



#InvestEUresearch



Horizon 2020 Work Programme for Research & Innovation 2018-2020

International Space Information Day
Paris
05/09/2019

Jean-Michel Monthiller

DG GROW – Internal Market, Industry
Entrepreneurship and SMEs

GROW/I1 - Space Policy and Research Unit

Research and
Innovation

Outline

1 - Policy context / EU Space programme(s)

2 - Horizon 2020 Work Programme

- **Space part** (Copernicus & Earth Observation, Space Technologies, Science, Security, Business), EGNSS



- Space in **European Innovation Council (EIC)**



- Space in **Access to Risk Finance (ARF)**



Space Strategy

COM(2016)705

- Maximising the benefits of space for society and EU Economy
- Fostering a globally competitive and innovative European space sector
- Reinforcing Europe's autonomy in accessing and using space in a secure and safe environment
- Strengthening Europe's role as a global actor and promoting international cooperation

Space Programmes and H2020 – MFF 2014-2020



~4.291 M€



~7.071 M€



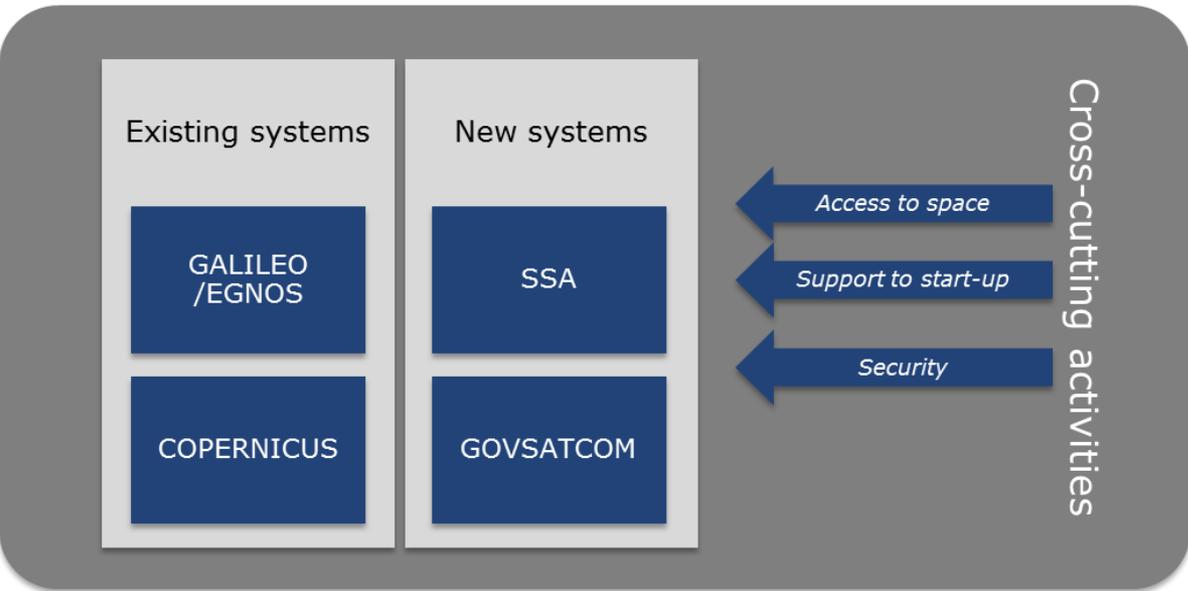
~1.479 M€



Commission Space related proposals for next MFF (2021-2027)

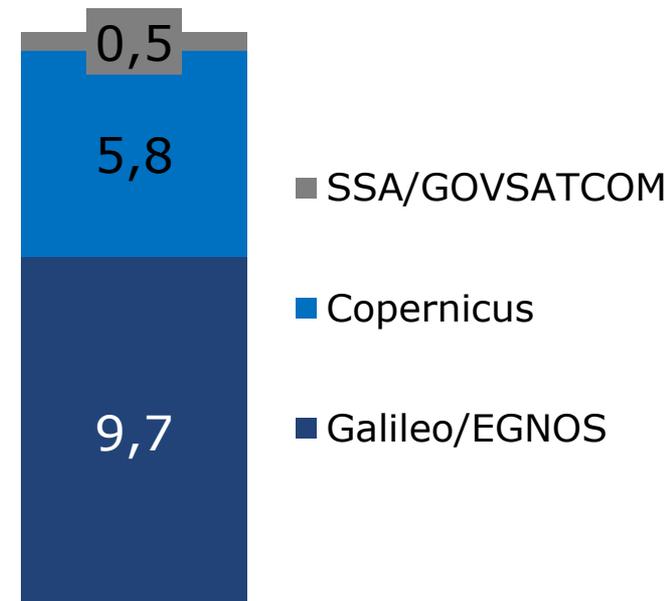
- **EU Space Programme 2021-2027:** 16 B€
- **Horizon Europe:** 100 B€.
- **InvestEU:** 38 B€

Proposal for a EU Space Programme 2021-2027



4 components – 3 horizontal activities

Allocation of the €16bn



MFF 21-27



Proposal for a EU R&I Programme 2021-2027

Boosting key technologies and solutions underpinning EU policies & Sustainable Development Goals

| Clusters implemented through usual calls, missions & partnerships | Budget (€ billion) |
|---|-----------------------|
| Health | € 7.7 |
| Inclusive and Secure Societies | € 2.8 |
| Digital and Industry* | € 15 |
| Climate, Energy and Mobility | € 15 |
| Food and Natural Resources | € 10 |
| Joint Research Centre supports European policies with independent scientific evidence & technical expertise | € 2.2 |



Digital and Industry

- * Manufacturing technologies
- * Advanced materials
- * Next generation internet
- * Circular industries
- * **Space**

- * Key digital technologies
- * Artificial intelligence and robotics
- * Advanced computing and Big Data
- * Low carbon and clean industry

* Cluster "Digital and Industry" includes Space

The programmes replaced

Equity Instruments

CEF Equity

COSME EFG

EaSI Capacity Building IW

Innovfin Equity

Guarantee Instruments

EaSI Guarantee

EFSI

Student Loans GF

Risk Sharing Instruments

Natural Capital Fin. Fac.

Innovfin Risk Sharing

CEF Debt Instrument



InvestEU

InvestEU indicative proposed budget allocation

| Window | Budgetary guarantee | Mobilised investment (estimate) |
|--|---------------------|---------------------------------|
| Sustainable infrastructure | 11 500 | 185 000 |
| Research, Innovation and Digitisation | 11 250 | 200 000 |
| SMEs | 11 250 | 215 000 |
| Social investment and skills | 4 000 | 50 000 |
| TOTAL <i>(EUR Million, in current prices)</i> | 38 000 | 650 000 |

- **The size of the EU guarantee proposed is EUR 38bn. and the provisioning rate 40 %, i.e. EUR 15.2 bn needed for the provisioning (EUR 14.2 bn. budg. Allocation + EUR 1bn. from reflows)**
- **Budget for InvestEU Advisory Hub, InvestEU Portal and accompanying measures is proposed to be EUR 525m.**
- **InvestEU is expected to mobilise more than EUR 650 billion of additional investment across Europe**

Space in support of EU policies

Mapping of natural disturbances and weather-related challenges

Monitoring COP21 commitments and CO₂ emissions

Better execution of CAP due to policy monitoring and precision farming

Enabling technologies in automotive, aviation and maritime sectors

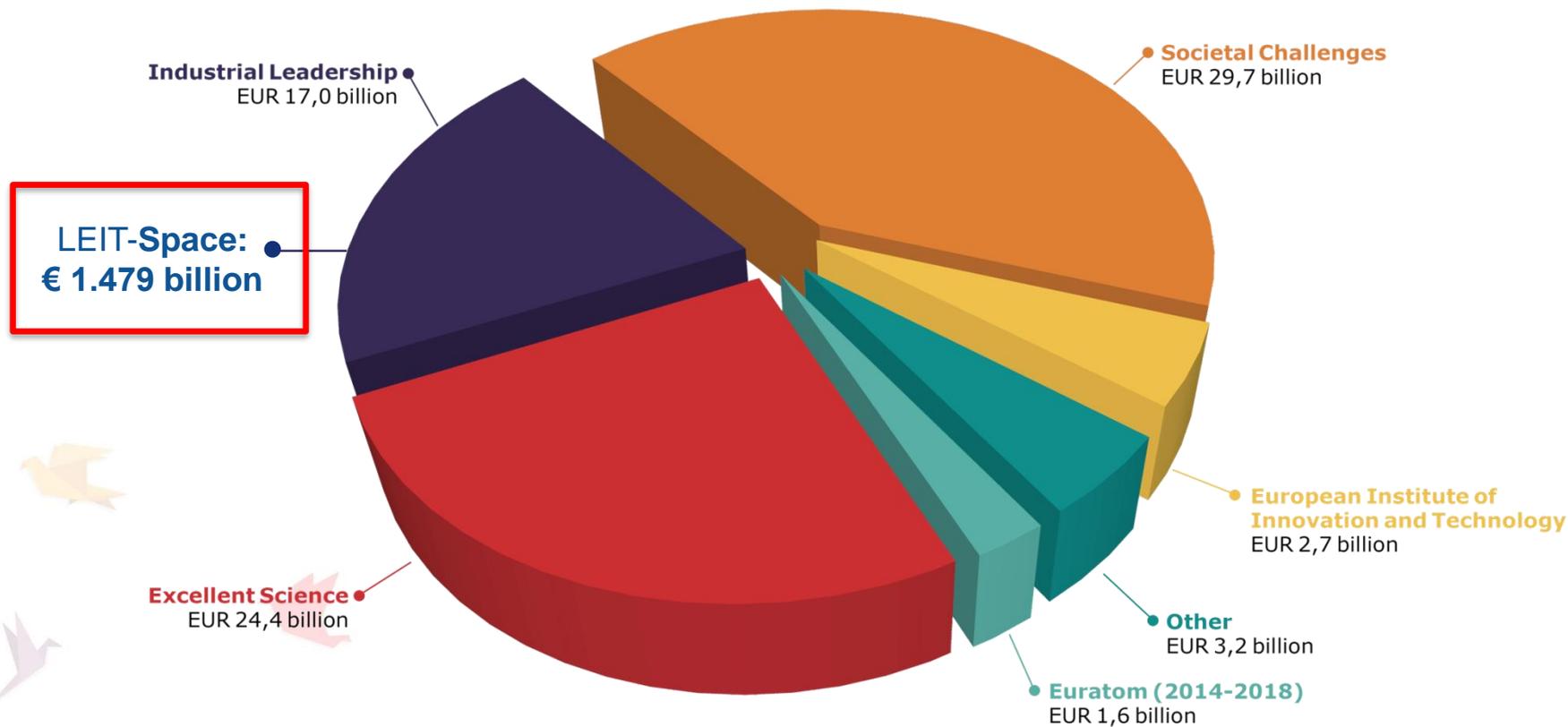
Supporting civil protection thanks to Emergency Management Service

Aiding the digitalisation through space and satellite communication

HORIZON 2020

*European Union programme
for research and innovation
for 2014-2020*

Horizon 2020 budget (in current prices): € 79 billion



LINKS TO OTHER H2020 PARTS

Priority 1

Excellent science

- European Research Council (ERC)
- Future and Emerging Technologies (FET)
- Marie Skłodowska-Curie Actions
- Research infrastructures

Priority 2

Industrial leadership

- Leadership in enabling and industrial technologies (LEIT)
 - Information and Communication Technologies (ICT)
 - Nanotechnologies
 - Biotechnology
 - Advanced manufacturing and Processing
 - **Space**
- Access to risk finance
- Innovation in SMEs

Priority 3

Societal challenges

- SC1 - Health, demographic change and well-being
- SC2 - Food security, sustainable agriculture and forestry, Marine, Maritime and Inland water research, and Bioeconomy
- SC3 - Secure, clean and efficient energy
- SC4 - Smart, green and integrated transport
- SC5 - Climate action, Environment, Resource efficiency and Raw materials
- SC6 - Europe in a changing world – Inclusive, Innovative and Reflective societies
- SC7 - Secure societies – Protecting freedom and Security of Europe and its citizens

EU AGENCIES INVOLVED

- Research Executive Agency (REA)
- European GNSS Agency (GSA)
- Executive Agency for SMEs (EASME)

TASKS include: Handling of calls and submission of proposals, evaluation process, grant agreement preparation, grant agreements signature, handling submission of reports, reviews, payments, audits...

Horizon 2020 Framework Programme (H2020)



Grant Management Services may experience issues with Grant Management tasks on Thursday, 31.01.2019, between 07:30 and 08:10 CET.

Type your Keywords or CPV code...

 Match whole words only GRANTS TENDERS

Filter by submission status

 FORTHCOMING OPEN CLOSED

Filter by programme (only for grants)

H2020

Filter by programme part

Space

Filter by focus area

Funding and tenders

Sort by: opening date title ID desc

17 results



Download all funding and tender opportunities to your calendar or subscribe to the RSS feed (unfiltered).

See all calls for tenders published by EC

Grant

SRC – In-Space electrical propulsion and station keeping SPACE-13-TEC-2019

Types of action: Research and Innovation action | **Programme:** Horizon 2020

Open for submission

Opening date: 16 October 2018**Deadline model:** single-stage
Deadline date: 12 March 2019 17.

Grant

Access to space SPACE-17-TEC-2019

Types of action: Research and Innovation action | **Programme:** Horizon 2020

Open for submission

Opening date: 16 October 2018**Deadline model:** single-stage
Deadline date: 12 March 2019 17.

Grant

EIC Horizon Prize for 'European Low-Cost Space Launch' Space-EICPrize-2019

Types of action: Inducement Prize | **Programme:** Horizon 2020

Open for submission

Opening date: 12 June 2018**Deadline model:** single-stage
Deadline date: 01 June 2021 1.

Grant

Copernicus market uptake DT-SPACE-01-E0-2018-2020

Types of action: Innovation action | **Programme:** Horizon 2020

Open for submission

Opening date: 16 October 2018**Deadline model:** single-stage
Deadline date: 12 March 2019

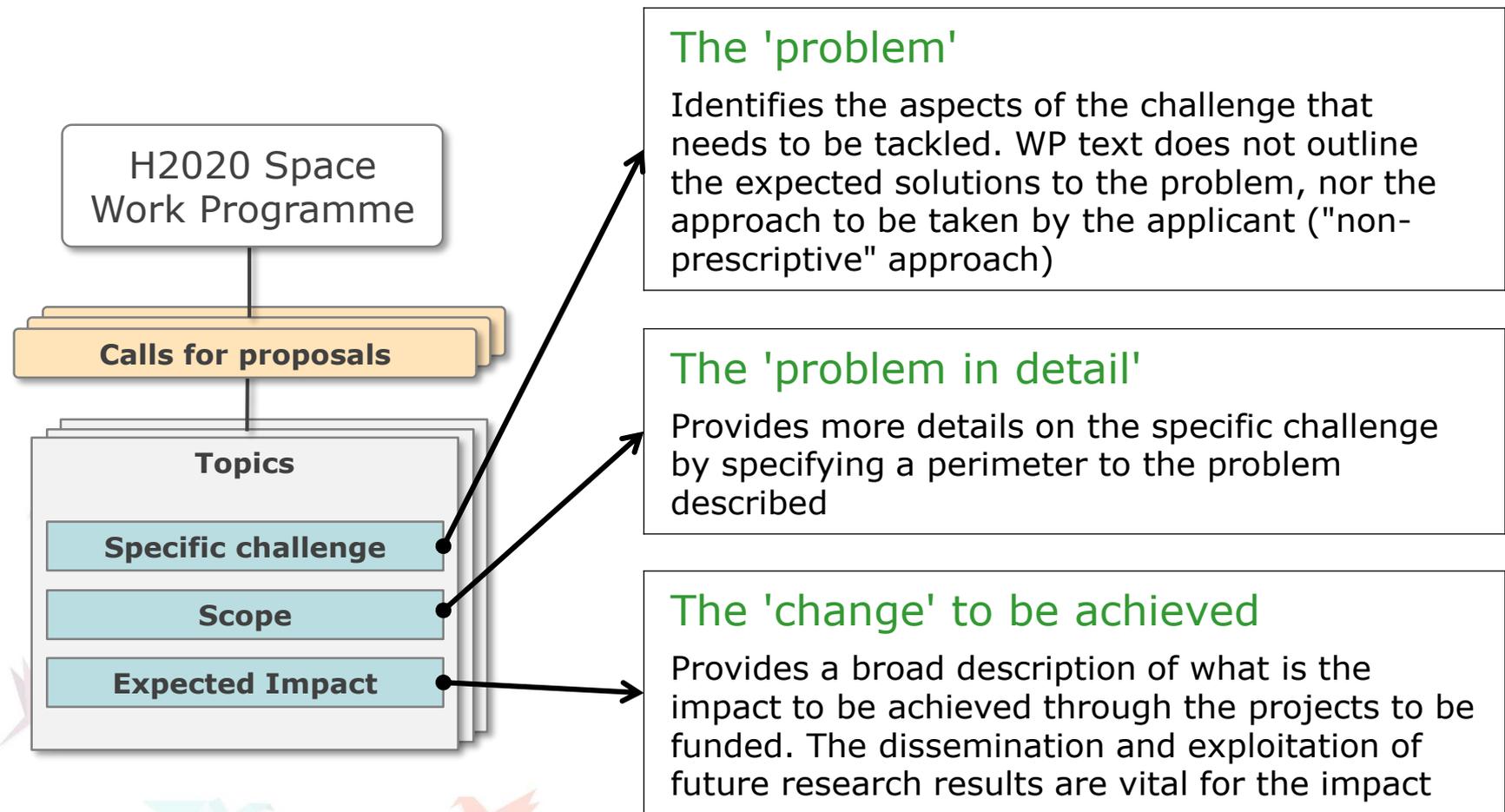
H2020 Space Work Programme

Calls for proposals

Other actions

Topics

Activities



Type of Actions

Research and innovation actions (Funding rate: 100%)

- Establish new knowledge
- New or improved technology (e.g. basic and applied research technology development)
- Testing and validation on a small-scale prototype.

Innovation actions (Funding rate: 70% - exception: 100% for non-profit legal entities)

- Produce plans, arrangements or designs for a new or improved product, design, process or service
- Large-scale product validation and market replication.

Coordination and support actions (Funding rate: 100%)

- Accompanying / complementary measures
- Standardisation, awareness-raising, communication, policy dialogues, networking, studies, etc.)

Full detailed description can be found in the **General Annexes 19 – part D** of the Work Programme 2018-2020:
https://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2018-2020/annexes/h2020-wp1820-annex-ga_en.pdf

WP 2018-2020 Building blocks

Maximising benefits of space for society and EU economy

SPACE-EO

- EO market uptake
- Copernicus mission and services evolution

SPACE-EGNSS

- EGNSS market uptake
- EGNSS infrastructure, mission and services evolution

SPACE-BIZ

- Support to space hubs
- Space outreach and education
- EIC Horizon Prize on "Low cost Space Launch"
- InnovFin Space Equity Pilot (ISEP)
- SME-instrument
- FTI – Fast Track to Innovation

Globally competitive and innovative space sector

SPACE-TEC

- Technologies for European non-depend. and competitiveness
- Strategic research clusters
- Generic space technologies
- EO and SatCom technologies
- In-orbit validation/demonstration

SPACE-SCI

- Scientific instrumentation and technologies for exploration
- Scientific data exploitation

Access to space & Secure and safe space environment

SPACE-TEC

- Access to space

SPACE-SEC

- Space weather
- Exploring concepts for space traffic management
- Space Surveillance and Tracking (SST)
- Near Earth Objects (NEOs)

+ under "other actions": ESA engineering support, REA/GSA project monitoring, studies & communication and support to the Space NCPs network

Earth Observation



Space call 2020: € 43 million
Deadline: 5 March 2020

Maximising benefits of space for society and EU economy

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- EO market uptake
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SPACE-EGNSS

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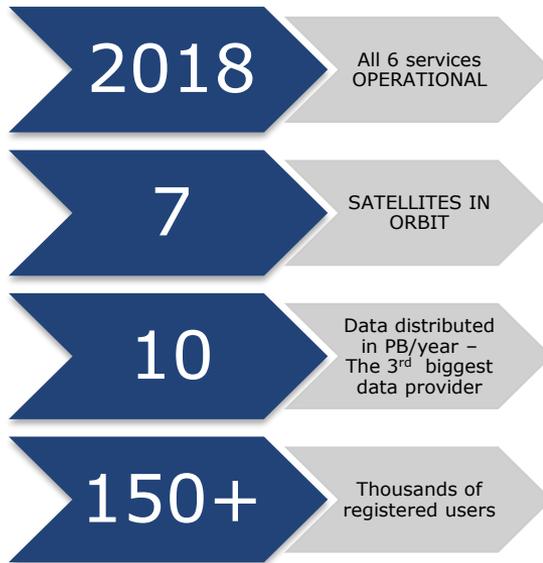
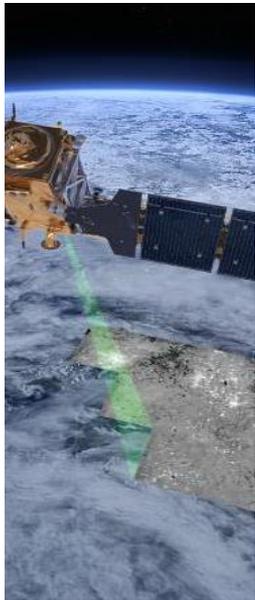
Access to space & Secure and safe space environment

SPACE-TEC

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SPACE-SEC

- Space weather
- Exploring concepts for space traffic management
- Space Surveillance and Tracking (SST)
- Near Earth Objects (NEOs)



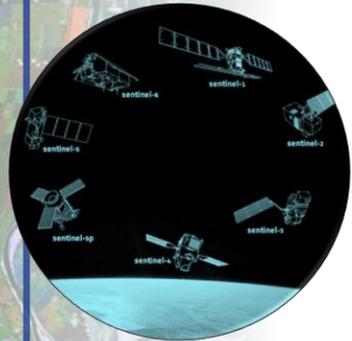
-  **Climate Change**
Support to mitigation strategies
-  **Atmosphere**
Air quality, solar Radiation, Emissions monitoring
-  **Natural/man-made disasters**
Floods, earthquakes, fires, hurricanes
-  **Security**
Border surveillance, Maritime Surveillance, Support to EU external action
-  **Agriculture and resources**
Precise farming, Forestry, Natural resources, Urban Planning
-  **Marine Environment**
Fisheries, Transport, Tourism, Coastal and marine resources

The most advanced Earth observation system in the world



Copernicus

COPERNICUS ARCHITECTURE



Space Component
Sentinels



Data

6 Services



Products (free)

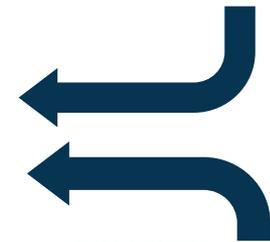


Applications

Downstream / Market Uptake



Contributing missions





Copernicus

COPERNICUS GOVERNANCE



SPACE

TECHNICAL COORDINATION BY
 esa

SENTINELS MISSIONS OPERATED BY
 esa **EUMETSAT**

CONTRIBUTING MISSIONS



SERVICES



ECMWF



MERCATOR OCEAN



European Environment Agency



ECMWF



EMSA **FRONTEX**

Entrusted Entities

IN SITU



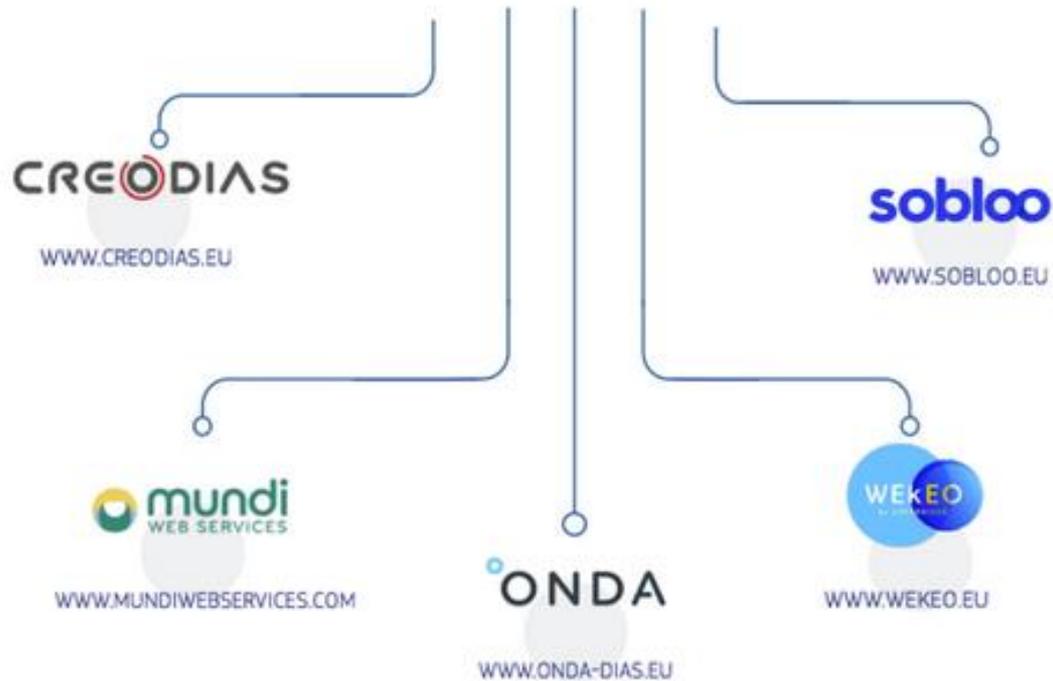
COORDINATED BY
European Environment Agency



Copernicus

DIAS PROVIDERS

THE DIAS & WHERE TO REACH THEM



ALL-IN-ONE
ACCESS



A WEALTH
OF SERVICES



USER FOCUSED
FROM PRODUCTION
TO ACTIONABLE INFORMATION



A WORLD
OF OPPORTUNITIES
WAITING TO BE CAPTURED





Earth Observation

| Topics | Type of Action | Indicative budget (€ million) | | |
|---|----------------|-------------------------------|------|------|
| | | 2018 | 2019 | 2020 |
| DT-SPACE-01-EO-2018-2020: Copernicus market uptake | IA | 9.0 | 9.0 | 9.0 |
| LC-SPACE-02-EO-2018: Copernicus evolution – Mission exploitation concepts | CSA | 8.0 | | |
| LC-SPACE-03-EO-2018: Copernicus evolution – preparing for the next generation of Copernicus Marine Service ocean models | RIA | 5.0 | | |
| LC-SPACE-04-EO-2019-2020: Copernicus evolution – Research activities in support of cross-cutting applications between Copernicus services | RIA | | 8.0 | 8.0 |

| Topics | Type of Action | Indicative budget (€ million) | | |
|--|----------------|-------------------------------|------|------|
| | | 2018 | 2019 | 2020 |
| LC-SPACE-05-EO-2019: Copernicus evolution - a gap analysis to prepare future activities for Copernicus data..... | CSA | | 2 | |
| LC-SPACE-06-EO-2019: International Cooperation Copernicus – Designing EO downstream applications with international partners | RIA | | 5.0 | |
| LC-SPACE-18-EO-2019: Copernicus evolution – Research activities in support of the evolution of the Copernicus services | RIA | | | 10.0 |
| LC-SPACE-19-EO-2019: Copernicus evolution: new concept of an innovative and holistic solution for Sentinels calibration & validation | CSA | | | 3.0 |
| LC-SPACE-24-EO-2020: Copernicus evolution – Mission exploitation concept for WATER | CSA | | | 3.0 |
| LC-SPACE-25-EO-2020: Big data technologies and Artificial Intelligence for Copernicus | RIA | | | 10.0 |

DT-SPACE-01-EO-2020: Copernicus market uptake

Specific Challenge

- Copernicus produces a wealth of data and information services
- Importance of the integration with **data assets from other domains** - not necessarily from the space/geospatial sector - and synergies with EGNOS/Galileo.
- **State-of-the-art ICT technologies** (e.g. big data processing and linking technologies, machine learning and artificial intelligence) to offer **user-friendly solutions**

Scope

- to help European companies to create business using Copernicus data and addressing European and global challenges
- **Use of existing European data infrastructure (e.g. DIAS)** is encouraged making sense of large volumes of diverse data from distributed sources
- Role of industry: to define **project's industrial requirements** and take ownership of the results
- Role of end-user: **to test the proposed solutions**
- access to other data sets (not Copernicus) shall be demonstrated already at the proposal preparation
- **Business model plan** to demonstrate user engagements and sustainability

Expected Impact

- Establish new sustainable data value chains with Copernicus data + commercial value
- Increase in the market of the **number of products and services**
- **Generate growth and new jobs**

**Recommended
project size**
1 to 3 M€

Indicative budget
9 M€

Type of action
Innovation Action

The participation of at least one industrial partner is mandatory, and the participation of SMEs and start-ups is encouraged

A business plan and evidence of user engagement is compulsory

LC-SPACE-18-EO-2020: Copernicus evolution

Research activities in support of the evolution of the Copernicus services

Specific Challenge: emerging user requirements and EU policies; integration of space research with other non-space domain

Scope: identify one (or more) core product(s) to be developed taking into account the **existing portfolio** of the services and clearly **define to what extent main model, algorithm, tool and technique should be improved to generate new or better products.**

- demonstrate technical operational feasibility
- **proof-of-concept or a prototype modular and scalable** and should guarantee the expandability required for the integration of new data from potential space or non-space new mission/sensors.
- **New IT tools for a better data exploitation, processing and distribution**, e.g.: cloud and HPC computing, distributed computing, Artificial Intelligence, machine learning, ensemble modelling, model coupling & nesting, software as-a-service.

Expected Impact:

- Focused projects scientifically validated and ready for pre-operations;
- Increased coverage of EU user requirements and EU policies

**Recommended
project size**
1 to 1,5 M€

Indicative budget
10 M€

Type of action
**Research and
Innovation Action**

The participation of at least one industrial partner is mandatory, and the participation of SMEs and start-ups is encouraged

A business plan and evidence of user engagement is compulsory

LC-SPACE-19-EO-2020 - Copernicus evolution: new concept of an innovative and holistic solution for Sentinels cal/val

Specific Challenge:

- Importance of a **proper calibration of the instruments and validation of the products for** operational services
- Global monitoring over extended periods will require even more rigorous **inter-calibration** in the future

Scope

- Define an innovative and holistic **strategy** for the cal/val activities for and across all existing and planned Sentinels in **an operational perspective** with specific reference to optimized sites or “supersite(s)”
- Clear identification of cross-Sentinels calibration requirements (from level 0 to level 1 data) and of validation requirements (from level 1 to level 2 data); clear identification of **different cal/val sources**; comparative evaluation of various methodologies; evaluation of the **direct impact on level 3 products** when relevant.
- Linkages with the international community

Expected Impact

- Consistent approach for the calibration and validation for and across Copernicus Sentinels
- Coordination of networks and space agencies and institutions contributing to Copernicus Sentinels cal/val activities

**Recommended
project size**
3 M€

Indicative budget
3 M€

Type of Action
**Coordination and
Support Action**

LC-SPACE-24-EO-2020: Copernicus evolution

Mission exploitation concept for water

Specific Challenge

- Data and product information related to water and hydrological / hydrodynamic processes already developed / used in several Copernicus services → **global water cycle**
- Improvement of the Copernicus portfolio for **inland waters (mapping and hydrodynamic water processes, hydrological cycle, connection with ocean processes, ...)** providing a real support to final users.

Scope

- **Analyse current and planned EO space capacities together with innovative processing, modelling and computing techniques**
- Integrated approach for a coherent and consistent **inland water monitoring system**

Specific themes should be addressed:

- Improved quality of inland water variables
- Development of high level biogeochemical products (e.g. water quality and food web modelling or analysis)
- Development of temporal and change detection

Expected Impact

- Support existing and new policies

**Recommended
project size**
3 M€

Indicative budget
3 M€

Type of Action
*Coordination and
Support Action*

DT-SPACE-25-EO-2020: Big data technologies and AI for Copernicus

Specific Challenge:

- **Big Data technologies and Artificial Intelligence** (AI) methods to analyse and manage Copernicus large data volumes:
 - **performance and automation of processes** to improved capabilities to deliver timely services
 - Integration, processing and analysis of Copernicus data and **other distributed data sources**
- Promoting collaboration of **ICT and EO/Space stakeholders**

Scope:

- To develop **NEW**, enabling, operational solutions to improve capabilities and performance of the Copernicus value chain.
- Proposals are strongly encouraged to make **use of existing European data infrastructures** such as (but not limited to) Copernicus' **DIAS** and to **involve end users** to drive the research with their requirements and test the developed solutions.
- Explore the **synergies with EGNOS/Galileo**

Expected Impact:

- Increased capacity of processing and analysing large volumes of Copernicus- EO data
- **Increased performance and/or automation of processes**

Recommended

project size

2 to 4 M€

Indicative budget

10 M€

Type of Action

Research and

Innovation Action

Participation of

industry, in particular

SMEs

Involvement of post-

graduate scientists,

engineers and

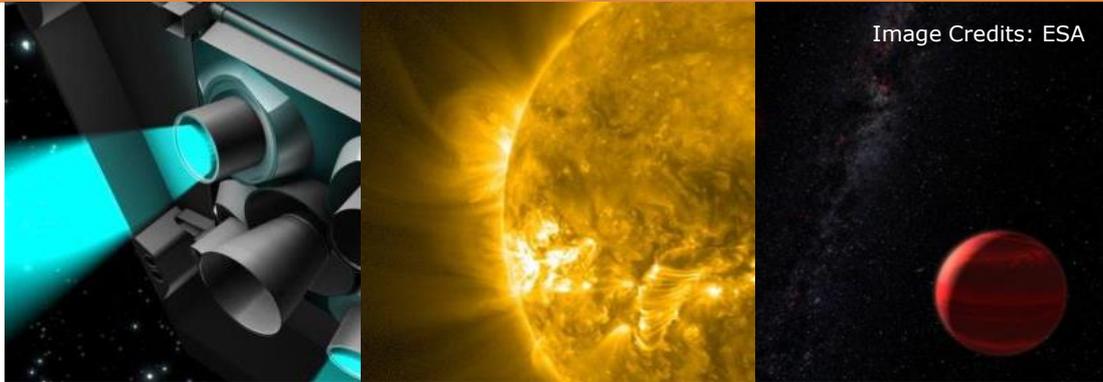
researchers and

promotion of gender

balance Encouraged



Globally competitive and innovative space sector



Space call 2020: 65 M€
2018-2020: 269 M€

Deadline: 5 March 2020

Maximising benefits of space for society and EU economy

SPACE-EO

- EO market uptake
- Copernicus mission and services evolution

SPACE-EGNSS

- EGNSS market uptake
- EGNSS infrastructure, mission and services evolution

SPACE-BIZ

- Support to space hubs
- Space outreach and education
- EIC Horizon Prize on "Low cost Space Launch"
- InnovFin Space Equity Pilot (ISEP)
- SME-instrument
- FTI – Fast Track to Innovation

Globally competitive and innovative space sector

SPACE-TEC

- Technologies for European non-depend. and competitiveness
- Strategic research clusters
- Generic space technologies
- EO and SatCom technologies
- In-orbit validation/demonstration

SPACE-SCI

- Scientific instrumentation and technologies for exploration
- Scientific data exploitation

Access to space & Secure and safe space environment

SPACE-TEC

- Access to space

SPACE-SEC

- Space weather
- Exploring concepts for space traffic management
- Space Surveillance and Tracking (SST)
- Near Earth Objects (NEOs)

Space technologies, Science and exploration

| Topics | Type of Action | Indicative budget (€ million) | | |
|---|----------------|-------------------------------|------|------|
| | | 2018 | 2019 | 2020 |
| SPACE-10-TEC-2018-2019-2020: Technologies for European non-dependence and competitiveness | RIA | 12.0 | 12.0 | 14.0 |
| SPACE-11-TEC-2018: Generic space technologies | RIA | 11.0 | | |
| SPACE-12-TEC-2018: SRC – Space Robotics Technologies | RIA | 18.0 | | |
| SPACE-13-TEC-2019: SRC – In-Space electrical propulsion and station keeping | RIA | | 10.0 | |
| LC-SPACE-14-TEC-2018-2019: Earth observation technologies | RIA | 8.0 | 8.0 | |
| SPACE-15-TEC-2018: Satellite communication technologies | RIA | 9.0 | | |
| SPACE-16-TEC-2018: Access to space | RIA | 10.0 | | |
| SPACE-17-TEC-2019: Access to space | RIA | | 9.0 | |

| Topics | Type of Action | Indicative budget (€ million) | | |
|---|----------------|-------------------------------|------|------|
| | | 2018 | 2019 | 2020 |
| SPACE-27-TEC-2020: SRC – Space Robotics Technologies | RIA | | | 9.0 |
| SPACE-28-TEC-2020: SRC – In-Space electrical propulsion and station keeping | RIA | | | 24.0 |
| SPACE-29-TEC-2020: Satellite communication technologies | RIA | | | 9.0 |
| SPACE-20-SCI-2018: Scientific instrumentation and technologies for exploration | RIA | 10.0 | | |
| SPACE-30-SCI-2020: Scientific data exploitation | RIA | | | 9.0 |

Specific Challenge

- Space: a strategic asset (independence, security and prosperity of Europe)
- Europe needs non-dependent access to critical space technologies
- This can also open new markets to our industries

Scope

- List of critical technologies established by COM-ESA-EDA Joint Task Force
- Complementary / synergies with other European activities
- Technological spin in and/or bilateral collaborations between European non-space and space industries, research centers and academia
- Analysis of relevant available roadmaps and how the selected critical space technologies can contribute to different space applications
- Commercial assessment of the supply chain technology in the space or non-space domains
- Show that technologies are free of any legal export restrictions or limitations (e.g. International Traffic in Arms Regulations - ITAR)

Impact

- European capacity to operate independently in space
- Enhance overall competitiveness of European space industry worldwide
- Reduce dependency on export restricted technologies
- Synergies with activities at EU and national level, space or non-space

Recommended EU-funding per project
1-3 MEur

Indicative budget
14 MEur

Type of Action:
Research and Innovation Action

Technical guidance document (high-level requirements, description of scope, initial and target TRLs) published on the Funding & Tenders Portal

Scope

Group A (2018):

- JTF-2018/20-3 – High Capacity FPGAs
- JTF-2018/20-8 – ASICS: 28nm DSM
- JTF-2018/20-16 – Active discrete power comp.
- JTF-2018/20-18 – RF components
- JTF-2018/20-19 – Passive components
- JTF-2018/20-22 – High temperature packaging

Group B (2019):

- JTF-2018/20-2 – ASICS for mixed signal processing
- JTF-2018/20-11 – Design and qualification of μ controller for space applications
- JTF-2018/20-12 – Design and prototype of nvRAM for SPACE with serial i/f
- JTF-2018/20-21 – High density (1000 pins and beyond) assy capabilities and PCBs
- JTF-2018/20-28 – Photonics component
- JTF-2018/20-31 – Advanced laser crystals for high power space applications

Group C (2020):

- JTF-2018/20-5 – Very high performance microprocessors
- JTF-2018/20-9 – Design and prototype of ultra-reprogrammable SoCs
- JTF-2018/20-14 – Fiber optic or photonic integrated technology gyro-based IMU
- JTF-2018/20-17 – Power amplification: travelling wave tube materials
- JTF-2018/20-23 – SW tool: automatic generation of code
- JTF-2018/20-33 – Advanced materials and material technology for combustion chambers

**Recommended
project size**

1 to 3 M€

Indicative budget

14 M€

Type of action

Research and

Innovation Actions



Specific Challenge

- The objective of this third call is to prepare the technologies for demonstrators planned to be implemented in the 2023-2027 timeframe.
- Successful proposals shall validate relevant applications for both orbital and planetary scenarios relying on technologies derived from previous SRC activities.

Scope

- a) In-orbit Demonstrator Mission Study
- b) Advanced Robotics Planetary Exploration

At least two proposals will be selected for subtopic a) and at least of one proposal for subtopic b)

Impact

- Increase the performance of space missions in a cost-effective manner and enable new business cases considering New Space approaches
- Specific impacts for a) and b) in the call Text

Recommended EU-funding per project
3 MEur

Indicative budget
9 M€

*Research and Innovation
Action*

*Guidance document
available on the Funding &
Tenders Portal*

*Also consult the
PERASPERA SRC Web
Site and roadmap*

PERASPERA

SPACE-28-TEC-2020: SRC In Space electrical propulsion and station keeping: Incremental Technologies

Specific Challenge

- Strategic research cluster (SRC) to enable major advances in Electric Propulsion (EP) for in-space operations and transportation
- European leadership through competitiveness and non-dependence at world level within the 2020-2030 timeframe

Scope

Incremental advances in

1. Hall Effect Thrusters (HET)
2. Gridded Ion Engines (GIE)
3. High Efficiency Multistage Plasma Thrusters (HEMPT)

a) Low power (200 W to 700 W)

EUR 12 million / Max. per proposal EUR 4 million.

At least one proposal will be selected for each line 1 HET, 2 GIE, 3 HEMPT

b) Medium power (> 3.0 kW for SK and > 5.0 kW for EOR)

EUR 9 million / Max. per proposal EUR 4.5 million

At least two proposals will be selected, each one of a different technology from the three Tech. HET, GIE, HEMPT

c) High power > 20.0 kW

EUR 3 million / Max requested EU funding per proposal EUR 3 million.

At least one proposal will be selected from the three tech. HET, GIE, HEMPT

Indicative budget

24 M€

Innovation Action

*Guidelines available on the
Funding & Tenders Portal.*

*Coherence and non-
duplication with the
existing and planned
developments at national,
commercial, EU and ESA
level: EPIC Roadmap*



SPACE-28-TEC-2020: SRC In Space electrical propulsion and station keeping: Incremental Technologies

Grants will be complementary to each other and complementary to grants awarded under other previous SRC Calls topics: COMPET-3-2016-a, COMPET-3-2016-b, SPACE-13-TEC-2019

Beneficiaries of complementary grants shall conclude a written "collaboration agreement"

Expected Impact

- Develop, in the mid-term and long term the European capacity to compete in the worldwide arena of electric propulsion satellites and missions
- Pursue developments which shall be mainly market-oriented
- Enable medium and longer term applications: Telecom, Space Transportation, LEO, MEO, Exploration or Science.
- Create new markets and shape existing ones.
- Develop the Incremental Technology Electric Propulsion System up to system demonstration in a space environment and ready for its qualification.

Indicative budget
24 M€

Innovation Action

*Guidelines available on the
Funding & Tenders Portal.*

Specific Challenge

- Broadband TV applications decreasing / internet connectivity is increasing
 - Demand for Very High Throughput satellite communications
 - Integration with 5G
 - Mega constellations / satellite networks based on micro-mini satellites.
- > Prepare the ground to maintain the technological leading edge and maintain global competitiveness

Scope: one of the following sub-Topics

- a) Secure and robust satellite communications including quantum technologies
- b) Bandwidth efficient transmission techniques
- c) High speed processing and flexible and reprogrammable telecommunication payloads
- d) Flexible broadband passive and active antenna techniques
- e) Ground systems technologies

Maximum one proposal per sub-topic will be selected

Impact

- Life-cycle cost reduction
- Develop European research and technology ecosystems
- Contribute to the integration of satellite communications into the 5G
- Industrial relevance / stronger take-up of research results.

Recommended Eu-funding per project
2-3 MEur

Indicative budget
9 MEur

Research and Innovation Action

Participation of industry, in particular SMEs, is encouraged

SPACE-30-SCI-2020: Scientific data exploitation

Specific Challenge

- Data exploitation of European missions and instruments
- With international missions where relevant

Scope

- Exploitation of all acquired and available data provided by space missions in their operative, post-operative or data exploitation phase and by space-related ground based investigations
- Projects may rely on the data available through ESA Space Science Archives when possible or other means (e.g. instrumentation teams)
- Combination and correlation of this data with international scientific mission is encouraged
- Involvement of post-graduate scientists, engineers and researchers and the promotion of gender balance is encouraged

Impact

- Higher number of scientific publications based on Europe's space data
- High-level data products made available through appropriate archives
- Tools and methods developed for the advanced processing of data.
- Add value to existing activities on European and international levels
- Enhance and broaden research partnerships

**Recommended Eu-funding
per project**
1-2 MEur

Indicative budget
9 MEur

Research and Innovation Action

IOD/IOV: In Orbit Demonstration / Validation

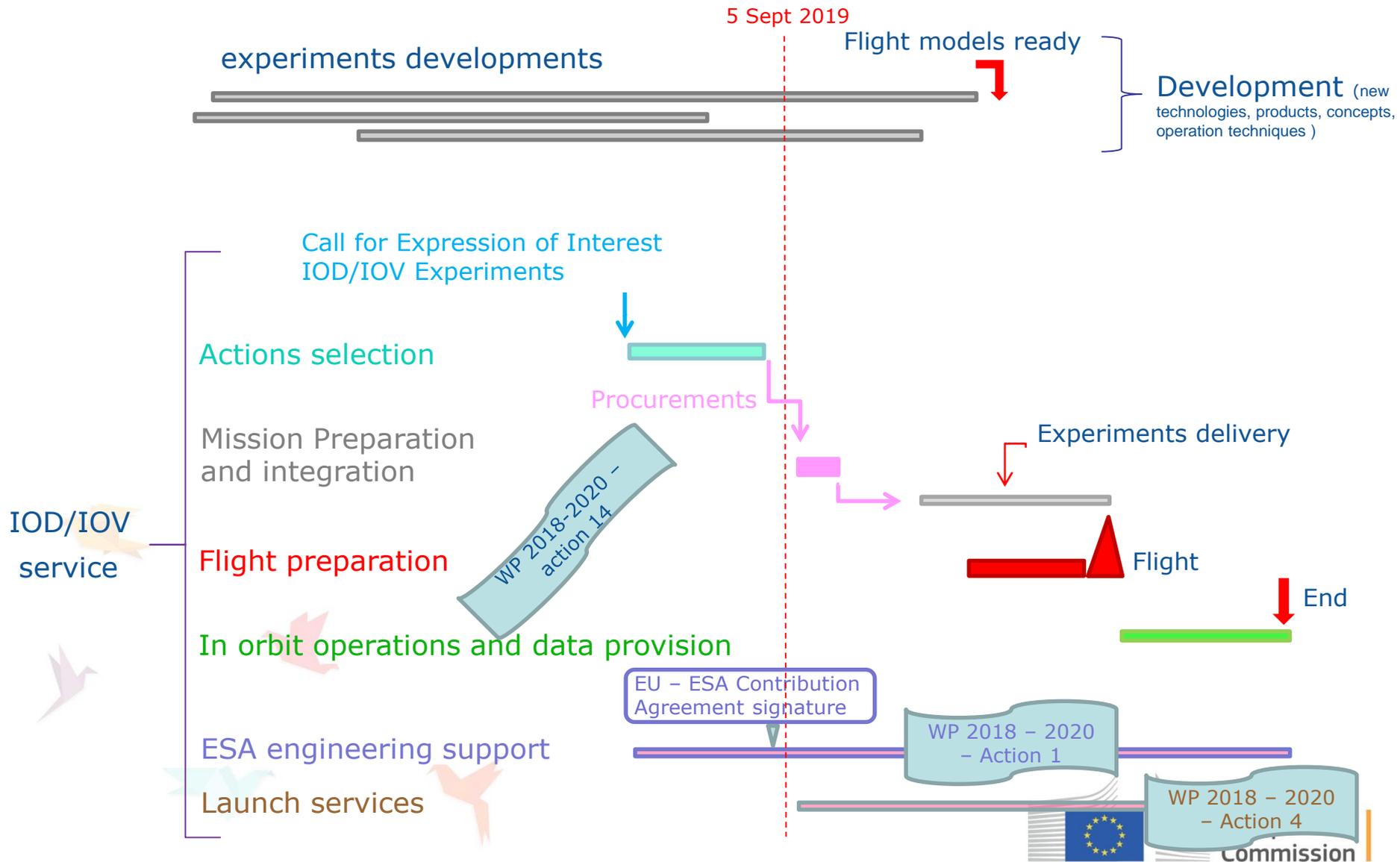
2018-2020

| Other actions | Type of Action | Indicative budget (€ million) | | |
|---|---|-------------------------------|-------------|------|
| | | 2018 | 2019 | 2020 |
| Activity 1 – ESA engineering support | Contribution agreement with an implementing entity (ESA) | 6.0 | - | - |
| Activity 4 – In-orbit demonstration/ validation – launch services | Contribution agreement with an implementing entity (ESA) | 39.0 | - | - |
| Activity 14 – In-orbit demonstration/ validation – Mission design, integration and implementation | Contribution agreement with an implementing entity (ESA) | - | 38.0 | - |

Procurements by ESA (indirect management):

- Activities for aggregation of experiments
- Launch services for
 - Aggregated experiments
 - Experiments in the form of Complete systems

Overall scheme - State of Play



Safe and Secure Environment



Space call 2020: 1.5 M€

Deadline: 5 March 2020

Maximising benefits of space for society and EU economy

SPACE-EO

- EO market uptake
- Copernicus mission and services evolution

SPACE-EGNSS

- EGNSS market uptake
- EGNSS infrastructure, mission and services evolution

SPACE-BIZ

- Support to space hubs
- Space outreach and education
- EIC Horizon Prize on "Low cost Space Launch"
- InnovFin Space Equity Pilot (ISEP)
- SME-instrument
- FTI – Fast Track to Innovation

Globally competitive and innovative space sector

SPACE-TEC

- Technologies for European non-depend. and competitiveness
- Strategic research clusters
- Generic space technologies
- EO and SatCom technologies
- In-orbit validation/demonstration

SPACE-SCI

- Scientific instrumentation and technologies for exploration
- Scientific data exploitation

Access to space & Secure and safe space environment

SPACE-TEC

- Access to space

SPACE-SEC

- Space weather
- Exploring concepts for space traffic management
- Space Surveillance and Tracking (SST)
- Near Earth Objects (NEOs)

Secure and Safe Space Environment

H2020 Call

| Topics | Type of Action | Indicative budget (€ million) | | |
|---|----------------|-------------------------------|------------|------------|
| | | 2018 | 2019 | 2020 |
| SU-SPACE-21-SEC-2020: space traffic management | CSA | | | 2.0 |
| SU-SPACE-22-SEC-2019: Space Weather | RIA | | 9.0 | |
| SU-SPACE-23-SEC-2019: NEO | RIA | | 6.0 | |
| SU-SPACE-31-SEC Network of governmental users for secure satellite communications | CSA | | 3 | |

Other Actions

| Topics | Type of Action | Indicative budget (€ million) | | |
|---|------------------|-------------------------------|------------|-------------|
| | | 2018 | 2019 | 2020 |
| Activity 5 – Improving the Performance of SST at European Level | SGA - RIA | | 4.9 | 65.7 |

CALL — Space 2018-2020 and other actions for 2018-2020 (sub-set)

Specific Challenge

- Cheaper technology and new investors lowers the threshold for access to space and the number of space actors is increasing
- The number of objects in orbit will likely increase dramatically in the near future (e.g. mass produced small satellites)
- New types of activities are emerging
- Concerns for long-term sustainability of space operations and assets
- Emerging activities in the US, Europe must maintain its autonomy for safely accessing and using space
- New technical guidelines or new best practices for “Space Traffic Management” (STM) are needed

Recommended Eu-funding per project
1.5 MEur

Indicative budget
1,5 MEur

Coordination and Support Action

Potential security scrutiny

Scope

- Networking opportunities for stakeholders (private space sector, research entities and the public space sector (space agencies))
- Identify responsibilities
- Assess available and needed technologies and capabilities, best practices, standards and guidelines to develop a STM, including in terms of costs, feasibility and effectiveness, taking into account amongst others experiences from the EU SST and EU SSA, ESA-Cleanspace and Cleansat Programmes as well as international developments in the context of the United Nations (UNOOSA)
- Propose a set of STM guidelines and best practices

Impact

- Overview of technical challenges to be addressed
- Description of the possible roles of current institutional and industrial actors
- Assessment of the paths for the SSA evolution to support safe and sustainable space operations;
- Identification of the benefits for the EU space market development, for European sovereignty as well as for international cooperation.

Recommended Eu-funding per project
1.5 MEur

Indicative budget
1,5 MEur

Coordination and Support Action

Potential security scrutiny

Other Action 5: Improving the performance of Space surveillance and tracking (SST) at European level

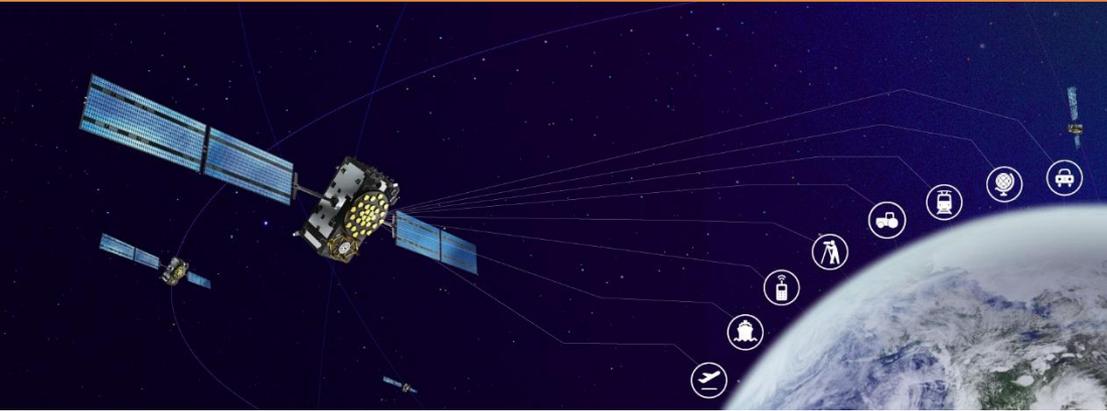
- Space surveillance and tracking capabilities in Europe are fragmented
- Depend on space surveillance systems controlled by third States.
- Need for coordinated efforts at Union level in the field of SST, in particular in the areas of service provision, networking of assets and sensors.
- Decision No 541/2014/EU of the European Parliament and of the Council of 16 April 2014 establishes a Framework SST
- Analysing, assessing and undertaking the necessary research, development and innovation activities with the specific aims of supporting the pooling of national resources
- Joined resources from Horizon 2020, EGNSS and Copernicus, in addition to the cumulative national investments of the participating Member States
- The activity should lead to connected SST assets with high added value with regard to coverage, cataloguing of space objects and performance indicators (including service provision quality) allowing for improved quality and performance of SST in the future.
- Closer interaction and complementarity among the various National Operations Centres and optimisation of the SST architecture thus achieving economies of scale while avoiding duplication.
- The option of full purchase costs of equipment, infrastructure or other assets could be included in the GA if/when duly justified.

**Indicative
budget: 2019 -
4.90 MEur 2020 -
65.70 MEur**

Type of Action:
Specific Grant
Agreement

Identified
Beneficiaries

EGNSS



Indicative budget: 20 M€;
Deadline: 5 March 2020

Maximising benefits of space for society and EU economy

SPACE-EO

- EO market uptake
- Copernicus mission and services evolution

SPACE-EGNSS

- EGNSS market uptake
- EGNSS infrastructure, mission and services evolution

SPACE-BIZ

- Support to space hubs
- Space outreach and education
- EIC Horizon Prize on "Low cost Space Launch"
- InnovFin Space Equity Pilot (ISEP)
- SME-instrument
- FTI – Fast Track to Innovation

Globally competitive and innovative space sector

SPACE-TEC

- Technologies for European non-depend. and competitiveness
- Strategic research clusters
- Generic space technologies
- EO and SatCom technologies
- In-orbit validation/demonstration

SPACE-SCI

- Scientific instrumentation and technologies for exploration
- Scientific data exploitation

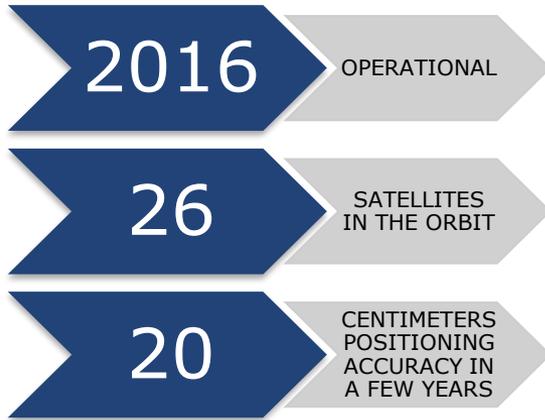
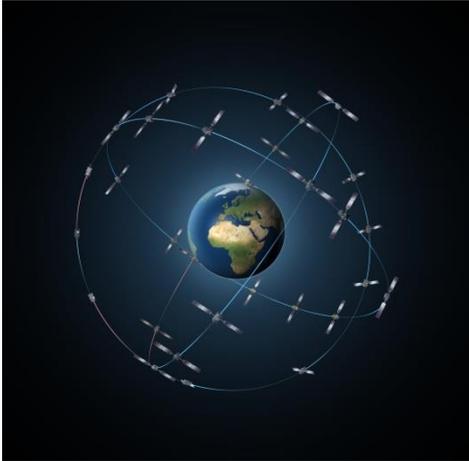
Access to space & Secure and safe space environment

SPACE-TEC

- Access to space

SPACE-SEC

- Space weather
- Exploring concepts for space traffic management
- Space Surveillance and Tracking (SST)
- Near Earth Objects (NEOs)



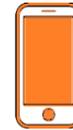
Soon the most precise satellite navigation system in the world

Galileo Differentiators:
Authentication – Search and Rescue – High Accuracy



HIGH PRECISION

1-meter (or even less) signal precision)



SMARTPHONES

All the latest models Galileo-compatible



ROAD

From April 2018, Galileo in every new car model supporting the eCall initiative .



AVIATION

275 airports in Europe are using EGNOS



AGRICULTURE

Farmers using EGNOS for precision farming



SEARCH AND RESCUE

Detecting a person in distress within 10 minutes

New Call: EGNSS market uptake 2020

H2020-SPACE-EGNSS-2020



Opening: 5th of November 2019
Deadline: 5th March 2020

| Type of Action* | Topic | Indicative budget (EUR mln) | Funding rate | Indirect costs |
|-----------------|---|-----------------------------|---|---|
| IA | EGNSS applications fostering green, safe and smart mobility | 10 | 70% (except for non-profit legal entities, where a rate of 100% applies) | 25% of the total eligible costs excluding: <ul style="list-style-type: none"> • Subcontracting • Costs of resources made available by 3rd parties • Financial support to 3rd parties |
| IA | EGNSS applications fostering digitisation | 4 | | |
| IA | EGNSS applications fostering societal resilience and protecting the environment | 4 | | |
| PCP | EGNSS applications for public authorities pilot | 2 | | |

Overall indicative budget: 20 MEur

***IA:** activities aimed at producing plans and arrangements or designs for new, altered or improved products, processes or services

PCP: Pre-Commercial Procurement actions aim to encourage public procurement of research, development and validation of new solutions that can bring significant quality and efficiency improvements in areas of public interest, whilst opening market opportunities for industry and researchers active in Europe. It provides EU funding for a group of procurers ('buyers group') to undertake together one joint PCP procurement, so that there is one joint call for tender, one joint evaluation of offers, and a lead procurer³ awarding the R&D service contracts in the name and on behalf of the buyers group.

LC-SPACE-EGNSS-1-2019-2020:

EGNSS applications fostering green, safe and smart mobility



Scope: Proposals should contribute to efficient, climate and environmentally friendly transport that will be safe and seamless for all citizens

Aviation

Advanced navigation



CNS



Air Traffic Management



Unmanned vehicles



Road

Connected and autonomous vehicles



eCall



Cooperative ITS



Mobility as a Service



Maritime

Vessel navigation & Traffic Management



Port operations



Fisheries



Autonomous vessels



Rail

Train signalling/control



Passenger-crew services



Autonomous trains



Multimodal logistics



Innovation Action

Project Indicative funding: 1 to 3 MEur - Total 10 MEur

Previous projects: have a look on GSA Web Site

DT-SPACE-EGNSS-2-2019-2020: EGNSS applications fostering digitisation



Scope: Actions should deliver new innovative applications integrating digital technologies like Internet of Things (IoT), cloud computing, big data and robotics

Mass market applications

Secure financial transactions



Tracking solutions



Augmented reality



Commercial Location Based Service



- Foster the adoption of **EGNOS and Galileo in mass markets**
- Applications that will make best use of EGNSS innovative features such as better **multipath resistance, authentication...**
- Foster **competitiveness of the European GNSS industry** in the area of mobile applications, with special focus on SMEs
- Maximise public benefits by supporting the development of applications that will address major societal challenges such as **health, citizen safety, mobility, regional growth** etc.

Project Indicative funding: 1 to 3 MEur
Innovation Action
Total budget 4 MEur
3rd call

SU-SPACE-EGNSS-3-2019-2020

EGNSS applications fostering societal resilience and protecting the environment



Scope: Proposals may address social and professional applications to support societal resilience, wellbeing of EU citizens, emergency and disaster management

Social and Professional applications

Emergency and disaster management



Search and Rescue



Surveying and mapping



Efficient Agriculture



Timing & Synchronisation



- Professional application should leverage **Galileo and EGNOS differentiators** in order to reduce the price and increase the effectiveness of the solution (Authentication – Search and Rescue – High Accuracy)
- Synergies with Copernicus
- Proposals addressing Galileo SAR service should leverage the **Forward and Return Link Services** to improve the users' safety
- Emergency and disaster management applications should target **integration of different sensors and position sources** to identify, locate and react in critical situations
- Applications in agriculture should **improve the productivity** and **decrease the negative environmental impact**

Project Indicative funding: 1 to 3 MEur

Total funding 4 MEur

Innovation Action

Space-EGNSS-5-2020: EGNSS applications for public authorities pilot



New innovative procurement tools for Galileo applications R&D (pilot in H2020 and full action in Horizon Europe) to:

- Establish long-lasting cross-border **working relationships among public authorities**;
- Stimulate the **industry competitiveness** (through a selection of suppliers competing to develop the product);
- Develop innovative EGNSS enabled **products** that meet public institutions' needs → create **public market for Galileo**

Examples of applications for EGNSS PCP/PPI:



Helicopter emergency medical services, flight approaches to non-instrument runways

Mobility as a service, public transport

Transmission of EGNOS corrections using AIS stations and IALA beacons, port operations

Innovative high accuracy solutions (e.g., RTK, PPP)

Solutions for efficient energy network

Monitoring of infrastructure

Other ideas: EGNSS for drones, crisis management; SAR

Call for action:

- Identify the public authorities that could benefit from the EGNSS applications PCP/PPI and put them in contact with GSA;
- Support dissemination of the new tool (e.g. through info days dedicated to the interested audience).



Project Indicative funding: 1 to 3 MEur

Total funding 3 MEur

Pre-Commercial Procurement

! Dedicated Workshop to be held at GSA on the 12th of September

Linking space to user needs



Get in touch:



www.GSA.europa.eu



EGNOS-portal.eu



GSC-europa.eu

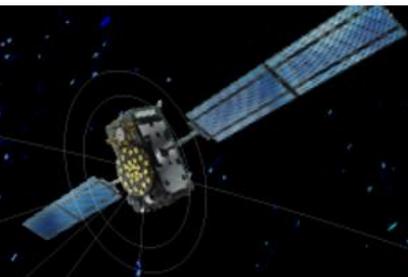


UseGalileo.eu



The European GNSS Agency is hiring!

Apply today and help shape the future of satellite navigation!



Space Business and Entrepreneurship



Indicative budget: 136 M€;
Space call: 2 M€
Deadline: 5 March 2020

Maximising benefits of space for society and EU economy

SPACE-EO

- EO market uptake
- Copernicus mission and services evolution

SPACE-EGNSS

- EGNSS market uptake
- EGNSS infrastructure, mission and services evolution

SPACE-BIZ

- Support to space hubs
- Space outreach and education
- EIC Horizon Prize on "Low cost Space Launch"
- InnovFin Space Equity Pilot (ISEP)
- SME-instrument
- FTI – Fast Track to Innovation

Globally competitive and innovative space sector

SPACE-TEC

- Technologies for European non-depend. and competitiveness
- Strategic research clusters
- Generic space technologies
- EO and SatCom technologies
- In-orbit validation/demonstration

SPACE-SCI

- Scientific instrumentation and technologies for exploration
- Scientific data exploitation

Access to space & Secure and safe space environment

SPACE-TEC

- Access to space

SPACE-SEC

- Space weather
- Exploring concepts for space traffic management
- Space Surveillance and Tracking (SST)
- Near Earth Objects (NEOs)

Space Business, Entrepreneurship, Outreach and Education

EIC/ARF

| Topics | Type of Action | Indicative budget (€ million) | | |
|---|----------------|-------------------------------|------------|------------|
| | | 2018 | 2019 | 2020 |
| DT-SPACE-07-BIZ-2018: Space hubs for Copernicus market uptake | CSA | 2.0 | | |
| DT-SPACE-08-BIZ-2018: Space outreach and education | CSA | 2.0 | | |
| DT-SPACE-09-BIZ-2019: Space hubs – support to start-ups | CSA | | 2.0 | |
| DT-SPACE-26-BIZ-2020: Space hubs – support to start-ups | CSA | | | 2.0 |

| Topics | Type of Action | Indicative budget (€ million) | | |
|--|----------------|-------------------------------|-------------|-------------|
| | | 2018 | 2019 | 2020 |
| EIC Horizon prize "Low cost space launch" | RIA | | | 10.0 |
| InnovFin Space Equity Pilot (ISEP) | RIA | 20.0 | 15.0 | 15.0 |
| SME Instrument | RIA | <---- 57.93 --> | | |
| Fast-track to innovation | RIA | 3.37 | 3.37 | 3.37 |

DT-SPACE-26-BIZ-2020: Space hubs (support to start-ups)

Specific Challenge

- Increase the number of initiatives for start-ups, scale-ups and entrepreneurs in the space downstream and upstream sectors
- Engage SMEs, especially those not traditionally involved
- Reduce technical and financial entry barriers to SMEs for Horizon 2020

Scope

- Supporting applications, notably with regard to EGNOS/Galileo and Copernicus
- Spinning-in/-out and solutions in view of commercialisation
- Complementary to other actions developed at EU level (EIC pilot, Copernicus and Galileo Masters, Copernicus Accelerator, Copernicus and Galileo Incubation initiatives, EIT KICs)
- Build bridges between local and European initiatives

Impact

- Generation of new initiatives at local level, e.g. Incubators, Accelerators, Hackathons, Appcamps
- Awareness raising activities to facilitate technology transfer
- Generation of new services oriented solutions
- Increased access to finance and funding opportunities
- Enhanced financial sustainability of start-ups and scale-ups
- Increased commercialisation of scalable and cost-efficient solutions.

Recommended Eu-funding per project
1 MEur

Indicative budget
2 MEur

Coordination and Support Action

See also DT-SPACE-09-BIZ-2019: Space hubs (support to start-ups)

Outline

1 - Policy context / EU Space programme(s)

2 - Horizon 2020 Work Programme

- **Space part** (Copernicus & Earth Observation, Space Technologies, Science, Security, Business), EGNSS

- Space in **European Innovation Council (EIC)**

- Space in **Access to Risk Finance (ARF)**

- **Future & Emerging Technologies (FET-Open)**
 - To develop breakthrough technologies from research base
 - No predefined topics, collaboration required (> 3 partners)
 - Grants ~€3 million
- **SME instrument**
 - SMEs with business plans to roll out marketable innovations
 - 13 topics, no required collaboration, must comply with SME definition
 - Phase 1 (€50K lumpsum); Phase 2 (<€2,5 million grant)
- **Fast Track to Innovation (FTI)**
 - Accelerate market uptake of innovations
 - Small consortia (3-5, majority private)
 - < €3 million grant
- **Prizes**
 - Recognition Prizes (iCapital ~ €1.5 million, Women Innovators ~ €0.35 million)
 - EIC Prizes ~ €40 million

EIC HORIZON PRIZES

- **Innovative Batteries for eVehicles** (€10 million)
- **Fuel from the Sun: Artificial Photosynthesis** (€5 million)
- **Early Warning for Epidemics** (€5 million)
- **Blockchains for Social Good** (€5 million)
- **Low-Cost Space Launch** (€10 million)
- **Affordable High-Tech for Humanitarian Aid** (€5 million)



EARLY WARNING FOR EPIDEMICS

Challenge:

Develop a scalable, reliable and cost-effective early-warning system prototype based on earth observation data to forecast and monitor vector-borne diseases

Expected result:

Demonstration of the prototype at local level: 'proven prototype'

Deadline for application: 1 September 2020

Award Criteria:

1. *Operational capability and integration of existing data*
2. *Demonstrated implementation within an affected community*
3. *Scalability and sustainability of the early warning concept*
4. *Focus on European technology demonstration*

EARLY WARNING FOR EPIDEMICS

EIC HORIZON prize

#eicHorizonPrize

SOLVE THE CHALLENGE

€5 million

Apply by 1 September 2020

European Commission



Low-Cost Space Launch Prize

- Space Launch EIC Horizon Prize
- Horizon 2020 Participant Portal
- EC-SPACE-LAUNCH-EIC-PRIZE@ec.europa.eu

SPACE LAUNCH
EIC HORIZON
prize

SOLVE THE CHALLENGE
€ 10 million
Apply by **1 June 2021**

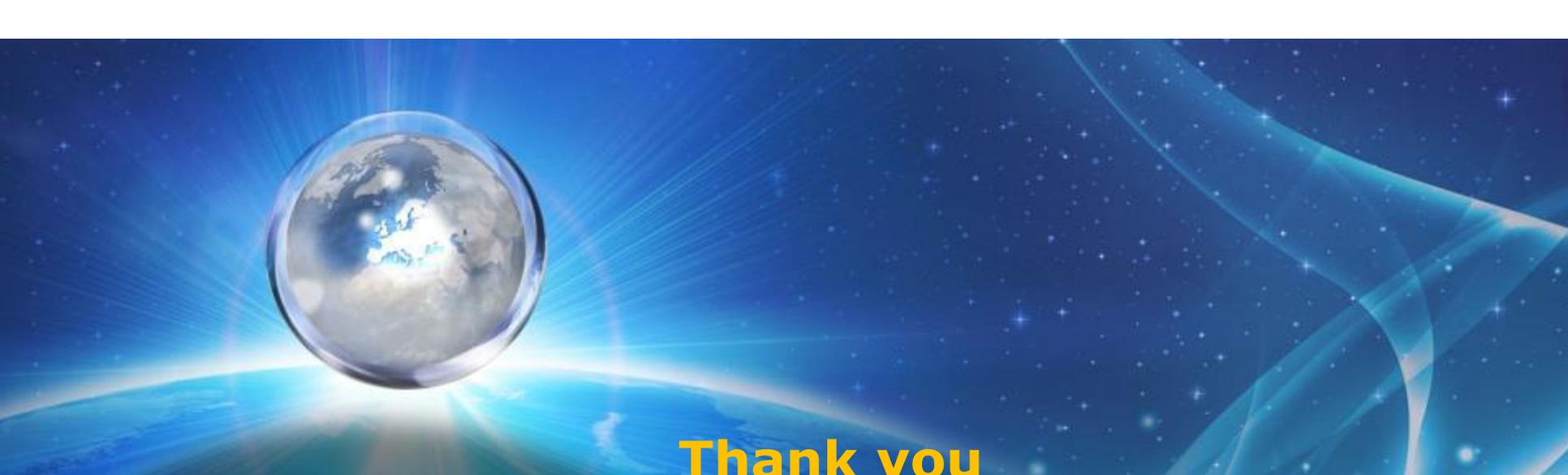
#eicHorizonPrize

European Commission

#eicHorizonPrize
#EUSpaceStrategy

SPACE EQUITY FUND (ISEP) – Product Features

- **Approach:** Invest in VC funds focused on innovative SMEs/small midcaps aiming to commercialise new products/ services linked to space data/ spacetech
- **EC's budget:** EUR 50m to be committed between 2018 – 2020 and allocated on a deal by deal basis to qualifying investments, based on magnitude of Space tech focus.
- **Overall size:** c. EUR 111m (EFSI+EC+EIF) enabling a portfolio of 4 to 6 fund investments and co-investments in Space related technologies.
- **Tools:** direct fund investments, co-investments alongside existing EIF fund managers and business angels.
- **Fund strategies:** space technologies focused funds or generalist funds with ex-ante Space technologies allocation.
- **Target final beneficiaries:** SMEs, projects that are developing or operating in the field of Upstream or Downstream Space technologies.
- **Stage focus:** early stage, expansion and growth stage. Demand-driven.
- **Geography:** fund managers and companies to be established or operating in the EU or Horizon 2020 Associated Countries. Demand-driven.



**Thank you
for your attention**

Calls opening: 5th november 2019

Jean-michel.monthiller@ec.europa.eu

Call closure: 5th of March 2020

Space research and guidance documents

<http://ec.europa.eu/growth/sectors/space/research/horizon-2020/>

Published work programme 2018-2020

<http://ec.europa.eu/info/funding-tenders/opportunities/portal/>