



EU SPACE

NEREUS Webinar on Horizon Europe

Overview on Horizon Europe and
space downstream R&D calls
planned for 2021-2022

23rd April 2021

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SPACE DOWNSTREAM R&D IN HORIZON EUROPE

- 1. New EU Space Programme**
- 2. Horizon Europe (structure, budget)**
- 3. Space in Horizon Europe**
- 4. Space downstream R&D in Horizon Europe –
Planned Calls in 2021 and 2022**
- 5. Other important R&D opportunities for space
downstream**
 - **CASSINI Start-up and Entrepreneurship initiative**
 - **EGNSS/ Copernicus in other HE Clusters**
 - **EIC instruments**



- **Political agreement on new EU Space Programme, covering, under one umbrella:**
 - GALILEO/EGNOS
 - COPERNICUS
 - Space Situational Awareness
 - GovSatCom
- **Budget: €14.8 billion for 2021-2027**
- **Foresees reshaped role and responsibility of GSA (-> EUSPA) for user uptake and R&D**
 - Central role in market and user uptake activities for all space programme components
 - R&D: EUSPA will be entrusted with all downstream applications and will support Commission in CASSINI initiative
- **Investment under EU Space Programme, combined with Horizon Europe and Invest EU, will support European space industry, and contribute to competitiveness, innovation, entrepreneurship, skills and capacity-building.**

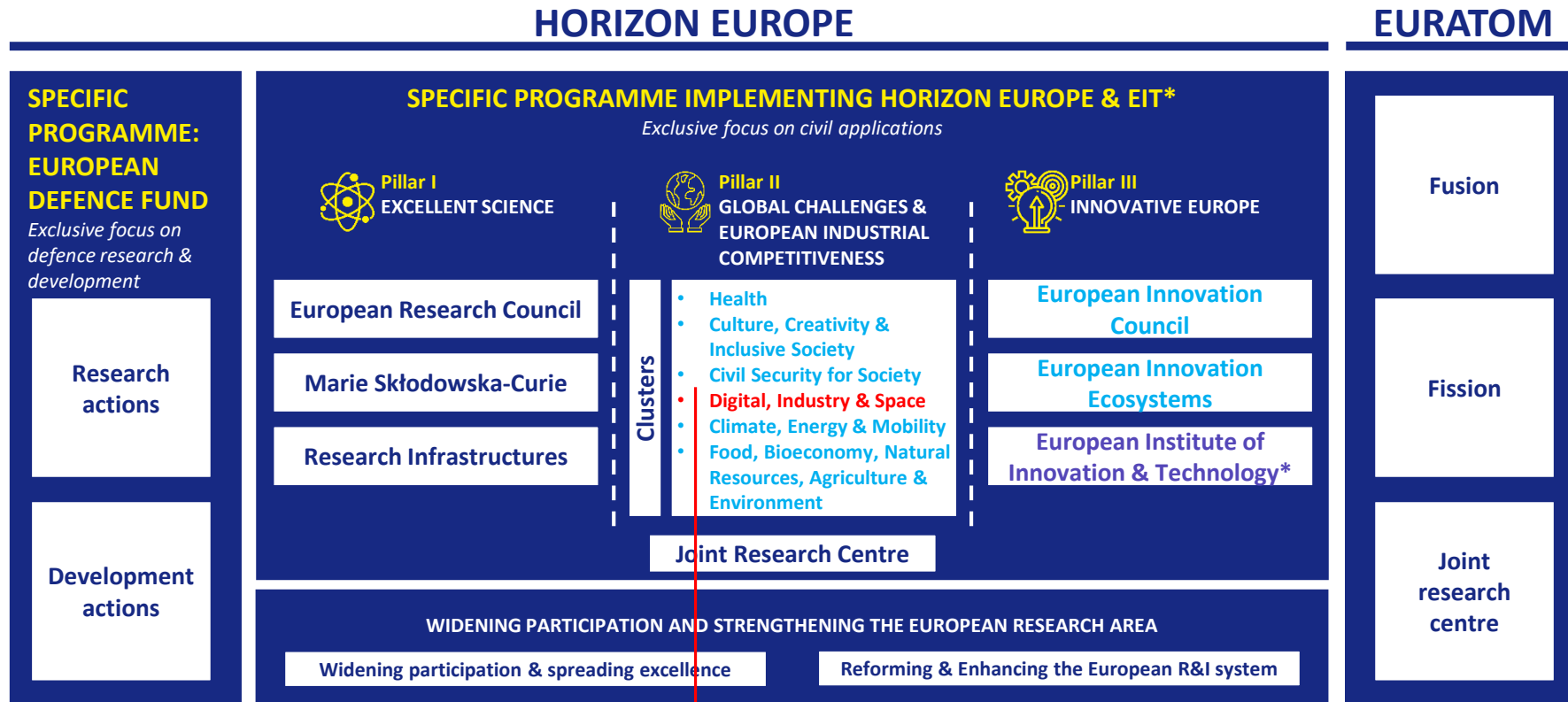




EU SPACE

HORIZON EUROPE

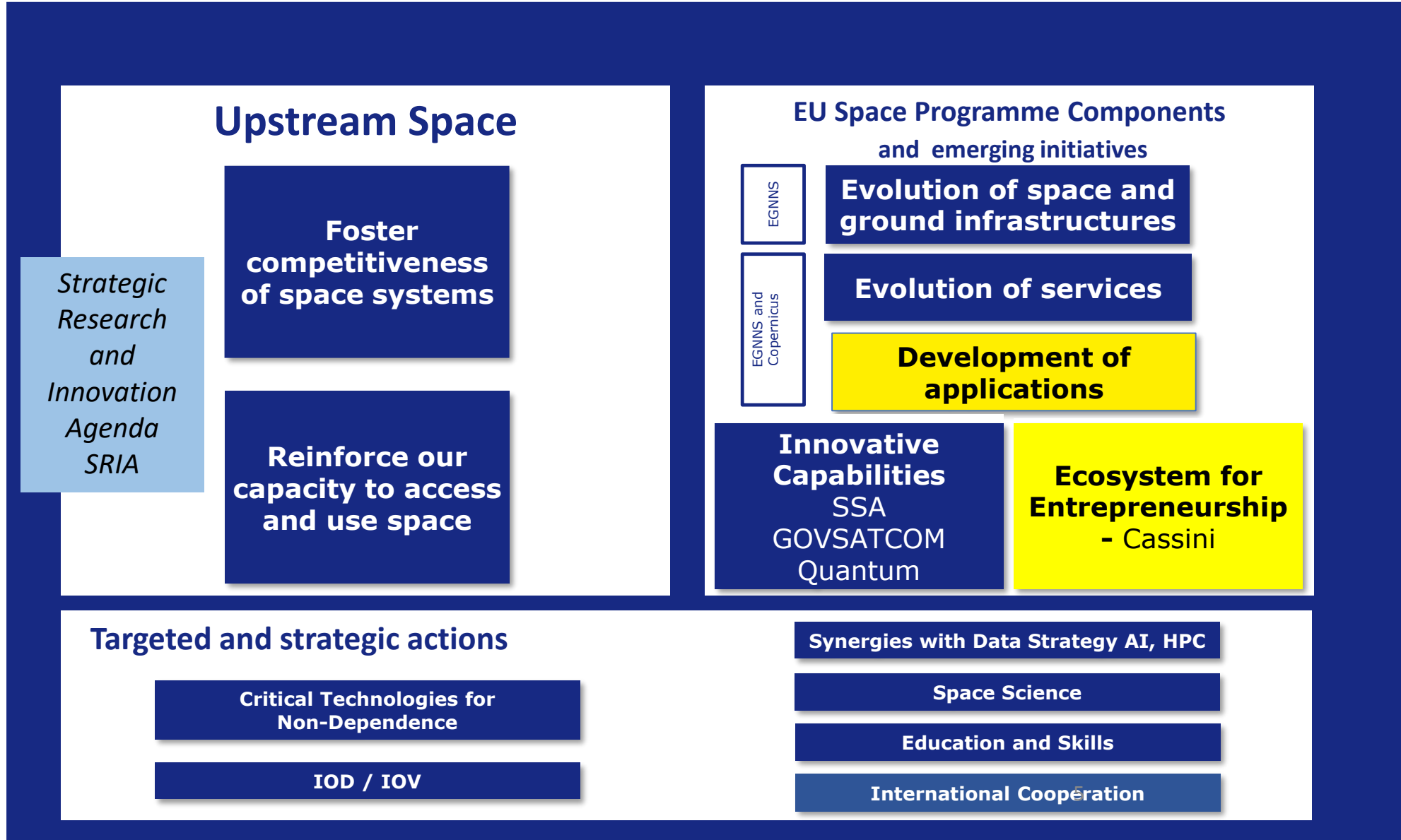
Budget : € 95,5 billion for seven years (2021-2027)



* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme
Areas of intervention

1. Manufacturing Technologies
2. Key Digital Technologies
3. Advanced Materials
4. Emerging Enabling Technologies
5. Artificial Intelligence and Robotics
6. Next Generation Internet
7. Advanced Computing and Big Data
8. Circular Industries
9. Low-carbon and Clean Industries
10. Space

Budget Cluster 4:
Digital, Industry and
Space: : € 15,348 bio



SPACE DOWNSTREAM R&D IN HORIZON EUROPE

Type of Action	Topic	Indicative budget (EUR mln)	Funding rate
IA	EGNSS and Copernicus applications fostering the European Green deal	14.0	70% (except for non-profit legal entities, where a rate of 100% applies)
IA	EGNSS applications for Safety and Crisis management	9.3	
IA	EGNSS applications for the Digital Age	9.3	
IA: activities aimed at producing plans and arrangements or designs for new, altered or improved products, processes or services			

2021 CALL

Draft WP version of 16/3
 (-> expert group)
 available at:
<https://ec.europa.eu/transparency/reg-expert/index.cfm?do=groupDetail.groupMeeting&meetingId=24499>

Calls will be published on
Horizon Europe Funding & Tenders Portal

Indicative information, subject to HE Work Programme approval



European Commission

2021 CALL

SPACE DOWNSTREAM R&D IN HORIZON EUROPE

1. EGNSS AND COPERNICUS APPLICATIONS FOSTERING THE GREEN DEAL

14
Mio
EUR

Proposals may be submitted in any of the following areas.

- A zero-pollution ambition for a toxic-free environment
- Mitigation of natural hazards
- Supplying clean, affordable and secure energy
- Accelerating the shift to sustainable and smart mobility
- Building and renovating in an energy and resource efficient way
- From “Farm to Fork”: a fair, healthy and environmentally friendly food system
- Preserving and restoring ecosystems and biodiversity

Indicative information, subject to HE Work Programme approval

The expected final TRL of the solution developed shall be between 7-9.





2021 CALL

SPACE DOWNSTREAM R&D IN HORIZON EUROPE

2. EGNSS APPLICATIONS FOR SAFETY AND CRISIS MANAGEMENT

9,3
Mio
EUR

Proposals may be submitted in any of the following areas:

- **Improved emergency disaster risk management and societal resilience**
 - solutions for critical services related to detection, preparedness, response, recovery and mitigation of emergencies and disasters,
 - drone and robot operations for disaster response
 - GNSS/Copernicus-based earthquake early warning system etc.
- **Timing and synchronisation applications focusing on emerging network synchronisation needs of critical infrastructures (electricity, telecommunications etc.)**
 - increasing receiver resilience to interference
 - tighter and more accurate time/phase requirements,
 - timing precise synchronisation between financial platforms, Critical Assets Monitoring and Data Centre resistance against spoofing data

The expected final TRL of the solution developed shall be between 7-9.





The expected final TRL of the solution developed shall be between 7-9.

3. EGNSS APPLICATIONS FOR THE DIGITAL AGE

9,3
Mio
EUR

Proposals may be submitted in any of the following areas:

- Internet of Things
- Mobile solutions
- mHealth - solutions for silver economy, robotics
- Artificial intelligence - Big Data, Geo-tagging, optimisation for multiple sensors
- Cybersecurity - solutions that are stimulating privacy, security of location data, exploiting synergies with quantum
- Sharing economy - solutions for logistics, mobility services, goods and food
- Sports and fitness - smart wearables



- **Exploit EGNSS differentiators such as HAS, OS-NMA, Galileo Signal Authentication Service and SAR** for the development of new innovative applications.
- Deliver **new innovative applications, with commercial impact and a clear market uptake.**
- Participation of **industry, in particular SMEs and midcaps**, is encouraged;
- Participation of, or outreach to, entities based in countries without a space tradition is encouraged;
- Involvement of **post-graduate researchers** (engineers, scientists, and others) is also encouraged, for example through professional work experience or through fellowships/scholarships when applicable;
- A **Business Plan** and **evidence of user engagement** shall be compulsory and shall be provided as part of the proposal, to demonstrate the user need and sustainability of the project.
- Proposals addressing PRS (Public Regulated Service) related applications not in scope of action.
- Proposals under this topic should exploit synergies and be complementary to national activities and activities funded by ESA.

SPACE DOWNSTREAM R&D IN HORIZON EUROPE

2022 CALL

Type of Action	Topic	Indicative budget (EUR mln)	Funding rate
IA	EGNSS applications for Smart mobility	9.5	70% (except for non-profit legal entities, where a rate of 100% applies)
PCP	Public sector as Galileo and/or Copernicus user	5.2	100 %
IA	Copernicus downstream applications and the European Data Economy	9.6	70% (except for non-profit legal entities, where a rate of 100% applies)
RIA	Large-scale Copernicus data uptake with AI and HPC	9.6	100%
RIA	Designing space-based downstream applications with international partners	5,1	100%
RIA	GOVSATCOM Service developments and demonstrations	9,1	100%
TOTAL budget:		48,1	

Indicative information, subject to HE Work Programme approval

Planned Opening: 5 May 2022
Planned Deadline: 6 September 2022

Horizon Europe – General Annexes provide info on types of action and specific conditions for actions with PCP/PPI

Commission

An aerial photograph of a multi-lane highway with several cars. To the left of the highway is a large parking lot filled with cars and a building. The image is used as a background for the top left section of the slide.

2022 CALL

SPACE DOWNSTREAM R&D IN HORIZON EUROPE

1. EGNSS APPLICATIONS FOR SMART MOBILITY

**9,5
Mio
EUR**

Proposals may be submitted in any of the transport areas or propose a multi-mode approach:

- Aviation
- Maritime
- Rail
- Road

The action focuses on the development of close to market EGNSS transport applications and mobility services through the realisation of large scale demonstration and implementation projects.

The expected final TRL of the solution developed shall be between 7-9.

indicative information, subject to HE Work Programme approval





2022 CALL

Indicative information, subject to HE Work Programme approval

SPACE DOWNSTREAM R&D IN HORIZON EUROPE

2. PUBLIC SECTOR AS GALILEO AND/OR COPERNICUS USER

5,2
Mio
EUR

Demand-driven innovation actions by public authorities aiming at development and adoption of EGNSS /Copernicus applications which meet their needs

Open call

Choice of market segment/ application left to the proposer, examples include EGNSS and/or Copernicus for

- Mobility as a service, cooperative ITS, public transport, smart cities and air quality monitoring and forecasting,
- Monitoring of infrastructure (rail, road, critical infrastructure)
- Crisis emergency management, including related to extreme events
- Civil security applications and border management
- Sustainable development, climate change adaptation, mitigation and resilience services etc
- Coastal area monitoring and modelling.

Aim: Foster exploitation of space applications to match needs of public authorities at national, regional or local levels

Proposals should

- focus on clearly identified needs
- demonstrate sustainable solution beyond lifespan of the project

Requested solutions should be validated through field-testing in at least two European countries.

Proposals addressing PRS related applications are not in scope of action.

2022 CALL

3. COPERNICUS DOWNSTREAM APPLICATIONS AND THE EUROPEAN DATA ECONOMY

**9,6
Mio
EUR**

- **Actions under this Topic**
 - will bring to market new or improved applications, products and services by exploiting Copernicus data assets and services products.
 - are required to adopt state-of-the-art ICT technologies (Big Data, AI etc.), and make use of European data infrastructures, e.g Copernicus DIAS platforms, European open data portals, and industrial data platforms.
- **Technical solutions to be adopted shall**
 - be user-friendly and work at the scale of the large quantities of data involved.
 - open up innovative business opportunities and support societal challenges
 - exploit the link with European satellite positioning, navigation and timing technologies, whenever relevant.

Activities are expected to start at TRL 5 and achieve TRL 8 by end of project



2022 CALL

4. LARGE-SCALE COPERNICUS DATA UPTAKE WITH AI AND HPC

9,6
Mio
EUR

Proposers are to respond to one of the following challenges:

- **Develop new/innovative products and services**
 - having Copernicus data assets and services products at their core, and
 - scaling up to increased data volumes of Copernicus archives, by solving technological challenges related to AI, HPC, Big Data processing and management/ integration with data sources from other industrial domains.
- **Develop new/ innovation solutions and technologies to improve capabilities and performance of Copernicus value chain and supporting infrastructure.**

Indicative information, subject to HE Work Programme approval

Activities are expected to start at TRL 3 and achieve TRL 5 by end of project.



2022 CALL



5. DESIGNING SPACE-BASED DOWNSTREAM APPLICATIONS WITH INTERNATIONAL PARTNERS

**5,1
Mio
EUR**

Projects with international cooperation partner countries, to contribute to:

- EGNSS : use of and sharing expertise with public and/or private entities to introduce EU-space based applications/solutions leveraging unique features of Galileo (authentication, high accuracy)
- Copernicus : jointly develop algorithms, services and/or products, which serve local user needs and/or enhance Copernicus global product quality
- Combined use of EGNSS/ Copernicus to develop innovative downstream applications

Actions should focus on technical developments of EU-space based applications/solutions, dissemination, awareness-raising, as well as provide opportunities for creation of business-oriented partnerships of European industry with international partners.

Tasks may include joint calibration and validation activities or integration of local in-situ systems to enhance the quality of data and service products.

2022 CALL

SPACE DOWNSTREAM R&D IN HORIZON

6. GOVSATCOM SERVICE DEVELOPMENTS AND DEMONSTRATIONS

**9.1
Mio
EUR**

1. R&I for consolidation of integrated use cases and demonstration of EU GOVSATCOM service interoperability in real user environment.

- Development of innovative use case (e.g. in area of crisis management, surveillance) exploiting a combination of secure SATCOM services
- Interoperability of services based on pooled and shared capacities from different satellite systems;
- Interoperability of governmental satellite-based communication services with terrestrial communication services;
- Integrated application leveraging the synergies with services provided by other Space Programme components (Galileo, EGNOS, Copernicus, SSA);
- Proof of concept in a real user environment;
- Awareness and outreach activities in favour of EU GOVSATCOM user uptake.

2. R&I Areas to be addressed:

- Interoperability between satellite communication systems' services;
- Seamless handover between satellite and terrestrial communications networks for provision of governmental communications services;
- Service level interoperability between commercial and MS owned satellite communications systems etc.



THE ROAD TO NEW SPACE

- Clear vision for European space businesses and markets
- New industry setup
- New entrants
- New private investment
- New markets
- New solutions

PROMOTION
CASSINI Hackathons
& Mentoring

**INNOVATION
COMPETITIONS**
CASSINI Prizes

BUSINESS GROWTH
CASSINI Business Accelerator

INVESTMENT
CASSINI Seed and Growth
Funding Facility (InvestEU)

MATCHMAKING
CASSINI Matchmaking with
Investors
CASSINI Industrial Partnering

IOD/IOV
CASSINI In-Orbit
Demonstration and
Validation

Funding from
Horizon Europe

CASSINI Hackathons & Mentoring

CASSINI Business Accelerator

CASSINI Prizes

CASSINI In-Orbit Demonstration and Validation Delegated to ESA

Commission (service contract); later EUSPA

Commission (service contract); later EUSPA

Commission; EUSPA selection procedure

Funding from
Space Programme,
InvestEU, and
EIF

CASSINI Seed and Growth Funding Facility

CASSINI Matchmaking with Investors

CASSINI Industrial Partnering

Delegated to EIF under InvestEU programme

In collaboration with ESA

CASSINI ACTIVITIES INTERESTING FOR SPACE DOWNSTREAM IN HORIZON EUROPE

**2021-2022
Activities**

Type of Action	Topic	Indicative budget (EUR mln)	Schedule	
Inducement prize	EIC Horizon and CASSINI Prize for digital space applications	3.4	Opening: Q3 2021 Deadline: Q2-Q3 2022 Award of prize: Q3-Q4 2022	
Public Procurement	CASSINI Business Accelerator	8.5	Action implemented by Commission Call for tender 2021 Selection of consortium of European business accelerators	
Public Procurement	CASSINI Hackathons & Mentoring	2.4	Action implemented by Commission Hackathons to stimulate development of innovative space applications	
	TOTAL budget:	13.3		

Indicative information, subject to HE Work Programme approval



European
Commission

26 Topics relevant to Galileo/Copernicus based solutions

EXAMPLES

- Increased safety, security, performance of the European Border and Coast Guard and of European customs authorities
- Autonomous systems used for infrastructure protection
- Integrated Disaster Risk Reduction for extreme climate events
- Enhanced assessment of disaster risks, adaptive capabilities and scenario building based on available historical data and projections
- Improved quality assurance / quality control of data used in decision-making related to risk management of natural hazards, accidents and CBRN events
- Improved impact forecasting and early warning systems supporting the rapid deployment of first responders in vulnerable areas

HORIZON-CL3-2021-FCT-01-07: Improved preparedness on attacks to public spaces

HORIZON-CL3-2021-FCT-01-08: Fight against trafficking in cultural goods

HORIZON-CL3-2021-FCT-01-09: Fight against crime

HORIZON-CL3-2021-FCT-01-10: Fight against crime

HORIZON-CL3-2021-FCT-01-11: Fight against crime

HORIZON-CL3-2021-FCT-01-12: Fight against crime

HORIZON-CL3-2021-FCT-01-13: Fight against crime

HORIZON-CL3-2021-FCT-01-14: Fight against crime

HORIZON-CL3-2021-FCT-01-15: Fight against crime

HORIZON-CL3-2021-FCT-01-16: Fight against crime

HORIZON-CL3-2021-FCT-01-17: Fight against crime

HORIZON-CL3-2021-FCT-01-18: Fight against crime

HORIZON-CL3-2021-FCT-01-19: Fight against crime

HORIZON-CL3-2021-FCT-01-20: Fight against crime

HORIZON-CL3-2021-FCT-01-21: Fight against crime

HORIZON-CL3-2021-FCT-01-22: Fight against crime

HORIZON-CL3-2021-FCT-01-23: Fight against crime

HORIZON-CL3-2021-FCT-01-24: Fight against crime

HORIZON-CL3-2022-BM-01-04: OPEN TOPIC

HORIZON-CL3-2022-BM-01-05: OPEN TOPIC

HORIZON-CL3-2022-BM-01-06: OPEN TOPIC

HORIZON-CL3-2022-BM-01-07: OPEN TOPIC

HORIZON-CL3-2022-BM-01-08: OPEN TOPIC

HORIZON-CL3-2022-BM-01-09: OPEN TOPIC

HORIZON-CL3-2022-BM-01-10: OPEN TOPIC

HORIZON-CL3-2022-BM-01-11: OPEN TOPIC

HORIZON-CL3-2022-BM-01-12: OPEN TOPIC

HORIZON-CL3-2022-BM-01-13: OPEN TOPIC

HORIZON-CL3-2022-BM-01-14: OPEN TOPIC

HORIZON-CL3-2022-BM-01-15: OPEN TOPIC

HORIZON-CL3-2022-BM-01-16: OPEN TOPIC

HORIZON-CL3-2022-BM-01-17: OPEN TOPIC

HORIZON-CL3-2022-BM-01-18: OPEN TOPIC

HORIZON-CL3-2022-BM-01-19: OPEN TOPIC

HORIZON-CL3-2022-BM-01-20: OPEN TOPIC

HORIZON-CL3-2022-BM-01-21: OPEN TOPIC

HORIZON-CL3-2022-BM-01-22: OPEN TOPIC

their autonomy

ated to protect local

infrastructure

exposure and its public

on for extreme climate
resilience building

r risks, adaptive
data and projections

es to enhance
seases

management of High-

quality control of data
al hazards, accidents and

HORIZON-CL3-2022-DRS-01-05: Improved impact forecasting and early warning systems

first responders and improved capacities to minimise time to react in urban areas in the case of CBRN-E-related events

Indicative information, subject to HE Work Programme approval

33 Topics relevant to Galileo/Copernicus based solutions

EXAMPLES

- **Development of high-resolution Earth system models for global and regional climate change projections**
- **More efficient and effective multimodal freight transport nodes to increase flexibility, service visibility and reduce the average cost of freight transport**
- **European demonstrators for integrated shared automated mobility solutions for people and goods**
- **Urban logistics and planning**
- **Smart enforcement for resilient, sustainable and more efficient transport operations**
- **Accelerating the deployment of new and shared mobility services for the next decade**
- **New concepts and approaches for resilient freight transport and logistics networks against disruptive events (including pandemics)**

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HORIZON-CL5-2021-D1-01-01: Improved understanding of greenhouse gas fluxes and radiative forcers, including carbon dioxide removal technologies

HORIZON-CL5-2021-D1-01-02: Climate change research and innovation for climate goals

HORIZON-CL5-2021-D1-01-03: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-04: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-05: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-06: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-07: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-08: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-09: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-10: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-11: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-12: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-13: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-14: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-15: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-16: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-17: Climate change impacts and adaptation

HORIZON-CL5-2021-D1-01-18: Climate change impacts and adaptation

HORIZON-CL5-2021-D3-02-06: Novel approaches to concentrated solar power (CSP)

fuels of non-

building stock

onomous

perception and

conditions (CCAM

), connectivity and

M Partnership)

al freight transport

cost of freight

sustainable

d shared

ip)

traffic management

urvivability

ership fires

ating urban freight

ent, sustainable and more

efficient transport operations

HORIZON-CL5-2022-D6-02-07: New concepts and approaches for resilient freight transport and logistics networks against disruptive events (including pandemics)

Open
Commission

- Data and technologies for the inventory, fast identification and monitoring of endangered wildlife and other species groups
- Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems
- Modelling land use and land management in the context of climate change
- User-oriented solutions building on environmental observation to monitor critical ecosystems and biodiversity loss and vulnerability in the European Union
- Preparing for pre-commercial procurement (PCP) for end-user services based on Environmental Observation in the area Climate Change Adaptation and Mitigation
- New technologies for acquiring in-situ observation datasets to address climate change effects

HORIZON-CL6-2022-FARM2FORK-01-14: African Food cities

to complement authoritative

Indicative information, subject to HE Work Programme approval

environmental conditions



SPACE

OTHER IMPORTANT R&D OPPORTUNITIES FOR SPACE DOWNSTREAM

European Innovation Council

Support to innovations with breakthrough and disruptive nature and scale up potential that are too risky for private investors **(70% of the budget earmarked for SMEs)**

**European
Innovation Council –
a one-stop-shop**

- Helping researchers and innovators create markets of the future, leverage private finance, scale up their companies
- Innovation centric, risk taking & agile, pro-active management and follow up
- Mostly 'bottom up', but also targeting strategic challenges
- EIC Programme Managers to develop visions for breakthroughs and steer portfolios

Complementary instruments bridging the gap from idea to market

PATHFINDER

R&I grants
(from early technology
to proof of concept)

TRANSITION

R&I grants
(proof of concept to
pre-commercial)

ACCELERATOR

Grants & investment (via EIC Fund) for
single SMEs & start-ups
(from pre-commercial to market & scale-up)



European
Commission

EIC Pathfinder	EIC Transition	EIC Accelerator
<ul style="list-style-type: none"> Consortia of at least three different independent legal entities (e.g. research organisations, universities, SMEs, industry) established in at least 3 different eligible countries; Single applicants or small consortia (two partners). 	<ul style="list-style-type: none"> Single applicants (SMEs, spin-offs, start-ups, research organisations, universities); Small consortia (two to 5 partners); Applications must build on results from eligible Pathfinder, FET or ERC Proof of Concept projects. 	<ul style="list-style-type: none"> Single Start-ups and SMEs (including spin-outs); Individuals (intending to launch a start-up/ SME); In exceptional cases small mid-caps (fewer than 500 employees).
<ul style="list-style-type: none"> Grants of up to EUR 3 million (open) or EUR 4 million (challenge driven) (or more if properly justified) to achieve the proof of principle and validate the scientific basis of breakthrough technology; 	<ul style="list-style-type: none"> Grants of up to EUR 2.5 million (or more if properly justified) to validate and demonstrate technology in application relevant environment and develop market readiness 	<ul style="list-style-type: none"> <u>Blended finance</u>: up to EUR 2.5 million grant component for technology development and validation; EUR 0.5 - 15 million investment component for scaling up and other activities. <u>Grant only/grant first</u>: under certain conditions. Investment component only for small mid-caps or as follow up to grant only (i.e. for SMEs, including start-ups)
TRL 1-4	TRL 4 to 5/6	TRL 5/6 to 8

OTHER IMPORTANT R&D OPPORTUNITIES FOR SPACE DOWNSTREAM



EIC main funding opportunities in 2021

Accelerator - Open	Apply any time (early stage screening)	~€593m (~50:50 grant/equity)
Accelerator – Challenges	Cutoffs for full applications in 9 June, 6 October	~€495m (~50:50 grant/equity)
<ul style="list-style-type: none"> • Green Deal innovations for the economic recovery • Strategic technologies: digital & health 		
Pathfinder - Open	19 May	~€168m
Pathfinder - Challenges	27 October	~€132m
<ul style="list-style-type: none"> • Awareness inside • Measure & stimulate brain • Cell & gene therapies • Green Hydrogen • Engineered Living Materials 		
Transition – Open	22 September	~€60m
Transition – Challenges		~€40m
<ul style="list-style-type: none"> • Medtech & devices • Energy harvesting & storage 		

[EIC Work Programme 2021.pdf](#)
(europa.eu)

Indicative information, subject to HE Work Programme approval

**Thank you for your
attention**