ISAM at ESA

Developing European leadership for In-Space Servicing Assembly and Manufacturing

Tiago Soares, Clean Space & Circular Economy Office, OPS, ESA

Agata Jozwicka-Perlant, Space Transportation Systems Studies, FLPP, ESA

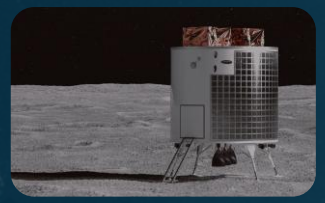
16/09/2026

EUROPEAN SPACE AGENCY

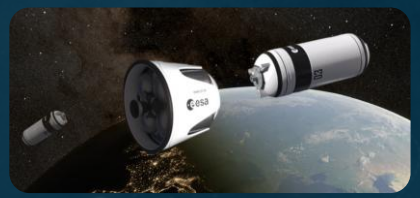
The Rise of the In-Space Economy...

Orbital economy
Act-in-Space

Defence & Security
Dynamic orbital ops



Autonomy for Exploration
Tugging & refilling



In-orbit refilling
Sustained presence & superiority

In-space infrastructures
Sovereign capabilities

European Commission

Defence Industry and Space

Home | About | Newsroom | EU Space | EU Defence Industry | EU Aeronautics Industry | Funding opportunities

Home > In Space Operations and Services – a strategic ability for the future

In-Space Operations and Services

Introducing the Future Space Ecosystem and our Strategic Capacity to Act in Space

Building a robust European future in sp

In-Space Operations and Services (ISOS) will enhance th
performance, resilience and sustainability of space ass
They include including satellite servicing, assembly, manufacturing, recycling and logistics in space. The Commission recognises the **strategic importance of ISOS** particular with regard to commercialisation and protection the infrastructure in space and the space environment.

ISOS will contribute to the fostering of a new in-space economy, as well as to the protection of space assets, safeguarding the EU's freedom to act in space.

EUROPEAN SPACEFLIGHT

Germany Commits €35 Billi
Space-Related Defence Pro

By Andrew Parsonson · September 26, 2025

Credit: BDI / Christian Kruppe

During his address at Germany's third annual Spa
Pistorius announced that Germany would invest
projects by 2030.

"The conflicts of the future will no longer be limi
sea. They will also be fought openly in orbit," said Pistorius. "That's
building structures within the Bundeswehr to enable us to effectively defend and
deter [threats] in space in the medium and long term."

Are we pilots or are we passengers?

Josef Aschbacher
Director General at European Space Agency - ESA

May 18, 2026

Recent changes to the Artemis architecture by the Unit
shifting landscape in human space exploration. Decisio
cancel Mars Sample Return disrupt Europe's lunar expl
a broader reality: Europe has become too exposed to

Europe must decide whether it prefers to be depende
explorers into space or to assume its role as a fully ca
head of the European Space Agency (ESA), I am convi
human spaceflight is not a luxury. It is a necessary an
freedom to unlock the scientific, economic, strategic
space and to inspire a new generation to shape Euro

Through ESA's Explore2040, Member States have alr
exploration strategy, laying the foundations for Euro
spaceflight capability. Yet, political decisions have al
full autonomy in human exploration – a hesitation w
consequences. To reconcile this, we now need the p
accelerate the roadmap.

SPACENEWS

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Military

Space Command chief calls for orbital gas stations as China tests satellite refueling

Military space assets need the same logistics backbone as terrestrial forces, argues Gen. Whiting

by Sandra Erwin · August 5, 2025

HUNTSVILLE, Ala. — The head of U.S. Space Command is pushing for a fundamental shift in how America thinks about its satellites, arguing that the military's orbital assets need the same robust that keeps jets flying and ships sailing — a call that comes as China is seeking to capabilities.

Whiting said, drawing parallels

INNOVATION • GOOGLE

FORTUNE

Google CEO Sundar Pichai says we're just a decade away from a new normal of extraterrestrial data centers

By Sasha Rogelberg
Reporter

April 3, 2026, 5:43 AM ET

Google CEO Sundar Pichai said the company will launch a prototype satellite to test AI hardware in

ISAM/ISOS Context & Strategic Importance

In-Space Operations and Services are seen by ESA and European Commission as critical for:

- Ensuring **Europe's freedom to act in space**
- Improving resilience, safety, and sustainability of European space assets
- Enabling **new commercial markets** and strengthening technological sovereignty

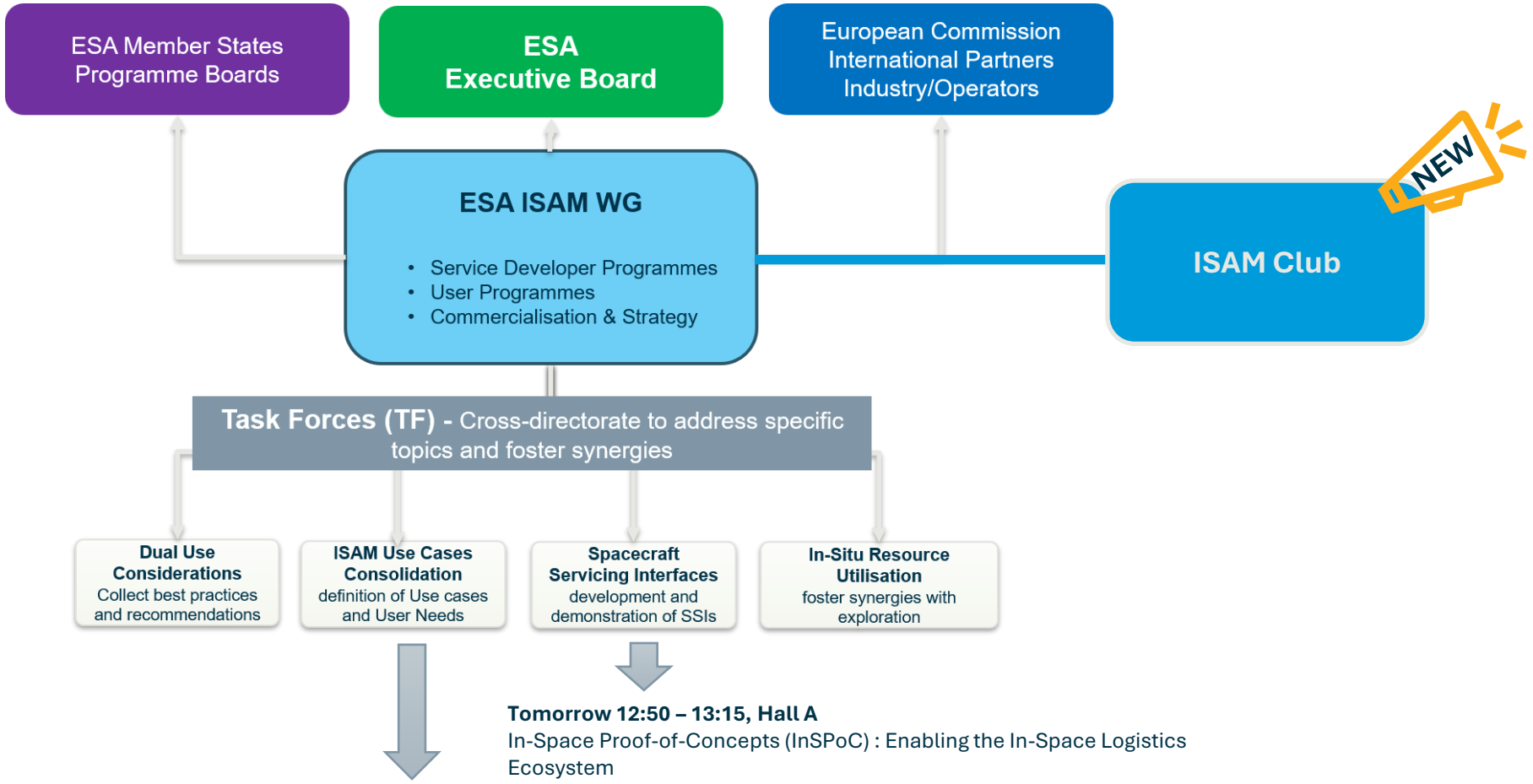
EC Activities

- **Horizon 2020 and Horizon Europe** technology programmes incl. establishment of the **Space Robotics Strategic Research Cluster**
- Implementation of the **ISOS4I Pilot Mission** as the seed of a **future flagship** / in-space service infrastructure, as an enabler of an in-space economy
- Community building through the EU ISOS Strategic Forum
- Proposal for regulatory framework (EU Space Act), incl. preparation of future assets for in-space servicing

ESA Activities

- ISAM is part of **ESA Strategy 2040**, focusing on autonomy and competitiveness
- Several missions/technologies under development and implementation
- **ESA ISAM Working Group** coordinating missions and interfaces & technology
- **ESA In-Space User Club** to coordinate initiatives with industry and operators

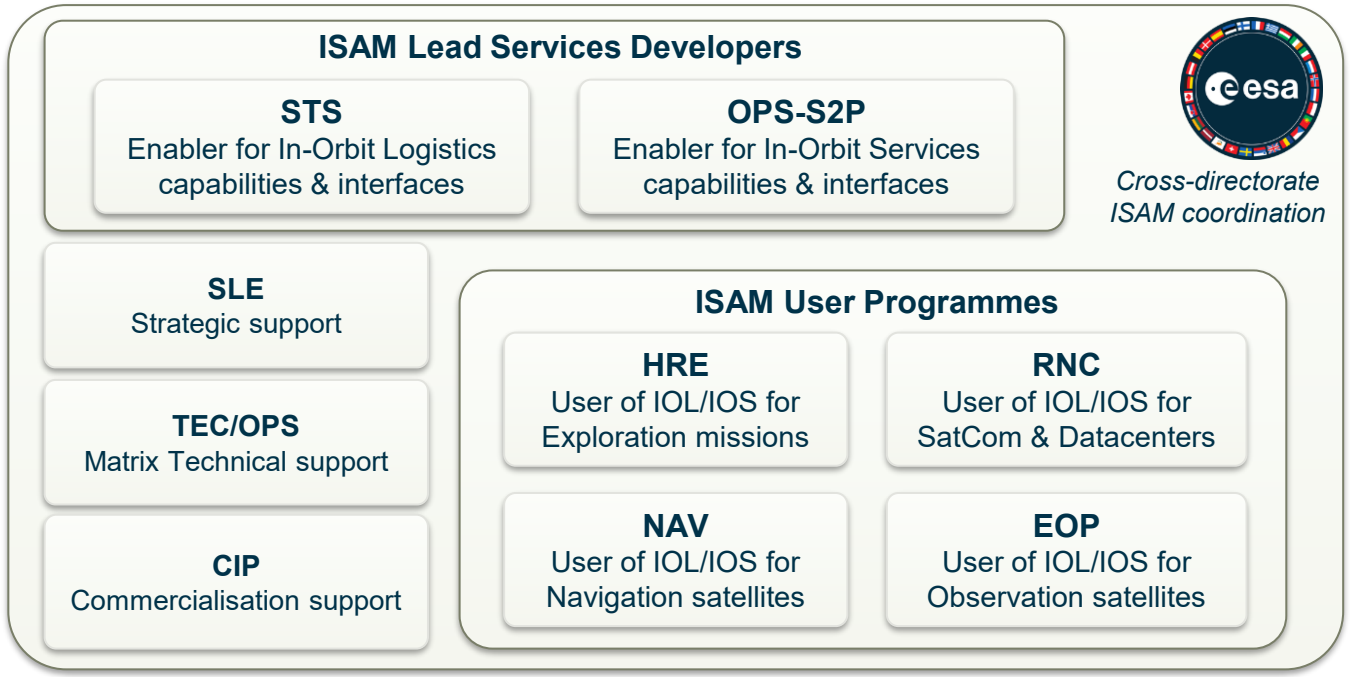
Coordination of ISAM activities



Tomorrow 12:50 – 13:15, Hall A
In-Space Proof-of-Concepts (InSPoC) : Enabling the In-Space Logistics Ecosystem

Today 16:10 – 16:35, Hall B
ESA Strategic Initiative on In-orbit Servicing, Assembly and Manufacturing (ISAM)

ESA ISAM Working Group

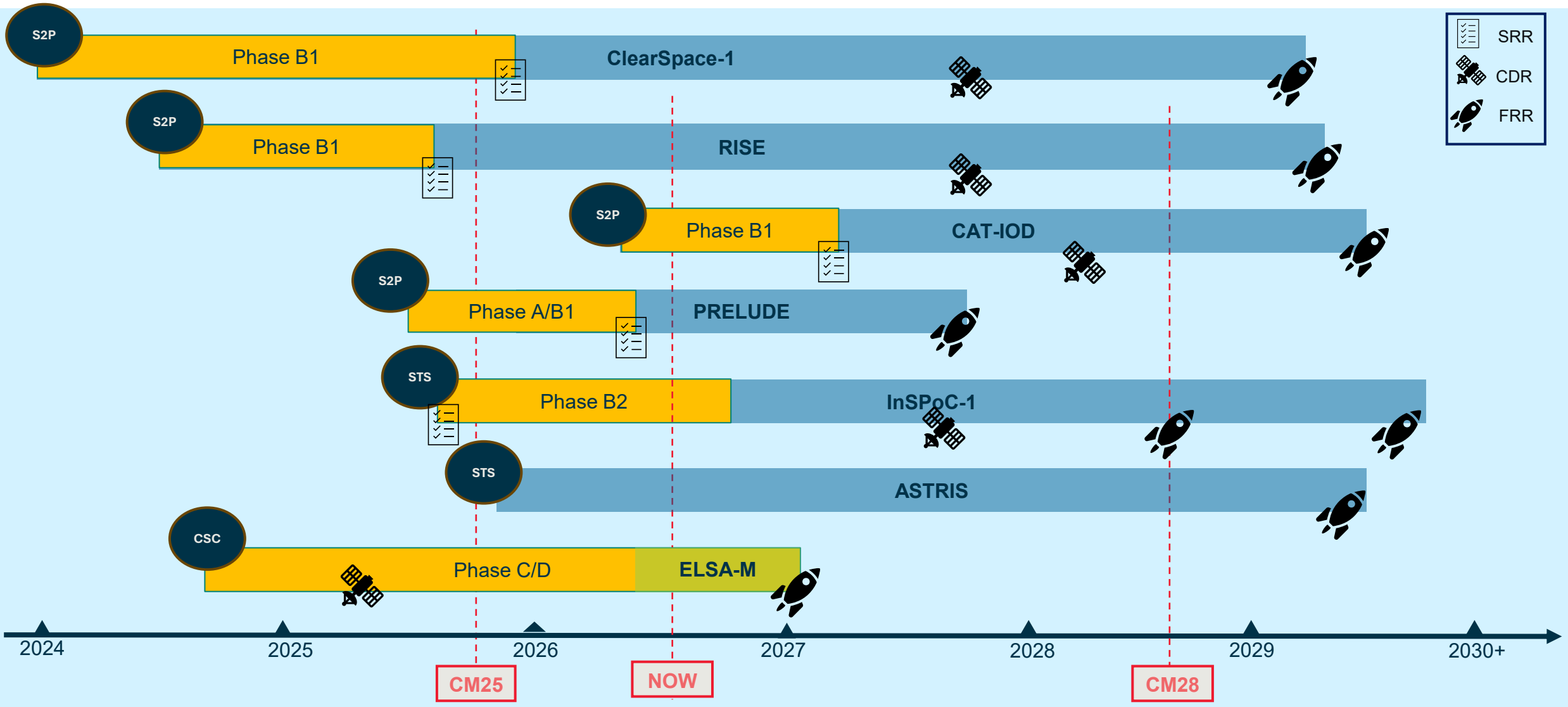


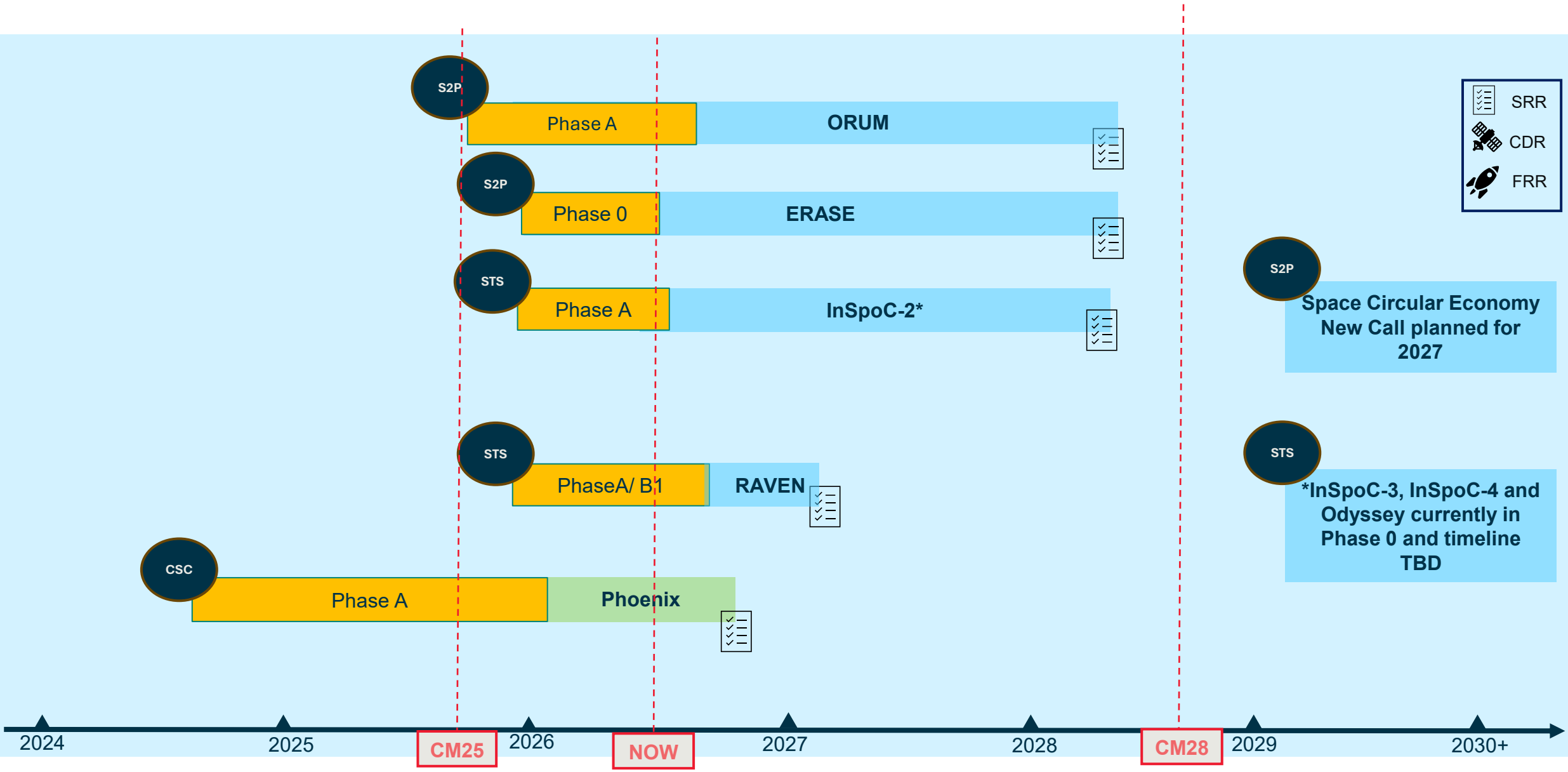
Composition

OPS-S2P, STS (Co-Chairs)
HRE, CSC, NAV, EOP, SLE, TEC, CIC

Objectives

- Coordinated cross-directorate ESA vision, strategy and policy for ISAM
- Ensuring a united voice for ISAM activities
- Maintain a reference map of ongoing ISAM projects & activities
- Act as the ESA lead for ISAM technology roadmaps
- Synergise ISAM use cases across the different application domains


S2P
Phase B1
ClearSpace-1
S2P
Phase B1
RISE
S2P
Phase B1
CAT-IOD
S2P
Phase A/B1
PRELUDE
STS
Phase B2
InSPoC-1
STS
ASTRIS
CSC
Phase C/D
ELSA-M
SRR
CDR
FRR
2024
2025
2026
2027
2028
2029
2030+
CM25
NOW
CM28


S2P
Phase A
ORUM
S2P
Phase 0
ERASE
STS
Phase A
InSpoC-2*
STS
PhaseA/ B1
RAVEN
CSC
Phase A
Phoenix
SRR
CDR
FRR
S2P
Space Circular Economy New Call planned for 2027
STS
*InSpoC-3, InSpoC-4 and Odyssey currently in Phase 0 and timeline TBD
2024
2025
CM25
2026
NOW
2027
2028
CM28
2029
2030+

Joint declaration between ESA and EC

To advance development of sovereign ISOS for the benefits of the European space ecosystem including the EU flagships, and to align as much as possible efforts across Europe

10th of June at ILA Berlin

European Commission and the European Space Agency (ESA) signed the declaration “sealing their long-standing in-space cooperation”

10th of September at Space Summit

ISOS Celebration at the International Space Summit

EC/ESA ISOS Joint Declaration

"The EC and ESA declare their intention to cooperate closely on the development and maturation of key technologies and mission concepts for In-Space Operations and Services facilitating the deployment of the EU's In-Space Operations & Services 4 Infrastructure (ISOS4I) pilot mission by 2030" :

1. "**Cooperate** toward the deployment of the EU's ISOS4I pilot mission, and on ISOS4I's evolution towards a European in-space service infrastructure (…)" .

2. "**Leverage** ESA's expertise in mission and technology development as well as in operations to enable commercially viable in-space services, promoting circularity".

3. "**Create** coordinated roadmaps that accelerate the development and demonstration of systems and related technologies (…), collaborating in preparing next generation operational capabilities".

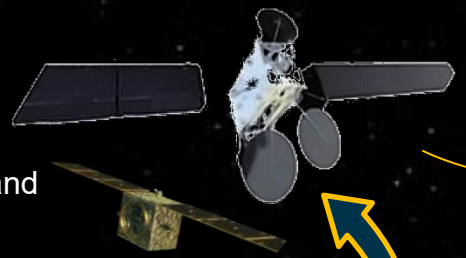
4. "**Promote** (…) European in-space service infrastructure fostering a resilient, sustainable and adaptive space infrastructure and protection of the space environment, using an aligned communication approach in global fora".

5. "**Develop** a framework implementing and formalising the cooperation described above through appropriate arrangements and in coordination with respective Member States."

ESA and EC ISAM / ISOS Architecture

EUROPEAN SPACE AGENCY

Servicing
Providing Commercial and governmental services



- **Active Debris Removal and Life Extension**
- **Refurbishment & Upgrade**

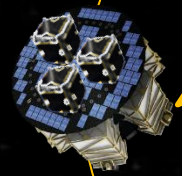
ORUM · CAT · ClearSpace-1 · RISE · ERASE · PRELUDE

Hosting
Providing supply for docked commercial and governmental servicer and logistic spacecraft, hosting and distributing peripherals, IOD/V experiments, propellant

- **IOD/V**
- **In-orbit infrastructure**

InSPoC-4 · ODYSSEY

Logistics
Transporting cargo and supplies, disposal of old cargo, providing transport services to spacecraft



- **Transportation**
- **InSPoC**

InSPoC-1 · InSPoC-2 · InSPoC-3 · ASTRIS · RAVEN · Space Rider

- **Refurbishment & Upgrade**
- **Modular platforms**

Expanding
Building an ecosystem of functional satellite upgrades (plug'n'play peripherals)

Pilot Mission ISOS4I
In-Space Operations & Services 4 Infrastructure
Pre-cursor for continuous provision of on-demand in-space services to the Space infrastructure

ESA involvement under discussion

Inauguration of the ISAM Club

Inauguration of the ISAM Club

14 October, 10h30 – 12h30 in Salons de l'Aveyron, Paris

Official launch of the ISAM Club, as the convergence of existing initiatives, to become the **one-stop-shop** for the **end-to-end in-space ecosystem** across **all ESA Directorates**.

Objective: ISAM Club will **gather the European SpaceTech stakeholders**, bringing together operators, integrators, service providers, enabling suppliers, investors, Member States delegates and national space agencies, **across in-space logistics, in-orbit servicing and in-space assembly and manufacturing**.

Link for future website: isam.esa.int

EUROPEAN SPACE AGENCY

THANK YOU!