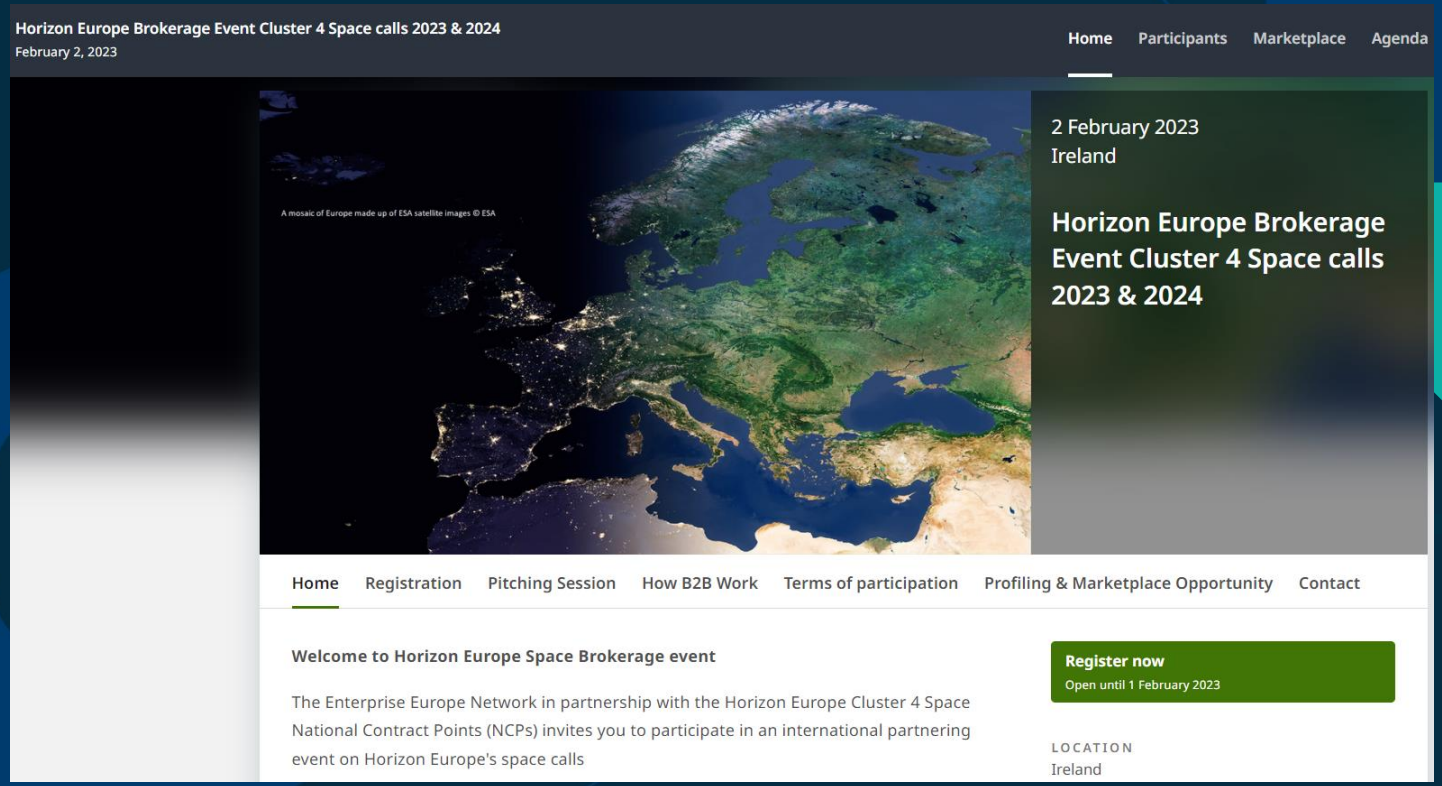
HORIZON EUROPE

Horizon Europe Space Brokerage event

Dublin, IE | 02 Feb. 2023

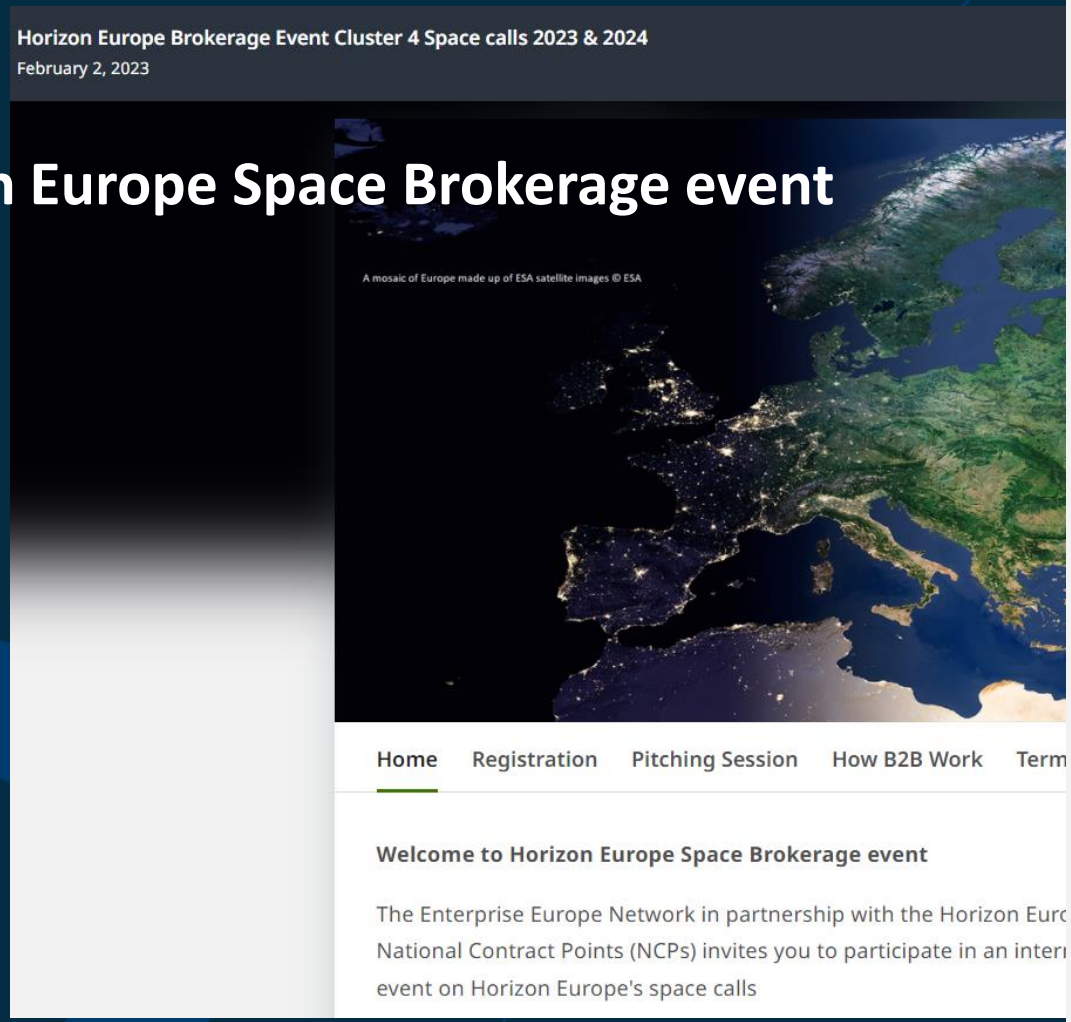
09:30-12:00 IST / 10:30-13:00 CET



HORIZON EUROPE

Horizon Europe Space Brokerage event

Agenda



Thursday, February 02, 2023

09:00 - 09:30	Registration, Coffee and Networking
09:30 - 09:40	Welcome and Introduction
09:40 - 10:20	Commission Remarks
10:20 - 10:30	EUSPA - EU Agency for the Space Programme
10:30 - 10:40	Horizon Europe National Contact Point
10:40 - 10:50	Coffee Break
10:50 - 11:55	Elevator Pitches
11:55 - 12:00	Closing comments
12:00 - 21:00	1:1 Meetings to build Horizon Europe consortia's

Horizon Europe Space Brokerage event

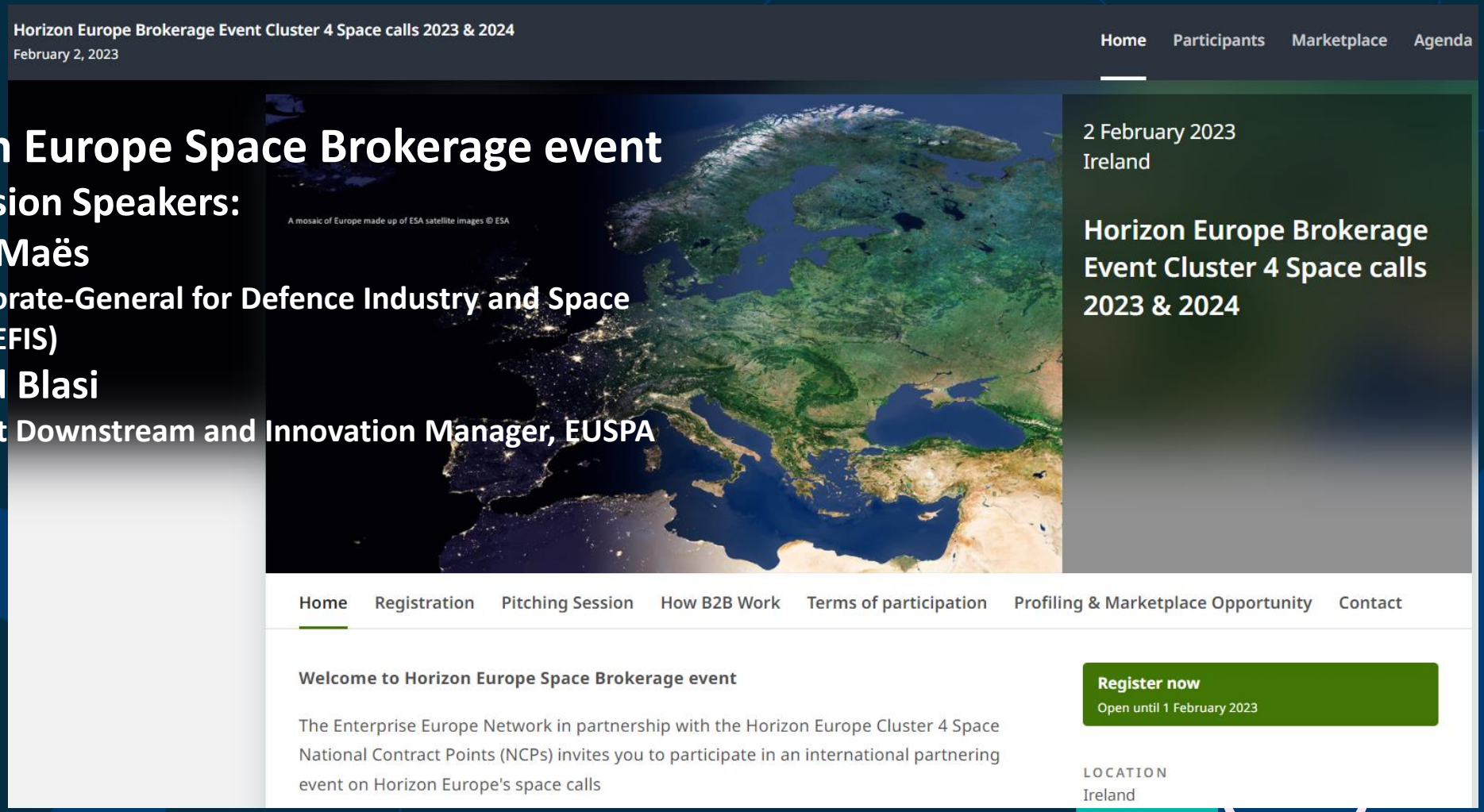
Commission Speakers:

Isabelle Maës

- Directorate-General for Defence Industry and Space (DG-DEFIS)

Reinhard Blasi

- Market Downstream and Innovation Manager, EUSPA



European Commission

THE EU RESEARCH & INNOVATION PROGRAMME

2021 – 2027

Horizon Europe Space Brokerage Event

Dublin, 02 February 2023

Space Work Programme 2023-2024

IOD/IOV opportunities

Research and Innovation

Structure of Horizon Europe

European Commission

WORK PROGRAMME 2023-2024 – DESTINATION 5

“Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data”

Will be implemented through:

A. Calls from HaDEA

- Call HORIZON-CL4-202**3**-SPACE-01: will open on 22 Dec 2022, with deadline 28 March 2023
- Call HORIZON-CL4-202**4**-SPACE-01: will open on 21 Nov 2023, with deadline 20 Feb 2024

B. Calls from EUSPA

- Call HORIZON-EUSPA-202**3**-SPACE: will open in Oct 2023, with deadline in Feb 2024

C. Tenders, calls and procurements from ESA

D. Tenders from the European Commission

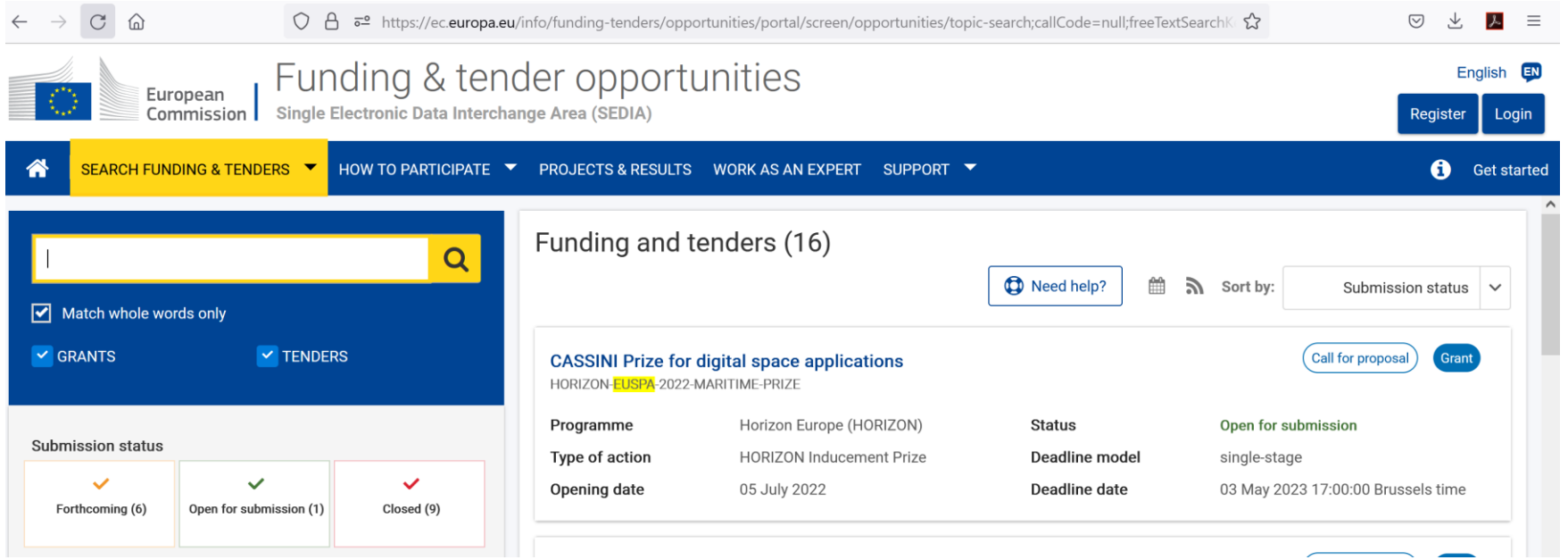
European Commission

Funding & Application

Funding rates:

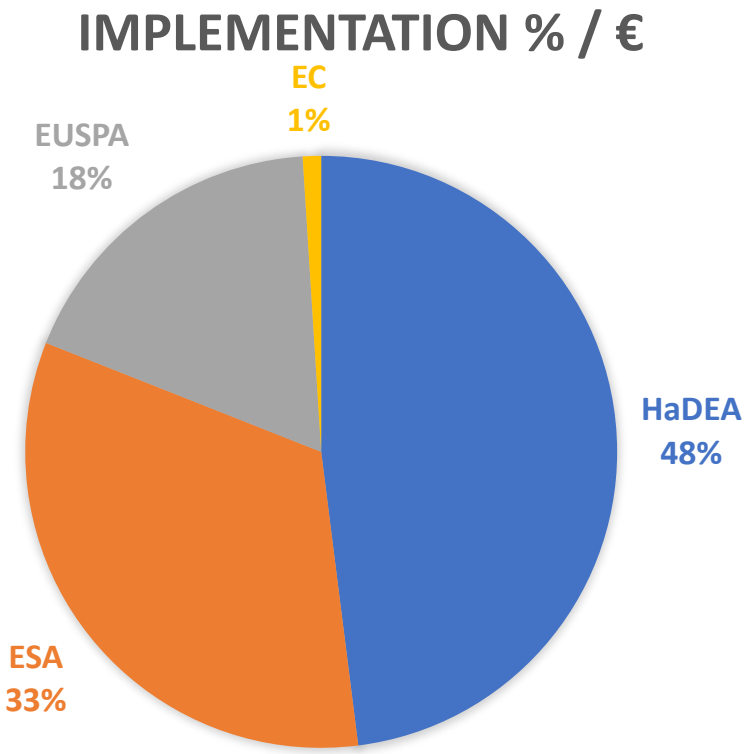
- Research and Innovation Actions (RIA): 100%
- Innovation Actions (IA): up to 70%
- Coordination and Support Actions (CSA): 100%

Application (HaDEA & EUSPA calls): EU Funding & Tender Portal



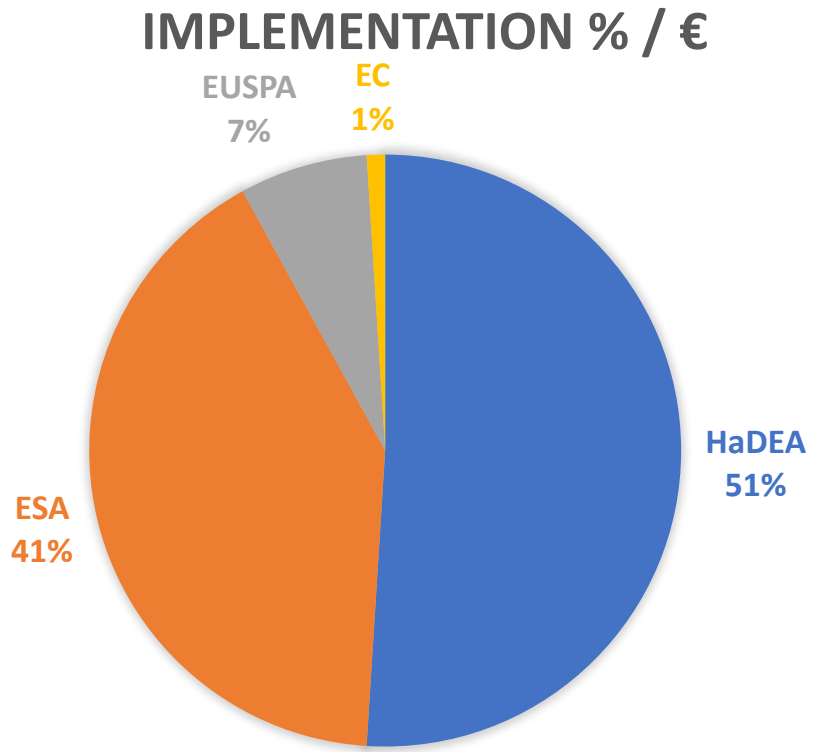
2023: €290 million → 11 areas → 29 topics

1.	Competitiveness	€28 million
2.	Access to Space	€53 million
3.	Evolution of EGNSS	€50 million
4.	GOVSATCOM/Secure Connectivity	€38 million
5.	Copernicus Services	€19 million
6.	EGNSS & Copernicus applications + PRS uses + GOVSATCOM uses	€47 million
7.	Quantum	€8 million
8.	Space Entrepreneurship	€1 million
9.	IOD/IOV	€15.1 million
10.	Technological non-dependence	€20 million
11.	Space Science	€10,7 million



2024: €200 million → 9 areas → 16 topics

3. Evolution of EGNSS	€46 million
4. GOVSATCOM/Secure Connectivity	€20,6 million
5. Copernicus Services	€10 million
7. Quantum	€14 million
8. Space Entrepreneurship	€13 million
9. IOD/IOV	€13 million
10. Technological non-dependence	€20 million
12. Space Surveillance and Tracking (SST)	€56.5 million
13. Space WEather (SWE) & Near-Earth Objects (NEO)	€5.7 million



A. Implemented by HaDEA

1- Competitiveness

Foster competitiveness of space systems

- HORIZON-CL4-2023-SPACE-01-11: End-to-end Earth observation systems and associated services
- HORIZON-CL4-2023-SPACE-01-12: Future Space Ecosystem and Enabling Technologies
- HORIZON-CL4-2023-SPACE-01-13: Future Space Ecosystem: Management and Coordination Activity

HORIZON-CL4-2023-SPACE-01-11: End-to-end Earth observation systems and associated services

Expected Outcomes

- Achieve and maintain the worldwide leadership for Earth Observation system;
- A flexible and competitive end-to-end system demonstration;
- Short to medium term disruptive development and maturation of key technologies;
- Contribute to European non-dependence for the development of Earth-observation technologies and to the Green Deal.

Scope

- **Earth observation technologies based on a network of small satellites with innovative capabilities** (e.g. high revisit times, high reconfigurability, enhanced autonomy, high spatial resolution) seizing the full innovation potential of low cost and/or disruptive and sustainable approaches;
- **Satellite Data Management and Processing including image processing** for end-to-end performance improvement and on **infrastructures and networks for ground processing and virtual network functions**;
- R&I to **identify, develop and implement AI in industrial processes means fostering digitalisation** for Earth observation including software validation and verification.

Indicative budget: 10.1 million EUR	Type of Action: IA
EU contribution per project: 1.0-2.5 million EUR	Financial set-up: Lump sum
Number of projects: 4	TRL: 5/6

- A proposal should address only one of the three areas outlined above, which must be clearly identified.
- Proposals are expected to promote cooperation between different actors (industry, SMEs and research institutions)
- Proposals under this topic should explore synergies and be complementary to already funded actions in the context of technology development at component level.

European Commission

HORIZON-CL4-2023-SPACE-01-12: Future Space Ecosystem and Enabling Technologies

This topic aims at enabling efficient in-space services by focussing on target-oriented development and qualification of innovative, game-changing technologies, key technology building blocks as well as new applications and services for the future space ecosystem.

Expected Outcomes

- A future space ecosystem, fostering the industrialisation and business in space;
- A sustainable, highly automated, flexible and economically viable space infrastructure, building on technologies and concepts for a circular economy in space such as plug-and-play spacecraft functionality
- New technologies and approaches for future space systems, application and services such as on-orbit services (OOS)
- Short to medium term disruptive development and maturation of key technologies.

Scope

- **Generic building blocks technologies for electric propulsion systems** considering paradigms relevant for industrialization;
- **Technologies and concepts with a clear application, pathway to applications and business sustainability** in mind, e.g., innovative approaches for operations, next generation of services, enabling technologies, or serial production and manufacturing concepts, software for mission control, new hardware/software approaches to shorten development, test, integration time or re-use/re-cycle platform functionalities.

Indicative budget: 15.0 million EUR	Type of Action: RIA
EU contribution per project: 0.5-2.5 million EUR	Financial set-up: Lump sum
Number of projects: 8	TRL: (1) 4-6 / (2) 3-5

- A proposal should address only one area, which must be clearly identified.
- Proposals are expected to promote cooperation between different actors (industry, SMEs and research institutions)
- Proposals should explore relevant and promising solutions derived in Horizon 2020 activities, especially project results from the Strategic Research Clusters *Space Robotics Technologies* and *Electric Propulsion*.

European Commission

HORIZON-CL4-2023-SPACE-01-13: Future Space Ecosystem: Management and Coordination Activity

Expected Outcomes

- Future Space Ecosystem roadmap focussing on in-space services, that take advantages of enabling technologies and of synergies between cluster 4 destinations and activities for the future space ecosystem maximising the market opportunities and benefits;
- Coherent principles, and guidelines and standards for On-Orbit Services supporting European actors implementing their business in this domain ensuring consideration of sustainability, safety and competitiveness.

Scope

- **Pathways to innovative and promising applications and services** taking into account new space approaches, enabling technologies as well as synergies with terrestrial sectors while making use of continuous market and trend analyses;
- **Pathways for quick maturation and space qualification** of game-changing/key technologies;
- Follow project(s) of other FSE calls to **support decisions regarding programmatic and strategy questions** and to **verify the applicability of the existing principles and guidelines** for future missions;
- Contribute to **international dialogue on recommendations for guidelines and standards for In-Space Services** based on the work done in the European Operations Framework (EOF) **supporting the European Commission in policy and standards development**;
- **Targeted dissemination and outreach activities for FSE activities** to showcase the paradigm shift and to facilitate support of European stakeholders, and to **promote EU Space R&I activities** in the future space ecosystem.

Indicative budget: 2.0 million EUR	Type of Action: CSA
EU contribution per project: 2.0 million EUR	Financial set-up: Lump sum
Number of projects: 1	TRL: -

European Commission

➢ Active participation of industrial actors including SMEs in the consortium is expected.

2 – Access to Space

Reinforce EU capacity to access to space

- HORIZON-CL4-2023-SPACE-01-21: Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground system tests
- HORIZON-CL4-2023-SPACE-01-22: New space transportation solutions and services
- HORIZON-CL4-2023-SPACE-01-23: Modern, flexible and efficient European test, production and launch facilities

Eligibility:

Participation is limited to legal entities established in Member States, Iceland and Norway and the United Kingdom.

The eligibility of entities established in the United Kingdom to participate is conditional upon the following: (i) the United Kingdom is associated to Horizon Europe, and (ii) the United Kingdom's equivalent space calls are published and open to the EU entities on a reciprocal basis." Both conditions must be fulfilled on the date of the opening of this topic for submission.

HORIZON-CL4-2023-SPACE-01-21: Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground system tests

Expected Outcomes :

- Contribution to the overarching objective of launch cost/price reduction by 50% by 2030 (with respect to A6/ Vega C cost/price 2021 economic conditions) for the benefit of EU Space programmes implementation.
- Contribute to enhance Europe's open strategic autonomy and sector competitiveness

Scope:

- The propulsion systems represent a significant part of launch system costs. It is necessary to mature new or optimised low cost effective, high performance (high thrust to weight ratio, high specific impulse) and green propulsion concepts, technologies and propellants for high thrust engines. The activities should address:
    1. Maturation of enabling technologies, building blocks, tools and processes including maintenance/overhaul and safety, and subsystem tests including prototyping and integrated ground tests at subsystems level by 2025;
    2. Demonstration of the above technologies by subsystems and engine on-ground demonstration tests by 2026.
- The matured technologies, building blocks, tools and processes should be applicable to strategic launchers able to launch EU Space Programme components, with the objective of enabling operational capacities by 2030 and preferably earlier.
- The proposed activities must also support Europe's non-dependence objective and include the assessment of costs reduction investigations.
- The activities should include as many as technologies possible to maximise the number of matured technologies to be submitted to integrated tests at subsystem level and for engine firing tests.
- All the activities should be complementary and coherent with the ESA on-going or future activities.

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
20,00	~20,00	1	RIA	7	N/A	Yes

European Commission

HORIZON-CL4-2023-SPACE-01-22: New space transportation solutions and services

Expected Outcomes :

- Contribute to EU Green Deal objective through the reduction of the environmental impact of space transportation and to be prepared for the upcoming REACH regulations, especially with respect to the use of hydrazine and its derivatives, focusing on commercial market as a driver for business growth.
- Contribute to expand commercial space transportation offer and services with new space transportation solutions. The objective is to contribute to double the accessible new space transportation service market to European industry by 2030.
- Design and performance studies as well as business cases (demonstration of economical viability).

Scope:

- The maturation of enabling new technologies and subsystems in the field of green propulsion, micro launchers and associated launch facilities, kick stage, orbital propulsion and distancing, attitude and landing, re-entry solutions, smart satellite deployment systems/dispensers, for space transportation including also new routes up to Lunar orbit or surface. The maturation could go up to subsystem and system level technology demonstration and must include at least one of the following areas and linked technologies:
    1. Technologies for recovery of Space Transport vehicles elements:
        - Technologies to be matured in order to allow the re-entry of launcher elements through the entire atmospheric flight domain from in-orbit up to soft landing on earth
        - Technologies enabling recovery, high reuse and limited refurbishment need of launcher fairing
        - Technologies maturation for micro launcher first stage and booster stage
    2. Space Transportation technologies in support to In-orbit servicing systems : Technologies allowing the in orbit reuse of a green and sustainable cryogenic elements for multiple operations and missions in-orbit
- All the activities should be complementary and coherent with the ESA on-going or future activities

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
23,10	4 to 10	4	RIA	5/6	N/A	Yes

European Commission

HORIZON-CL4-2023-SPACE-01-23: Modern, flexible and efficient European test, production and launch facilities

Expected Outcomes :

- Contribution to the overall objective of launch cost/price reduction by 50% by 2030 (with respect to A6/ Vega C cost/price 2021 economic conditions).
- Contribute to expand commercial space transportation offer and services with new space transportation solutions. The objective is to contribute to double the accessible new space transportation service market to European industry by 2030.
- Improve cost efficiency of European test, production and space launch facilities.
- Matured technologies, standardised technology for improving cost efficiency, interoperability of access to space ground facilities in Europe, ground assets portability to speed-up deployments.

Scope:

- Cost reduction and improving flexibility of European launch systems are the main challenges in order to foster European industry competitiveness .
- Access to space ground facilities in Europe need to become interoperable allowing to decrease the launch service costs.
- The activities will address one or several of the following listed domains:
    1. Multi sites flexible industrial platform
    2. Develop standardised and cost-effective innovative technologies to improve cost efficiency of Test and Launch facilities, their interoperability and compatibility/attractiveness for new users.

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
10,00	2 to 5	3	RIA	5/7	N/A	Yes

European Commission

3 – Quantum

Innovative space capabilities: Quantum

- HORIZON-CL4-2023-SPACE-01-62: Quantum Communication Technologies for space systems
- HORIZON-CL4-2023-SPACE-01-63: Quantum Space Gravimetry Phase-A Study
- HORIZON-CL4-2024-SPACE-01-64: Quantum Space Gravimetry Phase-B study & Technology Maturation

HORIZON-CL4-2023-SPACE-01-62: Quantum Communication Technologies for space systems

Expected Outcomes :

- Support the EU space policy and the EU initiative to establish the Union Secure Connectivity Programme and foster the development of ultra-secure EU services based on or using space systems
- Ensure the EU sovereignty and non-dependence for the development of capacities leading to the availability of ultra-secure services based on QKD
- Enhance the TRL of the critical components necessary to build QKD space systems and foster the development of the associated QKD standards.

- **Indicative budget: 5 MEUR**
- **EU contribution per project: 2.5 MEUR**
- **Type of Action: RIA**
- **TRL: 5/6**

European Commission

HORIZON-CL4-2023-SPACE-01-63: Quantum Space Gravimetry Phase-A Study

Expected Outcomes :

- Support the EU space policy and the green deal by assessing the feasibility of a quantum space gravimetry pathfinder mission
- Propose a mission, system and operation concept for the Quantum Space Gravimetry pathfinder mission
- Establish the list of critical components for a Quantum Space Gravimetry mission

- **Indicative budget: 3 MEUR**
- **EU contribution per project: 1.5 MEUR**
- **Type of Action: RIA**
- **TRL:3**

European Commission

HORIZON-CL4-2024-SPACE-01-64: Quantum Space Gravimetry Phase-B study & Technology Maturation

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
14,20	~14,00	1	RIA	6/7	N/A	Yes

Expected outcomes :

- Support the EU space policy and the EU Green Deal by assessing the feasibility of a quantum space gravimetry pathfinder mission.
- Ensure EU sovereignty and non-dependence for the development of capacities leading to the availability of quantum space gravimetry.
- Enhance the TRL of the critical components necessary to build quantum gravimetry for space Up to two phase-A study proposals will be selected under this call, and their outcomes will contribute to the selection of a Quantum Space Gravimetry pathfinder mission.

Scope: The final objective of this call is to prepare the next phases of the implementation of a Quantum Space Gravimetry pathfinder mission. To achieve this objective, one proposal for a phase B study (Up to PDR), as specified in ECSS-M-ST-10C, leading to a preliminary definition of a quantum space gravimetry pathfinder mission, will be selected.

This activity will cover both the quantum space gravimetry payload and satellite platform. This activity will also include the implementation measures that will enhance the technological readiness of the critical components leading to TRL 6/7 at the end of the project.

4 – Copernicus Services

Evolution of services: Copernicus

- HORIZON-CL4-2023-SPACE-01-31: Copernicus for Atmosphere and Climate Change, including CO2
- HORIZON-CL4-2023-SPACE-01-32: Copernicus for Emergency Management
- HORIZON-CL4-2023-SPACE-01-33: Copernicus in-situ component
- HORIZON-CL4-2023-SPACE-01-34: Copernicus for Marine Environment Monitoring
- HORIZON-CL4-2024-SPACE-01-35: Copernicus for Land and Water
- HORIZON-CL4-2024-SPACE-01-36: Copernicus for Security

NB: see also the Guidance Document on the Copernicus Evolution of the Horizon Europe Work Programme 2023-2024

HORIZON-CL4-2023-SPACE-01-31: Copernicus for Atmosphere and Climate Change, including CO2

Expected Outcomes :

• Enhanced quality and efficiency of the Copernicus Atmosphere Monitoring and Copernicus Climate Change services to respond to evolving policy and/or user requirements and to technological developments
• Continuation of the set-up of the new Copernicus service element for the monitoring of anthropogenic CO2 emissions
• Development of efficient and reliable product chains, new algorithms for data fusion, big data and analytics, use of new Sentinels and contributing missions

Scope *(one focus per proposal)*:
• CAMS focus: improve aerosol representation in CAMS operational global and regional systems
• C3S focus: develop innovative methodologies to characterise compound and cascading extreme weather events, including determining the potential frequency, intensity and impacts of these events in a changing climate
• CO2MVS focus: improve the requirements (accuracy, mass-conservation) for the numerical schemes in the CO2MVS system

Indicative budget: EUR 8.60 million
EU contribution per project/service line: between EUR 2.00 and 3.00 million
Type of Action: Research and Innovation
TRL: 5-6 (feasibility of integration into existing core service)

European Commission

HORIZON-CL4-2023-SPACE-01-32: Copernicus for Emergency Management

Expected Outcomes, *at least three of the following* **:**

- Automated characterisation of building height and use through integration of different sensor types and/or open source non-EO data
- Integration of new EO satellite data for early warning and active global fire detection and monitoring
- Integration of high and very-high spatial resolution data and sensors for continuous multi-scale mapping and assessment of fuel structure and condition at pan-European level
- Improvements of hydrological process representation in continental and/or global scale model of the flood and drought early warning component, including flood predictions
- Addressing limitations of Synthetic Aperture radar (SAR) based flood monitoring in challenging environments (e.g. urban areas) and/or adverse meteorological conditions
- Enhanced seamless sub-seasonal to seasonal predictions of severe-to-extreme hydrometeor events, as well as droughts and associated multi-sectoral impacts
- Optimised integration of different data sources and indexes characterising extreme meteorological events and related hazards, droughts
- Integration of UAV along the full value-added chain in the emergency response

Scope – Innovative methods and technologies for **emergency related applications** addressing the needs of the Copernicus Emergency Management Service: enhancement/automation of an existing element or component; new elements or components to the existing (core) service; new services complementing the core services and providing added functionality as required by users (e.g. in a national or regional context)

Indicative budget: EUR 3.0 million
EU contribution per project: EUR 3.0 million
Type of Action: Research and Innovation
TRL: TRL-6 (proof-of-concept or prototype demonstration)

NB The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

European Commission

HORIZON-CL4-2023-SPACE-01-33: Copernicus in-situ component

Expected Outcomes, *two or more of the following*:

- Optimal use of early observations: past observing methods, error analysis, quality control and bias adjustment
- Better use of Copernicus relevant observations and auxiliary data collected during R&I projects
- Enhanced availability and quality of in situ data critical for Copernicus products and data services
- Appropriate consideration of Copernicus Services' cross-cutting challenges and R&I priorities

Scope :

- Sustainable reuse of in situ data collected during field campaigns for validation and information services
- Innovative observation strategies in selected data sparse areas (e.g. acoustic observations to characterize marine ecosystems such as micronekton)
- Synergistic use of complementary types of surface observations, such as pCO2 and pH observations from research vessels, ships of opportunities and Argo to improve the estimation of air/sea fluxes of CO_2
- Application of machine learning technologies for the quality control of historic and real-time meteorological and hydrological in-situ observations

Indicative budget: EUR 2.0 million
EU contribution per project: EUR 2.0 million
Type of Action: Research and Innovation
TRL: 5-6

European Commission

HORIZON-CL4-2023-SPACE-01-34: Copernicus for Marine Environment Monitoring

Expected Outcomes :

- Improved quality and efficiency of CMEMS to support policies, the Mission “Healthy oceans” and the UN Decade of Ocean Science
- New innovative products tackling higher volumes of data for the continuity of the service
- New algorithms using new EO missions (new sentinels, contributing missions) for enhanced continuity of the service in coastal areas

Scope:

Services to address the coastal zones for policy implementation, conservation, resilience to climate change and sustainable blue economy. Advanced and seamless monitoring and forecasting from regional to coastal scale high spatio-temporal resolution and dynamics to constrain coastal applications. The project should contribute to DestinE and the Digital Twin Ocean. New technologies (cloud, HPC, AI and machine learning, ensemble modelling, model coupling and nesting) welcome

- Develop pan-European satellite coastal observation retrievals at high resolution and improve access and processing of in-situ data
- Develop improved inputs of freshwater flows (incl. BGC) and methods to couple hydrological models with CMEMS and coastal models
- Develop coupling techniques between CMEMS and downstream coastal modelling systems, including impact assessment on key coastal applications and policies

Indicative budget: EUR 5.0 million
EU contribution per project: EUR 5.0 million
Type of Action: Research and Innovation
TRL: 5-6 (strengthening system element for operational development in the future)

European Commission

HORIZON-CL4-2024-SPACE-01-35: Copernicus for Land and Water

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
4,00	1,50 to 2,00	2	RIA	5/6	Lump sum	No

Expected outcomes:

- **Enhanced quality and efficiency of the Copernicus Land Monitoring service** to respond respectively to several Green Deal policy and/or user requirements.
- **Development of efficient and reliable new products chains,** calling for new paradigms in data fusion, data processing and data visualisation to handle more high-volume satellite data sets and product sets.
- **Development of efficient and reliable integrated products chains**, calling with a holistic approach for better land use planning and hydrological monitoring and forecasting, combining and assimilating the current Copernicus service products, and the potential development of new state of the art products complementing the existing ones.
- **Development of a common leading-edge approach across services**, and in the area of hydrological modelling serving the interests of various applications. The development should consider cross services approaches.
- **Development of new algorithms and processing chains** preparing the use of the new types of space observation data (being from new Sentinels or other contributing missions) in order to allow development of new products or the improvement of existing products.

A proposal should address only one area among:

1. Innovative methods to integrate the current land products into land surface, land use and cover change
2. Integrated product provision system using innovative methods and observations (e.g.; SWOT mission) to improve the portfolio of the current inland and coastal/shore hydrological satellite observation products

HORIZON-CL4-2024-SPACE-01-36: Copernicus for Security

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
8,00	~4,00	2	RIA	5/6	Lump sum	Yes

Expected outcomes:

- Enhanced fitness of the current services to better respond to evolving policy and user requirements.
- Enlargement of current service scope through the inclusion of new, complementary elements and extended communities of users.
- Significant technological enhancement in detection capabilities, timely access to data or delivery of information, narrowing the gap between capabilities and the more stringent security observation requirements.
- Significant improvement in integration of non-space data along end-user intelligence supply chains, bringing added value at operational level also at regional at local levels, or in support to field campaigns.
- Development of processing chain(s) to handle an increasing volume of satellite data, keeping abreast with technology developments and include new paradigms in data fusion, processing, automation, as well as added-value information access and visualisation.
- Integration of the Geospatial Artificial Intelligence (GeoAI) and Earth Observation data analytics with a variety of other application-specific data sources like data from remote sensors accessed through IOT, as well as crow-sourced data, high velocity transnational data and social media posts.

Scope:

1. Innovative methods and technologies to explore new and enlarged data sets and the development of applications addressing requirements not currently tackled by the current services.
2. Actions in support to the evolution and scope of the security services, namely increasing user reach, responding to specific regional needs and increasing service added value in user operational scenarios.

5 – Space science & technological non-dependence

Targeted and strategic actions supporting the EU space sector

- HORIZON-CL4-2023-SPACE-01-71: Scientific exploitation of space data
- HORIZON-CL4-2023-SPACE-01-72: Space technologies for European non-dependence and competitiveness
- HORIZON-CL4-2024-SPACE-01-72: Space technologies for European non-dependence and competitiveness

HORIZON-CL4-2023-SPACE-01-71: Scientific exploitation of space data

Expected Outcomes:

- Support the data exploitation of European missions and instruments, in conjunction, when relevant, with international missions.
- A higher number of scientific publications based on Europe's space data, high-level data products made available through appropriate archives, and tools and methods developed for the advanced processing of data. Projects are also expected to add value to existing activities on European and international levels, and to enhance and broaden research partnerships.
- Increased collaboration of scientific teams both within and outside Europe across different domains.
- To strengthen European scientific excellence and support the development of leading-edge scientific research in Europe

Scope: Exploitation of all acquired and available data provided by space missions in their operative, post-operative or data exploitation phase ensuring complementarity with activities already supported by ESA or national agencies during development phases.

Projects may rely on data available through Copernicus DIAS (Data and Information Access Services), ESA Space Science Archives when possible or other means (e.g. instrumentation teams). Combination and correlation of this data with international scientific mission data, as well as with relevant data produced by ground-based infrastructures all over the world, is encouraged to further increase the scientific return and to enable new research activities using existing data sets.

These activities shall add scientific value through analysis of the data, leading to scientific publications and higher-level data products, tools and methods. Resulting analyses should help preparing future European and international missions.

International cooperation is encouraged in particular with countries active in space exploration and space science.

Indicative budget: EUR 10.7 million
EU contribution per project: EUR 1.0-1.5 million
Type of Action: RIA
TRL: 3-4

European Commission

HORIZON-CL4-2023-SPACE-01-72: Space technologies for European non-dependence and competitiveness

Recent geopolitical developments have highlighted the **urgency of increasing the effort on technological dependencies** therefore **safeguard the Union's strategic assets, interests, autonomy, and security.**

Expected Outcomes :

- **Reduce the dependence on critical space technologies and capabilities from outside EU** for the EU space programme components (i.e. Galileo/EGNOS, Copernicus, Govsatcom and SSA) and other space applications;
- Develop or regain in the mid-term the **European capacity to operate independently in space**;
- Enhance the technical capabilities and overall **competitiveness of European space industry vendors on the worldwide market**;
- Open **new competition opportunities for European manufacturers by reducing dependency on export restricted technologies** that are of strategic importance to future European space efforts;
- Improve the overall European space technology landscape and complement and/or **create synergy** with activities of European and national programmes **either in the space or non-space fields**.

Indicative budget: 20.1 million EUR
EU contribution per project: 2 to 3 million EUR
Type of Action: RIA
TRL: varies from 4 to 8

European Commission

Eligibility: Participation is **limited to legal entities established in Member States, Iceland and Norway**

Technology lines supported in 2023 by the topic:

1. High speed DAC-ADC
2. Space qualified carbon fibre pre-impregnated material sources
3. Enhanced performance and space qualified detectors – IR range
4. Mid-power range electric propulsion thruster technology: Qualification of electrical propulsion thrusters and PPUs for power ranges up to 5kW
5. Mid-power range electric propulsion thruster technology: Development of new generation of thrusters based on non-dependent propellants (i.e. not Xe or Kr)
6. Replacement solutions for metallic lead (Pb)
7. High performance, cost effective multi - junction solar cells for space applications

Please refer to the **technical guidance document for further technical specifications for each of the areas.**

Specificities:

1) **T**his WP topic has a higher level of requirements. **Already in the proposal**, applicants are asked to:

   - **Describe the technologies and/or technology processes to be used and show that they are free of any non-EU legal export restrictions or limitations**, such as those established in the International Traffic in Arms Regulations (ITAR), Export Administration regulation (EAR) such as EAR99 or equivalent instruments applicable in other jurisdictions;
   - **Set up a suitable technology development process aiming at avoiding export restrictions of non-EU states** and assess vulnerabilities of the supply chain.

2) **As per WP 2023**, companies that have a multinational nature will be requested to provide guarantee of absence of foreign control through the **OCA procedure**.

3) **Legal obligation**: **For a period of up to 4 years after the end of the project, access rights to the use of products and/or processes generated by the project shall be given to European entities**, in compliance with the signed Grant Agreement and with no legal restrictions and limitations stemming from International Traffic in Arms Regulations (ITAR), EAR99 or equivalent instruments applicable in other jurisdictions.

HORIZON-CL4-2024-SPACE-01-73: Space technologies for European non-dependence and competitiveness

Similar as 2023 topic.

Expected outcomes:

- To reduce the dependence on critical technologies and capabilities from outside EU for the EU space programme components (i.e. Galileo/EGNOS, Copernicus, Govsatcom and SSA) and other space applications;
- To develop or regain in the mid-term the European capacity to operate independently in space and enhancing competitiveness by developing products/technical capabilities reaching equivalent or superior performance level than critical technologies and capabilities from outside EU;
- To open new competition opportunities for European manufacturers by reducing dependency on export restricted technologies that are of strategic importance to future European space efforts.

Technologies:

- Low shock Non-Explosive Actuators (NEA) for smallsats
- High data rate (12.5 to 28 Gbps or higher 56 Gbps), low consumption, short range links
- Power laser sources in the eye-safe region
- Enhanced performance and space qualified detectors – visible range
- Ultra Deep Submicron technology for next generation space integrated circuits: ASICS, FPGA and microprocessors
- Discrete power devices (200V normally-off GaN)
- Photonics components

6 – SSA (Identified beneficiary = EUSST)

- HORIZON-CL4-2024-SSA-SST-MS - New & improved EUSST Missions and Services
- HORIZON-CL4-2024-SSA-SST-AE - SST & STM system architecture and evolutions
- HORIZON-CL4-2024-SSA-SST-SB - Space-based SST (mission, system and sensors network)
- HORIZON-CL4-2024-SSA-SST-SP - SST Sensors and Processing
- HORIZON-CL4-2024-SSA-SST-SD - SST Networking, Security & Data sharing

HORIZON-CL4-2024-SSA-SST-MS - New & improved EUSST Missions and Services

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
6,00		TBD	RIA	6/7 TBD	N/A	Yes

Expected outcomes:

- **Keep EU knowledge and capabilities in the Space Surveillance and Tracking domain at the leading edge**.
- Adapt, improve and evolve the current EUSST initial services portfolio in line with future user needs and the space environment.
- Improve the overall performance of the EUSST services and ensure, in the long-term, a high level of performance and appropriate autonomy at Union level.
- Identify and define new missions and services,
- Explore the implementation of new services, in complementation to the three existing ones.
- Support pre-developments and end-to-end early demonstration of new SST services.

Scope:

- R&I on evolution of the Collision Avoidance service towards a higher responsiveness in case of risks, and in all phases of the spacecraft life;
- R&I on evolution of the EUSST system for debris mitigation in order to reduce the generation of space debris;
- R&I on evolution of the EUSST system for space debris remediation by managing existing space debris.
- R&I on evolution of the EUSST Service Provision Portal in line with the evolution of existing services (CA, RE, FG) and the inclusion of new ones.

This Space Surveillance and Tracking (SST) topic contributes to ensuring full and optimal capacity of the EUSST Partnership once the latter is set up. Its outcomes and scope are expected to build on previous and ongoing actions and aim at achieving full capacity of the EUSST Partnership by end 2024.

HORIZON-CL4-2024-SSA-SST-AE - SST & STM system architecture and evolutions

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
6,00		TBD	RIA	6/7 TBD	N/A	Yes

Expected outcomes:

- The environment in which the EUSST system performs its mission and delivers its services is constantly evolving due to e.g. technological or political factors changing the way in which space is used, orbital environment, etc.
- EUSST system architecture engineering & evolutions: **the analysis of the EU SST system architecture needs to continuously progress to determine how the system has to evolve in the medium- and long-term at network level, data processing level and services level**. Other aspects like data flows, security constraints, interconnectivity and complementarity between EU assets as well as cooperation with other non-European SST systems need to be considered as well.

Scope: R&I activities include:

- EUSST architecture engineering.
- Improve the future EUSST architecture and the associated development roadmap.
- Contribute to technical standardisation activities in these areas.

This Space Surveillance and Tracking (SST) topic contributes to ensuring full and optimal capacity of the EUSST Partnership once the latter is set up. Its outcomes and scope are expected to build on previous and ongoing actions and aim at achieving full capacity of the EUSST Partnership by end 2024.

HORIZON-CL4-2024-SSA-SST-SB - Space-based SST (mission, system and sensors network)

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
10,00		TBD	RIA	6/7 TBD	N/A	Yes

Expected outcomes:

- With a growing orbital population and the need to observe smaller objects in order to be able to better protect EU space assets, the need for and added-value of developing Space-Based Space Surveillance (SBSS) missions in complementation to ground-based SST sensors should be studied in Europe
- **Projects are expected to contribute to the following outcomes:**
  - **Study and assess several technical solutions for the development of future European SBSS capabilities.**
  - **Explore the use of small satellite solutions** to reduce capital expenditures CAPEX and operational expenditures OPEX.
  - In the medium-term, **develop European capacities to operate SBSS independently**.
  - **Reduce dependence on critical SBSS technologies and capabilities** from outside Europe.

Scope: Study various mission configurations and payload definition to maximize the number of catalogued objects and associated accuracy. Analyse EUSST gaps and solutions to fill them with best value for money.

This Space Surveillance and Tracking (SST) topic contributes to ensuring full and optimal capacity of the EUSST Partnership once the latter is set up. Its outcomes and scope are expected to build on previous and ongoing actions and aim at achieving full capacity of the EUSST Partnership by end 2024.

HORIZON-CL4-2024-SSA-SST-SP - SST Sensors and Processing

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
27,50		TBD	IA (45%)	6/7 TBD	N/A	Yes

Expected outcomes: Supporting the upgrade and development of on-ground assets, in particular radars and telescopes as well as data processing.

- SST radiofrequency & optical sensors (radars, telescopes, etc.) technological research and innovation
- SST data processing research and innovation (e.g. Artificial Intelligence)

Scope: R&I activities which needs to be addressed include:

1. Adapt and improve technologies already in use in SST sensors such as radars, telescopes and lasers.
2. Specify, develop, test and pre-integrate improved sensors.
3. Develop innovations for detection of smaller objects and higher processing capabilities. Develop new detection strategies to cope with an increased number/size of objects in the sensors' Field of Regard/Field of View.
4. Explore new technologies and/or processing algorithms and techniques to develop and implement potential new services developed in HORIZON-CL4-2024-SSA-SST-MS New & Improved EUSST Missions and Services topic.
5. Improve algorithms: for a more agile and accurate cataloguing of the growing space objects population and increasing services provision; for data fusion for a more efficient use of data and information coming from different sensors on the same object.
6. Other, please refer to WP text.

This Space Surveillance and Tracking (SST) topic contributes to ensuring full and optimal capacity of the EUSST Partnership once the latter is set up. Its outcomes and scope are expected to build on previous and ongoing actions and aim at achieving full capacity of the EUSST Partnership by end 2024.

HORIZON-CL4-2024-SSA-SST-SD - SST Networking, Security & Data sharing

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
7,00		TBD	RIA	6/7 TBD	N/A	Yes

Expected outcomes:

- Support the upgrade, development and security issues of the EUSST infrastructure based on the European network of assets.
- Concrete aspects of the EUSST network (e.g. pooling of data from multiple sensor sources; exchange between multiple operations centres of Member States) shall be considered in highly detailed case studies, modelling.
    - SST networking of sensors & operation centres (EU SST network Command & Control)
    - Research on EUSST network hardening against external threats

Scope:

- Update operation centres to improve current services (Collision Avoidance; Fragmentation; Re-entry) adapted to future user needs and the space environment.
- Update operation centres to new missions and services.

This Space Surveillance and Tracking (SST) topic contributes to ensuring full and optimal capacity of the EUSST Partnership once the latter is set up. Its outcomes and scope are expected to build on previous and ongoing actions and aim at achieving full capacity of the EUSST Partnership by end 2024.

B. Implemented by EUSPA

7 – Applications for Galileo, EGNOS and Copernicus, including Galileo PRS & GOVSATCOM

- **HORIZON-EUSPA-2023-SPACE-01-41**: EGNSS - Transition towards a green, smart and more secure post-pandemic society
- **HORIZON-EUSPA-2023-SPACE-01-42**: EGNSS - Closing the gaps in mature, regulated and long lead markets
- **HORIZON-EUSPA-2023-SPACE-01-43**: Copernicus-based applications for businesses and policy-making
- **HORIZON-EUSPA-2023-SPACE-01-46**: Designing space-based downstream application with international partners
- **HORIZON-EUSPA-2023-SPACE-01-61**: EU GOVSATCOM for a safer and more secure EU
- **HORIZON-EUSPA-2023-SPACE-01-45**: Joint test activities for Galileo PRS services
- **HORIZON-EUSPA-2023-SPACE-01-44**: The Galileo PRS Service for governmental-authorised use cases

HORIZON-EUSPA-2023-SPACE-01-41: EGNSS - Transition towards a green, smart and more secure post-pandemic society (1/2)

Expected Outcomes :

- Stimulate the development, validation and use of efficient & resilient commercial downstream solutions based on **synergies between the different EU space programme components** and cutting-edge digital technology.
- Foster the development and validation of space technologies that **improve the quality of life in Europe**, toward environmentally-friendly and energetically-efficient communities.
- Create new space-based commercial opportunities by **exploiting digitalisation and the adaptation of business processes in the post-pandemic environment** in order to improve prospects of businesses.

Indicative budget: EUR 3.50 million
EU contribution per project: EUR 1.50 million to 2.50 million
Type of Action: Innovation actions

TRL: 7-9

European Commission

HORIZON-EUSPA-2023-SPACE-01-41: EGNSS - Transition towards a green, smart and more secure post-pandemic society (2/2)

Scope:

Proposals should **leverage EGNSS services** including their differentiators (OSNMA, HAS, RLS, CAS, etc.) to develop technologies that focus on commercial exploitation in one of the following priority areas:

- Improving the **quality of life in cities** by addressing efficient mobility, energy efficiency and environmental friendliness, including the green, safe and digital transition of the construction industry. They can also cover solutions for personal assistance, healthcare, support to the elderly and city dashboards.

- Addressing the **challenge of higher reliance on existing infrastructure**, the increased use of remote resources and the associated cyber-threats. Proposals may cover applications for claims assessment (insurance), timestamping of transactions (finance), as well as commodities trading and risk assessment, including solutions for the certification of GNSS based timing equipment. Ideas from the energy sector could emphasise increasing the share of electricity from renewables (e.g. monitoring and forecasting of electricity generation from wind and solar power).

In addition to synergies with EGNOS and Copernicus, applications may also consider the integration of future GOVSATCOM services into their commercial solutions and the use of data models for transforming the Galileo signal to a proper geodetic reference frame.

HORIZON-EUSPA-2023-SPACE-01-42: EGNSS - Closing the gaps in mature, regulated and long lead markets (1/2)

Expected Outcomes :

- Broaden the reach of EGNSS by supporting its **adoption in long lead markets** including rail, maritime inland waterways, fisheries and aquaculture, road and automotive, and aviation
- Development of industry-accepted **certification and standardization schemes** that exploit the use of EGNSS and its differentiators for operational services

Indicative budget: EUR 8 million
EU contribution per project: EUR 1.50 million to 2.50 million
Type of Action: Innovation Actions

TRL: 7-9

European Commission

HORIZON-EUSPA-2023-SPACE-01-42: EGNSS - Closing the gaps in mature, regulated and long lead markets (2/2)

Scope:

- **Rail safety critical applications** that support the rail network efficiency and cost reduction, converging towards a pan-European EGNSS-based solution adoption. Addressed activities can include the amendment of the European Rail Traffic Management (ERTMS) technical specifications for interoperability to support the use of EGNSS, and synergy with Copernicus / GOVSATCOM / other sensors for infrastructure monitoring.

- EGNSS-supported operations **in coastal, harbour and maritime areas** (including for energy production), inland waterways, fisheries and aquaculture, addressing potential standardization and certification bottlenecks and assisting a diverse pool of stakeholders.

- Certification bottlenecks for the use of EGNSS for **road and automotive market** safety-related applications (e.g. connected and autonomous cars, emergency assistance), liability applications (e.g. insurance telematics) and fleet management systems. Areas requiring further consolidation: Galileo Emergency Warning System (WES), Galileo HAS in the deployment of 5G high accuracy networks, reduction of congestion charging in cities, road maintenance.

- **Aviation**: consolidation of standardization and certification for efficient and green operations supported by EGNSS, EGNSS timing for 4D trajectory operations, EGNSS timing for System Wide Information Management (SWIM), integration of Dual Frequency Multi-constellation (DFMC) SBAS in avionics/aircraft and integration of Copernicus data into current aviation systems, and supporting airport operations via DFMC and the Galileo ARAIM. Proposals may also include applications **for drones' urban air mobility**, e.g. urban air deliveries trough EGNSS data and services for the navigation operations, supported by EO data with provision of meteorological data and obstacle information.

- Proposals could explore **synergies with Copernicus and/or GOVSATCOM**, addressing the certification and regulatory aspects that their use might bring.

HORIZON-EUSPA-2023-SPACE-01-43: Copernicus-based applications for businesses and policy-making (1/2)

Expected Outcomes :

- **Enhance existing applications or develop new applications and products relying on Copernicus** data and services, making an impact on users, businesses and/or answering needs from public authorities, e.g. support policy making and implementation such as for the Green Deal, Destination Earth or the Horizon Europe missions
- Increase the integration and uptake of Copernicus data, services and applications in the European economy, in particular the European data economy

Indicative budget: EUR 7 million
EU contribution per project: EUR 1.00 million to 2.00 million
Type of Action: Research and Innovation Actions

TRL: 2

HORIZON-EUSPA-2023-SPACE-01-43: Copernicus-based applications for businesses and policy-making (2/2)

Scope:

- **Emergency service** downstream applications for better preparedness to extreme events, geohazards, prediction insurances, resilience to climate change, local emergency management and short-term recovery
- **Security service** downstream applications or exploiting the combination of Sentinels with national missions or new space services to support resilience to major pan-European crises like pandemics
- **Marine service** downstream applications with special focus on biodiversity conservation, maritime spatial planning, local and demersal fisheries, coastal to shore services, new sources of pollution from land and blue carbon farming. The applications shall build on existing infrastructure and services
- **Climate change service** downstream applications, e.g. forecast and preparedness to counteract extreme climate events and/or Sentinel Data integration in decision-support systems
- **Land service** downstream applications for better land use and/or natural resources planning, as well as citizen awareness and reporting of environmental and biodiversity protection issues
- **Atmosphere monitoring service** downstream applications that tailor, refine and combine the products for serving users particularly in the areas of air quality, health, biodiversity, wildfires monitoring and greenhouse gases.
- A proposal should address **only one area**, which should be clearly indicated

HORIZON-EUSPA-2023-SPACE-01-46: Designing space-based downstream application with international partners (1/2)

Expected Outcomes :

- **Use of EGNSS and sharing of expertise** with public and/or private entities to introduce EU-space based solutions leveraging in particular Galileo differentiators and European know-how
- The **use of Copernicus data**, to develop jointly algorithms, services and/or products, which serve local user needs and/or enhance the Copernicus global product quality
- The **combined use of EGNSS and Copernicus** to develop innovative downstream applications
- *Legal entities established in countries that have signed an administrative cooperation arrangement on Copernicus data access and Earth observation data exchange are* ***exceptionally eligible for Union funding:***
  United States, Australia, Ukraine, Chile, Colombia, Serbia, African Union member states, India and Brazil

Indicative budget: EUR 6.00 million
EU contribution per project: EUR 0.80 million to 1.00 million
Type of Action: Research and Innovation Action

TRL: 3-4

European Commission

HORIZON-EUSPA-2023-SPACE-01-46: Designing space-based downstream application with international partners (2/2)

Scope:

- Proposals should target one of the three expected outcomes
- Actions should focus on technical developments of EU-space based solutions, dissemination, awareness-raising, as well as provide **opportunities for the creation of business-oriented partnerships** between European industry and international partners in order to demonstrate the advantages of the differentiators
- It is important to **exploit the value-added of integration** of EO data (both satellite, airborne and ground-based) with positioning data and ICT (e.g. cloud computing) from international partner countries
- Proposals dealing with EGNSS are encouraged to **involve relevant organisations** on the European side (e.g. EASA, ESSP, EMSA)
- **When dealing with Copernicus-based applications, participation of at least one partner from a country that has signed a Copernicus Cooperation Arrangement is required**
- Proposals are encouraged to use the Copernicus DIAS and integrate third-party data

HORIZON-EUSPA-2023-SPACE-01-61: EU GOVSATCOM for a safer and more secure EU (1/2)

Expected Outcomes :

- Identification, assessment and development of one or more suitable use cases in the area of surveillance, crisis management and key infrastructure;
- Support the development and/or improvement of GOVSATCOM demonstration terminals enabling end-to-end validation of the first services provided by the GOVSATCOM HUB
- Elaborate the definition of the GOVSATCOM validation strategy and a user engagement plan
- Foster the identification/definition of GOVSATCOM tools required for the development of the GOVSATCOM terminals
- Develop the application necessary to enable end-to-end demonstration of the selected use case(s) using services provided by the EU GOVSATCOM Hub and operational terminals
- Perform extensive in-field activities and a final demonstration aimed at verifying the suitability of the solution, involving the relevant user communities

Indicative budget: EUR 10.00 million
EU contribution per project: EUR 3.00 million to 4.00 million
Type of Action: Innovation Actions

TRL: 7-9

Eligibility: at least one public entity must participate as member of the consortium selected for funding as the public entities are the main users of GOVSATCOM

HORIZON-EUSPA-2023-SPACE-01-61: EU GOVSATCOM for a safer and more secure EU (2/2)

Scope:

- Proposals should select at least one GOVSATCOM use case and support the adaptation of one or more existing SATCOM terminals in order to carry out the demonstration and ensure engagement of relevant user communities
- Proposals focusing on the following areas are encouraged:
    - Disaster response or Emergency services / ambulances (for Civil Protection)
    - Rail traffic management to improve the limitations linked to geographical barriers (e.g. valleys, cities)
    - Telemedicine for humanitarian aid
- The projects should improve one or more operational terminals to demonstrate the access of the respective users to an early EU GOVSATCOM service, showcasing the benefits and fostering users' uptake
- The equipment should support demonstration activities of the early developed services

HORIZON-EUSPA-2023-SPACE-01-44: The Galileo PRS Service for governmental-authorised use cases

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
9	1 to 2	5	Delegated to EUSPA - IA	5/7	Lump sum	Yes

Expected outcomes:

- **Develop the use cases for authorised civilian users** based on the added value of PRS service;
- **Develop the PRS applications** targeting civilian users by leveraging PRS technology;
- Build on top of previous exploratory activities and lessons learnt on the development of PRS items by stimulating the corresponding downstream PRS uptake;
- **Foster a European-level cooperation** of industrial entities for the development of authorised PRS applications;

Scope: Proposals should identify, design and create applications leveraging the items for the first generation of Galileo. Applications should address the governmentally authorised user communities and scenarios for which the technical, operational and security related features requirements of PRS Service constitute barriers to entry.

HORIZON-EUSPA-2023-SPACE-01-45: Joint test activities for Galileo PRS services

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
3	1,5 to 3	2	Delegated to EUSPA - IA	6/7	Lump sum	Yes

Expected outcomes:

- Support the Programme activities related to the validation of the PRS Service, Support the PRS Participants defined activities related to testing, validation and introduction of the PRS Service;
- Build on top of previous Joint Test Activities and lesson learnt thereof;
- Foster cooperation among European PRS Participants.

Scope:

1. Proposals shall be coordinated by the Competent PRS Authorities and should address actions related to the1) **validation and verification PRS Service** (support to the Galileo Programme); 2) **testing of PRS Service and PRS items** (PRS Participants actions); and 3) **preparation of the awareness activities and uptake to the authorised users**.
2. The proposed activities shall be carried out in full compliance with applicable regulatory framework (e.g. Decision 1104/2011, PRS regulatory framework).

8 – Cassini

- Support to New Space - CASSINI Business Accelerator
- Support to New Space - CASSINI Hackathons & Mentoring
- Support to New Space - CASSINI myEUspace

Will be presented by EUSPA ☺

C. Implemented by ESA (mostly)

9 – Space Weather & NEO

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
5,70		TBD	Delegated to ESA	TBD	N/A	No

Space Weather:

- Research and innovation activities will deal with "**development of certain technology elements for promising precursor services including development, testing and validation of physics-based space weather models**" and "**exploratory space weather payloads studies**". They shall be complementarity to Space Weather services developed through the Space Situational Awareness component of the EU Space Programme.

Near Earth Objects:

- Research and innovation activities will study "**precursor services / European hot-redundant Minor Planet Centre backup**" and "**Increase networking of national assets**".

10 – EGNSS Upstream

- Other Actions: Mission and Services
- Other Actions: Technology and Infrastructure
- Other Actions: Operations and service provision

EGNSS Mission and Services

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
2023 – 2,5 2024 – 2,5	n/a	TBD	COM Public procurement	N/A	N/A	TBD on a case-by-case basis

- The objective is to **study potential new user needs**, as well as the resulting enhancement of services, and determine whether and **how the EGNSS programmes Galileo and EGNOS shall evolve** to answer these new user needs. This includes the preparation of contributions and technical analysis supporting the EU position in multilateral and bilateral working groups and meetings.
- The upstream R&D actions in this area will cover the assessment of new mission concepts and of services improvements and of new services or capacities to be introduced based on the user needs, developing the service concept including with international partners when relevant, assessing costs to the programme versus benefits to users and defining the roadmap of activities until an operational service could be provided.

EGNSS Technology and Infrastructure

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
2023 – 43 2024 - 43	n/a	TBD	Delegated to ESA	N/A	N/A	TBD on a case-by-case basis

- Actions under this area will address upstream R&D activities. They will cover the **maturing of the existing technologies and the development of new and emerging technologies** (e.g. Low Earth Orbit Positioning, Navigation and Timing EOPNT), the engineering activities for the further evolution of Galileo and EGNOS existing systems, technical studies for the assessment of exploratory system concepts and/or responding to new mission needs and a changing environment, the development and maintenance of state-of-the-art system tools and technical test-beds, the implementation of actions agreed at Programme level to reduce the dependence of the supply chain on non-EU markets, the definition, design, development and implementation of experimental satellite demonstrator, and others.

EGNSS Operations and service provision

Budget - € million		# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
2023 only – 5	n/a	TBD	Delegated to EUSPA	N/A	N/A	TBD on a case-by-case basis

- The improvement of the complex operations is essential to improve the performance of EGNSS services. Likewise, maintenance activities must be subject to a continuous improvement process to guarantee the service continuity. Actions under this area will cover the **development and use of service demonstrators to consolidate the future EGNSS services**, **the optimization of the operation scheme**s using advanced dynamic strategies (e.g. machine learning, advanced on-board diagnosis, predictive maintenance) for Galileo constellation / system management for the efficient and continuous provision of the full portfolio of Services in EGNOS and in Galileo, and others.

11 – GOVSATCOM / Secure Connectivity (IRIS^2)

- Other Actions: GOVSATCOM/Secure Connectivity infrastructure
- Other Actions: GOVSATCOM/Secure Connectivity upstream R&D

GOVSATCOM/Secure Connectivity infrastructure: Development and Validation

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
2023 – 28 2024 – 20,6	tbd	TBD	Delegated to ESA	TBD	N/A	TBD on a case-by-case basis

- The Commission has adopted a proposal for a Union Programme for Secure Connectivity. The future satellite-based communication infrastructure should build upon the GOVSATCOM component of the EU Space Programme, which should also take advantage of additional national and European capacities, and develop further the European Quantum Communication Infrastructure (EuroQCI) initiative.
- This action should therefore enable and **support the development and validation actions for the construction of the initial space and ground infrastructure required for the provision of governmental services**. This includes the development and validation of the Quantum Key Distribution (QKD) payload for the EuroQCI 1st generation satellites based on EU technologies.

GOVSATCOM/Secure Connectivity upstream technology R&D activities

Budget - € million	Per project - € million	# of projects	Type of action	TRL by end of project	Financial set-up	Country restriction
2023 only - 10		TBD	Delegated to ESA	TBD	N/A	TBD on a case-by-case basis

- A number of key technology needs have been identified in order to provide state of the art GOVSATCOM services, either through the GOVSATCOM pooling and sharing HUB or through a new secure connectivity infrastructure. These activities will be implemented by ESA under Contribution Agreement between the Commission and ESA.
- The upstream R&D actions in this area will cover **development of critical building blocks in the space segment**, **ground control and mission** (network) **segment and user segment terminals**, such as multi-orbit compatible broadband user terminals and government services user terminals.
- Proposals under this topic should explore synergies and be complementary to already funded actions in the context of technology development at component level. In particular, the topics: Critical Space Technologies for European non-dependence (H2020 SPACE-10-TEC-2018-2020, COMPET-1-2014-2015-2016-2017, HorizonEurope 2021-SPACE-01-81, 2022-SPACE-01-81). Furthermore, activities must be complementary to national activities and activities funded by ESA, while contributing to EU non-dependence (at system, equipment and component level).

12 – IOD/IOV

Expected outcomes:

- To contribute to reduce the time to market or operational use of new technologies, products, concepts, architectures, and operations techniques;
- To provide a cost-effective service for regular aggregation (if needed), launch and operations in orbit for IOD/IOV experiments, based on EU solutions both for the spacecraft and for the launch services;
- To have at least one opportunity every year during the Horizon Europe implementation period.

Scope:

- The IOD/IOV activities intend to provide a regular and cost-effective service and solution for common flight ticket actions (management, spacecraft design including reuse of existing solutions, assembly, integration and tests, launch and operations) based on EU solutions both for the spacecraft (i.e. platform, experiments aggregation, operations in orbit including preparation and associated Ground Segment) and for the launch services.
- The scope of the activities may include mission design, integration and implementation, for all the necessary tasks to prepare, provide and operate spacecraft(s), together with the related ground segment, which accommodates the selected IOD/IOV experiments as well as the associated launch services.
- Concerning launch aspects, IOD/IOV activities should support the European launcher exploitation policy, therefore relying as far as possible on EU manufactured launcher solutions launched from the EU territory.

Budget:

€15,1 million in 2023 and €13,0 million in 2024

IOD/IOV Service – Overview

- **Implementation** is entrusted to ESA on behalf of the European Commission
- The IOD/IOV service is broadly **open to** experiment providers from academia, research organisations, SMEs, large industrial companies, space agencies, etc.
- IOD/IOV **experiments** are defined as innovative technologies, products, concepts, architectures, and operations techniques, They may be instrument, equipment, technologies, system experiment, missions, industrial payloads, etc.
- Experiments may be accommodated **on IOD/IOV spacecrafts or** be provided as **complete systems (satellites)**
- Experiments will receive free **IOD/IOV services** :
  - ❑ aggregation on a carrier, if needed
  - ❑ launch
  - ❑ operations

IOD/IOV Service – Process & Schedule

March – May 2022

- Call for Expression of Interest (EoI) for experiments.

June – July 2022

- Analysis of received applications by independent experts and ESA experts.

Aug – Sept 2022

- Preliminary accommodation analysis by ESA to identify possible configurations of missions (cubesat/ smallsat) and confirm the experiment pre-selection

July – Dec 2022

- ESA tendering and contracting for procurement of platform and aggregation services.

2023 – 2024

- Procurement of launch services.

2023 – 2025

- Launch of missions and complete systems.

Constraints and requirements for experiments *(Call 2022)*

- Experiments shall preferably have technology readiness level (TRL 5/6).
- For experiments needing aggregation, compliance with resources and interfaces compatible with small satellites/ cubesat missions.
- For experiments in the form of complete systems (i.e. ready to fly satellites), compatibility with EU manufactured launcher solutions.
- Compliance with the overall planning regarding flight model delivery and launch (as indicated in the Call for Expression of Interest).
- Providers are required to fund their own experiments.
- A platform needing demonstration and validation services can be considered as an IOD/IOV experiment in the form of complete system.

IOD/IOV Service – New Opportunities as of early 2023

For experiments

Permanently open calls for Expression of Interest, with multiple cut-off dates for:

- IOD/IOV Experiments needing aggregation → by COM
- Ready to Fly IOD/IOV satellites (i.e. complete systems) → fast joint scheme by COM/ESA with new co-funding mechanism

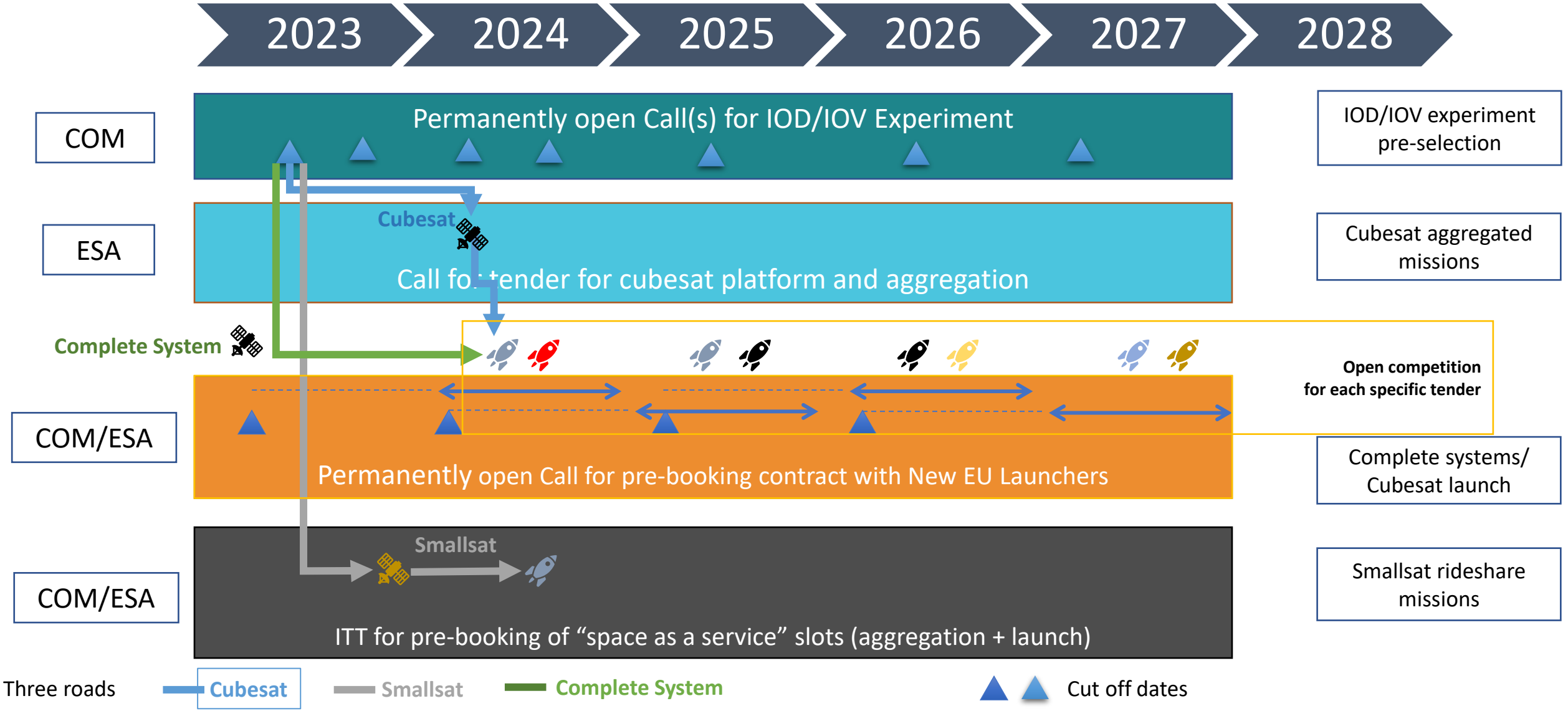
For EU system integrators

- Procurement of cubesat/ smallsat carriers and associated aggregation services → by ESA

For EU launch service providers

- “Flight Ticket Initiative”: Call for Expression of Interest to select a pool of available EU launch solutions that could compete for each specific contract → by COM/ESA

IOD/IOV Initiative *(as of 2023)*



Thank you for your attention!

Contact: isabelle.maes@ec.europa.eu

HorizonEU

http://ec.europa.eu/horizon-europe

Back-up slides Cassini

CASSINI myEUSpace

Expected Outcomes:

- To enhance the spur-of-the-moment development of innovative commercial solutions based on data and information coming from Copernicus satellite images and Galileo positioning signals and services, with a view to:
  - Incentivize new ideas;
  - Develop prototypes further into viable business propositions;
  - Support commercialization and scale up of final products;
- Addressing specific EU priorities (e.g. EU green deal, digitisation, resilience, etc.);
- To stimulate innovation and maximize innovative applications with commercial and social benefits, impact and a clear market uptake endeavor;
- To explore synergies and integration of space data with other non-space, deep technologies (e.g. AI, extended reality, quantum, metaverse).

Budget: €1 million

Cut-off dates:

- 30/11 cut-off for submission of ideas → **15 ideas awarded**
- 10/02 submission of prototype → **10 best prototypes awarded**
- 25/04: submission of product → **5 best products awarded**

CASSINI Business Accelerator

Expected Outcomes:

- The aims are to **promote commercial use cases for the EU's space programme and the commercialisation** of the products of New Space companies, by providing qualified business development support. The objective is to increase the number of space-based companies that achieve high revenue growth. This will allow the companies to attract investments and capture new market shares.
- The expected economic benefits include an increase in the number of successful start-ups and scale-ups using space data and space technology, through an increase in sales, market share growth and staff hiring. These outcomes will allow the companies to attract larger amounts of financing through bank loans and equity investments.

Budget: € 8,5 million

CASSINI Hackathons & Mentoring

Expected Outcomes:

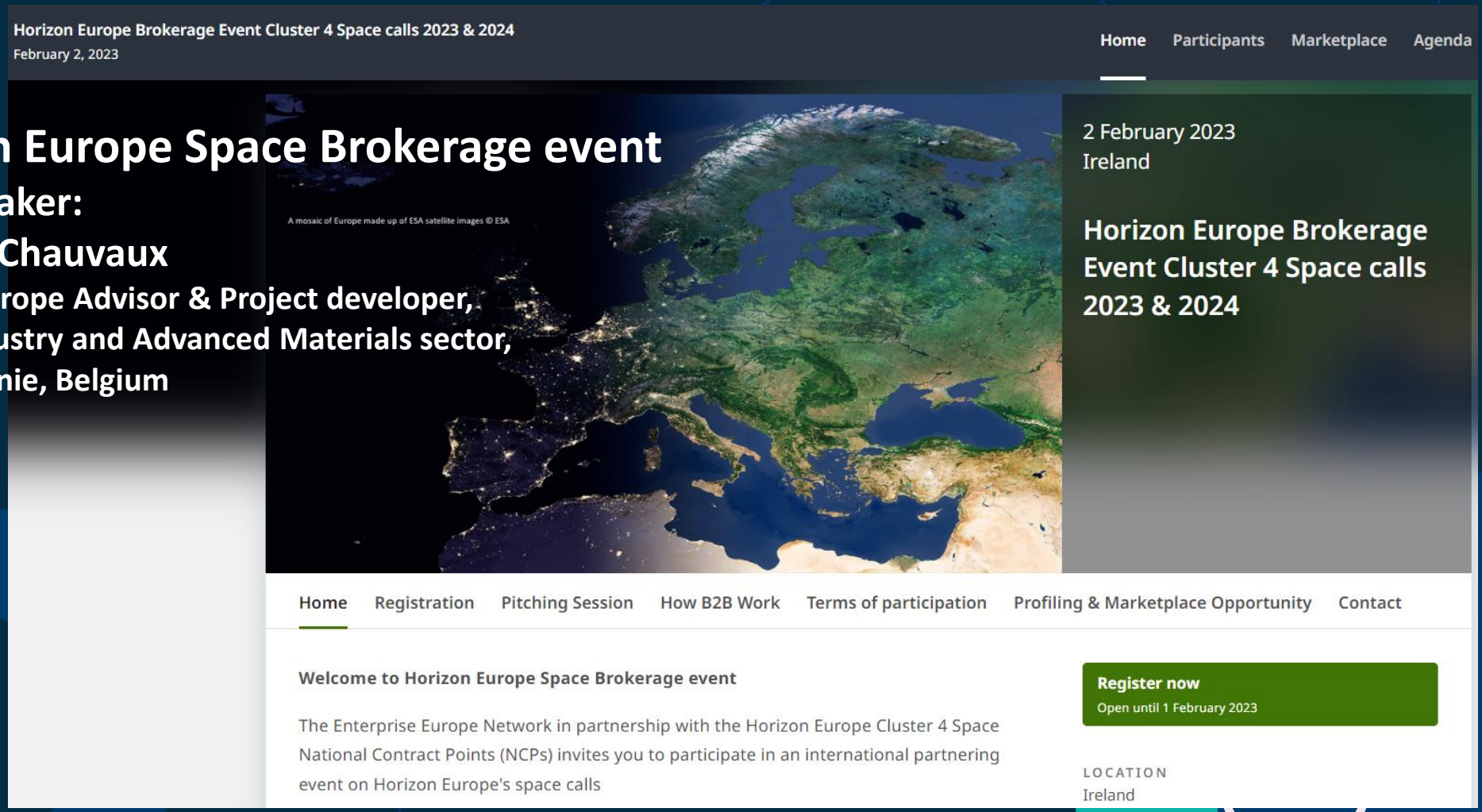
- To solve important problems for society & industry with a purpose
- To foster the next generation of space entrepreneurs
- To stimulate the spur-of-the-moment development of innovative applications based on data and information coming from Copernicus satellite images and EGNOS and Galileo positioning signals and services.
- To give people hands-on experience with EU space data and signals
- To promote the EU's space programmes Copernicus and EGNOS/Galileo to a broader audience.

Budget: € 8,5 million

HORIZON EUROPE

Horizon Europe Space Brokerage event

NCP Speaker:
Thomas Chauvaux
Horizon Europe Advisor & Project developer,
Space, Industry and Advanced Materials sector,
NCP Wallonie, Belgium



ncpwallonie.be

“Horizon Europe National Contact Point”

Your official partner to support you in European project

03/02/2023

NCP Wallonie


Francisco Santana Ferra – Coordinator & Manager
Sylvia Gaspard – Event Manager & Data Analyst
Alicja Rystowska – Project Manager E.E.N
Valentina Albarani – Advisor Health, EIC/EIT
Mathias Lucas – Advisor Climate, Food, Environnement, NCP Legal & Finance
Thomas Chauvaux – Advisor Industry, Space, Advanced Materials
Lison Rabuel – Advisor Digital, Security, Defence
Jean-Jacques Lemaire – Advisor Energy, Mobility, Raw Materials
Jennifer Lecluse – Senior Communication Officer







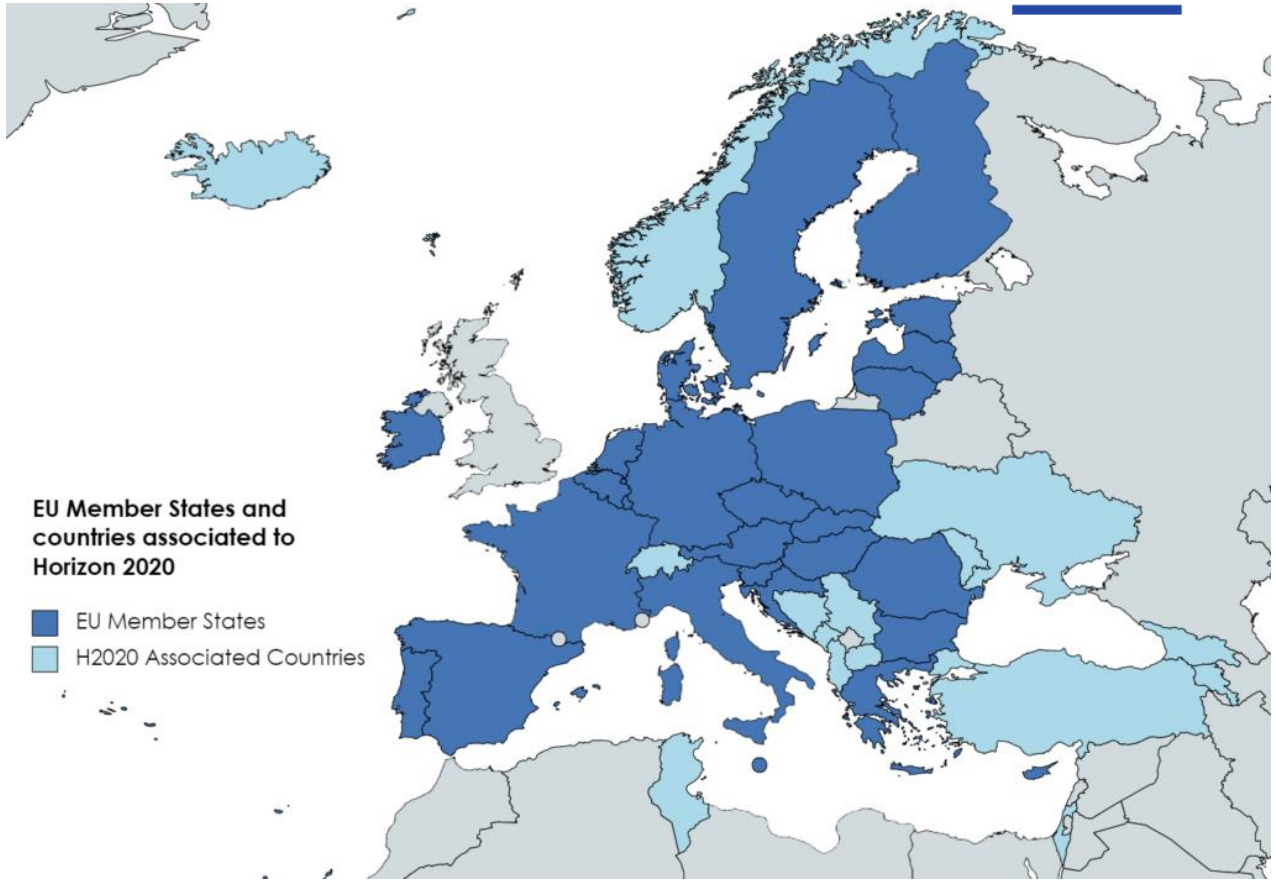
Where ?

There is always a NCP nearby !

- **All EU members states**
- **All associated countries**
- **Some non-associated countries**

or third countries (low&middle income)

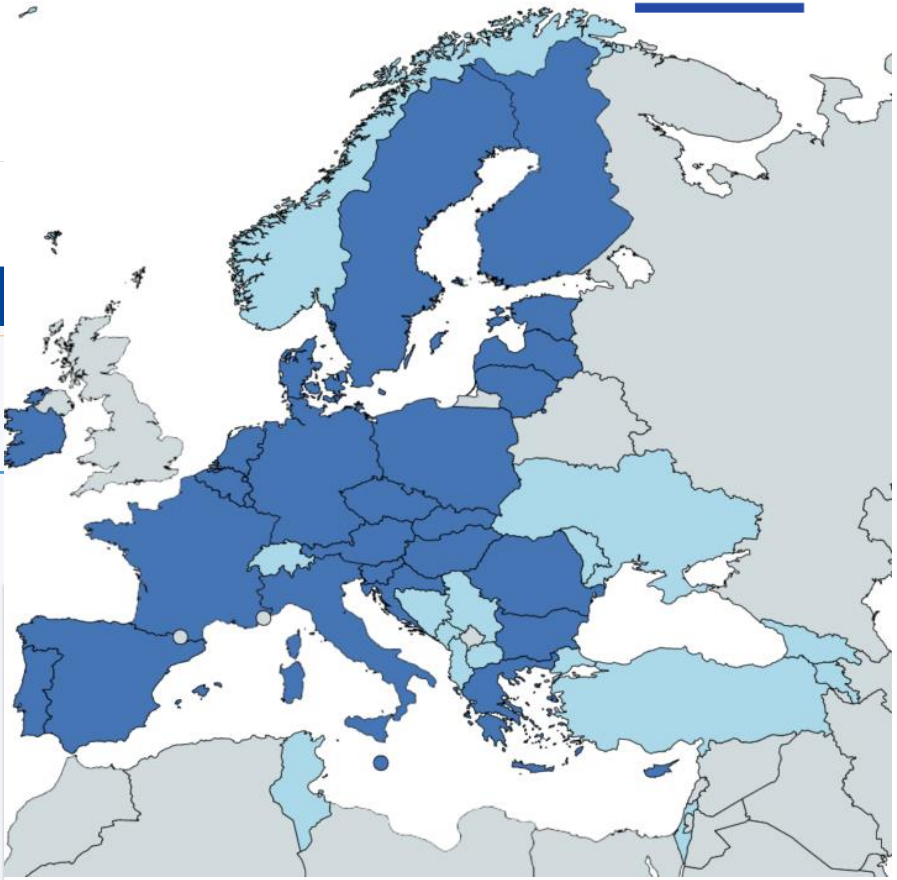
- Albania
- Armenia
- Bosnia & Herzegovina
- Faroe Islands
- Georgia
- Iceland
- Israel
- North Macedonia
- Morocco
- Moldova
- Montenegro
- Norway
- Serbia
- Tunisia
- Turkey
- Ukraine



Where ?

There is always a NCP nearby !

List of NCP ➔ go to F&T portal



European Commission | Funding & tender opportunities
Single Electronic Data Interchange Area (SEDIA)

SEARCH FUNDING & TENDERS | HOW TO PARTICIPATE | PROJECTS & RESULTS | WORK AS AN EXPERT | SUPPORT

National Contact Points for Horizon Europe

The network of National Contact Points (NCPs) is the main structure to provide guidance, practical information and assistance on all aspects many non-EU and non-associated countries ("third countries").

Search by

Country Group: Member states*, Ass...
Country(ies): Select a country...
Function(s): Digital, Industry and ...

Clear

Order By: Country | Contact | Recent | Organisation

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/support/ncp

What ?

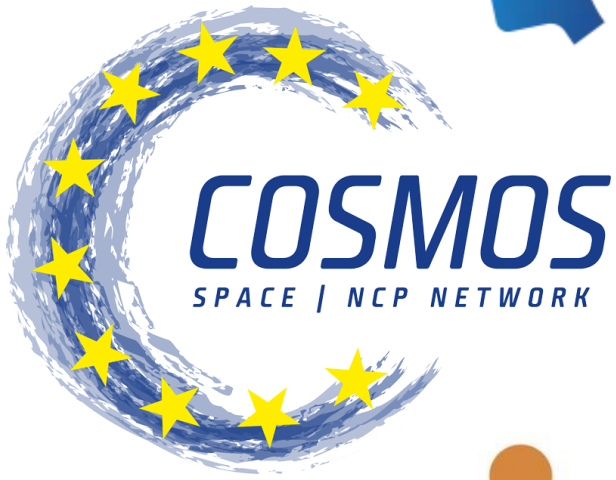
- NCP services

- Informing — Circulate info, promotional activities
- Training — Workshop on proposal writing, infos session
- Connecting — Researchers/ Organisations - new actors & SME's, partner search using network (EEN!)
- Advising — Administration, Appropr. Mgmt, modalities of funding schemes
- Reviewing — Assistance on L&F issues and proposal check
- Sign posting — Guidance on relevant EU program

Why ?

- The network of National Contact Points (NCPs) = structure to provide guidance, practical information and assistance on all aspects of participation in Horizon Europe
- **Main interface** between the Commission/ Agencies and the applicants
- NCPs are **national structures** in MS and AC
- '**No wrong door**' principle !
- Usually **free of charge** services

NCP networks



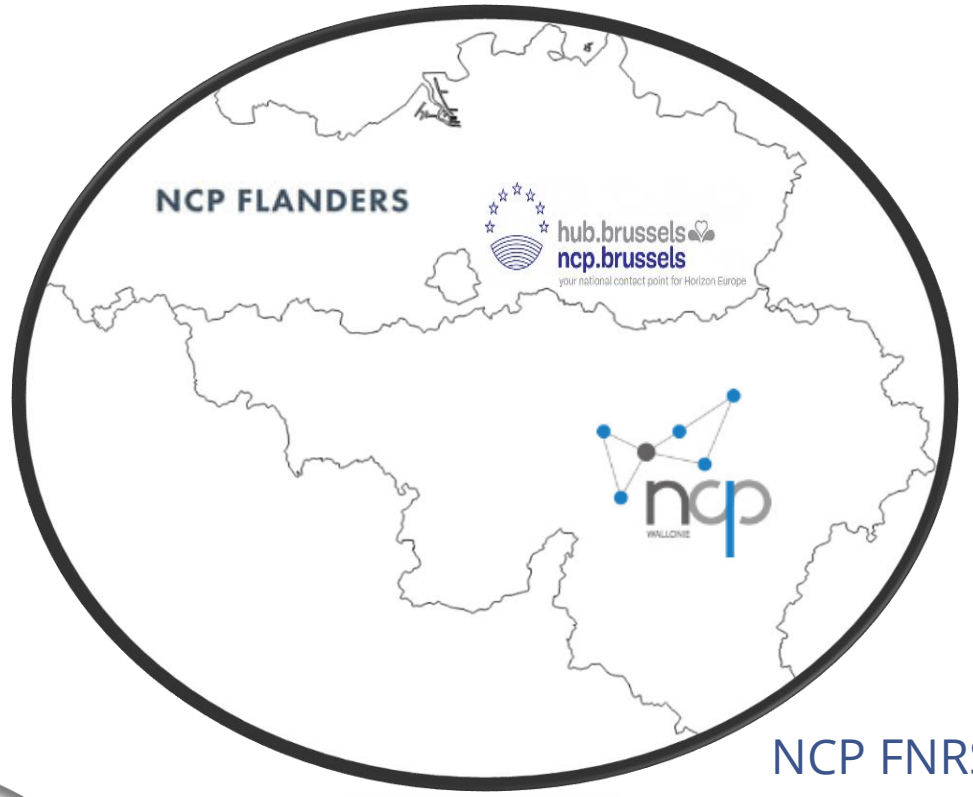
NCP networks

- Initiated during FP7, now **COSMOS4HE**
- Runtime: July 2022 – August 2025
- Partner: NCPs from 16 countries
- Coordinator: Greece

Organise Brokerage event on regular basis

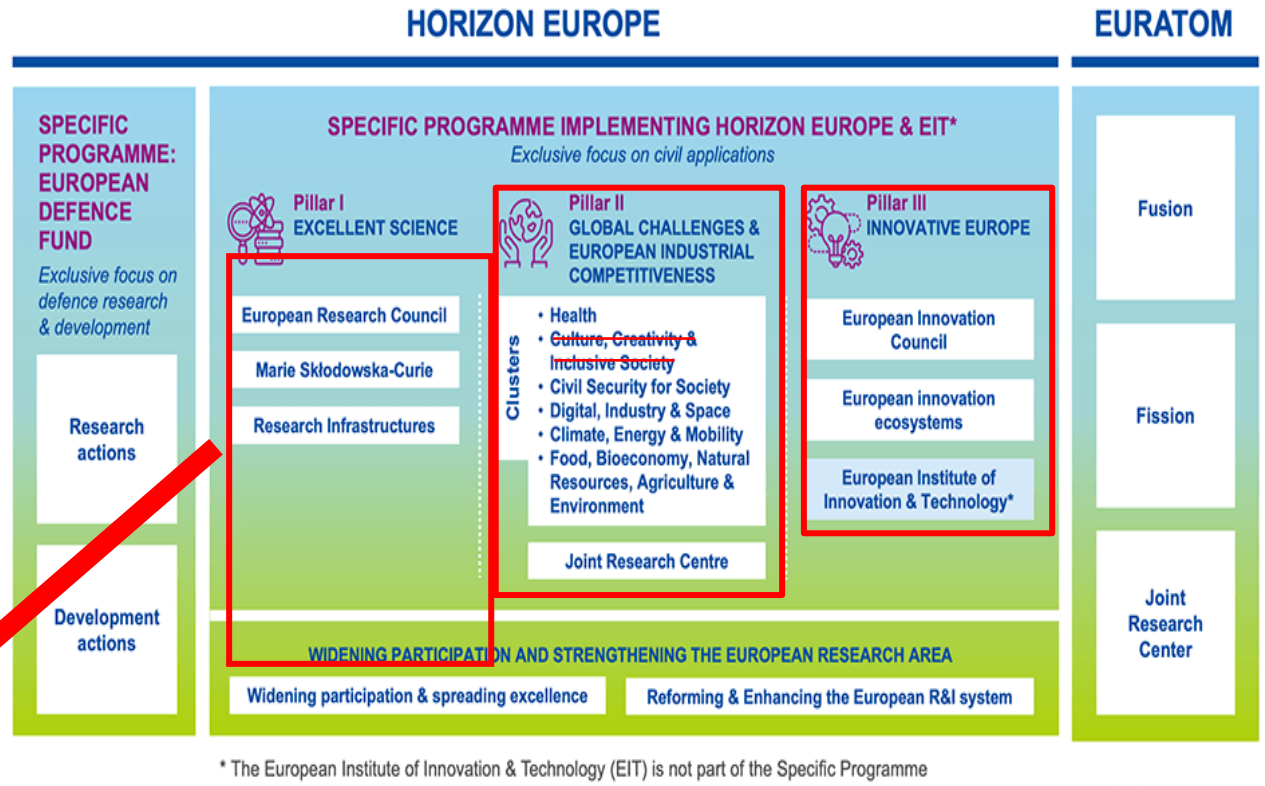
✓ Past 8th of December for Cluster 4 – Space calls 2023

Belgium NCPs



NCP FNRS

3 regionals NCP for 3 regions in pillar II & III



+ 1 federal NCP : BELSPO

Other programs we follow

NOS SERVICES

Digital Europe Programme

EUROPEAN DEFENCE AGENCY

Life

INNOVATION FUND programme

Inform

Advise

Connect

Fews numbers in Wallonia

- EU space projects related under H2020 :

25 projects funded

Total budget funded : 7.548.690 €

12 Walloon actors

- EU space projects related under Horizon Europe :

4 projets financés

Total budget funded : 2.555.680 €

5 Walloons actors

Merci pour votre attention

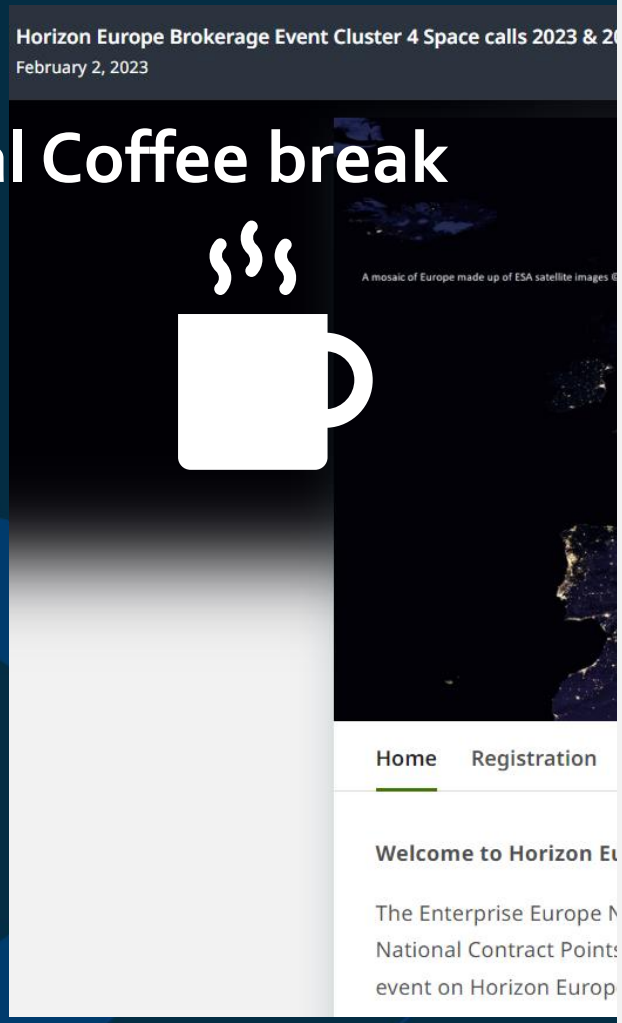
Retrouvez-nous sur ncpwallonie.be

ncp-wallonie

NCPWallonie

Horizon Europe Space Brokerage event

Virtual Coffee break



Horizon Europe Brokerage Event Cluster 4 Space calls 2023 & 2024

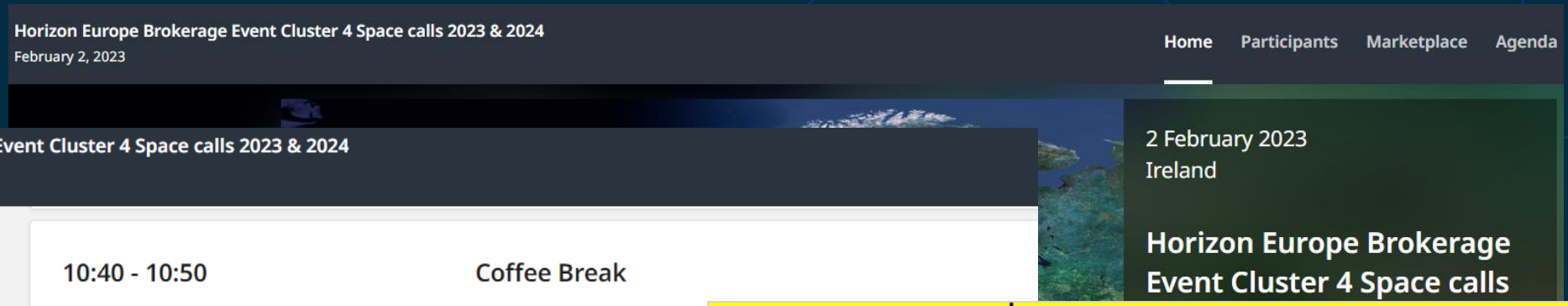
Thursday, February 02, 2023

09:00 - 09:30	Registration, Coffee and Networking
09:30 - 09:40	Welcome and Introduction
09:40 - 10:20	Commission Remarks
10:20 - 10:30	EUSPA - EU Agency for the Space Programme
10:30 - 10:40	Horizon Europe National Contact Point
10:40 - 10:50	Coffee Break

HORIZON EUROPE

Horizon Europe Brokerage Event Cluster 4 Space calls 2023 & 2024
February 2, 2023

Home | Participants | Marketplace | Agenda



Horizon Europe Brokerage Event Cluster 4 Space calls 2023 & 2024
February 2, 2023

10:40 - 10:50	Coffee Break
10:50 - 11:55	Elevator Pitches
11:55 - 12:00	Closing comments
12:00 - 21:00	1:1 Meetings to buil

National Contract Points (NCPs) invites you to
event on Horizon Europe's space calls

Pitch Presenter	Company running order
César Gracia Berges	Kineis
Lee Barry	Varadis
George Suciu	BEIA Consult International
Eoghan Gilleran	SUAS Aerospace
Aya Radi	Global Smart Rescue
Freddy Gabbay	Technion Israel Institute of Technology
Mark McCarville	Mindseed
Kevin O'Neill	PixQuanta
Danny Gleeson	Realtra Space Systems Engineering
Mohammed Hassine	Tisalabs
David Browne	School of Mechanical and Materials Engineering, UCD
Derek Harris	Nammo Ireland

European Commission

HORIZON EUROPE

Horizon Europe Space Brokerage event

kinéis

Kinéis

New space for IoT data connectivity world-wide

Kinéis: our company and technology offer

French satellite telecommunications operator

- 60 employees (90% R&D & Innovation engineers), Toulouse
- Experience in EU funded projects: ESA, Horizon Europe, Eurostars…
- 9 ARGOS legacy satellites + 25 nanosatellites to be launched in 2023
- Fundraising of 100M€ in 2020: new constellation fully funded
- 20.000 active IoT devices

Global data connectivity for connected objects (IoT)

- Miniaturization: small modems (2cm*3cm), easy integration (UART)
- Small data packets (3 to 27 bytes) for very low energy consumption (100-500mW)
  → *Long autonomy on small batteries for autonomous devices*
- Low cost: modems (15-25 euros) and airtime (monthly fee 1 to 10 euros / device)

- Global coverage, no white spots, no roaming
- Dedicated licensed frequency bands ~400MHz
- Downlink: remote configuration, commands
- Native Doppler-effect geolocation (low precision)
- Revisit time (latency): 5 to 15 minutes

Kinéis: our IoT markets

Sciences & Environment

Humanitarian

Maritime

Smart agriculture

Outdoor activities

Networks & Infrastructures

Transports & Logistics

Topics cluster 4 – Copernicus + in-situ data collection devices

Different topics can benefit from in-situ data collection (IoT devices deployed in the field)

In-situ quick detection and alerting to trigger Copernicus-based analysis / actions

Remote inland zones and oceans: need for satellite IoT backup data connectivity

- **HORIZON-CL4-2023-SPACE-01-32 - Copernicus for Emergency Management** :
  In-situ detection & alert: radioactivity, chemical leaks (air/water), forest fires, flood…
  Example: Kinéis Eurostars project FORESTSENS (forest fire detection)
- **HORIZON-CL4-2023-SPACE-01-33 - Copernicus in-situ component** :
  In-situ data for production, calibration and validation of Copernicus data services + quick alerts
- **HORIZON-CL4-2023-SPACE-01-34 - Copernicus for Marine Environment Monitoring** :
  In-situ detection & alert: hazards of natural or anthropic origins, storm, flooding, acidification, leaks
- **HORIZON-CL4-2024-SPACE-01-36 - Copernicus for Security** :
  Remote sensors in unpopulated borders, fragile areas, accident prone zones…
- **HORIZON-CL4-2024-SPACE-01-35 - Copernicus for Land and Water**

Topics cluster 4 – Satellite technology enablers

- **HORIZON-CL4-2023-SPACE-01-11 - End-to-end Earth observation systems and associated services :**
  "Contribute to European non-dependence for the development of Earth-observation technologies"

  Kinéis constellation can be used to implement quick satellite relays between EO satellites and ground stations (via ISL links) → reduce EO services latency

- **HORIZON-CL4-2023-SPACE-01-12 - Future Space Ecosystem and Enabling Technologies :**

  Kinéis future constellation (2030): near-real time, higher capacities, UHF and S bands

  Looking for partners, providers of technology components: multibeam easy deployable antennas for cubesats, SDR payloads, etc.

Contact details:

César Gracia Berges
Research Development Innovation Project Manager
cgracia@kineis.com
+33(0)6.48.42.52.21

www.kineis.com

HORIZON EUROPE

Horizon Europe Space Brokerage event

Describe your Organization:

- Varadis
- SME
- Varadis make RADFETs, a microelectronic chip, engineered to be sensitive to high energy (ionising) radiation. The RADFETs are small, robust, require no power to detect radiation, can easily be integrated into electronic systems. Varadis RADFET’s are on the International Space Station, CERN's Large Hadron Collider and most recently NASA's Artemis. Varadis are the world leader in this technology.
- Varadis have not participated in any Horizon programs but have experience in ESA ARTES
    - The team members however have worked in
        - H2020-EU.3.1. - SOCIETAL CHALLENGES - Health, demographic change and well-being
        - FP7-NMP - Specific Programme "Cooperation": Nanosciences, Nanotechnologies, Materials and new Production Technologies

Horizon Europe topics we are targeting as coordinator/main partner:

Have you discussed the topic with your NCP? Yes

The proposal fits under 2 calls, final proposal will be submitted under most appropriate call.

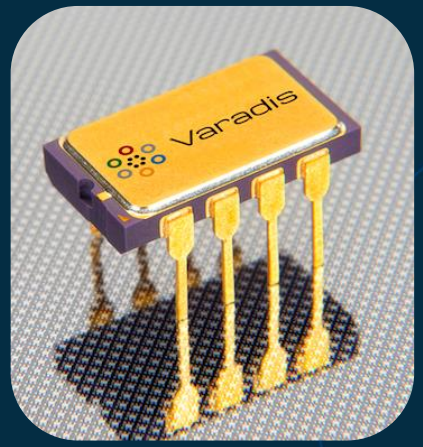
HORIZON-CL4-2023-SPACE-01-12: Future Space Ecosystem and Enabling Technologies

- Wider range ionizing radiation detection modules with improved discrimination will be critical for projects that are aimed at beyond LEO orbits especially GEO and interplanetary/lunar missions
- Varadis are embedded in this market and a recognized leader in the technology
- We are seeking partners with manufacturing and test capability in both semiconductors and PCBs

HORIZON-CL4-2023-SPACE-01-72: Space technologies for European non-dependence and competitiveness:

- Wider range ionizing radiation detection module with improved discrimination is a critical technology. Currently Europe has the lead in such technology and it is imperative that to retain that lead we grow the technology and retain a European manufacturing base
- Varadis aim to retain and grow this market position
- We are seeking partners with manufacturing and test capability

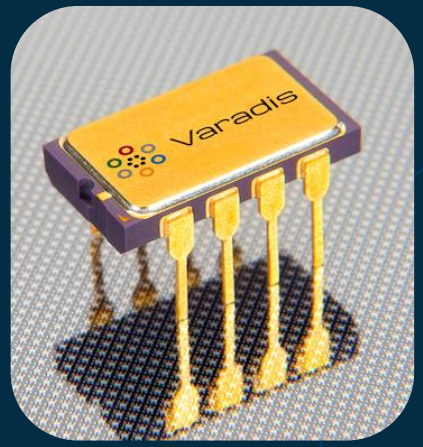
Varadis



Our idea:

- Main objective: To take our exiting RADFET chips and improve and characterize their sensitivity with additional specificity. We will then combine different range RADFET(s) with this sensitivity into a single small space market targeted module.
- Coordinator: Lee Barry (Varadis)
- Current partners: None selected but potential candidates identified
- Partner gap/s in the consortium (profile of the sought partner and role): We would be interested in research semiconductor foundries, Hardware test and qualification partners, Space experienced module design and manufacture
- Who to contact: Lee Barry (lee@varadis.com)

Varadis



Contact details:

- Lee Barry
- lee@varadis.com
- www.varadis.com
- 00 353 86 811 0013

HORIZON EUROPE

Horizon Europe Space Brokerage event

BEIA Consult International

Who is BEIA?

- **George Suciu**, R&D and Innovation Manager, george@beia.eu
- **BEIA (SME)** founded in 1991
  - Offices in: Austria, Belgium, Romania www.beia.eu
    - one of the leading providers of ICT solutions and services in Romania for cloud communications and IoT telemetry
  - **Expertise of the R&D Department**
    - team of 80 people in various programme Eureka, ITEA, Celtic, Eurostars, ERA-Net, Horizon, LIFE+, ESA/ROSA, etc.

Main technologies:

- hardware (sensors, actuators, IoT),
- service innovation (AI, blockchain, cloud, big data, quantum security),
- information technologies (data analytics, back end, interfaces, front end), integration (software/hardware),
- communication technologies (speech processing, ASR/TTS, NLP/NLU, sentiment analysis, emotional computing),
- communication/ dissemination/marketing, project management.

- Over **8000 commercial projects** and over **100 R&D and Innovation** projects

Area and topic (main partner)

- Copernicus for Emergency Management
- Copernicus for Marine Environment Monitoring
- Copernicus for Land and Water
- Copernicus for Security
- End-to-end Earth observation systems and associated services
- Quantum Communication Technologies for space systems
- Experience in SPACE/ESA related projects: CHRISS, CITISIM, V-SPACE, UFO ALMA, 3DSAFEGUARD, TERRA-RO, LOCOMAX, etc.

Area and topic (main partner)

- Main objective: Robust monitoring, reporting and verification (MRV) technologies integrated in a centralized platform able to merge information from EGNSS data, drone hyperspectral images and ground sensors in the fields to cover different needs and opportunities.
- Coordinator: BEIA
- Current partners: 15 participants from 7 different countries, 1 large enterprise and 9 SMEs (Greece, Spain, Italy, Switzerland, Germany, Luxembourg, Romania)
- Partner gap/s in the consortium (profile of the sought partner and role):
  a. robotics
  b. carbon footprint
  c. use case provider (biodiversity, soil health, water quality, etc.)

Other topic of interest **HORIZON CL4 Destination 5**. Open strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data & **EUSPA**

- HORIZON-EUSPA-2022-SPACE-02-51: EGNSS applications for Smart mobility
- HORIZON-EUSPA-2022-SPACE-02-52: Public sector as Galileo and/or Copernicus user
- HORIZON-EUSPA-2022-SPACE-02-54: Copernicus downstream applications and the European Data Economy
- HORIZON-EUSPA-2022-SPACE-02-55: Large-scale Copernicus data uptake with AI and HPC
- HORIZON-EUSPA-2022-SPACE-02-56: Designing space-based downstream applications with international partners
- HORIZON-EUSPA-2022-SPACE-02-61: GOVSATCOM Service developments and demonstrations
- **HORIZON-CL4-2023-SPACE-01-11: End-to-end Earth observation systems and associated services.**
- HORIZON-CL4-2023-SPACE-01-12: Future Space Ecosystem and Enabling Technologies.
- HORIZON-CL4-2023-SPACE-01-13: Future Space Ecosystem: Management and Coordination Activity
- **HORIZON-CL4-2023-SPACE-01-31: Copernicus for Atmosphere and Climate Change, including CO_2.**
- **HORIZON-CL4-2023-SPACE-01-32: Copernicus for Emergency Management.**
- **HORIZON-CL4-2023-SPACE-01-33: Copernicus in-situ component.**
- **HORIZON-CL4-2023-SPACE-01-34: Copernicus for Marine Environment Monitoring**
- **HORIZON-CL4-2023-SPACE-01-62: Quantum Communication Technologies for space systems**
- HORIZON-CL4-2023-SPACE-01-71: Scientific exploitation of space data.
- HORIZON-CL4-2023-SPACE-01-72: Space technologies for European non-dependence and competitiveness
- HORIZON-CL4-2023-RESILIENCE-01-06: Earth Observation platform, products and services for raw materials (IA)
- HORIZON-CL5-2023-D1-01-01: Further climate knowledge through advanced science and technologies for analysing Earth Observation and Earth System Model data
- HORIZON-CL6-2024-CLIMATE-01-7: EU-China international cooperation on improving monitoring for better integrated climate and biodiversity approaches, using environmental and Earth observation

Specific contributions to the topic: Telemetry, Galileo, GNSS, Copernicus, Earth Observation, drones

Experience: CHRISS, CITISIM, V-SPACE, UFO ALMA, 3DSAFEGUARD, TERRA-RO, LOCOMAX, Arrowhead, DOME, HUBCAP, E-STAR, SenSyStar, etc.

Contact details

George Suciu

E-mail: george@beia.eu

Twitter: @GeorgeSuciuG

Company Website: http://www.beia.eu/

Skype: george_suciu

Mobile: +40744-91.47.98

Company Details:

• Peroni 16, 041386 Bucharest, Romania.

• Rue Montoyer 23, Brussels, 1000 & Technologiepark, Ghent,9052, Belgium

• Absberggasse 29/1, 1100 Wien, Austria

Telephone/Fax: +40-21-332.30.06

HORIZON EUROPE

Horizon Europe Space Brokerage event

SUAS

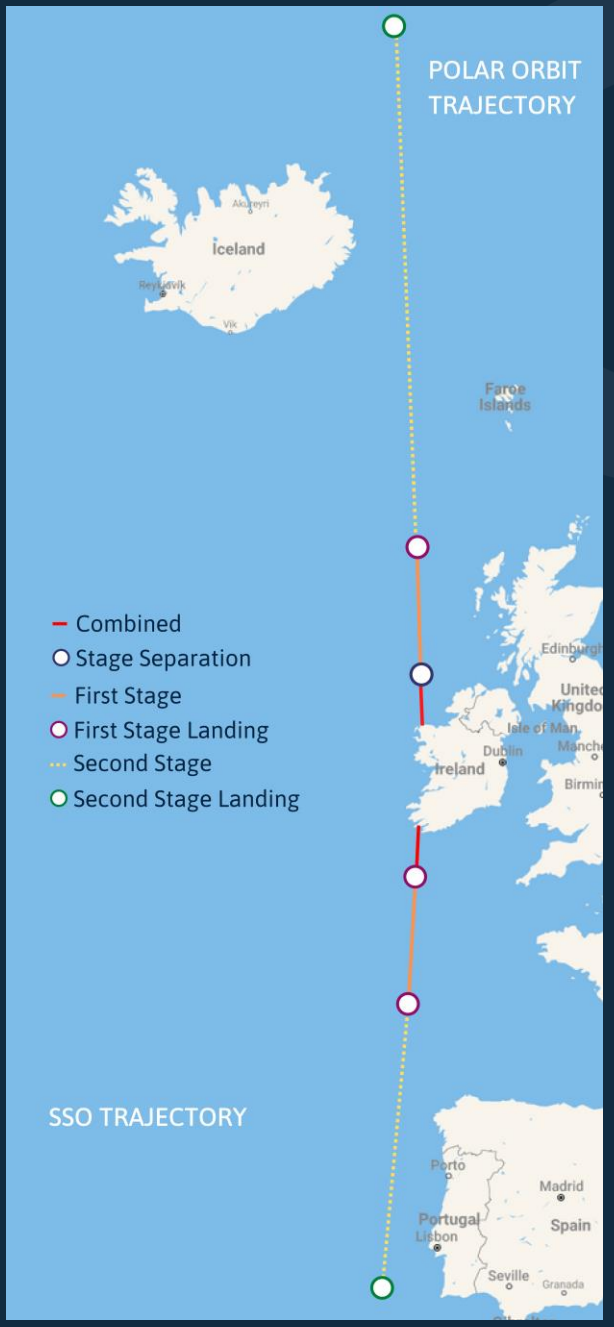
AEROSPACE

SUAS
AEROSPACE

SUAS Aerospace will build two leading European Spaceports to provide safe and profitable orbital launches from Ireland

- Rocket Engine Test Facility
- Suborbital Launch Opportunities
- Space Industry/Academic Cluster

- Strategic link with the National Space Centre
- Interested launch providers



SUAS
AEROSPACE

SUAS is targeting

- **(01-21) Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground system tests – as a partner**
- **(01-23) Modern, flexible and efficient European test, production and launch facilities – as a partner**

- Align well with goals of establishing a launch site and a rocket engine test facility
- In touch with interested coordinators on both calls

SUAS
AEROSPACE

(01-21) :

- Develop high thrust rocket engine testing facility
  - Facilitate test stand development with LRE coordinator
- Seeking partners in fluidics, health monitoring

(01-23) :

- Develop systems for the spaceport that allow interoperability and standardization of launcher infrastructure
  - Based on value chain analysis work with GSE coordinator to implement technologies and operations that industrialize spaceport and engine testing efficiency.
- Seeking partners in legal and cost modeling

Contact: David Rudge - dr@suasaerospace.com
Eoghan Gilleran - eg@suasaerospace.com

HORIZON EUROPE

Horizon Europe Space Brokerage event

Global Smart Rescue

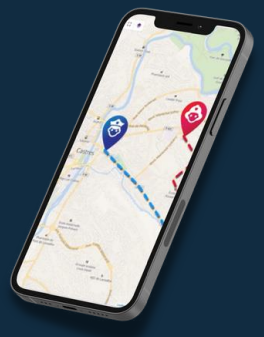
Revolutionizing Crisis Management

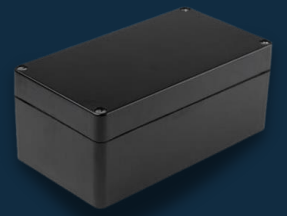
What do we do at Global Smart Rescue?

When all means of communication are interrupted during natural or industrial disasters, the biggest challenge is to keep a communication link and avoid aggravated balance sheets.

Global Smart Rescue offers a patented, low-cost, resilient communication solution, via a secure satellite link, which allows you to anticipate a disaster and track the incident in real time to optimise rescue coordination and risk management.

Our solution combines artificial intelligence and Newspace technologies in a smart and compact box that collects and sends essential information to our servers before, during and after a disaster, continuously, via satellite or any resilient means of communication."





Topics:

Call

Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data 2022 - applications (HORIZON-EUSPA-2022-SPACE)

GOVSATCOM Service developments and demonstrations

TOPIC ID: HORIZON-EUSPA-2022-SPACE-02-61

Global Smart Rescue provides Smart terminals and sensors to collect data, communicate and track.

GLOBAL SMART RESCUE
Making a safer world

Public sector as Galileo and/or Copernicus user

TOPIC ID: HORIZON-EUSPA-2022-SPACE-02-52

Looking for partners & european end users to join the project

Atraksis kinéis TRAAK High performance wearable tracking Qt FDC Kalisio GLOBAL SMART RESCUE Making a safer world

GLOBAL SMART RESCUE

Making a safer world

Contact details

Aya Radi, Business Developer & COO

aya.radi@globalsmartrescue.com
+33783417132

www.globalsmartrescue.com

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Horizon Europe Space Brokerage event

Design for resilience, security, and fault-tolerance systems

Prof. Avi Mendelson – Technion
avi.mendelson@technion.ac.il

Prof. Freddy Gabbay – Technion
freddyg@technion.ac.il

Describe your Organization:

- Technion Israel Institute of Technology
- Research
- We participate in quite a few EU projects, such as
  - Terafux
  - Eurolab4HPC
  - Advisory board of HiPEAC consortium
  - EMC^2

Horizon Europe topic you are targeting as coordinator/main partner:

- Indicate Area and Topic title/identifier: Secure and resilient computer architectures
- Does your idea fit the topic scope and impact?: yes
- Have you discussed the topic with your NCP? Not yet
- Other? I will be very glad to participate as a main partner but not as the coordinator

Problem Statement (motivation)

- Traditionally, a system treats resilience, security, and fault tolerance as independent entities.
- We suggest taking a holistic approach and threatening these design factors, in a unified way
- It will allow us to
  - ① extending the lifetime of a product
  - ② to dynamically detect security-related attacks
  - ③ building secure systems that may contain potentially insecure element(s)

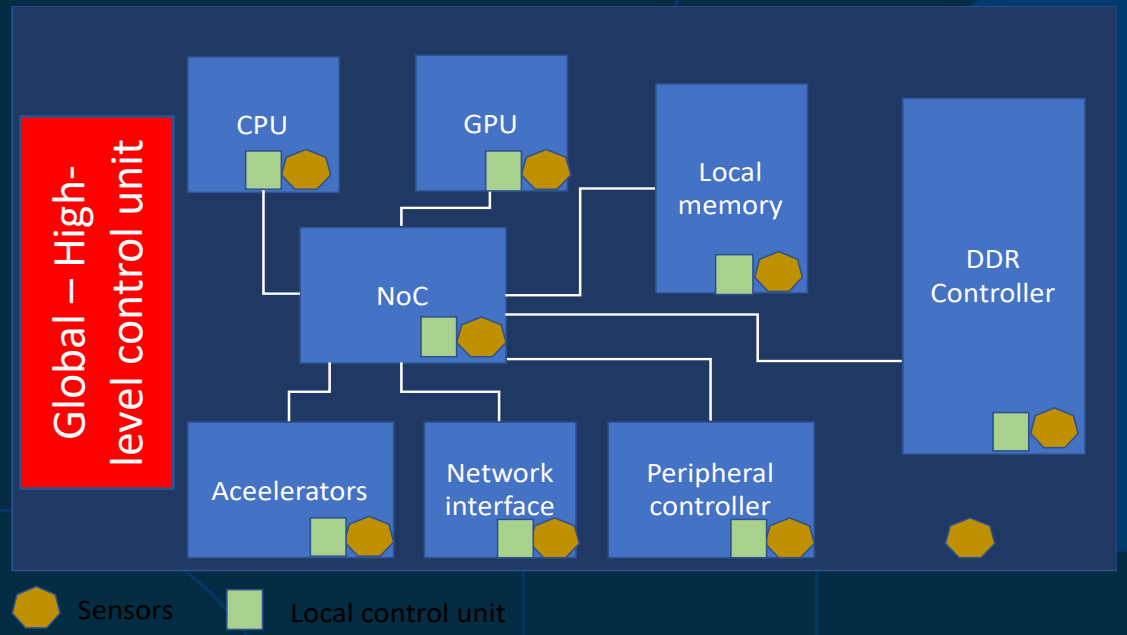
Extending the lifetime of a product

- We found that a major reason for reducing the lifetime of silicon is due to physical phenomena such as electromigration and aging of the material
- In two papers we recently published, we show that by using advanced computer architecture mechanisms, we can significantly extend the lifetime of a project.
- This finding is particularly valid for space-related communication and control systems

Dynamically detect security-related attacks

- Use dynamic, learnable, abnormal detection algorithms
  - Based on HDR – a biology-inspired algorithm
  - Hierarchical solution
    - High level – aims to detect the current state of the machine and predict all possible “normal changes” of the system
    - Low level – fast and based on assumptions the higher level made
    - Well fitted to control systems with restricted power and resources
- Execute the learning and the deployment algorithms in parallel so that
  - Can learn new normal and abnormal scenarios
  - Can use “pre-knowledge” on the systems

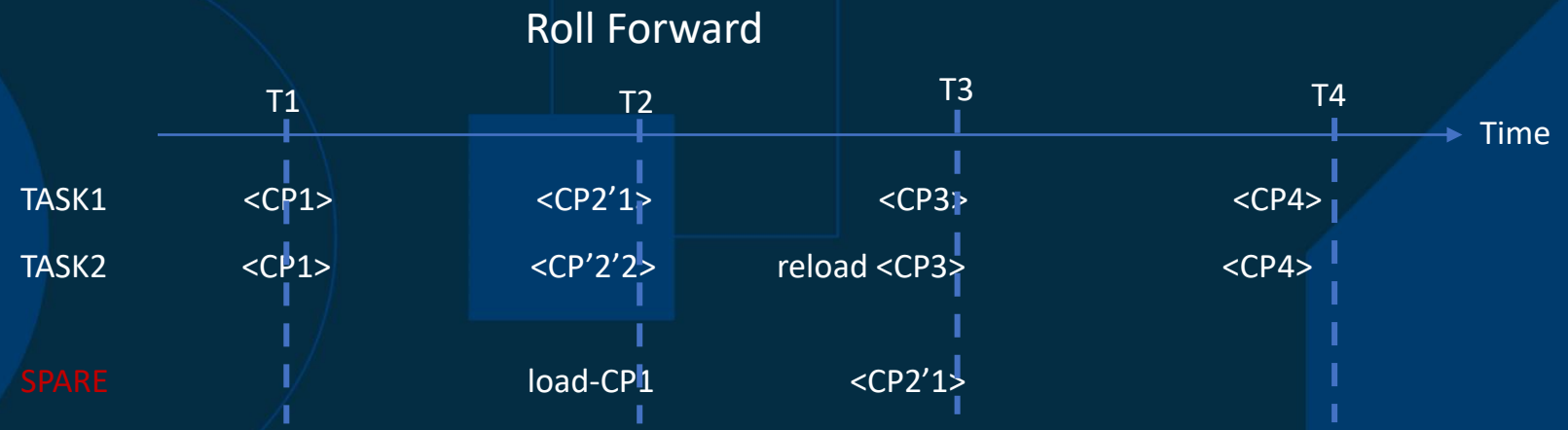
Proposed solution – Dynamic and Hierarchical



- At the device level, each component implements a simple algorithm to detect immediate attacks
- At the global level, we implement a learnable algorithm that requires more power and resources but being executed infrequently

A secure system that potentially contains an insecure element

- SoC based on Open-Source CPU (e.g., RISC-V)
- Establish “hooks” that could help to bypass hardware Trojan Horses and other artifacts of security attacks
- Incorporate FT mechanisms; e.g., use of TMR (three module redundancy) or Roll forward (two module redundancy with recovery mechanism)
- Advanced secure boot mechanisms



Thanks and looking forward to collaborate with you

Avi Mendelson and Freddy Gabbay

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Project in EU Space Surveillance and Tracking Support

SPACE EXPLORATION LIMITED

Located in Ireland & Spain

Mindseed

Located in Ireland

EU Partner/s

Describe your Organization:

- **Space Exploration Limited (SEL)** specializes in R&D of electro-optical systems and related technologies. We operate an electro Optical Ground Station in Spain which is managed from our control center in Ireland
- **Mindseed Limited** offers consulting and business development services for companies and organizations introducing new products in space and ground segment technology, integrating machine learning and machine vision
- Mindseed have developed proposals for FP7 and H2020 and since 2011 have developed over 20 ESA funded proposals in Ground Segment technologies

We are targeting Mindseed as Co-Ordinator & Partner in AI & ML and SEL as partner in Optical Ground Station development :

- Our Topic - EU Space Surveillance & tracking support – Call reference Horizon-CL4-SSA-SST-SP-SST Sensors and Processing
- The current partnership profile matches the call profile
- We have not discussed it with the NCP
- SEL have an existing OGS in Andalucía in Spain
- Mindseed have a 100% funding record on 20+ ESA Full Proposal Submissions

Your idea:

- Main objective: Develop the existing SEL OGS to integrate with EUSST infrastructure to improve detection sensor performance
- Coordinator: Mindseed – Proposal Development, Project Coordination
- Current partners: SEL – OGS systems/Mindseed – Machine Vision/Machine Learning & AI
- Partner gap/s in the consortium (profile of the sought partner and role): Knowledge in EUSST, tracking algorithms, collision probability, security
- Who to contact: mark@mindseed.ie

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PixQuanta

PixQuanta Executive Summary

PixQuanta is an Irish SME with a proprietary silicon-based CMOS compatible SWIR sensor technology:

- Quantum Efficiency > 75% from 450nm to 1600nm
- Tunable internal gain up to 10,000
- Signal Rise Time (10% to 90%) < 3.5ns (limited by our test setup)
- CMOS compatible, i.e., scalable at low cost
- Simple monolithic integration of sensing layer on any ROIC
- Low power
- Small form factor

Applications include:

- 3D Imagers (LiDAR & consumer)
- Spectral Imagers
- Silicon based monolithically integrated data/telecom sensors
- Biosensing for wearable

Applications

Platform Technology

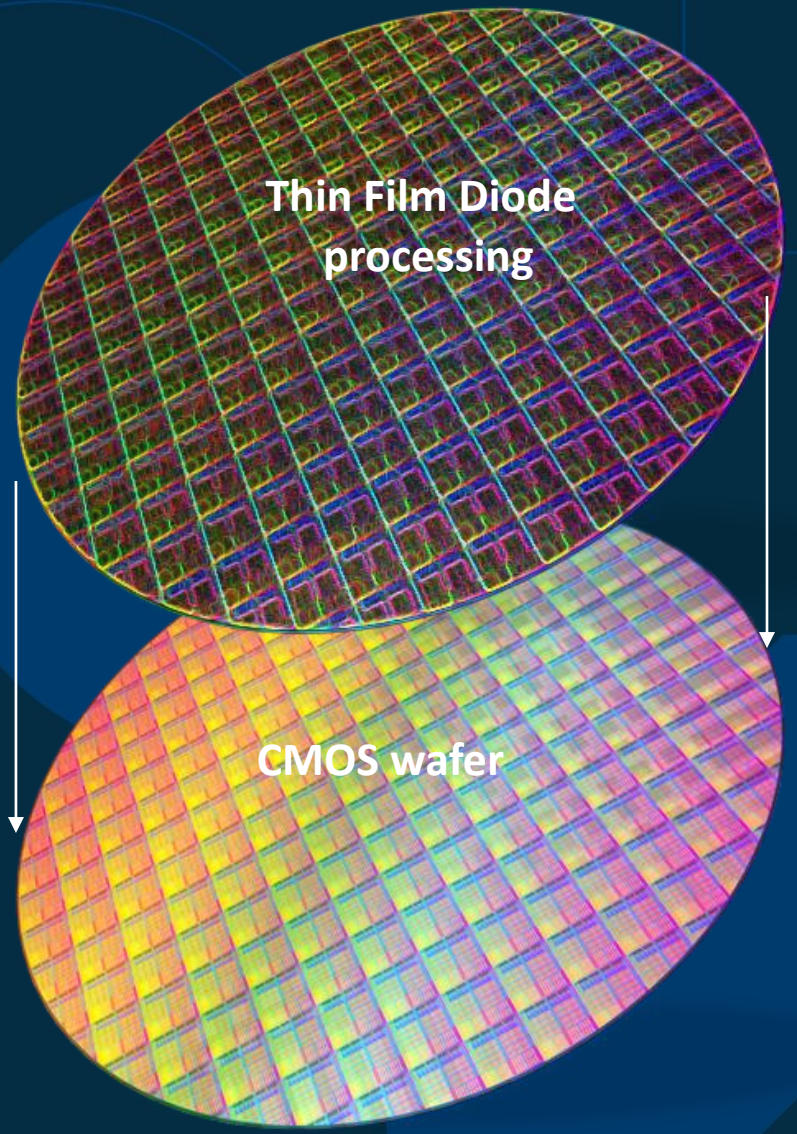
PixQuanta Photodiode (PixQDiode™)

- ADAS - LiDAR
  - >1M Pixel resolution w/dToF
  - BIC eye-safe 300m range
  - CMOS cost
- Consumer LiDAR/3D imaging
  - Greater range (25m)
  - Greater resolution
  - Lower power
  - CMOS Cost
- Data/Telecoms
  - Monolithic solution - small size
  - Cost
- Vis-NIR-SWIR Camera / Hyperspectral Imaging
  - Enabling/expanding potential for Hyper-Spectral Imaging
  - Monolithic solution - small size
  - Cost

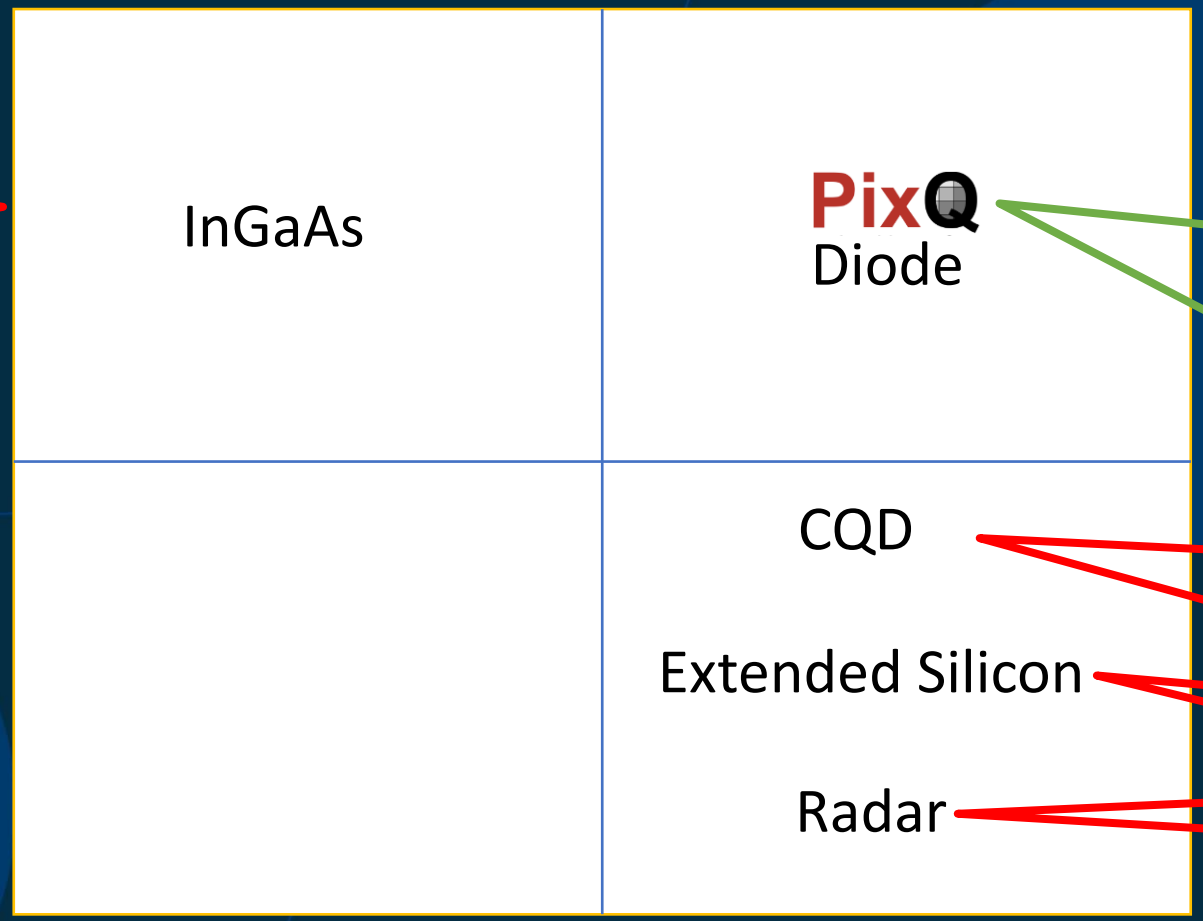
Value Proposition

Current Capability

Technology	Silicon CMOS
Wafer Size	Current: 150mm From 2023: 200mm & 300mm
Volumes	2000 wafers per year
Technology node	Current: 0.8µm Future: < 0.8µm
No. masks	5
Fabrication Turnaround Time	2 weeks



Technology Positioning



Higher cost base, requiring separate fabs for ROIC and Sensor
+ chip stacking

- Low system level cost
- High gain up to 10^5x
- Hi QE over Visible-NIR-SWIR
- Monolithic imager/receiver
- Small Form Factor & high Fill Factor
- High resolution – enables MPixel
- Greater Reliability

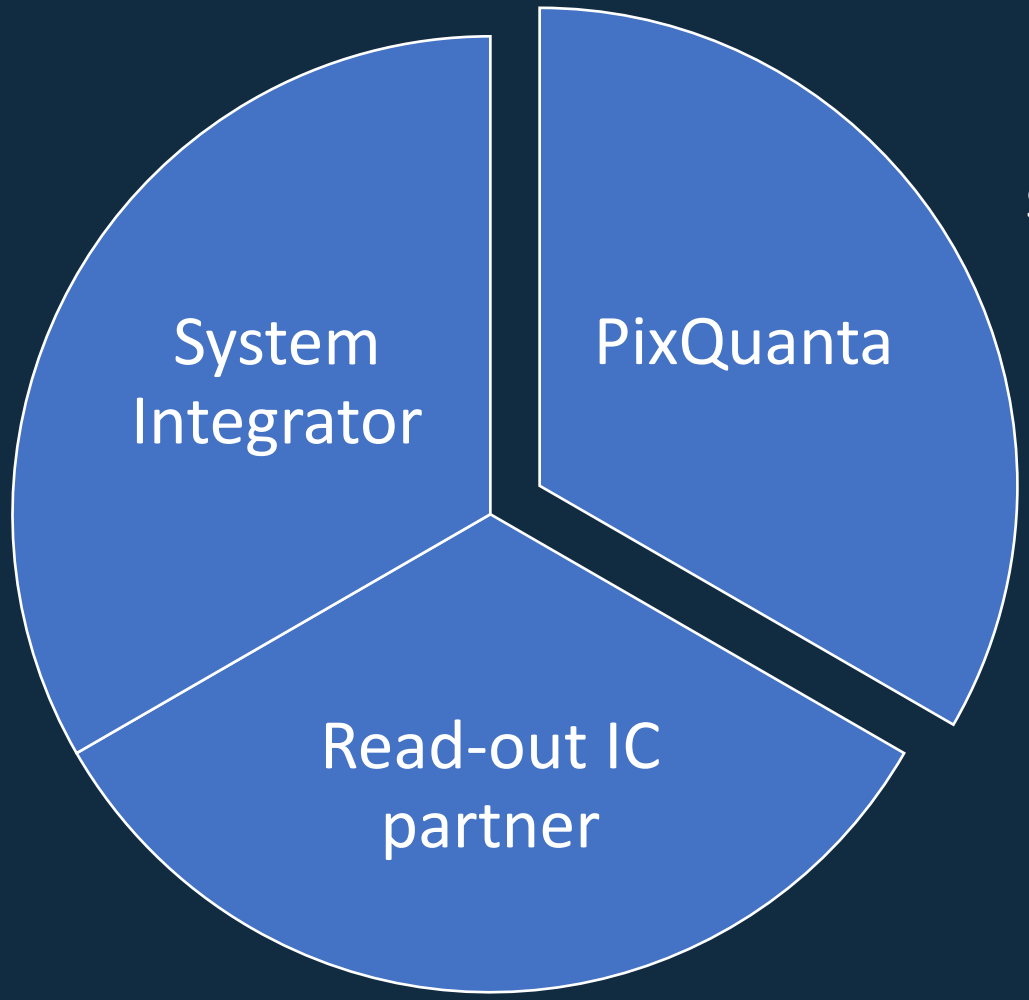
- Limited to 2D imaging
  - Poor timing
- Poor quantum efficiency
- Poor reliability
- High dark current

- Low quantum efficiency

- Good for velocity & range but weak imaging performance

Proposed Consortium

- 3D image systems manufacturer
- LiDAR supplier
- Hyperspectral imager integrator
- Datacomms Transceiver supplier



Sensor-on-wafer provider

Fabless IC design+manufacture partner

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Thank You!

For More Information, Please Contact

Kevin O'Neill
Lee Mills House
Lee Maltings, Dyke Parade
Cork T12 YK71

Ireland

kevin.oneill@pixquanta.com
+353-87-658-1976

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Réaltra Space Systems Engineering

Describe your Organization:

- Réaltra Space Systems Engineering
- Réaltra is an Irish company that is dedicated to the design, development and manufacture of cost-effective space electronic systems using cutting-edge technologies combining COTS and Hi-Rel/Rad-Hard approaches to deliver cost-effective solutions that meet the challenges set by our customers.
- Réaltra participate in the EU Horizon program as a member of the SALTO consortium that are developing the THEMIS re-useable launcher system.

Horizon Europe topic you are targeting as coordinator/main partner/partner:

- New Space Transportation Solutions + Service HORIZON-CL4-2023-SPACE-01-22
- Réaltra has expertise as a system integrator of COTS electronics systems technologies for space launcher missions that can be a methodology adopted across a broader range of systems to achieve a cost, schedule and risk optimized development of future New Space Transportation Solutions and Services.
- The project would design, develop and demonstrate a cost optimized avionics suite for future space transportation systems based on integrating existing COTS technologies and utilizing innovative AI systems in MAIT & Production to lower costs.

Your idea:

- Main objective: The project would design, develop and demonstrate a cost optimized space transportation system based on integrating existing COTS technologies utilizing AI systems in MAIT & Production.
- Coordinator: Réaltra Space Systems Engineering
- Current partners: Réaltra, Realtime
- Partner gap/s in the consortium (profile of the sought partner and role): Providers of COTS aerospace avionics systems
- Who to contact:
  Daniel Gleeson (Chief Commercial Officer)
  Réaltra Space Systems Engineering
  Email: dgleeson@realtra.space
  Tel: +353 87 2448148
  Web: www.realtra.space

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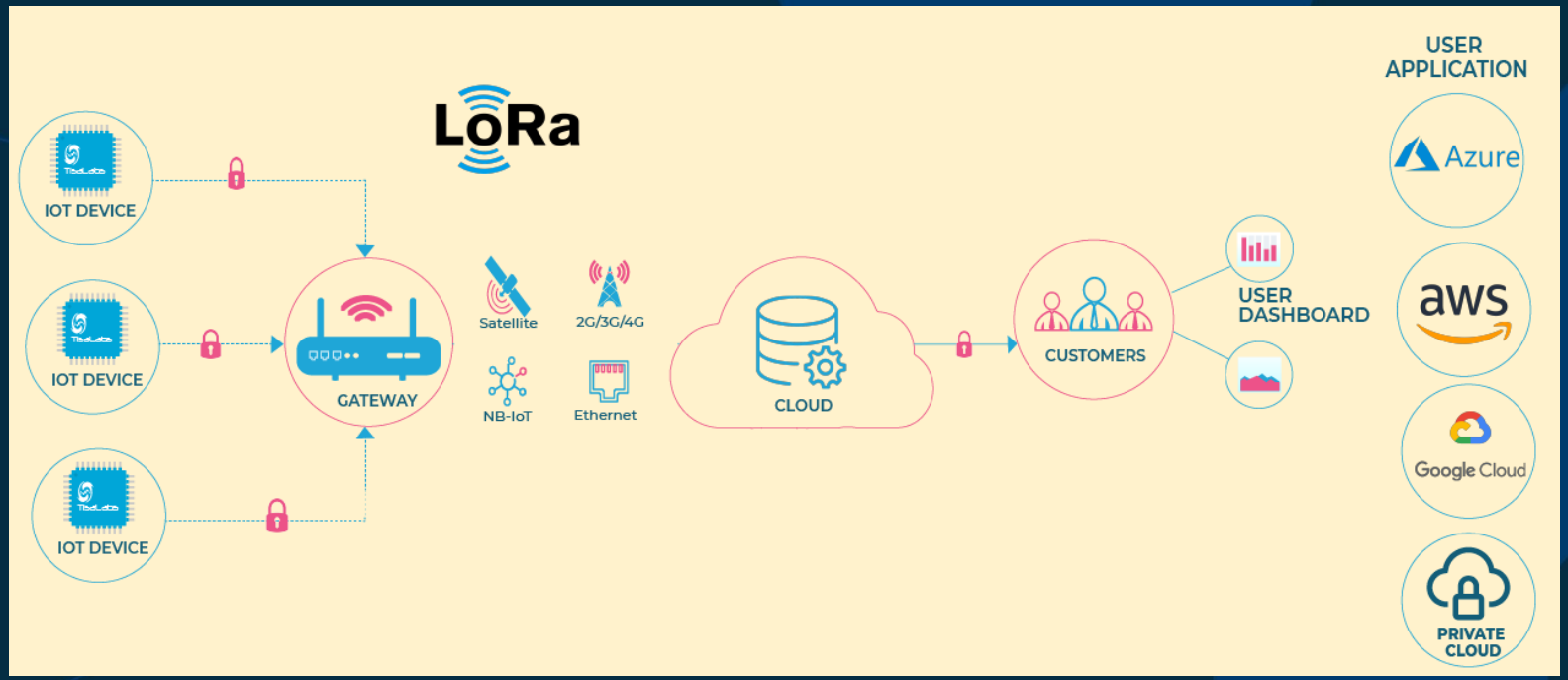
Tisalabs Limited

Mo Hassine, Founder & CEO
mo.hassine@tisalabs.com

Tisalabs

- We are an IoT and IoT security company
- We provide a secure, end-to-end communications platform that allows you to switch between satellite, cellular or ethernet connectivity in real-time with zero downtime.
- Our iron-clad security measures ensure that your software and firmware are deployed safely to any device in the field.



Projects

- ESA Secure Satellite Project €700K
  - Secure Satellite Project was developed to implement Hardware security keys to messages to allow for end-to-end security.
- DTIF Trident Project €3.5M
  - Trident project aims at developing a novel approach to energy storage and distribution. Our contribution to the project in terms of secure communications, data storage and retrieval, Battery failure prediction and overall system failure prediction
- Fish farm water quality monitoring
  - The project was developed for a customer to implement fish farm water quality and present the data to the User for tracking and quality tracing.
- Forest Harvest management
  - The aim of the project was to collect data from harvesting machines using either Cellular or satellite communications. The data packet had to be encoded to reduce the data payload to reduce cost. A User interface was developed with boundaries as well as environmental maps for better navigation.

- We also Participated in some H2020 Projects that have not been awarded

Horizon Europe topic you are targeting <u>as main partner</u>:

- Indicate Area and Topic title/identifier:
- We are looking to participate in a project with strong partners in the following areas:
  - Digital Twin implementation for Earth Observation
  - Implementation of machine learning and AI models with Copernicus data for Crop yields, natural resources
  - Implementing ML and AI to predicts disasters
  - ML and Computer vision to detecting changes overtime to be used in urban planning, transportation and Security

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University College Dublin

Advanced Metallic Materials for Spacecraft

New High Performance Alloys for Extreme Environments

Phase Transformation Research Group

Prof David Browne – Director of PTRG @ UCD

Describe your Organization:

- Phase Transformation Group (PTRG) at University College Dublin
- Research into Advanced Metallic Materials
- Experience of FP and FP7 programmes:
- FP6: IMPRESS (project on intermetallic alloys in space environment)
- FP7: MintWeld (project on welding of dissimilar metals)
- I-Form: National Research Centre focused on Additive Manufacturing
- ESA: projects on solidification of alloys in microgravity, and in development of Bulk Metallic Glasses for use in space mechanisms.

Prof. David Browne is on the Facility Science Team developing a new in-situ X-Ray diagnostic tool for microgravity research on board the ISS.

Prof. Browne is a member of ESA Science Strategy Expert Group (Physical Sciences); invited to develop space science strategy for the Human and Robotic Exploration Directorate.

Horizon Europe topic you are targeting partner:

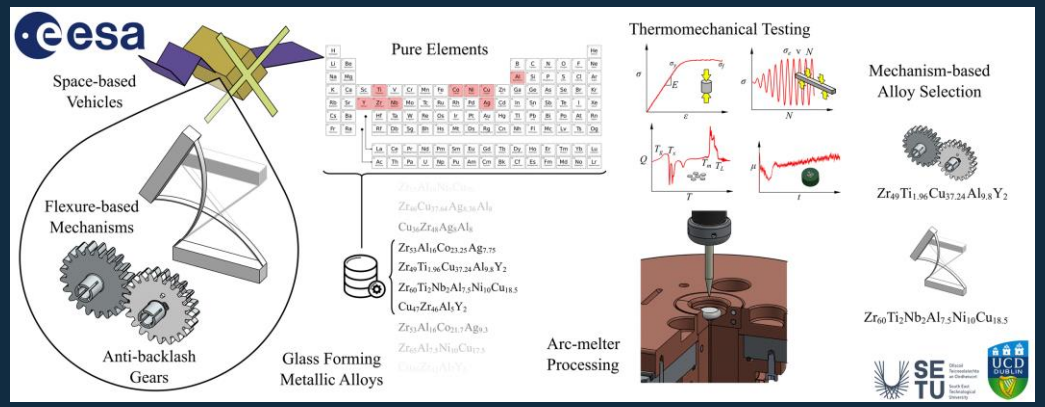
- Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground system tests
- New space transportation solutions and services
- Modern, flexible and efficient European test, production and launch facilities

- Does your idea fit the topic scope and impact?: Yes
- Have you discussed the topic with your NCP? Yes

Topic Codes:

(1) HORIZON-CL4-2023-SPACE-01-21
(2) HORIZON-CL4-2023-SPACE-01-22
(3) HORIZON-CL4-2023-SPACE-01-23

Your idea:



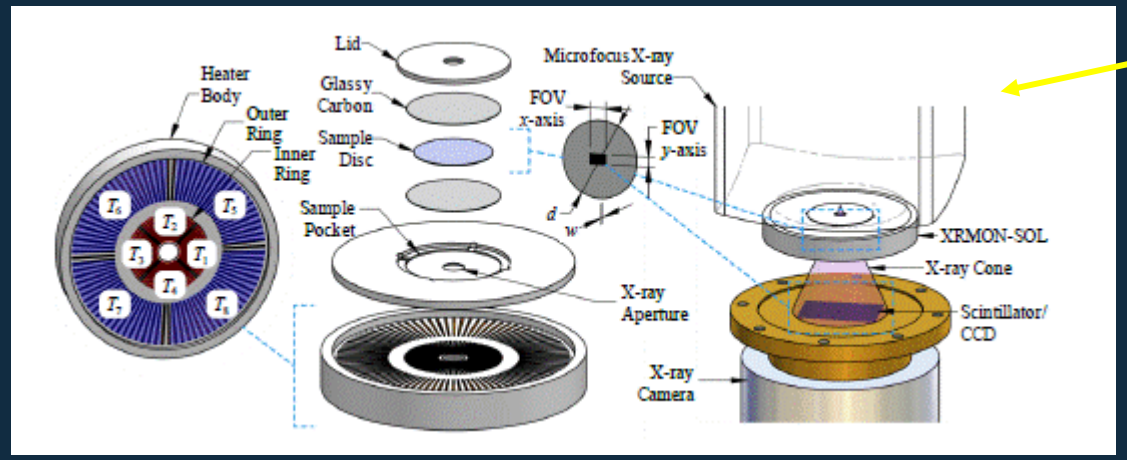
- Main objective: New High Performance Alloys for Spacecraft and Rovers
- Materials: Bulk Metallic Glasses and High Entropy Alloys
- Coordinator: TBD
- Current partners: TBD
- Partner for consortium (profile of the current partner and role):
- Materials and components for extreme environments of space: high and low temperatures, vacuum, radiation, dust, wear, fatigue.
- Who to contact: Prof. David J. Browne

BMG worm gear (ϕ6mm) for space conditions

Bulk Metallic Glasses (BMGs) and High Entropy Alloys (HEAs) have very high strength, and are wear resistant and corrosion resistant.

BMGs have very high elastic energy storage, and can easily be nano-patterned or take a mirror polish, and some have high optical reflectance (UV-vis-IR).

HEAs retain mechanical properties at high temperature, and some show increasing strength at elevated temperatures.



Your idea:

- Main objective: In-Space Manufacturing in Metals: Casting and Additive Manufacturing.
- Coordinator: TBD
- Current partners: TBD
- Partner for consortium (profile of the current partner and role):
- Manufacturing to Near Net Shape in Microgravity Environment – via Casting or 3D Printing
- Who to contact: Prof. David J. Browne

Conventional **casting** depends upon gravity to hold liquid metals and to fill moulds or dies. PTRG@UCD has extensive experience of melting of alloys and solidification in the microgravity conditions of space. Similar problems will be encountered when joining by **welding**.

Most 3D printing processes for metals depend upon gravity for powder handling and delivery, and for shape generation via localised melting and solidification. PTRG@UCD has experience of these **Additive Manufacturing (AM) p**rocesses and we have developed computational tools to aid in the control of the process and microstructural evolution and as-printed properties. How can we design AM processes for space?

Contact:

Professor David Browne
Director, Phase Transformation Research Group
School of Mechanical and Materials Engineering
University College Dublin
Belfield
Dublin 4
Ireland

tel: +353 1 716 1901
email: david.browne@ucd.ie

Advanced Metallic Materials for Spacecraft

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Horizon Europe Space Brokerage event

Nammo Ireland

Flow Control for Space Propulsion

Nammo Ireland:

- Established in 1982, as Aer Lingus industrial R&D facility
- Long time collaborator on the Ariane 5, Ariane 6. Structural supports for the Vulcain and Vinci engines
- Part of the Nammo AS Space and Defense group
- Space propulsion products for chemical, green, cold gas
- Nammo space activities in 4 sites around Europe. Ireland, UK, and Norway
- Nammo Ireland have developed and qualified flow control valves for spacecraft AOCS, apogee and interplanetary engines. Also for sounding rocket RCS on JAXA SS-520
- Developments on going for the green propulsion system on Vega upper stage Roll and Attitude Control

Horizon Europe topics on Nammo targeting:

- Space technologies for European non-dependence and competitiveness
  - Europe is dependent on a number of US flow control suppliers
  - Nammo can eliminate the risk of supplies being withdrawn
- Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground system tests
  - Nammo can adapt the existing qualified high flow valve technology from the high thrust apogee engine to support the goal of European strategic space launchers
  - Additionally Nammo technology exists for 30kN green thrusters than can be utilized.

What is needed:

- Main objective: To reduce dependency of European Prime contractors from the United States valve suppliers. To support European goals for low-cost launchers.
- Coordinator: TBD
- Current partners: ArianeGroup, ESA, IHI Aerospace, Taiwan Space Agency, Surrey Satellite Technology Limited, Bradford ECAPS, Lukasiewicz Institute of Aviation Poland, Nammo UK, Nammo Norway
- Partner gap/s in the consortium: Nammo is flexible
- Who to contact: Derek Harris
- Derek.Harris@nammo.com
- +353 87 211 9010

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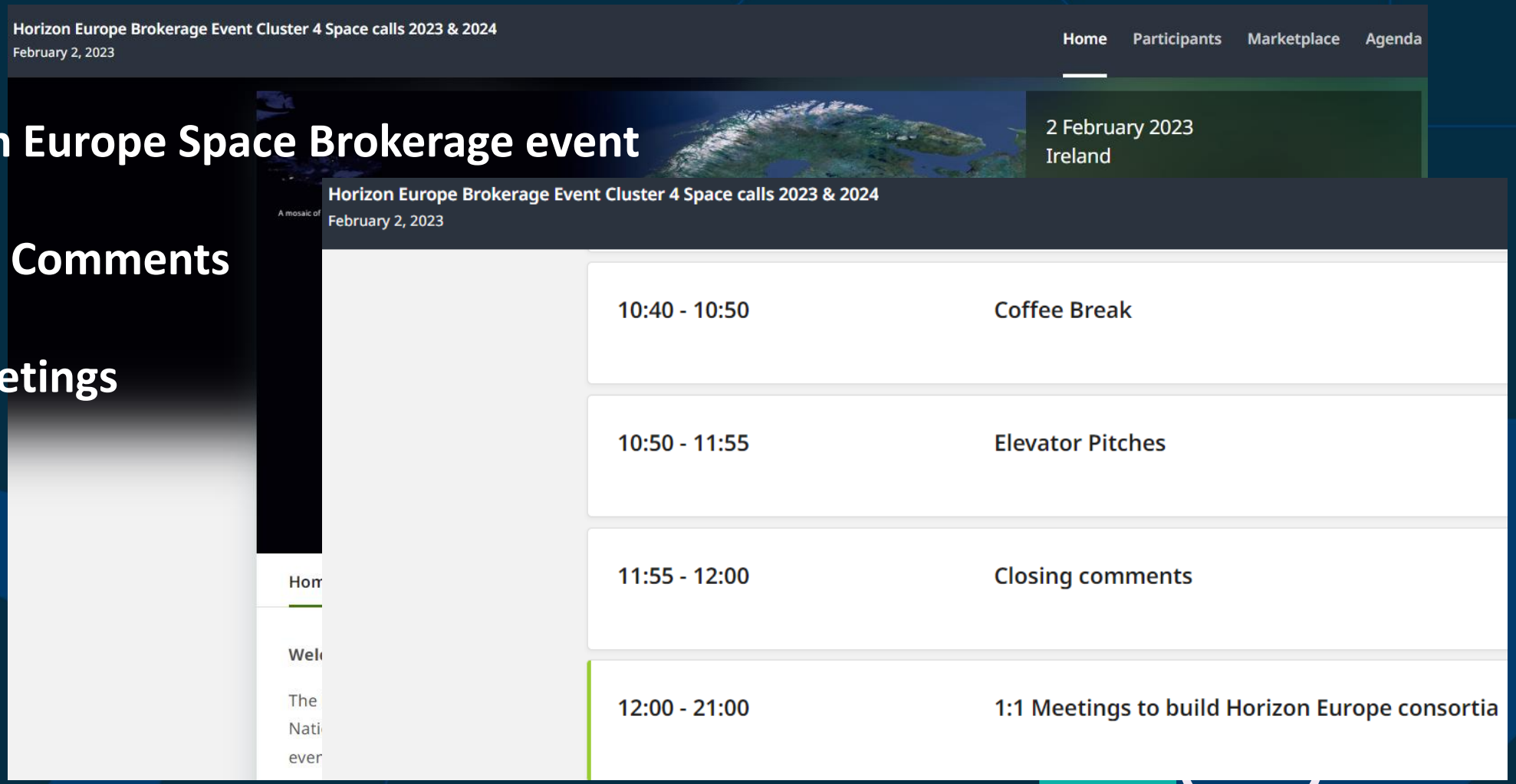
Closing Comments

1:1 Meetings



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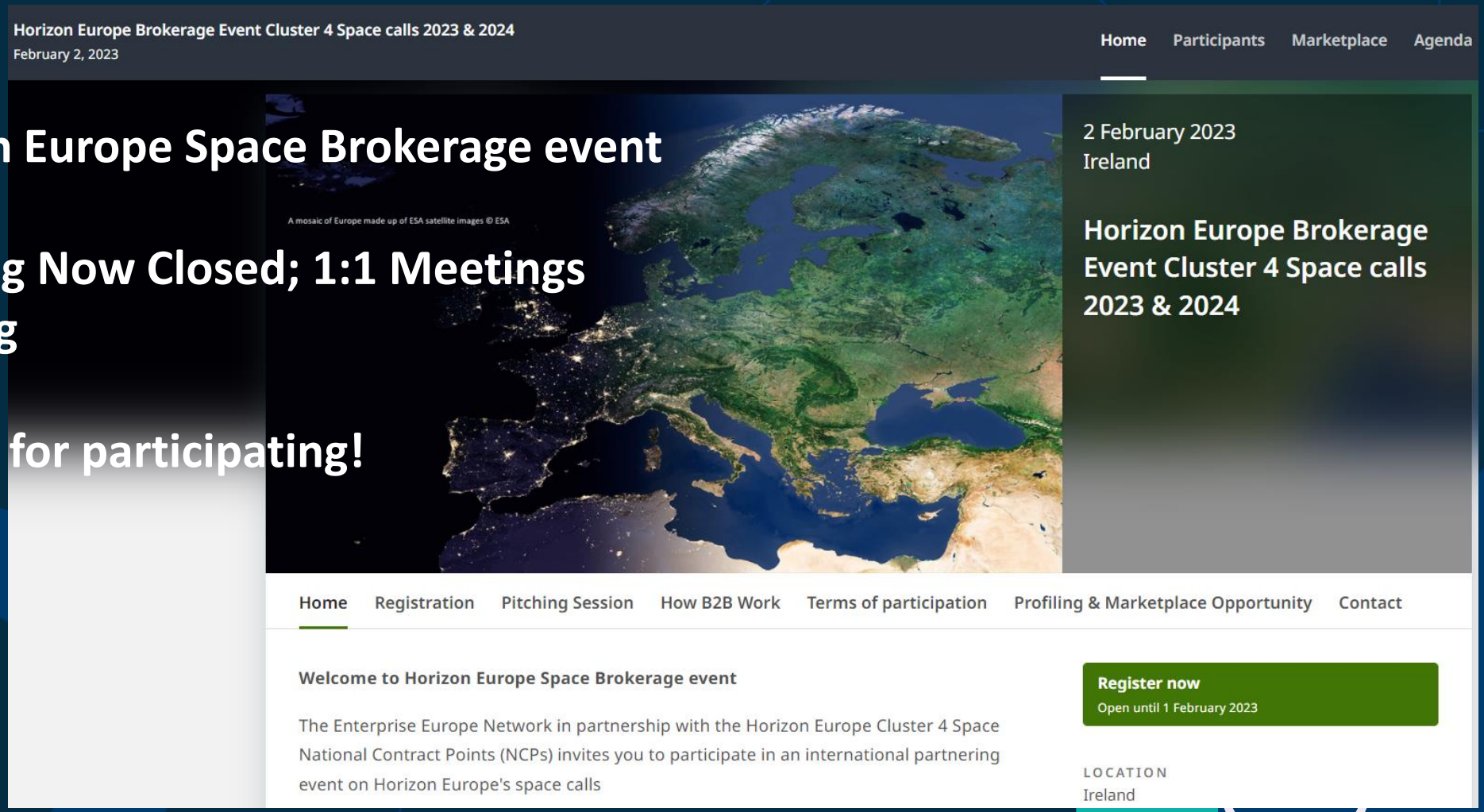
Meeting Now Closed; 1:1 Meetings ongoing

Thanks for participating!



European Commission