

Welcome to ESRIN - Earth Observation at CM22

CCI Colocation Meeting
24 October 2022

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ESA UNCLASSIFIED – For ESA Official Use



Welcome to the ESA ESRIN Establishment



- Earth Observation
- Space transportation
- Science Hub
- NEO Coord. Centre
- ESA Security Office
- Corporate IT
- Comms, Archives
- Contracts, Personnel
- Site Management



ESA's EO Vision
Taking the Pulse of our Planet

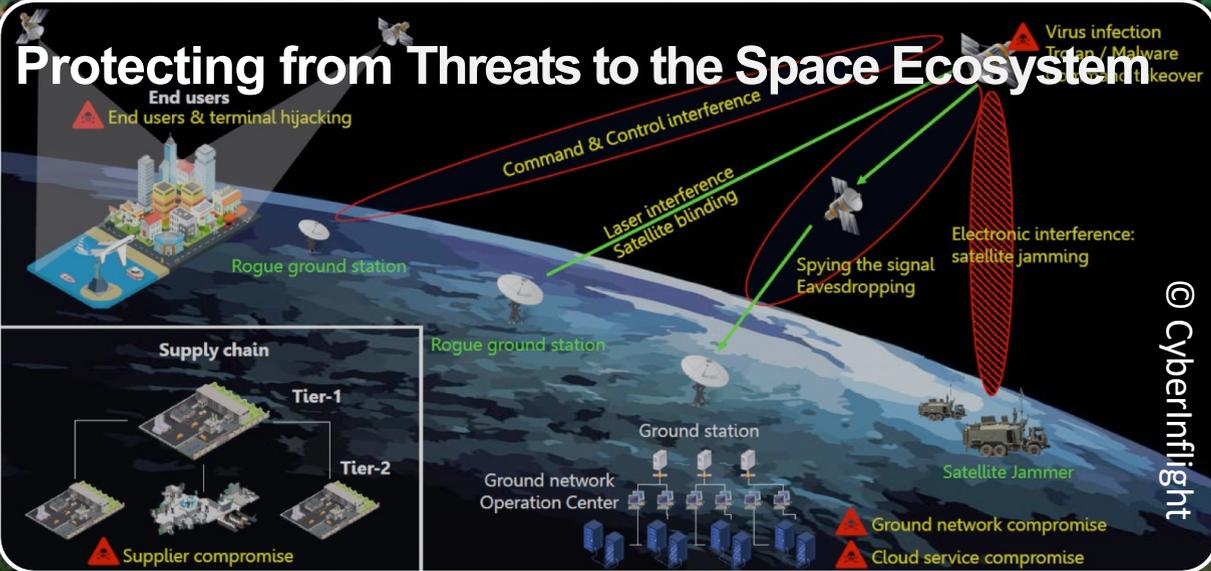
NEOCC, a core element of ESA's Planetary Defence Office



ESRIN hosts the VEGA European Small Launcher Team - Vega-C Successfully launched July '22



EO centre for cooperation on Earth system science



Recent Developments in ESA Earth Observation



MTG-I1
at Thales
Alenia Space's
Cleanroom in Cannes



MTG-I1 On Route to Kourou
Expected launch December '22

**'Securing the Future of Global
Weather Forecasting'**

EarthCARE: In full flight configuration
currently being tested for space
at ESA's ESTEC Test Centre



Expected launch 2023



Developments in Sentinel Expansion Missions



Spacecraft PDR Board held in July 2022, close out report expected end October 2022



CHIME

Spacecraft PDR on-going, Board scheduled on 29 November 2022



ROSE-L

Spacecraft PDR on-going, Board scheduled on 3 November 2022



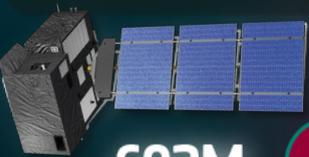
LSTM

Successful spacecraft PDR held on 10 October 2022



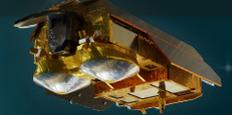
CIMR

Successful spacecraft PDR in March 2022



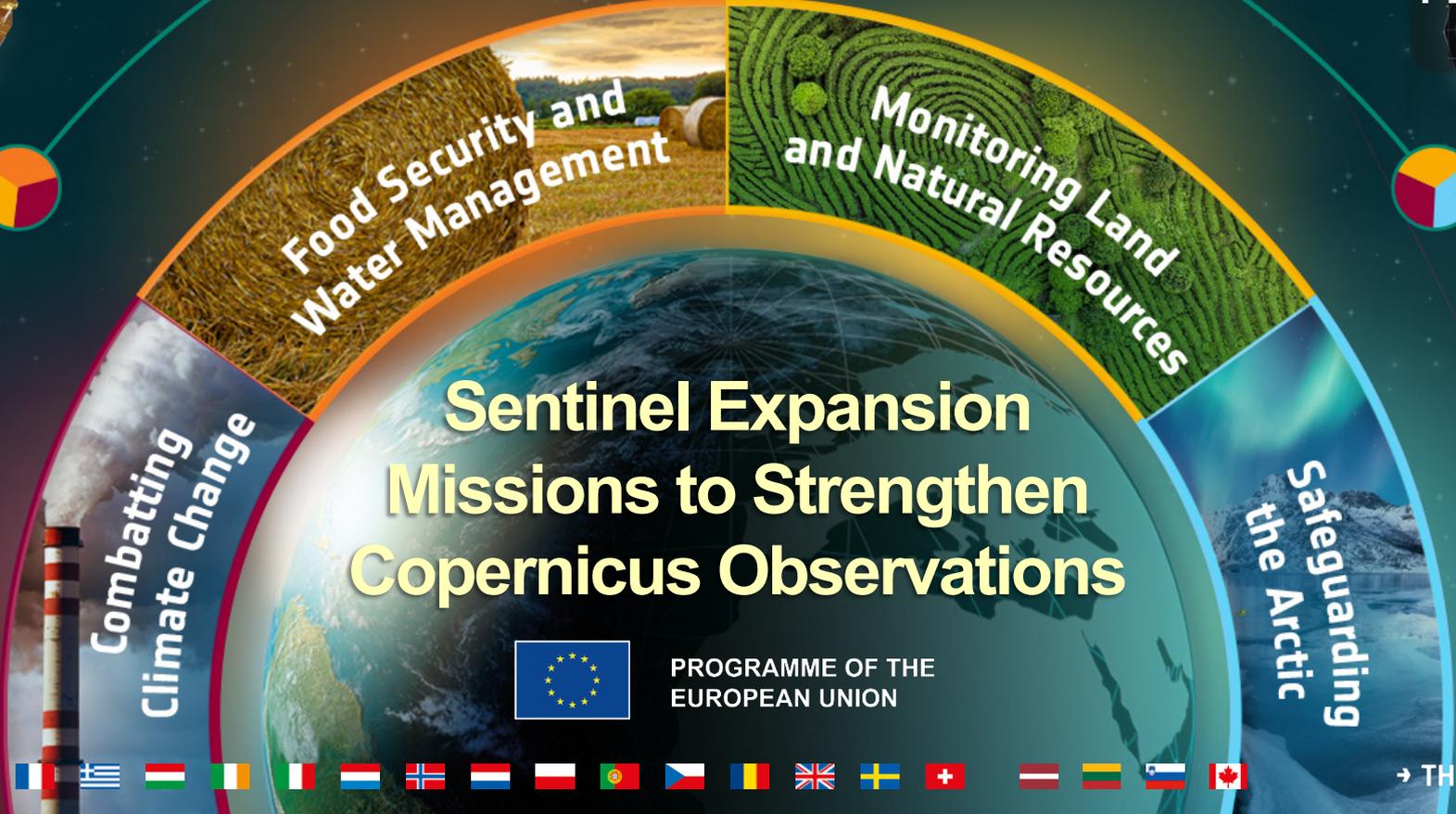
CO2M

Successful spacecraft PDR in March 2022



CRISTAL

Sentinel Expansion Missions to Strengthen Copernicus Observations



PROGRAMME OF THE EUROPEAN UNION



→ THE EUROPEAN SPACE AGENCY



ESA Climate Office & Copernicus Services define common R&D interests, data standards and interoperability activities.

Global Climate Observing System (GCOS) submitted updated implementation plan to UNFCCC.

€10.6bn of benefits
Benefits of Aeolus-1 and Aeolus-2 estimated at €3.5bn and €7.1bn, respectively. Benefits estimated over 13.5 years (3.5 × 10)

Primary benefits: €2.4Bn
Benefits to direct users of Aeolus data and information based on average willingness-to-pay and 4,000 EUMETSAT users

Wider benefits: €8.2Bn
Aeolus contributes less than 1% of inputs in NWP¹, but improves forecasting accuracy by 4%. Weather-dependent GDP assumed to grow in accuracy

WTP grows with awareness
WTP is 44% greater for those who are aware of wider benefits:

- Catalytic: captured by third-party;
- Technological: research and development; and
- Strategic: including provision of unique information.

Aeolus to help reach Net Zero
With an estimated five-fold² increase in renewable energy in Europe by 2050, accurate weather and wind forecasting will be crucial determinants of success on Europe's path to Net Zero

Open data policy removes barriers
Small organisations (budget <€5m) have a lower WTP of €16k. The open data policy ensures they can benefit from Aeolus data and information and derive value and benefits in spite of the small budget. Large organisations benefit from the open data policy by being able to share and reuse data.

Engaged decision makers
European decision makers across 20/28 countries in scope (ESA Members, Cooperating and Associate members) at 30% response rate. Stakeholders cover Met Offices, Climate Service, Aviation, and Energy

Benefits vastly exceed costs
Total estimated benefits greatly exceed mission costs of €1.5bn across Aeolus-1 and Aeolus-2

Successful pilot study
The success of using Value-of-Information to estimate benefits of Aeolus shows the method is ready for use with other missions

Average WTP > €60k
Average Willingness-to-Pay (WTP) of European decision makers for Aeolus data and information across selected sectors exceeds €60k per year

Value of Information Study concluded on Aeolus-1 & 2

For more information visit:
<https://earth.esa.int/eogateway/missions/aeolus>

1: Numerical Weather Prediction
2: European Commission (2018), A Clean Planet for All, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:520180C073&from=EN>



Harmony selected as EE10
(Expected launch 2029)

Today's satellite instruments only cover up to the mid-infrared part of the spectrum (4–15 microns).
Forum will extend our view into the far-infrared (up to 100 microns).

EE9 FORUM Industrial Contract Awarded
(Expected launch 2027)

EO at CM22 in a context of Worldwide Challenges



AN EO PROGRAMME PROPOSAL PACKAGE THAT IS:

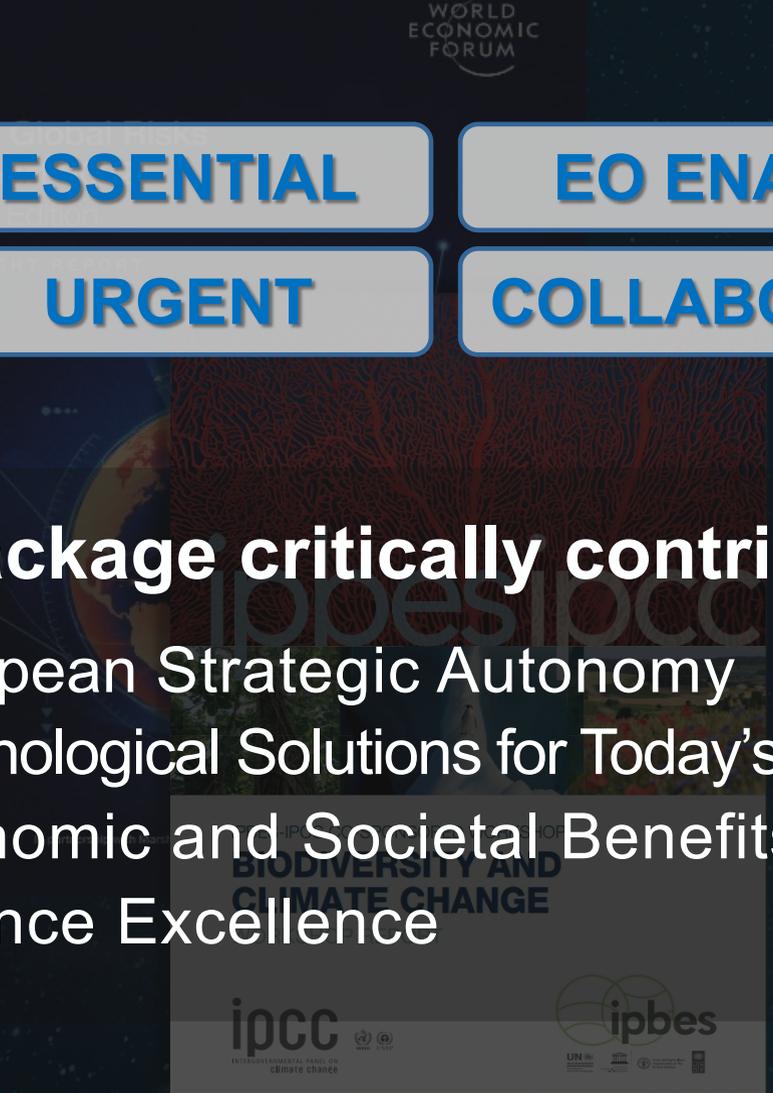
ESSENTIAL
URGENT

EO ENABLED
COLLABORATIVE

COHERENT
LONG TERM

An EO package critically contributing to:

- ... European Strategic Autonomy
- ... Technological Solutions for Today's Challenges
- ... Economic and Societal Benefits
- ... Science Excellence



EO Programme Proposal at CM22

Pre-operational activities answering demands from user communities, industry, Member States

CUSTOMISED EO

COMMERCIALISATION
InCubed 2

TRUTHS

DIGITAL TWIN EARTH (DTE)

CLIMATE-SPACE

OPERATIONAL EO

METEOROLOG Y
Aeolus-2

Securing the long-term continuation of Europe's eyes on our planet

COPERNICU S
Sentinels Next Gen.

FutureEO

Earth Science, Preparation of EO future and World-class EO Research Missions

BASIC ACTIVITIES

Worldwide data and a walk in the past to better understand the present and the future

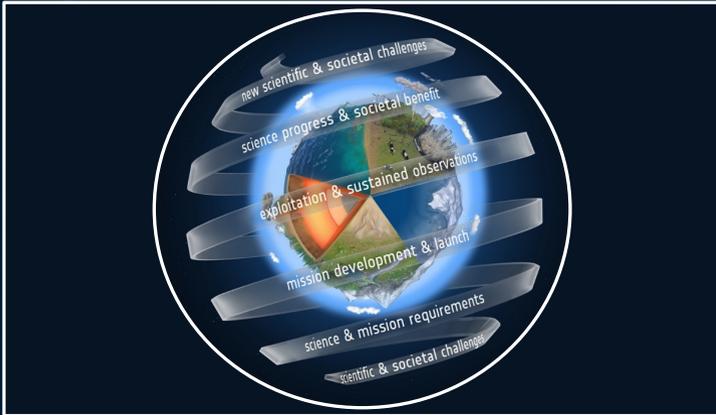
Earthnet

Heritage Space

DPTD



Earth Science, Preparation of EO future and World-class EO Research Missions



Foundations and Concepts



Research Missions

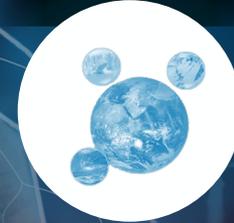


Mission Management



Earth Science for Society

Harmony



Scout 3 & 4



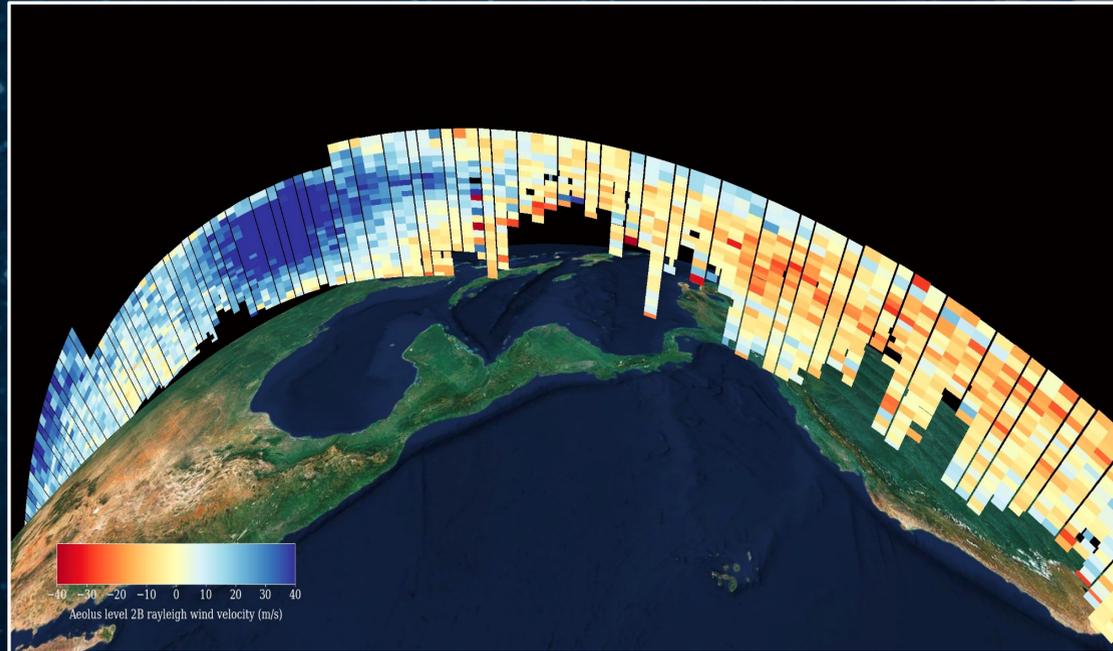
EE-11



MAGIC/NGG



Securing the long-term continuation of Europe's eyes on our planet



Meteorology - Aeolus-2

Copernicus Sentinels Next Generation



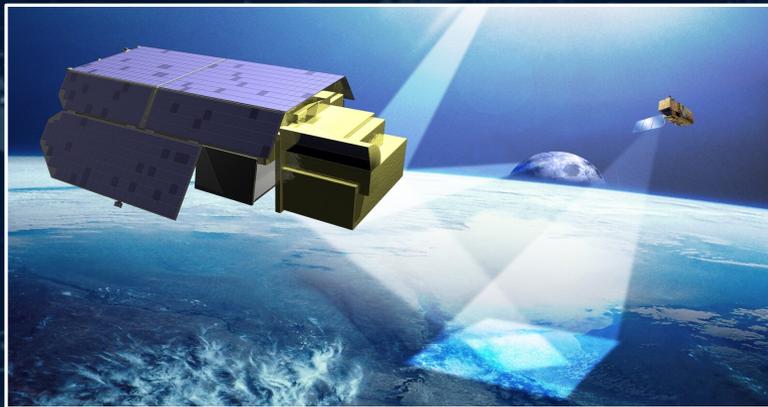
Pre-operational activities answering demands from user communities, industry, Member States



CLIMATE-SPACE



Incubed-2



TRUTHS



Digital Twin Earth

MAKE SPACE FOR EUROPE

www.esa.int

