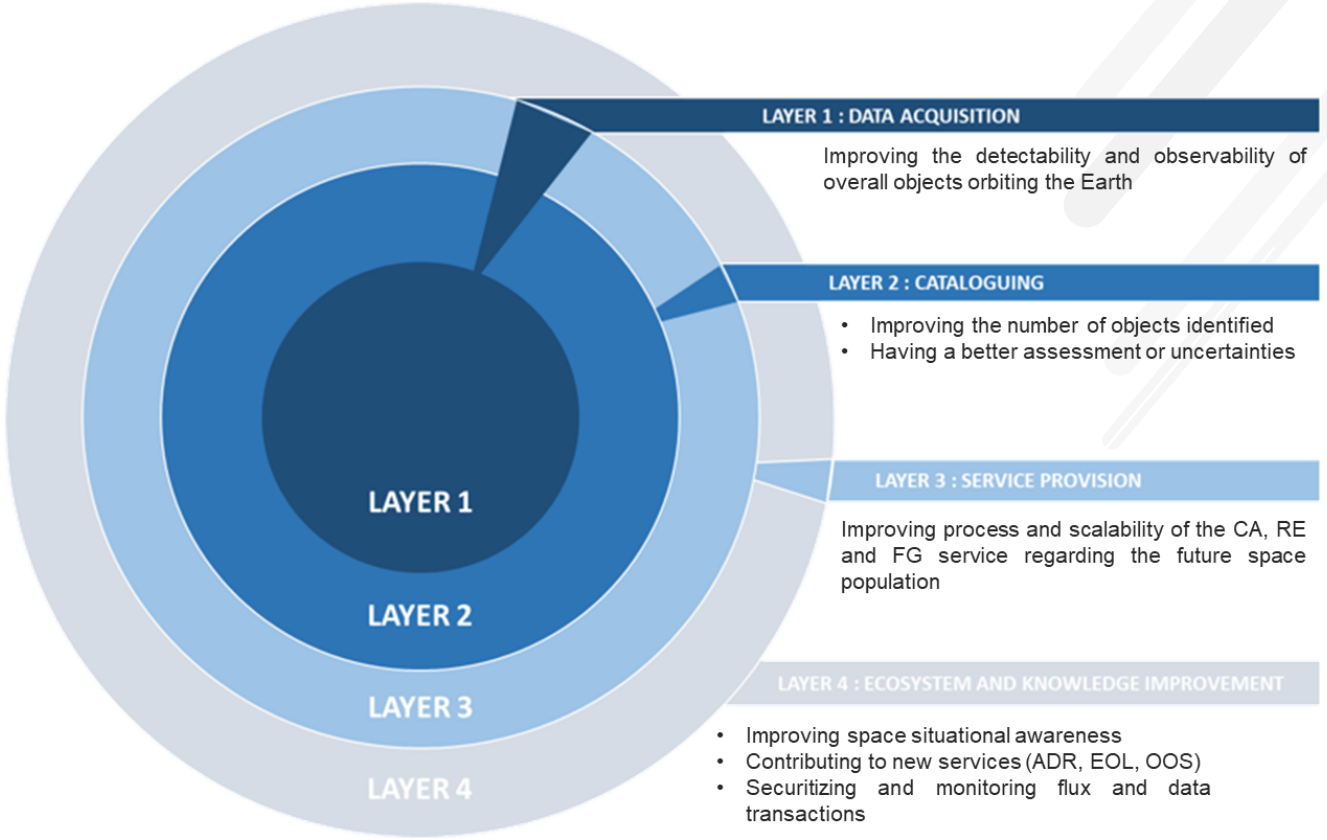
EU SST
Space Surveillance and Tracking

Objectives

Expert team System Evolution aims to define the long-term vision of EUSST performance and autonomy through :

- Defining the technical **development plan** aiming to spearhead the continuous improvement of the EUSST ;
- Coordinating all **research and development (R&D)** activities accordingly to the development plan ;
- Conducting **architecture studies and added value analyses** in order to identify sensors that are potent candidates for the EU SST effort, and assessing the performance of the proposed network of assets ;
- Conducting studies and development leading to improve the **space environment knowledge**, and make sure the long-term vision for the EUSST will be scalable ;
- Conducting studies and development leading to improve **the 3 core services CA, RE and FG**.

Development plan



System Evolution (WP6)

Open calls (HE TOP 1 – TOP3)

Title	Subco / FSTP	Partner	MS	Call open	Start date
R&D on analytical propagation model including uncertainties (DB & catalogue)	Subco	DLR	DE	Q4/2024	Q1/2025
Architecture design and added-value analysis	Subco	CNES	FR	03/2024 - closed	11/2024
R&D on CA	Subco	AEE	ES	Q4/2024	Q1/2025
R&D on CA	Subco	CNES	FR	04/2024 - closed	11/2024
R&D on laser contribution to cataloguing and operational services	Subco	DLR	DE	Q2/2023 - closed	11/2024
R&D on manouvre detection and estimation from multiple sources	Subco	AEE	ES	Q4/2024	Q1/2025
Monitoring of rate of compliancy	Subco	DLR	DE	10/2024	Q1/2025
R&D on attitude estimation through multiple sources data fusion	Subco	CNES	FR	Q4/2024	Q1/2025
R&D on radio frequency interference, emission detection & catalog building	Subco	CNES	FR	Q4/2024	Q1/2025
Horizon Scanning	Subco	DLR	DE	Q4/2024	Q1/2025
Population evolution and building of a new population file	Subco	DLR	DE	Contract is on-going	
Potential hazardous object identification and space capacity	Subco	AEE	ES	Q4/2024	Q1/2025
Architecture study evolution toward numerical twin concept	Subco	AEE	ES	Q4/2024	Q1/2025
Architecture study evolution toward numerical twin concept	Subco	CNES	FR	02/2024 - closed	11/2024
SBSS activity	Subco	CNES	FR	Q4/2024	Q1/2025

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
R&D on analytical propagation model including uncertainties (DB & catalogue)	Subco	DLR	Call for proposals	Forthcoming	Q4/2024	Q1/2025	Non-disclosed	1

Outcomes

- Assessing consequences of propagations and models on catalogue accuracy
- Increasing cataloguing accuracy;

Scope

- Modeling uncertainties in analytical propagation
- Assessing consequences of the error of space weather model in propagated orbits
- Enhancing realism by modeling the error (e.g. solar activity, atmospheric model)

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
Architecture design and added-value analysis	Subco	CNES	Call for proposals	02/2024	03/2024	11/2024	Non-disclosed	1
Architecture study evolution toward numerical twin concept	Subco	CNES	Call for proposals	02/2024	03/2024	11/2024	Non-disclosed	
Architecture study evolution toward numerical twin concept	Subco	AEE	Call for proposals	Q4/2024	Call opening + 1 Month	Q1/2025	Non-disclosed	1

Outcomes

- Up-and-running simulation software to assess theoretical performance of EU SST in terms of detection and catalogue
- Technical report regarding added-value of new sensors, including recommendations
- Technical report regarding EU SST gap and development recommendations

Scope

- Improving evaluating process
- Improving decision making process
- Assessing the scalability of the EUSST regarding long-term evolution of the space population
- Implementing synthetic population replicating the real current population observable
- Modeling Network Coordinated Scheduler (COPLA) within simulation chains
- Implementing CA / RE / FG simulation replay modules based on EU SST long-term population file and real data

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
R&D on Collision Avoidance	Subco	CNES	Call for proposals	02/2024	03/2024	11/2024	Non-disclosed	Several contracts
R&D on Collision Avoidance	Subco	AEE	Call for proposals	Q4/2024	Open + 1 Month	Q1/2025	Non-disclosed	

Outcomes

- Improving CA process and product
- Improving the scalability of the CA service to the space population evolution (launch and in-orbit)
- Improving mitigation recommendations

Scope

- Developing All vs All optimized screening environment
- Developing uncertainties characterization method and alogithms
- Improving risk estimations methods thanks to alternative methods (e.g Hall, LAAS)
- Implementing risk assessment at launch methods (CNES method inheritance) to provide operative recommendations
- Performing Maneuver Computation to provide operative recommendations

System Evolution (WP6)

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	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
R&D on Collision Avoidance	Subco	CNES	Call for proposals	02/2024	03/2024	11/2024	Non-disclosed	Several contracts

WP1 – Screening All vs All	WP2 – Uncertainty Caracterization	WP3 – Risk Estimation	WP4 – Mitigation process and Maneuvers co mputation	WP5 – Risk assessment at launch
Construct test database (ephemeris + reference results, i.e TCA and identified risks)	Constitute test cases for Taylor series, in covariance propagation in EOR	Constitute a CDM database, based on the criteria that methods lead to different values of PoC,	Construct a database for the maneuver optimisation	Construct a test database for launches that must be as exhaustive as possible for the various launch phases and types,
Apply "Smart Sieve etc.." on SP and O/O ephemeris,	Apply Taylor algo to test database	Standarize this database to open the test case to scientific community,	Problem definition and filtering, merging and information selection methods	Use current CNES code on various contexts to evaluate an recommend risk criteria thresholds,
Eventual correction of the code,	Correct / improve the code for Taylor series,	Develop a tool to visualize geometry, give indicators to descrimine cases	Creating the test environment	Provide a report on parameter recommendations,
Production of a report on peformances and parameter recommendation.	Write report on the effeciency or non-effeciency of the Taylor approach (in terms of computation time and accuracy)	Update the bibliography on methods,	Test the code on on-board equivalent hardware,	Improvement of LEOPARD code have to be envisaged if the study show the need of it.
	Identify interesting alternatives to Taylor	Identify interesting non-yet implemented methods (Hall, LAAS 3D, other metric than PoC...)	Method implementation and tests	
	Perform statistical analysis in order to improve uncertainty representation for SP ephemeris,	Produce code	State of the art in decision-making	
	Methodology to choose the best covariance possible	Test on the new database	Implementation of a decision-making method	
			Avoidance maneuvers within a close formation	

Procurement process currently on-going

Procurement to be scheduled

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
R&D on laser contribution to cataloguing and operational services	Subco	DLR	Call for proposals	Contract will start soon			Non-disclosed	1

Outcomes

- Improving catalogue methods to include lasers data related to uncooperative objects
- Assessing daylight tracking feasibility
- Assessing transversal improvement feasibility thanks to lasers data

Scope

- Scheduling observation campaign
- SDLR automation scheduler reworks (interfaced to COPLA)
- OD and cataloguing process reworks to manage lasers data for non-cooperative
- Cataloguing process reworks to manage daylight observations

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
R&D on manouvre detection and estimation from multiple sources	Subco	AEE	Call for proposals	Q4/2024	Start + 1 Month	Q1/2025	Non-disclosed	1

Outcomes

- Enhancing CA and catalogue capabilities thanks to maneuver characterization (LEOP, Mission, EOL)
- Improving accuracy of EU SST products thanks to highest model fidelity

Scope

- Developing and implementing filtering methods helping for maneuver detection
- Implementing new propulsion model (such as low-thrust model) and strategies (such as station-keeping) for detecting maneuvers
- Assessing different methods feasibility and performances for maneuver detection:
- Stochastic methods
- Artificial methods
- Statistical methods
- Data fusion based correlation (radar + optical)
- Assessing data fusion influence on maneuver detection feasibility

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
Monitoring of rate of compliancy	Subco	DLR	Call for proposals	Q4/2024	Call opening + 1 Month	Q1/2025	Non-disclosed	1

Outcomes

- Preparing potential future EU SST service : Compliancy reporting with Space Debris Mitigation Standards
- Increasing EU SST autonomy regarding this highly strategic topic
- Acting as major stakeholder in STM regulation works

Scope

- Defining useful set of indicators for assessing compliancy
- Defining sources and data fusion process to collect data of interest for assessing compliancy
- Designing Compliancy Monitoring Software

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
R&D on attitude estimation through multiple sources data fusion	Subco	CNES	Call for proposals	Q4/2024	Call opening + 1 Month	Q1/2025	Non-disclosed	1

Outcomes

- Improving event predictions thanks to attitude
- Improving space situational awareness and object characterization
- Supporting ADR, OOS and EOL activities

Scope

WP1 – Attitude estimation thanks to data fusion	WP2 – Commercial Data acquisition	WP3 – Continuous screening environment (Optional)
T1.1 : AI-based attitude estimation through data fusion	T2.1 : Radar based data acquisition	T3.1 : Attitude based catalogue builder
T1.2 : Attitude estimation through the use of adaptive optics	T2.2 : Optical based data acquisition	T3.2 : Screening environment implementation
T1.3 : Attitude estimation process implementation	T2.3 : Laser based data acquisition	T3.3 : Additional observation acquisition scheduler implementation
	T2.4 : Passive Ranging based data acquisition	

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
R&D on radio frequency interference, emission detection & catalog building	Subco	CNES	Call for proposals	Q4/2024	Call opening + 1 Month	Q1/2025	Non-disclosed	Several

Outcomes

- Improving interference event predictions thanks to RF
- Improving space situational awareness and object characterization
- Preparing potential future new EU SST service

Scope

WP1 – RFI and third-party emission detection from antenna logs	WP2.a – R&D on reservation probability computation	WP2.b – Reservation probability Computation – Library development (optional)	WP3 – RFI situation report	WP4 – LEO Observation acquisition
T1.1 : RFI definition and characterization	The aim of this work package is to estimate whether it is possible to deduce the future bookings of a satellite at certain times (the times of the predicted RFI) given its past visibilities, its past emission observations and its future visibilities.	T2b.1 : Library specifications	The end goal of this Work Package consists in establishing an RFI situation report in order to monitor the situation and be able to observe trends in RFI occurrences. In order to do that, a metric measuring the RFI impact on a mission shall be created. This metric shall allow the reader of the report to compare the RFI affecting missions with different downloading strategies and different bandwidths	This work package aims at testing LEO emission observation acquisition. These purchased data may be used as input to WP 2 on "future emission probability computation". This work package targets the following observations: - Emission observation in S and X band - Emission observation of LEO satellites
T1.2 : Third party signal characterization		T2b.2 : Library implementation		

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
Horizon Scanning	Subco	DLR	Call for proposals	Q4/2024	Scall opening + 1 Month	Q1/2025	Non-disclosed	1

Outcomes

- Fostering European cooperation
- Assessing continuously European Industry capabilities and development plan identifying evolution of space commerce
- Monitoring the international SSA ecosystem

Scope

- Collecting continuously information regarding the SSA ecosystem
- Benchmarking SSA market to identify trends and development plan
- Building SSA potential development scenarios
- Making recommendations for future EU SST development plan and schedule

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
Population evolution and building of a new population file	Subco	DLR	Call for proposals	Contract already on-going				Several

Outcomes

- Enhancing EU SST autonomy regarding space population awareness
- Mastering space environment
- Contributing to other EU SST services to improve long-term studies realism

Scope

- Defining space environmental indexes
- Building EU SST space population catalogue
- Defining long-term scenarios taking into account :
  - Effect of incremental number of object increasing
  - Effect of satellites spiraling-up / down
  - Effect of satellite defects
  - Effect of fragmentations

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
Potential hazardous object identification and space capacity	Subco	AEE	Call for proposals	Q4/2024	Call opening + 1 Month	Q1/2025	Non-disclosed	Several

Outcomes

- Enhancing EU SST autonomy regarding space population awareness
- Mastering space environment
- Contributing to other EU SST services to improve long-term studies realism

Scope

- Defining space environmental indexes
- Quantifying the potential of any mission to degrade the orbital environment
- Implementing Long-term statistical / stochastic propagation
- Assessing the accumulated risk for a satellite (or constellation) overall the duration of the mission
- Analyzing space capacity and consequences of future mission

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
SBSS activity	Subco	CNES	Call for proposals	Q4/2024	Call opening + 1 Month	Q1/2025	Non-disclosed	Several

Outcomes

- Benchmarking technology capabilities and performances for SBSS applications
- Optimized on-board / on-ground approach
- Breadboard emulating a SBSS mission

Scope

Legal Workpackage 1 : Auxiliary Payload

- Designing an autonomous secondary payload dedicated to SST activities
- At least one of the three targeted use could be selected :
  - LEO, MEO and GEO
- Aiming to deal with identified constraints from platforms such as IRIS²

Legal Workpackage 2 : Primary payload

- Supporting the development of primary payload dedicated to SST activities, but using disruptive approaches or improving the overall SBSS capabilities

Legal Workpackage 3 : Opportunistic SBSS solutions

- Supporting the development of an innovative solution contributing to SST activities in an opportunistic way
- Demonstrating the possibility to use an equipment for SST purposes although it is not used for that (e.g. Startracker)

CONTRACTUAL PERIMETER

TASK 1 : Hardware design and testing

- Benchmarking technology capabilities and performances for building this device
- Building the Engineering model

TASK 2 : On-board autonomy

- Designing and testing algorithms and methods in order to increase the On-board autonomy considering the constraints applied to the solution
- Designing and testing the most appropriate observation strategy that complies with the constraints applied to the solution.

TASK 3 : Long-term perspectives assessment

- Evaluating the benefits of the solution once operational (i.e commercial solution is up and running)
- Designing the operational cost model

System Evolution (WP6)

Open calls (HE TOP5)

Title	Subco / FSTP	Partner	MS	Call open	Start date
R&D on DB & CAT	Subco	DLR	DE	Q4/2024	Q1/2025
R&D commercial use	Subco	AEE	ES	Q1/2025	Q2/2025
Secure network	Subco	DLR	DE	Q4/2024	Q1/2025
DLT added value	Subco	CNES	FR	Q1/2025	Q2/2025

* Call specifications & selection proposals on EU SST partnership level

System Evolution (WP6)

	Type	Entity	Procedure	Call open	Call deadline	Start	Budget	# contracts
DLT added value	Subco	CNES	Call for proposals	Q1/2025	Start + 1 Month	Q2/2025	Non-disclosed	1

Outcomes

- Studying the added-value of Distributed Ledger Technologies for EU SST considering three scenarios :
  - DLT used as data qualification
  - DLT used as a central Data Management System
  - Bottom-up definition
- Building CONOPS, Proof-of-Concept and Security assessment

Scope

WP1 – Validation process of the data coming from sensors, based on DLTs	WP2 – Use of DLTs for EU SST Data Management System	WP3 – Bottom-Up definition of use case of DLTs in EU SST context
T1.1 : CONOPS definition	T1.1 : CONOPS definition	T3.1 : CONOPS definition
T1.2 : State of the art analsysis and trade-off	T2.2 : State of the art analsysis and trade-off	T3.2 : State of the art analsysis and trade-off
T1.3 : PoC design and implementation	T2.3 : PoC design and implementation	T3.3 : PoC design and implementation
T1.4 : Security impact analysis	T2.4 : Security impact analysis	T3.4 : Security impact analysis

EU SST
Space Surveillance and Tracking

Ensuring space safety
and sustainability

Merci de votre attention

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