



Warsaw, May 24th, 2018

# SPACE SECTOR FORUM 2018

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*European Commission*

## Outline

- **Space Strategy for Europe**
- **Space Programmes**
  - **Copernicus**
  - **Galileo & EGNOS**
- **Horizon 2020 space research**



# Space Strategy for Europe



## **Designed to deliver on 4 strategic priorities:**

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



# Space Programmes (1)

# Copernicus



- Copernicus is the European Union's **Earth Observation** Programme, looking at our planet and its environment for the ultimate benefit of all European citizens.
- It offers information services based on *satellite* and *in situ* (non-space) data.
- The **most advanced Earth Observation system** in the world, created to answer big societal challenges (e.g. climate change, natural disasters, development).







Space Component

# THE SENTINELS

FULL, FREE AND OPEN

## Sentinel Mission and Status

## Key Features

	<b>SENTINEL-1:</b> 9-40m resolution, 6 days revisit at equator	<i>S-1A In Orbit</i> <i>S-1B In Orbit</i>	▶ Polar-orbiting, all-weather, day-and-night radar imaging
	<b>SENTINEL-2:</b> 10-60m resolution, 5 days revisit time	<i>S-2A in Orbit</i> <i>S-2B in Orbit</i>	▶ Polar-orbiting, multispectral optical, high-res imaging
	<b>SENTINEL-3:</b> 300-1200m resolution, <2 days revisit	<i>S3-A in Orbit</i> <i>S3-B Launch April 2018</i>	▶ Optical and altimeter mission monitoring sea and land parameters
	<b>SENTINEL-4:</b> 8km resolution, 60 min revisit time	<i>1st Launch Q4 2022</i>	▶ Payload for atmosphere chemistry monitoring on MTG-S
	<b>SENTINEL-5p:</b> 7-68km resolution, 1 day revisit	<i>In orbit</i>	▶ Mission to reduce data gaps between Envisat, and S-5
	<b>SENTINEL-5:</b> 7.5-50km resolution, 1 day revisit	<i>1st Launch in 2021</i>	▶ Payload for atmosphere chemistry monitoring on MetOp 2 <sup>nd</sup> Gen
	<b>SENTINEL-6:</b> 10 days revisit time	<i>July 2020</i>	▶ Radar altimeter to measure sea-surface height globally





Space Component

# THE CONTRIBUTING MISSIONS



Subject to Data Owner's Data Policy



In situ

## IN - SITU : O V E R V I E W

- *In situ* data = observation data from ground-, sea-, or air-borne sensors, reference and ancillary data licensed for use in Copernicus
- Use of *In situ* data:
  - Validate & calibrate Copernicus products
  - Reliable information services
- Implementation in two tiers:
  - Tailored *in situ* data for each Copernicus service level
  - Cross-cutting coordination across services by the EEA





Copernicus

# COPERNICUS SERVICES

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



*... Six cross-cutting Thematic Services*



Copernicus

# CONCLUSIONS

## The Union Earth Observation and monitoring programme

Increase general knowledge  
on the state of the Planet



Protect people  
and assets



Improve environmental  
policy effectiveness



Monitor  
the environment



Facilitate adaptation  
to climate change

Foster downstream  
applications in  
a number of fields



Help managing emergency  
and security related situations



# Space Programmes (2)

# Galileo & EGNOS

# EUROPES'S CONTRIBUTION TO **SATELLITE NAVIGATION**



## **EGNOS**

- Satellite Based Augmentation System
- Improves GPS (and Galileo) performance
- European/regional coverage
- Operational since 2009, Safety-of-life service (for aviation) operational since 2011



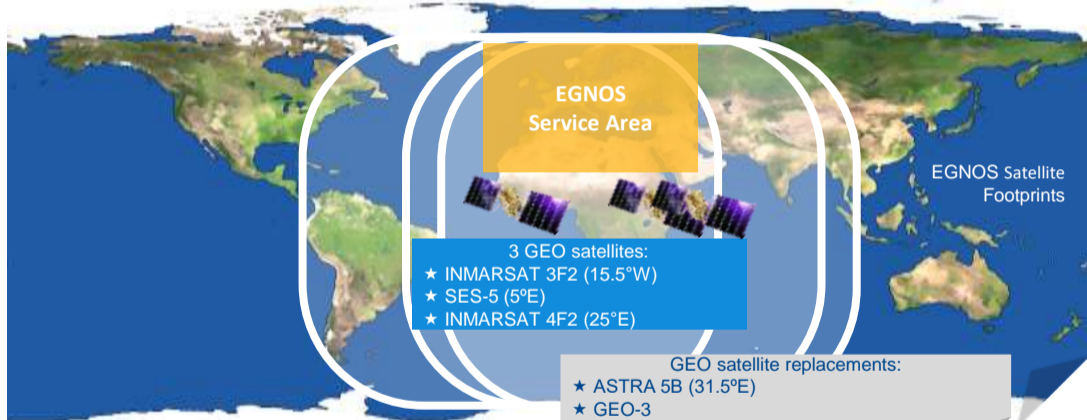
'It's there, use it'

## **Galileo**

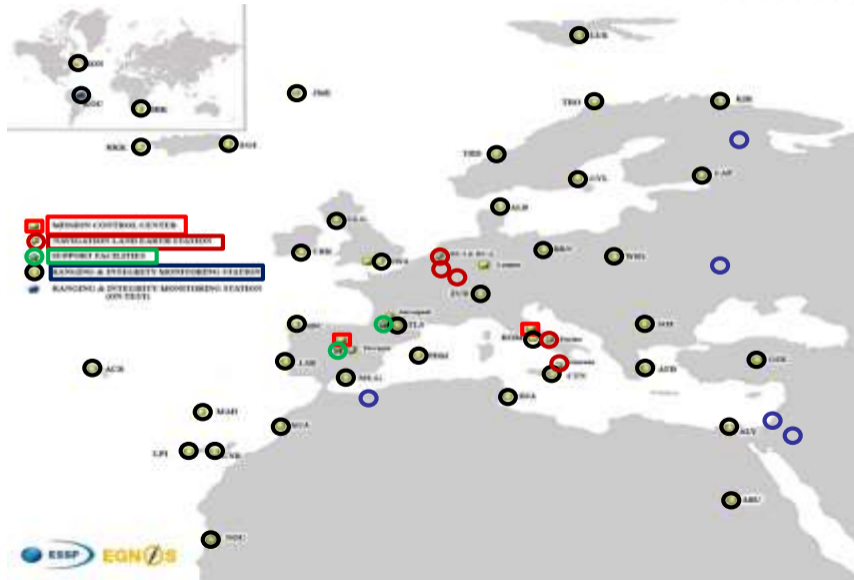
- Global satellite navigation system (*GNSS*)
- Autonomous infrastructure
- Performances and features better than GPS
- Worldwide coverage



# EGNOS SPACE SEGMENT

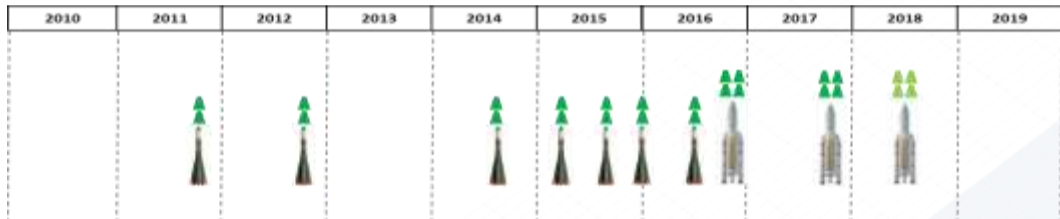


# EGNOS GROUND SEGMENT & SUPPORT SEGMENT





# GALILEO CONSTELLATION DEPLOYMENT



Next launch: **July 2018!**

# GALILEO GROUND SEGMENT



# 15 DECEMBER 2016...START OF INITIAL SERVICES !



# GALILEO SERVICES



## ▪ **Open Service**

- free
- interoperable with other GNSS
- worldwide access



## ▪ **Public Regulated Service**

- access restricted to government-authorized public users
- worldwide coverage



## ▪ **Search and Rescue**

- free
- worldwide coverage (Cospas-Sarsat)



# COMPATIBLE RECEIVERS



2017

TIMING



SMARTPHONES/MASS MARKET



AUTOMOTIVE



UAVs



HIGH PRECISION



THALES



## USE GALILEO.EU

FIND A GALILEO-ENABLED DEVICE TO USE TODAY

Galileo is Europe's Global Satellite Navigation System (GNSS), providing users with improved positioning and timing information.

Click on the icons to find Galileo-enabled devices:



# GALILEO-ENABLED PIONEERS



**BQ Aquaris X5**

July 2016



**Sony  
Xperia  
XZ**



**Huawei P10,  
P20, Mate 9**



**Samsung S8, S9,  
Galaxy Note 7, 8, 9**



**iPhone 6s, 7, 8,**

## FUTURE - DIFFERENTIATORS



- **High Accuracy Service [20 cm]**
- **Authentication [= "electronic signature", anti-spoofing feature]**
- **Search And Rescue "Return Link"**



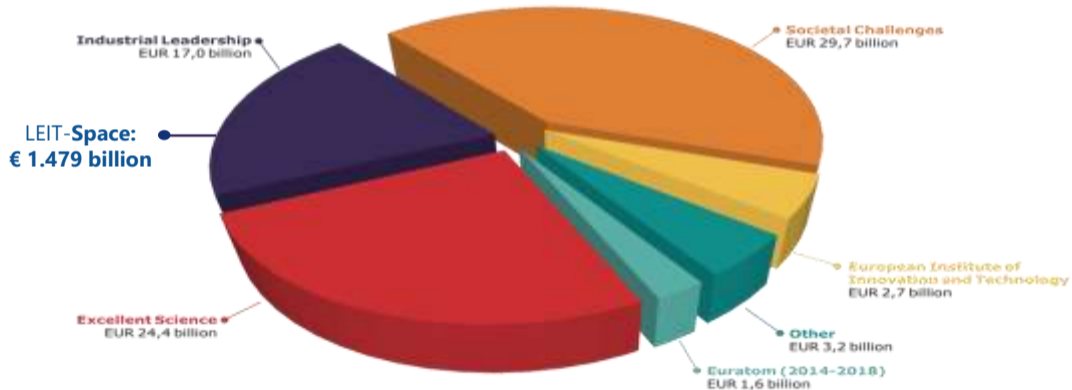
# SPACE RESEARCH IN HORIZON 2020





## SPACE IN H2020

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





## 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

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

### 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
- Scientific instrumentation and technologies for exploration
- Scientific data exploitation

#### SPACE-SCI

### 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)

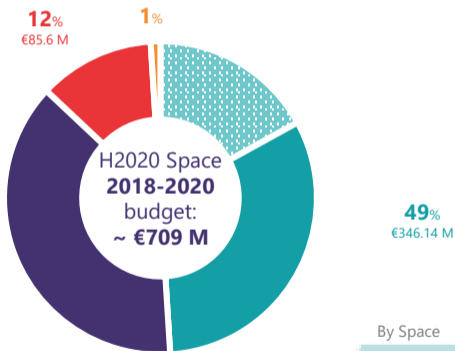


## INDICATIVE BUDGET BREAKDOWN (2018-2020)

2018	2019	2020
<b>Security</b>		
<b>SEC (€85.6M)</b>		
16.8	30.9	37.9

2018	2019	2020
<b>Technology and science</b>		
<b>TEC (€250 M)</b>		
81.0	75.0	94.0
<b>SCI (€19 M)</b>		
10.0	0.0	9.0

**38%**  
269 M€



In add.  
By EIC  
& ARF

**Miscellaneous (1%)**  
\*Miscellaneous: Proposal evaluation, project monitoring, support to the NCP network; studies and communication activities

2018	2019	2020
<b>Flagships, Entrepreneurship</b>		
104.7	124.7	120.5

**EGNS (€122 M)**

36.0 | 54.0 | 32.0

**EO (€88 M)**

22.0 | 31.0 | 35.0

**BIZ (€136.14 M)**

46.7 | 39.7 | 49.8

By Space

33.3 | 27.3 | 32.4

SME Instrument 19.3 | 19.3 | 19.4

EIC prize | | 5.0

ISEP 14.0 | 8.0 | 8.0



## SEARCH FOR TOPIC

- [Horizon 2020 – Participant Portal](#)
- *Funding opportunities*
- *Calls H2020*

*Advanced search for topics*

The screenshot shows the 'Calls for Proposals' section of the Horizon 2020 Participant Portal. On the left, a sidebar lists various EU programmes, with 'Calls' highlighted in a red box. The main content area is titled 'Calls for Proposals' and features a search filter for 'Horizon 2020'. A red arrow points to the link 'Advanced search for topics' in the top right corner of the main content area. Below the search filter, there are checkboxes for 'Excellent Science' (ERC, PET, Marie-Sklodowska-Curie Actions, Research Infrastructures) and 'Industrial Leadership' (LEIT, ICT). At the bottom, there are filters for 'Status' (Calls with forthcoming topics, Calls with open topics, Calls with only closed topics) and 'Sort by' (Call title, Call identifier, Publication date).



## INVOLVEMENT OPPORTUNITIES IN SPACE PROGRAMMES

- **Space Research in Horizon 2020:**
  - *H2020 Space calls for proposals*
  - *SME Instrument*
  - *Future and Emerging Technologies (FET)*
  - *InnovFin Space Equity Pilot (ISEP)*
- **Space Surveillance and Tracking (SST)**
- **Copernicus – Data and Information Access Service (DIAS)**
- **Galileo & EGNOS – Fundamental Elements**



**Thank you for your attention.**

**Any question?**