ESA & Copernicus EO Programmes

Dragon 4
12 Nov 2018 Shenzhen China
2018年11月12日

Eric Doyle, ESA
Science, Applications and Climate Department
Directorate of Earth Observation Programmes

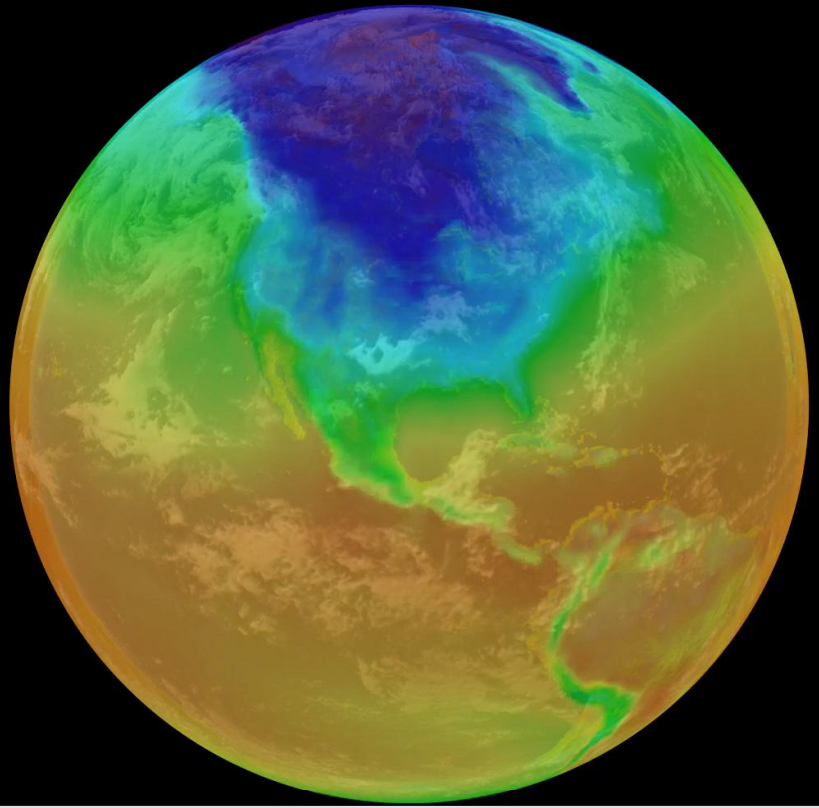
Our Mission

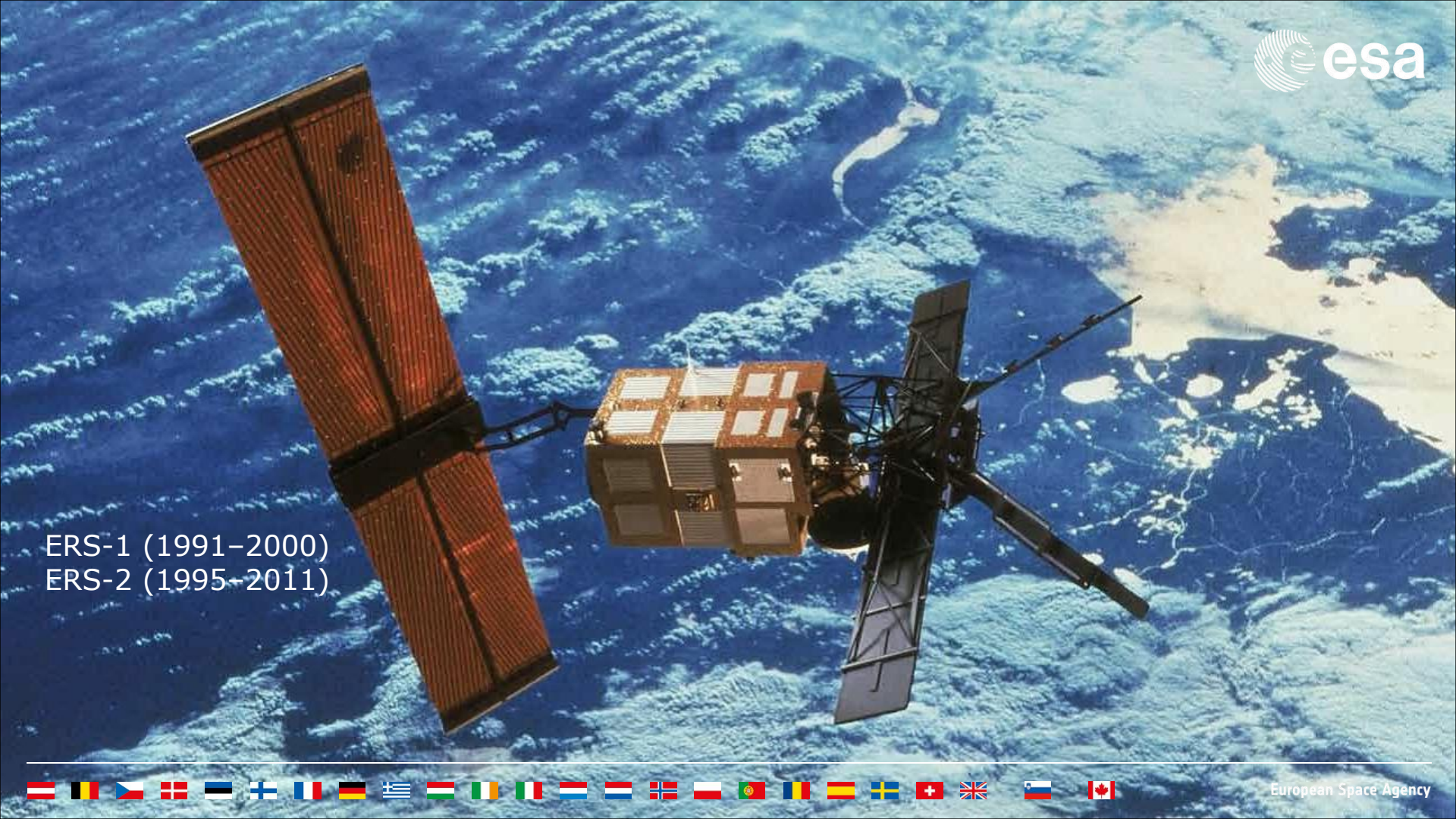
Develop world-class Earth Observation systems

addressing scientific & societal challenges

with European and global partners

ESA Monitors the Health of the Planet




esa
ERS-1 (1991–2000)
ERS-2 (1995–2011)
European Space Agency

ESA–DEVELOPED EARTH OBSERVATION MISSIONS

2010

Proba-1
SMOS
GOCE
CryoSat
Proba-V
Swarm
Meteosat 10 (MSG)
MetOp-B
Sentinel-1A
Sentinel-2A
Sentinel-1B
Sentinel-2B
Sentinel-3A
Sentinel-3B
Sentinel-5p
Aeolus
Seosat
EarthCARE
Biomass
FLEX

2015

Meteosat 11 (MSG)
Sentinel-6A
Sentinel-2C
Sentinel-1C
Sentinel-3C
Sentinel-1D
Sentinel-2D
Sentinel-3D
Sentinel-6B

2020

MetOp-C
Sentinel-5A
MetOp-SG-A1
MetOp-SG-B1
MTG-I
Sentinel-4A
MTG-S1

2025

MTG-I2
Sentinel-5B
MetOp-SG-A2
MTG-I3
MetOp-SG-B2

2030

Sentinel-4B
MTG-S2

Science

Copernicus

Meteorology

EUMETSAT

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European Space Agency

European Space Agency

ESA–DEVELOPED EARTH OBSERVATION MISSIONS

2010

Proba-1

SMOS

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Meteosat 10 (MSG)

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Sentinel-3C

Sentinel-1D

Sentinel-2D

Sentinel-3D

Sentinel-6B

2020

MetOp-C

Sentinel-5A
MetOp-SG-A1

MetOp-SG-B1

MTG-I

2025

Sentinel-4A
MTG-S1

MTG-I2

Sentinel-5B
MetOp-SG-A2

MTG-I3

MetOp-SG-B2

2030

Sentinel-4B
MTG-S2

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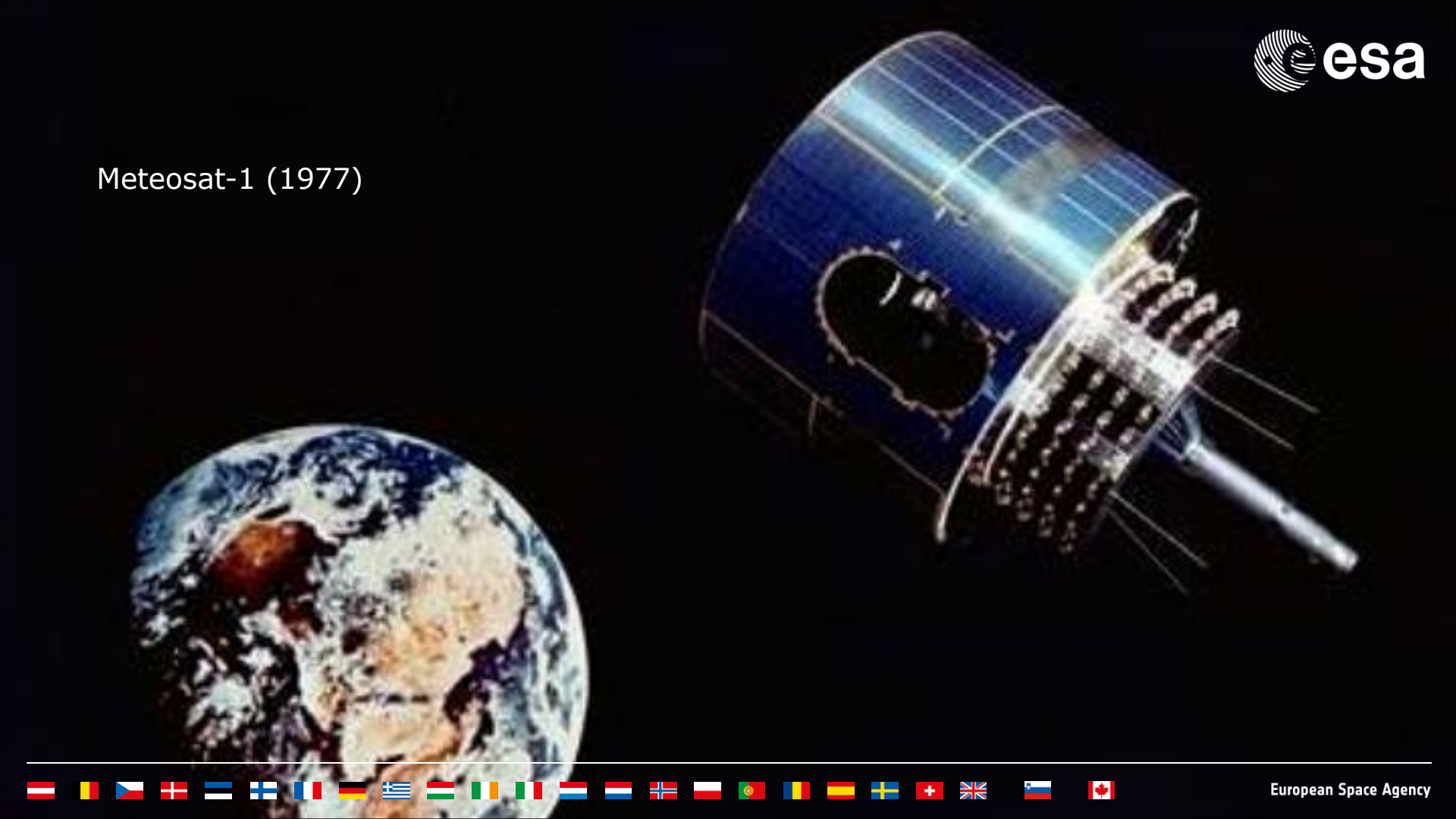
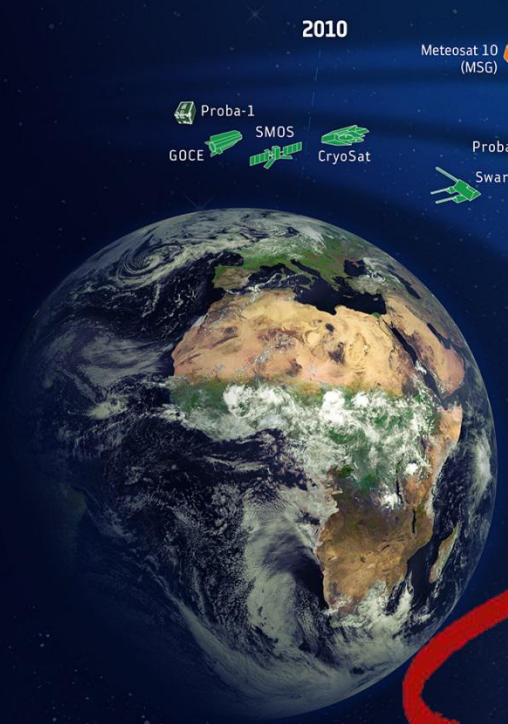
Meteosat-1 (1977)



MetOp-C Launched 7th November 2018

- **MetOp** is a series of three polar Orbiting Meteorological Satellites
- MetOp-A 2006
- Metop-B 2012
- MetOp-C 2018
  - Soyuz Rocket from Europe's Spaceport in French Guiana.

ESA–DEVELOPED EARTH OBSERVATION MISSIONS



2010

Proba-1
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MTG-I2
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MetOp-SG-A2
MTG-I3
MetOp-SG-B2

2030

Sentinel-4B
MTG-S2

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Meteorology
EUMETSAT

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European Space Agency

The Earth Explorers Missions

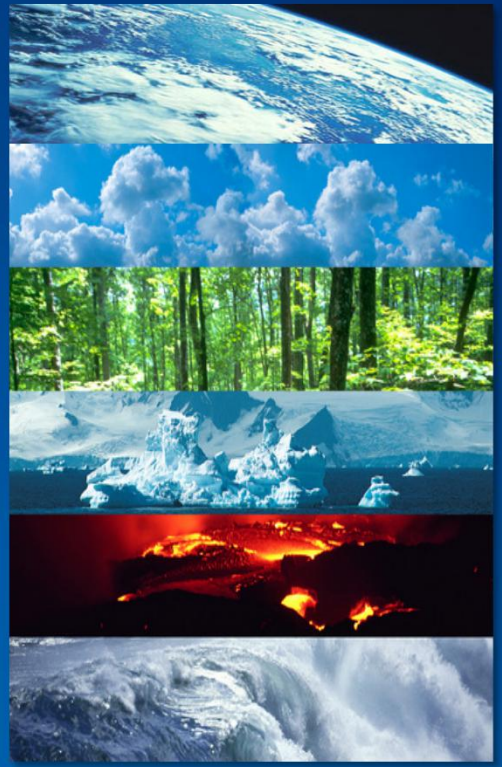
- Science driven programme
- Mission selection proposed by a peer committee "Advisory Committee for Earth Observation"
- Financed through the Earth Observation Envelope Programme (EOEP)
- On average one mission every 2 years

Explorer Core Missions

Major missions covering primary research objectives

Fast Track Missions

Smaller research and demonstration missions



Science: Earth Explorers

flex
→ ESA'S FLUORESCENCE MISSION

2022

biomass
→ ESA'S FOREST MISSION

2022

earthcare
→ ESA'S CLOUD, AEROSOL & RADIATION MISSION

2021

aeolus
→ ESA'S WIND MISSION

2018

goce
→ ESA'S GRAVITY MISSION

2009 – 2013

smos
→ ESA'S WATER MISSION

2009 – Present

cryosat
→ ESA'S ICE MISSION

2009 – Present

swarm
→ ESA'S MAGNETIC FIELD MISSION

2013 – Present

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MTG-I2
Sentinel-5B
MetOp-SG-A2
MTG-I3
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2030

Sentinel-4B
MTG-S2

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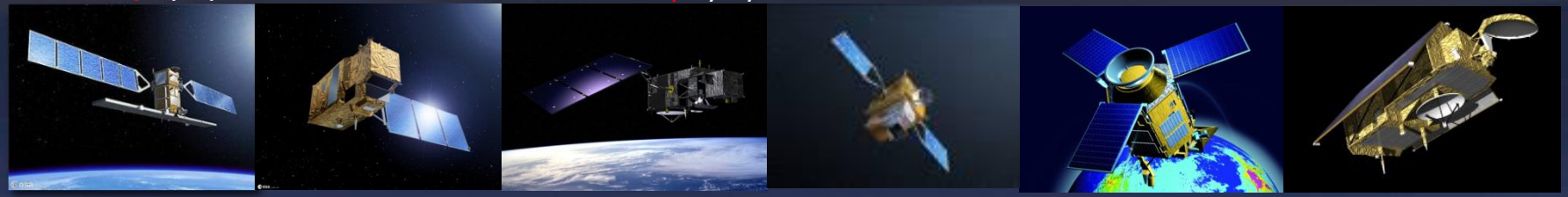
European Space Agency

European Space Agency

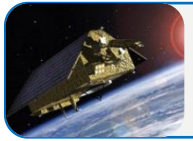
Sentinels: A New Generation of Data Source

Sent-1A/B/C/D Sent-2A/B/C/D Sent-3A/B/C/D Sent-4A/B Sent-5A/B/C/5P Sent-6A/B



- Copernicus - European space flagship programme, led by the EU
- ESA is responsible for space component, Sentinel development, operation of some Sentinels, data buy from other partners, system evolution
- Sentinels – designed to monitor various elements of the Earth System in a fully operational manner
- Free and open data policy

CSC: Sentinel Satellites

	**Sentinel 1** (A/B/C/D) **SAR Imaging**	All weather, day/night applications, interferometry
	**Sentinel 2** (A/B/C/D) **Multispectral Imaging**	Land applications: urban, forest, agriculture, … Continuity of Landsat, SPOT
	**Sentinel 3** (A/B/C/D) **Ocean & Global Land Monitoring**	Wide-swath ocean colour, vegetation, sea/land surface temperature, altimetry
	**Sentinel 4** (A/B) **Geostationary Atmospheric**	Atmospheric composition monitoring, pollution; instrument on MTG satellites
	**Sentinel 5** (A/B/C) & Precursor **Low-Orbit Atmospheric**	Atmospheric composition monitoring; instrument on MetOp-SG satellites
	**Sentinel 6** **Jason CS (A/B)**	Altimetry reference mission


→ EO SCIENCE FOR SOCIETY
EOEP5–Block4 Introduction
Scientific Exploitation

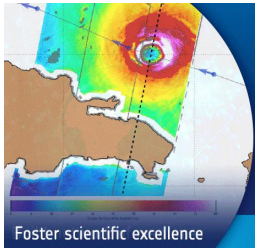
EO Science for Society #EO4society

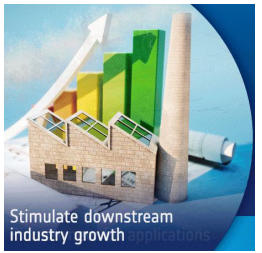
EO Science for Society (EOEP5 Block 4) built on successes of previous ESA exploitation activities:

- adapting them to the new European EO context
- responding to recommendations of programmatic and scientific review.

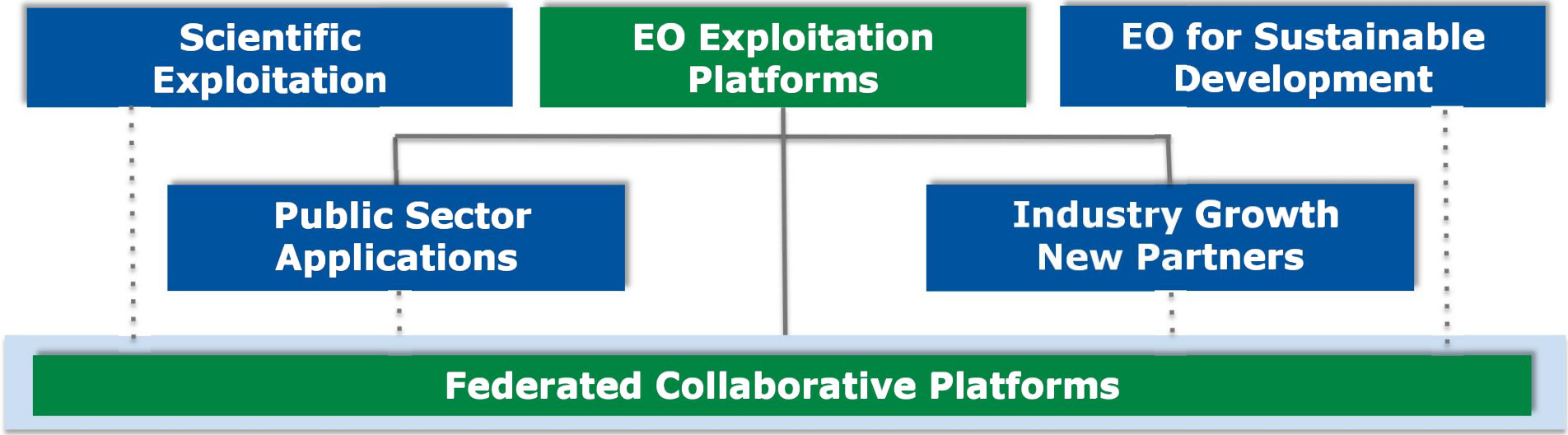
MAIN OBJECTIVES

- Foster scientific excellence
- Pioneer new EO applications
- Stimulate downstream industry growth
- Support international responses to global societal challenges
- Develop platforms technical capabilities
- Build network of resources

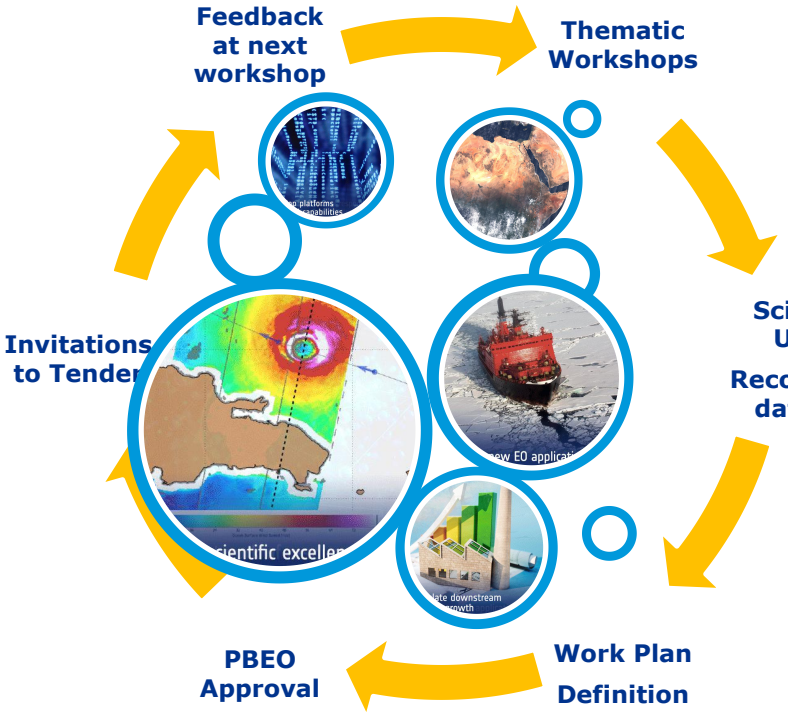




#EO4society – Components



#EO4society – Consultations



ESA facts and figures

- Over 50 years of experience
- 22 Member States
- Eight sites/facilities in Europe, about 2300 staff
- 5.6 billion Euro budget (2018)
- Over 80 satellites designed, tested and operated in flight

ESA ESRIN Establishment

Activities

- Earth Observation
- Vega Launcher
- Corporate Informatics
- ESA Security Office
- Contracts, Personnel
- Site Management
- Communication

50.000 visitors per year

813 personnel on the site


esa
Thank you for your attention!
谢 谢
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