



#InvestEUresearch

Horizon 2020 Work Programme for Research & Innovation 2018-2020

ESF-ESSC, Geneva, 23 May 2018

DG GROW – Internal Market, Industry
Entrepreneurship and SMEs

GROW/I1 - Space Policy and Research Unit

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Research and
Innovation

SUMMARY

1. Horizon 2020
2. Horizon 2020 focus areas
3. Horizon 2020 rules for participation
4. European Union Space Programmes
5. Space research in Horizon 2020
6. Horizon 2020 Space Work Programme 2018-2020
7. Space in EIC pilot
8. Space in ARF - ISEP
9. Work Programme 2018-2020 Status & Implementation calendar
10. Next steps: beyond Horizon 2020

1 HORIZON 2020

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

WHAT IS NEW IN HORIZON 2020?

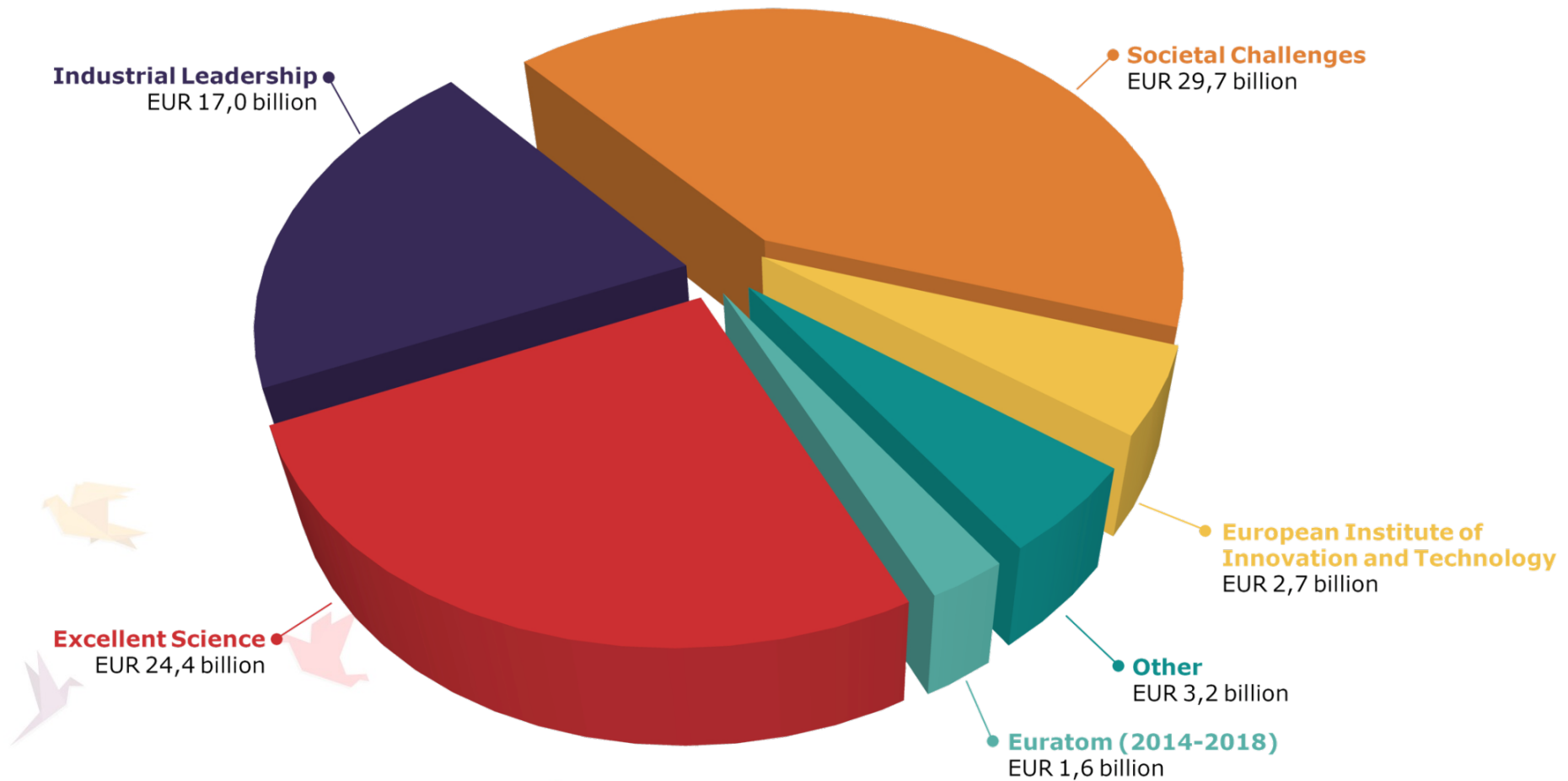
- **A single programme** bringing together three separate programmes/initiatives*
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, lean energy and transport
- **Simplified access**, for all companies, universities, institutes in all EU countries and beyond

* The 7th Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT)

Horizon 2020

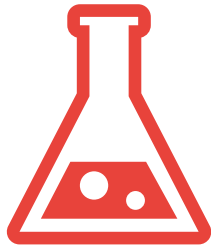
HORIZON 2020 BUDGET (IN CURRENT PRICES)

€ 79 billion from 2014 to 2020



2013 figures

Horizon 2020 Priorities



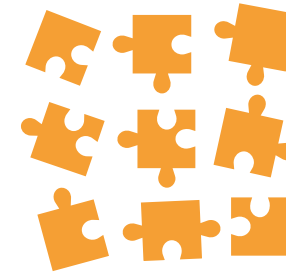
Priority 1. Excellent science

- 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

2 HORIZON 2020 FOCUS AREAS

Horizon 2020 Focus Areas

- **BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE**

- Contributes to the goals of the **Paris Agreement**
- Total indicative budget (2018-2020): **EUR 3343 MILLION**

- **BOOSTING THE EFFECTIVENESS OF THE SECURITY UNION**

- Contributes to developing the EU as a Security Union
- Total indicative budget (2018-2020): **EUR 1000 MILLION**

- **DIGITISING AND TRANSFORMING EUROPEAN INDUSTRY AND SERVICES**

- Addresses the priorities of the Digital Single Market Strategy of the EU and helps seizing the opportunities offered by digital technologies
- Total indicative budget (2018-2020): **EUR 1689 MILLION**

- **CONNECTING ECONOMIC AND ENVIRONMENTAL GAINS – THE CIRCULAR ECONOMY**

- Directly support the circular economy policy
- Total indicative budget (2018-2020): **EUR 940 MILLION**

3 HORIZON 2020 RULES FOR PARTICIPATION

Conditions for participation

Minimum conditions

- Standard collaborative action
At least three legal entities each established in a different Member State or an Associated Country
- ERC, SME instrument, programme co-fund, coordination and support, training and mobility action
One legal entity established in a Member State or in an Associated Country

Additional Conditions

- In the work programme

International participation

- Open for all legal entities established in third countries and for international organisations
- Restrictions only possible if introduced in the work programme (for reciprocity reasons; for security reasons)

4 EUROPEAN UNION SPACE PROGRAMMES

Space Programmes

Multiannual Financial Framework 2014-2020



~ 1 479 M€



~ 4 291 M€



~ 7 071 M€

~ 12 841 M€



Status of the EU space programmes (1/2)

COPERNICUS

- The most advanced Earth Observation system in the world, created to answer big societal challenges (e.g. climate change, natural disasters, development)
- 3 components: space, services, in-situ
- 7 Sentinels currently in orbit; 6 satellites under development for timeframe 2025
- All 6 services up and running operationally, serving a growing community of users world-wide
- More than 50,000 users registered; more than 5 million products and more than 6 Petabytes downloaded
- Launch of Data and Information Access Services (DIAS)



Space Component

THE SENTINELS

FULL, FREE AND OPEN

Sentinel Mission and Status

Key Features



SENTINEL-1:
9-40 m resolution, 6-day revisit at equator

S-1A In Orbit
S-1B In Orbit

Polar-orbiting, all-weather, day-and-night radar imaging



SENTINEL-2:
10-60 m resolution, 5-day revisit time

S-2A In Orbit
S-2B In Orbit

Polar-orbiting, multispectral optical, high-res imaging



SENTINEL-3:
300-1200 m resolution, <2-day revisit

S-3A In Orbit
S-3B In Orbit

Optical and altimeter mission monitoring sea and land parameters



SENTINEL-4:
8 km resolution, 60 min revisit time

1st Launch
Q4 2022

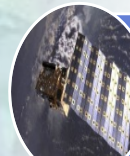
Payload for atmosphere chemistry monitoring on MTG-S



SENTINEL-5p:
7-68 km resolution, 1-day revisit

In orbit

Mission to reduce data gaps between Envisat, and S-5



SENTINEL-5:
7.5-50 km resolution, 1-day revisit

1st Launch
in 2021

Payload for atmosphere chemistry monitoring on MetOp 2ndGen



SENTINEL-6:
10-day revisit time

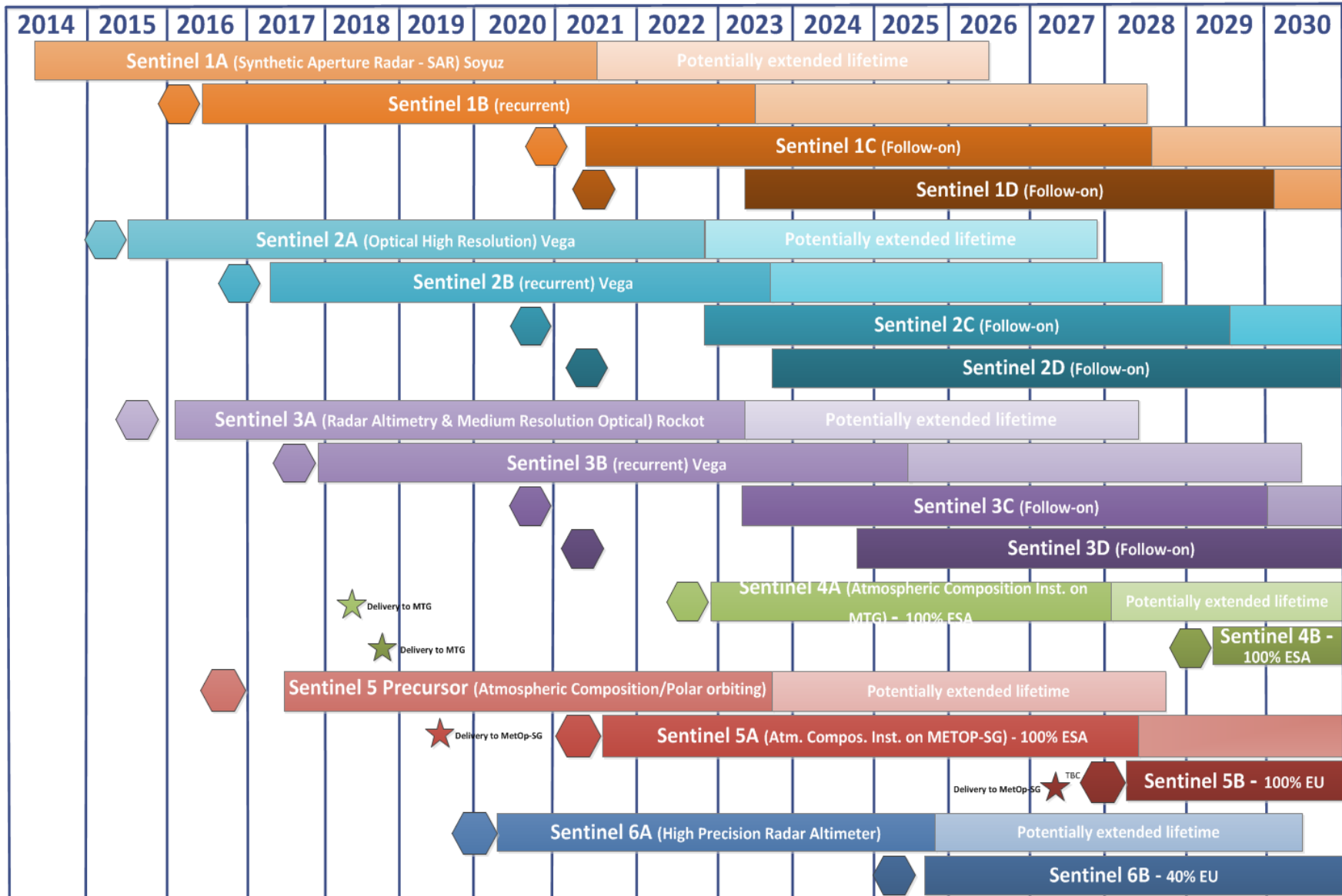
July 2020

Radar altimeter to measure sea-surface height globally



Space Component

SENTINEL FAMILY DEPLOYMENT SCHEDULE



Legend: Flight Acceptance Review



Space
Component

COPERNICUS SERVICES

*Monitoring the State of the
Earth System Environment ...*

Land Monitoring

Marine Environment
Monitoring

Climate Change

Atmosphere Monitoring

Emergency
Management

Security

*... Six cross-cutting
Thematic Services*

Status of the EU space programmes (2/2)

EGNOS

- Augments the GPS signal over Europe, EU owned and fully operational since 2011
- 2 main components: (limited) space segment with payloads on geostationary satellites, a ground segment with more than 40 stations all over Europe
- Delivers services, in particular for aviation and Safety-of-Life

GALILEO

- EU owned worldwide satellite navigation system ("EU GPS")
- 3 main components: a space segment, a ground segment and a service provision infrastructure
- 22 satellites in orbit
- Ground segment in its initial version completed
- Initial services declaration – December 2016

EUROPES'S CONTRIBUTION TO **SATELLITE NAVIGATION**



EGNOS

- Satellite Based Augmentation System
- Improves GPS (and Galileo) performance
- European/regional coverage
- 3 services

Fully operational since 2011



Galileo

- Autonomous infrastructure
- Performances and features better than GPS
- Global coverage
- 5 services

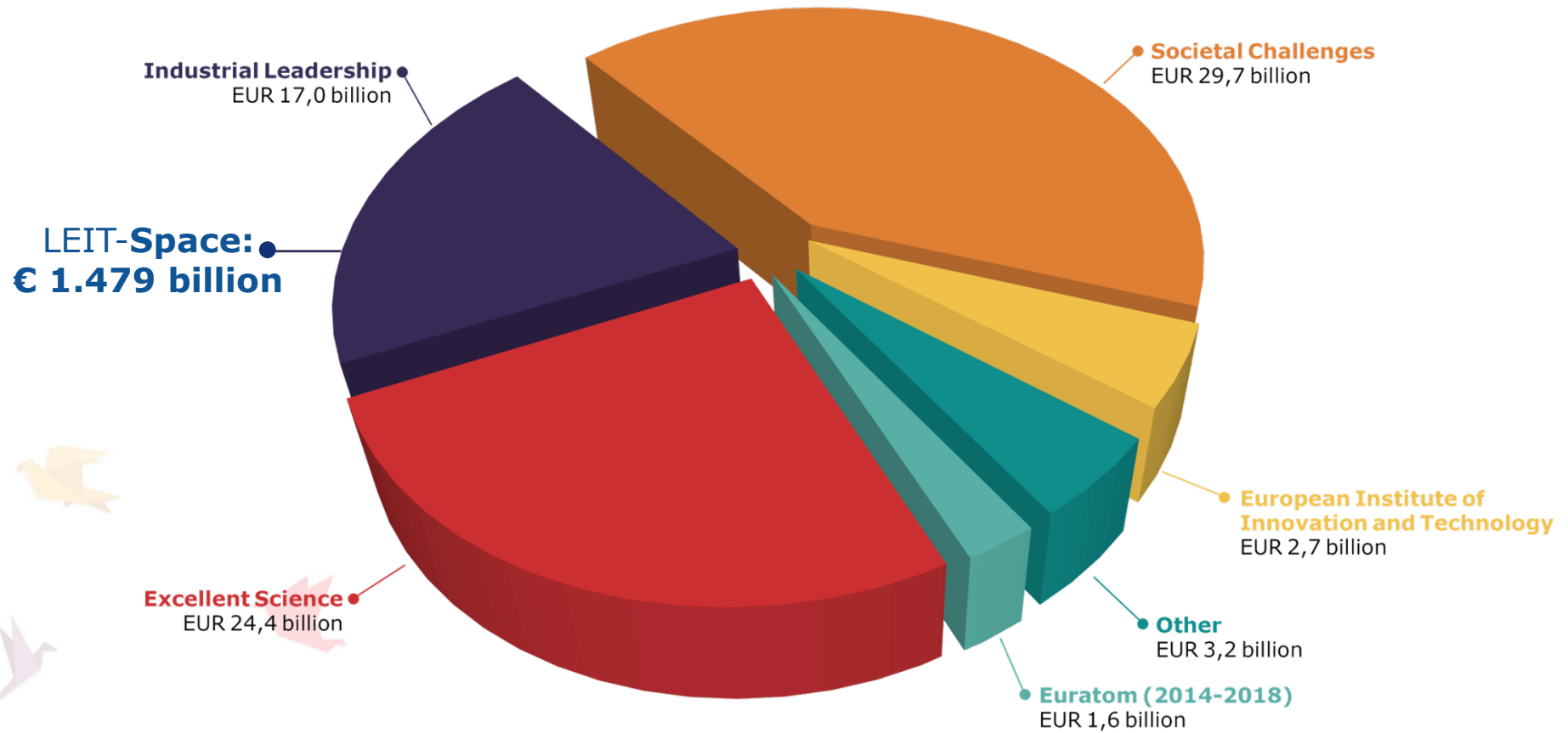
Initial services since December 2016



5 SPACE RESEARCH IN HORIZON 2020

SPACE IN H2020

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

Others H2020 Work Programmes

integrating Space

- **European Innovation Council (EIC) pilot**
- **Access to Risk Finance (ARF): InnovFin Space Equity Pilot (ISEP)**

Work Programme implementation

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...

Full detailed description can be found in the General Annexes 20 – part D of the Work Programme 2018-2020

6 HORIZON 2020 SPACE WORK PROGRAMME 2018-2020

Horizon 2020 Space 2018-2020 'calls'

Horizon 2020 Participants Portal:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/>

H2020 Space Work Programme

Calls for proposals

Participant Portal

European Commission > Research & Innovation > Participant Portal > Calls

HOME RAISING OPPORTUNITIES HOW TO PARTICIPATE EXPERTS SUPPORT Search [] LOGIN REGISTER

EU Programmes 2014-2020

Search Topics

Updates

Calls

H2020

Research Fund for Coal & Steel

COSME

3rd Health Programme

Consumer Programme

EU Programmes 2007-2013

Calls

Other Funding Opportunities

Calls for Proposals

Horizon 2020

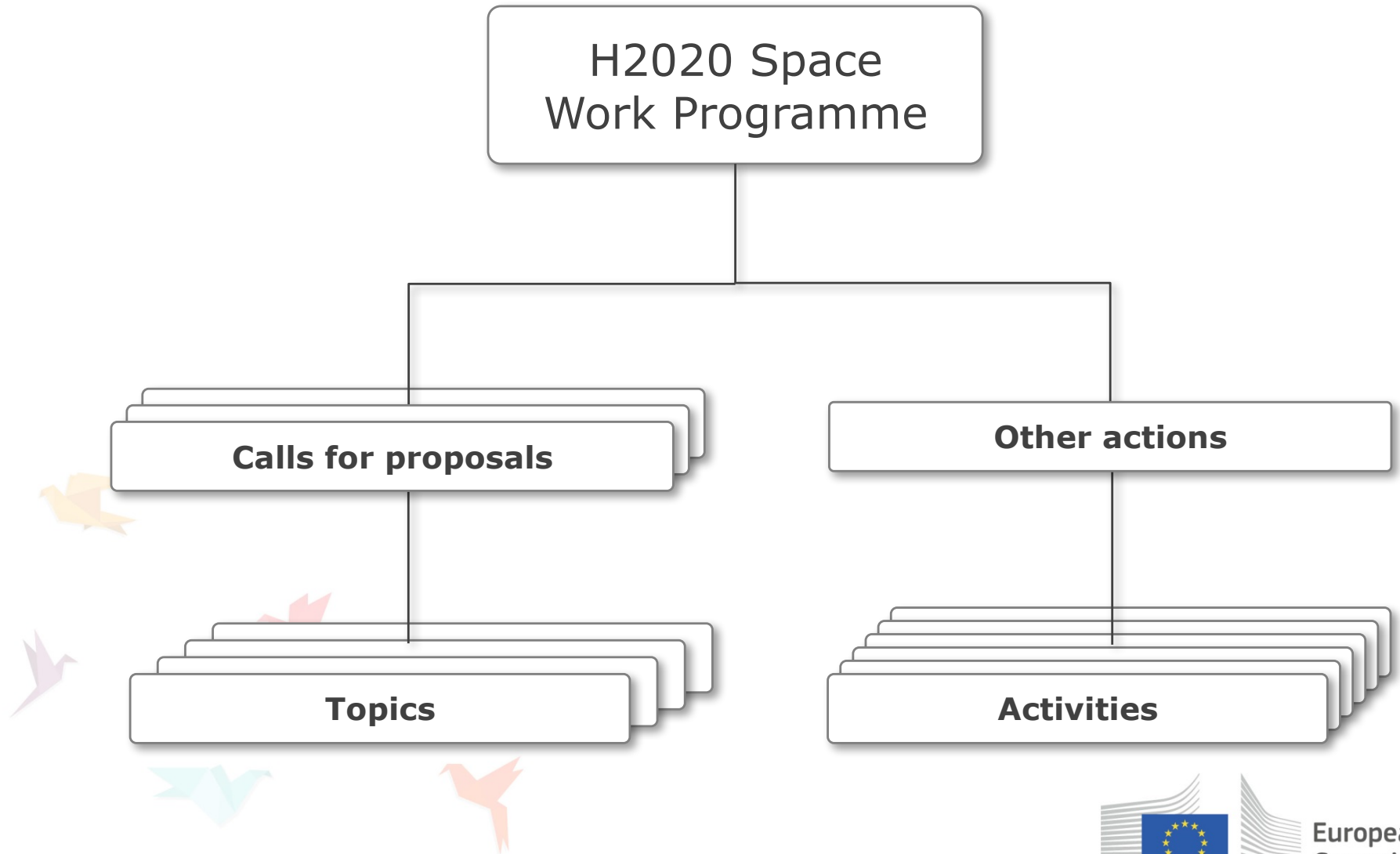
Advanced search for topics
Calls for tenders on TED

- Advanced materials
- Biotechnology
- Advanced manufacturing and processing
- Space
- Access to risk finance
- Innovation in SMEs
- Societal Challenges
- Health, demographic change and wellbeing

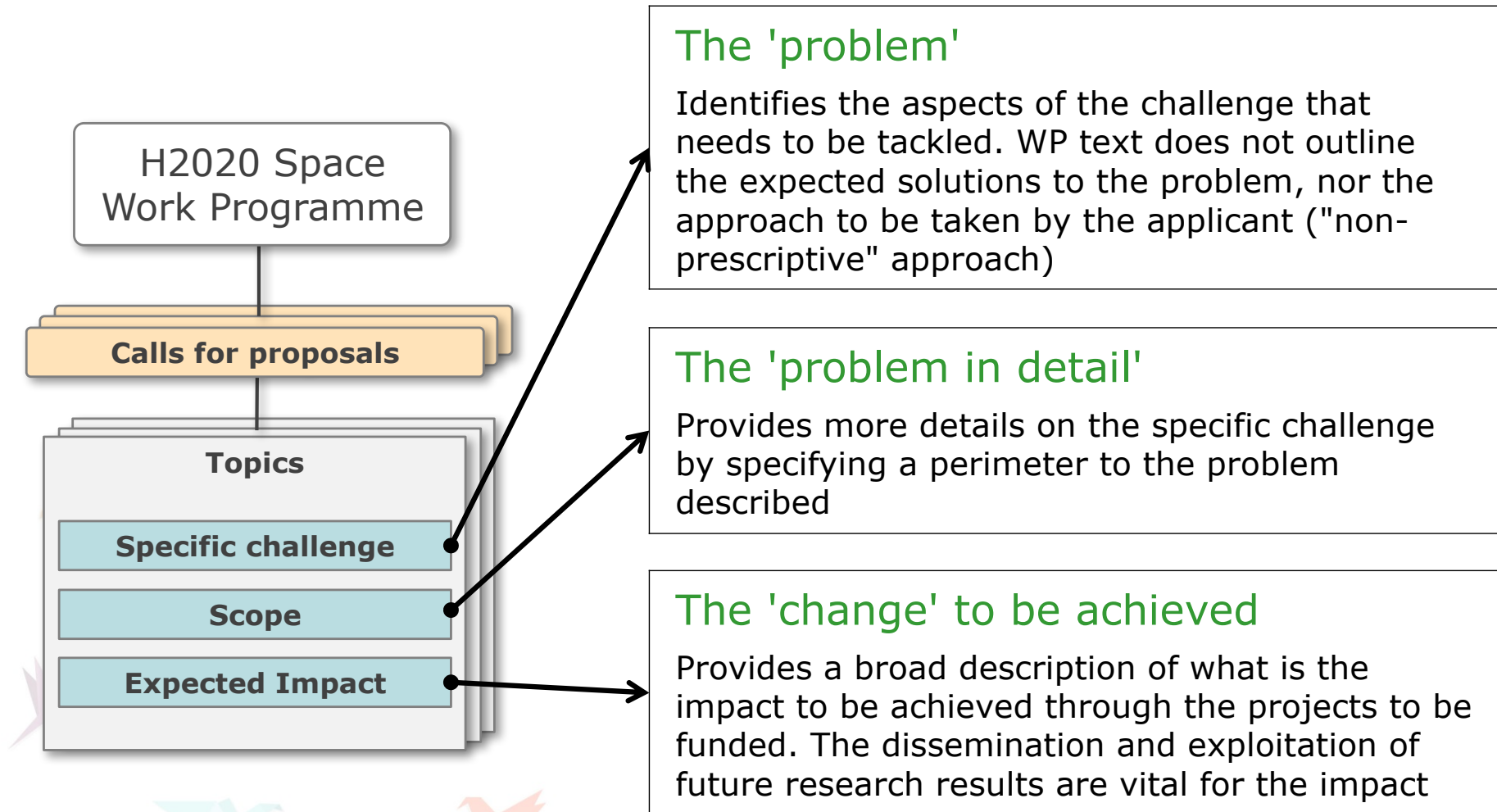
Sort by Call title Call identifier Publication date Filter on Filter

Industrial Leadership Applications in Satellite Navigation-Galileo 2014-2015 H2020-Galileo-GSA-2014-2015 Publication date: 11-12-2013	Industrial Leadership Horizon 2020 dedicated SME Instrument Phase 1 and 2, 2014-2015 H2020-SMEInst-2014-2015 Publication date: 11-12-2013	Industrial Leadership H2020-LEIT-Space-Competitiveness of the European Space Sector-2014 H2020-CORPET-2014 Publication date: 11-12-2013
Industrial Leadership H2020-LEIT-Space-Competitiveness of the European Space Sector-2015 H2020-CORPET-2015 Publication date: 11-12-2013	Industrial Leadership Earth Observation-2014-LEIT SPACE H2020-EO-2014 Publication date: 11-12-2013	Industrial Leadership Earth Observation-2015-LEIT SPACE H2020-EO-2015 Publication date: 11-12-2013
Industrial Leadership Protection of European assets in and from Space-2014-LEIT SPACE H2020-PROTEC-2014 Publication date: 11-12-2013	Industrial Leadership Protection of European assets in and from Space-2015-LEIT SPACE H2020-PROTEC-2015 Publication date: 11-12-2013	

WORK PROGRAMME STRUCTURE



STRUCTURE OF CALLS AND TOPICS



TYPES OF ACTIONS AND FUNDING RATES

- **Research and innovation actions (Funding rate: 100%)**: Projects aiming to establish new knowledge, new or improved technology by possibly including 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)**: Projects aiming to produce plans, arrangements or designs for a new or improved product, design, process or service by possibly including large-scale product validation and market replication
- **Coordination and support actions (Funding rate: 100%)**: Projects consisting of accompanying/complementary measures (standardisation, awareness-raising, communication, policy dialogues, networking, studies, etc.)

Full detailed description can be found in the **General Annexes 20 – part D** of the Work Programme 2016-2017: http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016-2017/annexes/h2020-wp1617-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

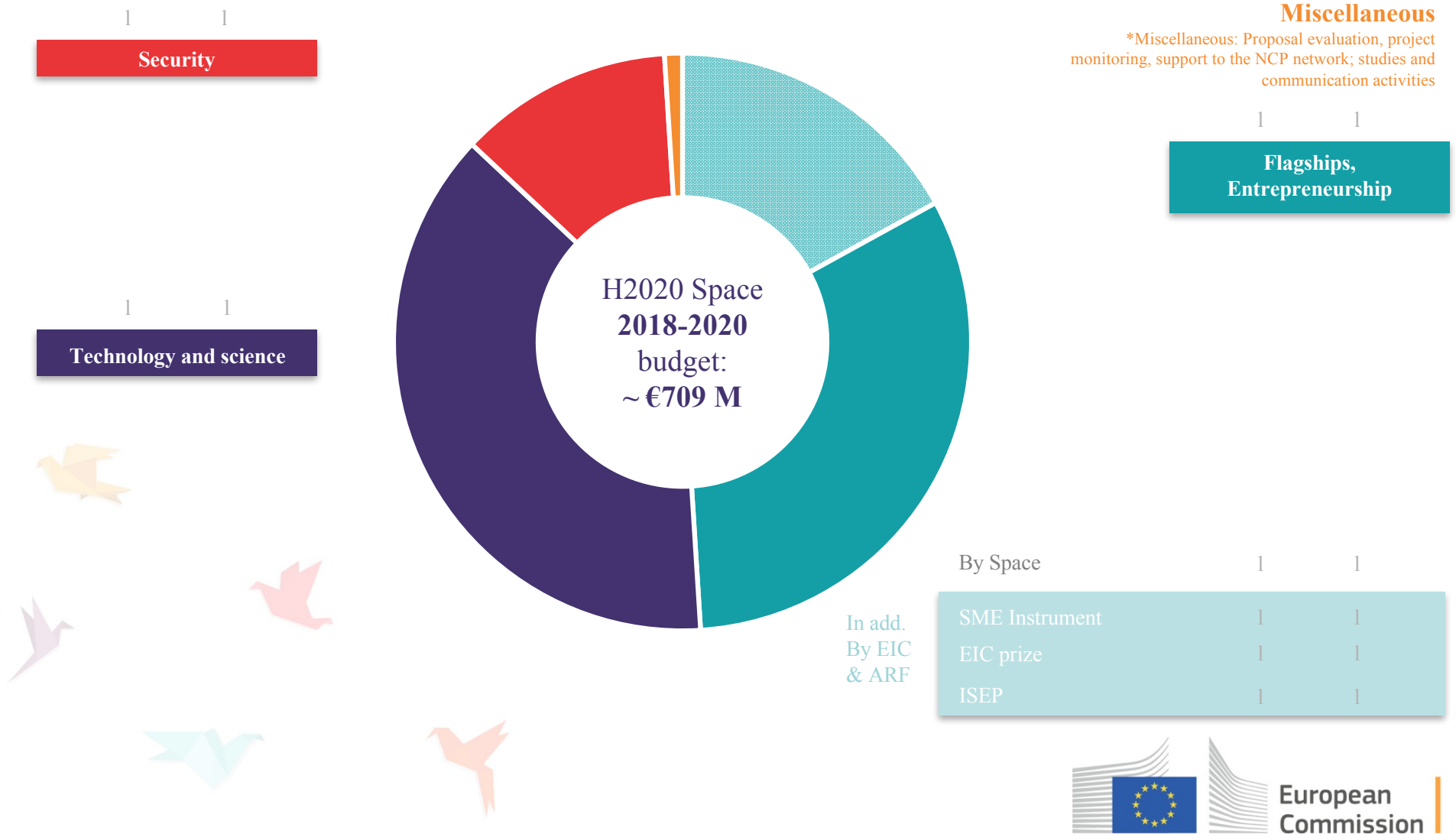
- Access to space

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

INDICATIVE BUDGET BREAKDOWN (2018-2020)



Space Work Programme 2018 – 2020



EN

Horizon 2020

Work Programme 2018-2020

*5.iii. Leadership in Enabling and Industrial Technologies -
Space*

Important notice on the Horizon 2020 Work Programme

This Work Programme covers 2018, 2019 and 2020. The parts that relate to 2019 and 2020 are provided at this stage on an indicative basis. Such Work Programme parts will be decided during 2018 and/or 2019.

(European Commission Decision C(2017)7124 of 27 October 2017)

Overall, these two activities will help to maximise the uptake of Galileo and EGNOS and to exploit the potential of the European GNSS industry, and contribute to growth, competitiveness and jobs in this sector, while capturing public benefits

To facilitate access to opportunities for applicants the following list includes dedicated 'Applications in Satellite Navigation – Galileo' activities in related calls and topics from other calls of H2020, in addition to those in this call:

Societal challenge 4 - Transport:

- MG-2-9-2019: Integrated multimodal, low-emission freight transport systems and logistics (Inco Flagship)
- LC-MG-1-2-2018: Sustainable multi-modal inter-urban transport, regional mobility and spatial planning
- MG-2-6-2019: Moving freight by Water: Sustainable Infrastructure and Innovative Vessels
- MG-2-8-2019: Innovative applications of drones for safety in transport
- MG-3-2-2018: The Autonomous Ship
- DT-ART-01-2018: Testing, validation and certification procedures for highly automated driving functions under various traffic scenarios based on pilot test data
- DT-ART-04-2019: Developing and testing shared, connected and cooperative automated vehicle fleets in urban areas for the mobility of all
- DT-ART-02-2018: Support for networking activities and impact assessment for road automation



7 SPACE IN THE EUROPEAN INNOVATION COUNCIL (EIC) PILOT

EIC PREPARATORY PHASE — WP 2018-20

- **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 (€50 K lump sum); Phase 2 (<€2 million grant)

- **Fast Track to Innovation (FTI)**

- Accelerate market uptake of innovations
- Small consortia (3-5, majority private)
- ~ €2 million grant

- **Prizes**

- Recognition Prizes (iCapital ~ €1.5 million, Women Innovators ~ €0.35 million)
- EIC Prizes ~ €30 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)



8 SPACE IN ARF — INNOVFIN SPACE EQUITY PILOT (ISEP)

CHALLENGE

Optimise benefits space can bring to European society and economy

- How?

- Better exploit possibilities of space data, space technologies, potential of Copernicus, EGNOS, Galileo
- Foster dynamic space innovation system, more favourable regulatory and business environment

- Leading to...

- Private sector has more appetite to invest in space domain
- Firms develop more innovative, space-related products and services

InnovFin Space Equity Pilot (ISEP)

- Key element

- Better access to risk finance for innovative 'space' enterprises

- Approach

- Invest in VC funds focused on innovative SMEs/small midcaps aiming to commercialise new products / services linked to space data / spacetech

- EU investment pot of € 50 mn combines:

- € 20 mn from '**LEIT – Space**'

- € 30 mn from 'Access to Risk Finance'

- € 20 mn in 2018, €15 mn in 2019, €15 mn in 2020

9 WORK PROGRAMME 2018-2020

Status & Implementation calendar

Work Programme 2018

Topic 2018	
DT-SPACE-01-EO-2018-2020	Copernicus market uptake
LC-SPACE-02-EO-2018	Copernicus evolution – Mission exploitation concepts
LC-SPACE-03-EO-2018	Copernicus evolution – Preparing for the next generation of Copernicus Marine Service ocean models
DT-SPACE-07-BIZ-2018	Space hubs for Copernicus
DT-SPACE-08-BIZ-2018	Space outreach and education
SPACE-10-TEC-2018-2020	Technologies for European non-dependence and competitiveness
SPACE-11-TEC-2018	Generic space technologies
SPACE-12-TEC-2018	SRC – Space robotics technologies
LC-SPACE-14-TEC-2018-2019	Earth observation technologies
SPACE-15-TEC-2018	Satellite communication technologies
SPACE-16-TEC-2018	Access to space
SPACE-20-SCI-2018	Scientific instrumentation and technologies enabling space science and exploration



		Topic budget M€	Proposals to be evaluated	EU funding requested M€
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H2020 Space call 2018 evaluation schedule

6 March 2018: Closing of Call

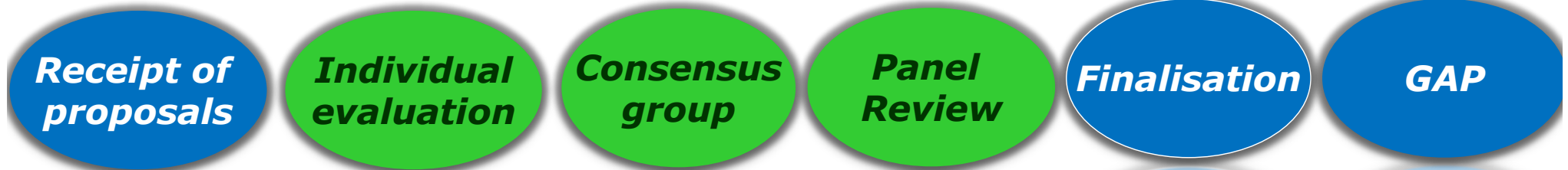
18-22 June 2018: Ethics screening

17 July 2018 (tentative*): Inform applicants

Remote evaluations
23 April – 25 May 2018

Central evaluations
28 May – 15 June 2018

6 November 2018
GAP ending



Eligibility check

Individual Evaluation Reports

Consensus Report

Panel report

Final ranked list

All Grant Agreements signed

Allocation of proposals to evaluators

(done remotely)

Evaluation Summary Report

Evaluation results sent to applicants

Cross-readings

Initiation Grant Agreement Preparation

Training of experts

Panel ranked list

Time-To-Inform (TTI): 5 months

*Legal limit for TTI is 6.8.2018

Time-To-Grant (TTG): 8 months

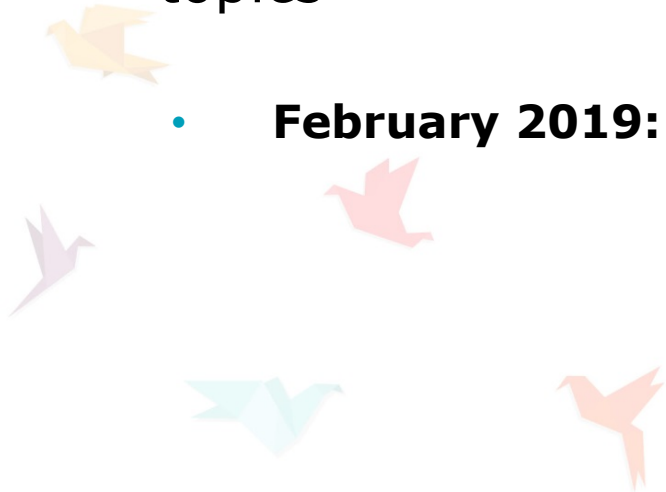
Horizon 2020 Work Programme 2018-2020 updates

Spring update: 2019 budget

- **16 July 2018:** adoption

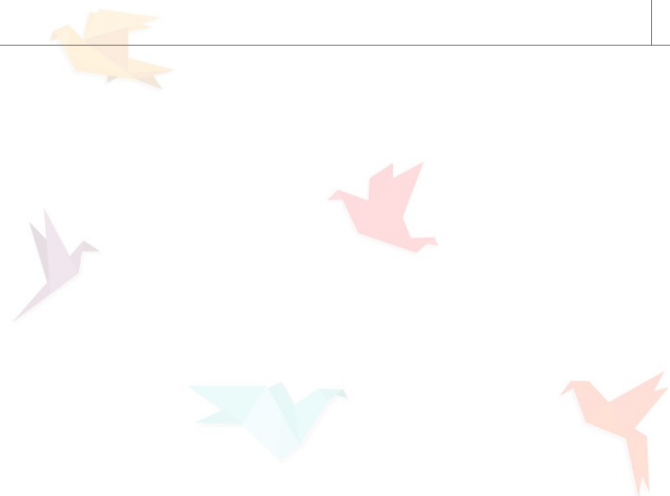
Autumn update: 2020 budget, includes full text for 2020 topics

- **February 2019:** adoption (exact date to be confirmed)



WP 2018-2020 Implementation calendar

Themes	Opening dates	Deadlines
EO, BIZ, TEC, SCI	31 October 2017	6 March 2018
EO, BIZ, TEC, SEC, EGNSS	16 October 2018	12 March 2019 5 March 2019
EO, BIZ, TEC, SCI, SEC, EGNSS	TBD 2019	TBD 2020



10 NEXT STEPS

Beyond H2020 (Work in Progress!)

EU budget for the future (COM(2018) 321, 2 May 2018)

Timeline

- **2 May 2018**
 - Commissioners adopt EU budget for the future
 - Budget proposals are presented to the European Parliament
- **14 May 2018**
 - Future budget presented to the EU Council of Ministers
- **6 June 2018**
 - European Commission's legislative proposals for spending programmes (2#3)
- **23-26 May 2019**
 - European elections

I SINGLE MARKET, INNOVATION & DIGITAL

1 Research & Innovation

Horizon Europe
Euratom Research and Training Programme
ITER - International Thermonuclear Experimental Reactor

2 European Strategic Investments

InvestEU
Connecting Europe Facility
Digital Europe Programme

3 Single Market

Single Market Programme
EU Anti-Fraud Programme
FISCALIS – Cooperation in the field of taxation
CUSTOMS – Cooperation in the field of customs

4 Space

European Space Programme

II COHESION & VALUES

5 Regional Development & Cohesion

European Regional Development Fund and Cohesion Fund
Support to the Turkish Cypriot Community

6 Economic & Monetary Union

Reform Support Programme
European Investment Stabilisation Function for the
Economic and Monetary Union
PERICLES - Protection of the euro against counterfeiting

7 Investing in People, Social Cohesion & Values

European Social Fund+
Erasmus +
European Solidarity Corps
Justice, Rights and Values
Creative Europe

III NATURAL RESOURCES & ENVIRONMENT

8 Agriculture & Maritime Policy

European Agricultural Guarantee Fund & European
Agricultural Fund for Rural Development
European Maritime and Fisheries Fund
International Fisheries Agreements

9 Environment & Climate Action

LIFE - Programme for the Environment and Climate Action

IV MIGRATION & BORDER MANAGEMENT

10 Migration

Asylum & Migration Fund

11 Border Management

Integrated Border Management Fund

V SECURITY & DEFENCE

12 Security

Internal Security Fund
Nuclear Decommissioning in Lithuania
Nuclear Safety and Decommissioning

13 Defence

European Defence Fund

14 Crisis Response

rescEU - Union Civil Protection Mechanism

VI NEIGHBOURHOOD & THE WORLD

15 External Action

Neighbourhood, Development and
International Cooperation Instrument
Humanitarian Aid
Common Foreign & Security Policy
Cooperation with Overseas Countries and Territories
(including Greenland)

16 Pre-Accession Assistance

Instrument for Pre-Accession Assistance

VII INSTRUMENTS OUTSIDE THE CEILING

Emergency Aid Reserve
European Union Solidarity Fund
European Globalisation Adjustment Fund
Off Budget - European Peace Facility

EU budget for the future

RESEARCH & INNOVATION

- **Horizon Europe (97,6 billion of Euro)**
 - EU's flagship programme to support research and innovation

EUROPEAN STRATEGIC INVESTMENTS

- **Invest EU (38 billion of Euro)**
 - Union's new investment instrument

SPACE

- **European Space Programme (16 billion of Euro)**
 - finances the deployment and exploitation of European space infrastructures and related services



Thank you

Space research and guidance documents

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

Published work programme 2018-2020

<http://ec.europa.eu/research/participants/portal/>

ADDITIONAL INFORMATION

[Link to the additional information file](#)



Space Strategy for Europe

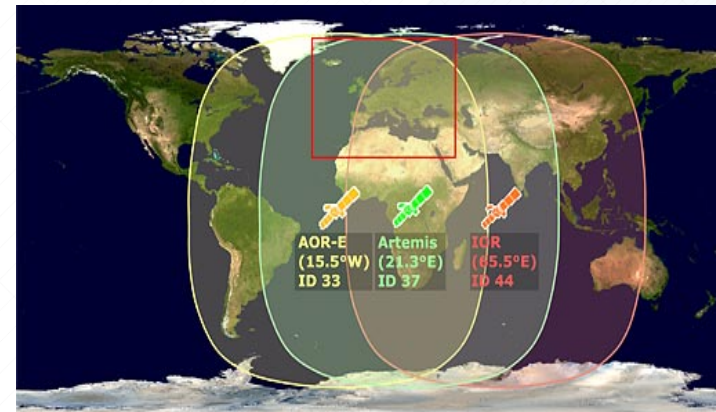
A Space Strategy designed to deliver on 4 strategic priorities:

- **Maximise the benefits of space for society and the EU economy**
- **Foster a globally competitive and innovative European space sector**
- **Reinforce Europe's autonomy in accessing and using space in a secure and safe environment**
- **Strengthen Europe's role as a global actor and promote international cooperation**

EGNOS IS FULLY OPERATIONAL



- EGNOS Open Service is operational since October 2009
- Its Safety of Life service has been declared operational in March 2011
- The EGNOS Data Access Service (EDAS) was declared in July 2012

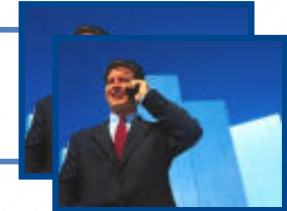


GALILEO SERVICES



Open Service (OS)

- Freely accessible service for positioning, navigation and timing



Public Regulated Service (PRS)

- Encrypted service for greater robustness and higher availability



Search and Rescue (SAR) - contribution

- Assists locating people in distress and confirms that help is on the way



Commercial Service (CS)

- Authentication and high accuracy services for commercial applications



Safety-of-Life (SoL) - contribution

- Provides vital integrity information for life-critical applications

