



UNIVERSITY
OF LJUBLJANA

FGG

Faculty of Civil and
Geodetic Engineering

Cultivating the Next Generation of Remote Sensing Experts to Meet Europe's Challenges and Needs

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Workshop on Recruitment and Capacity Development Challenges in the Geospatial Domain

Ljubljana, November 19, 2024

Contents

- Cultivating
- Next Generation
- Remote Sensing Experts
- Europe's Challenges and Needs

Copernicus Programme

Europe's eyes on Earth



Programme Manager

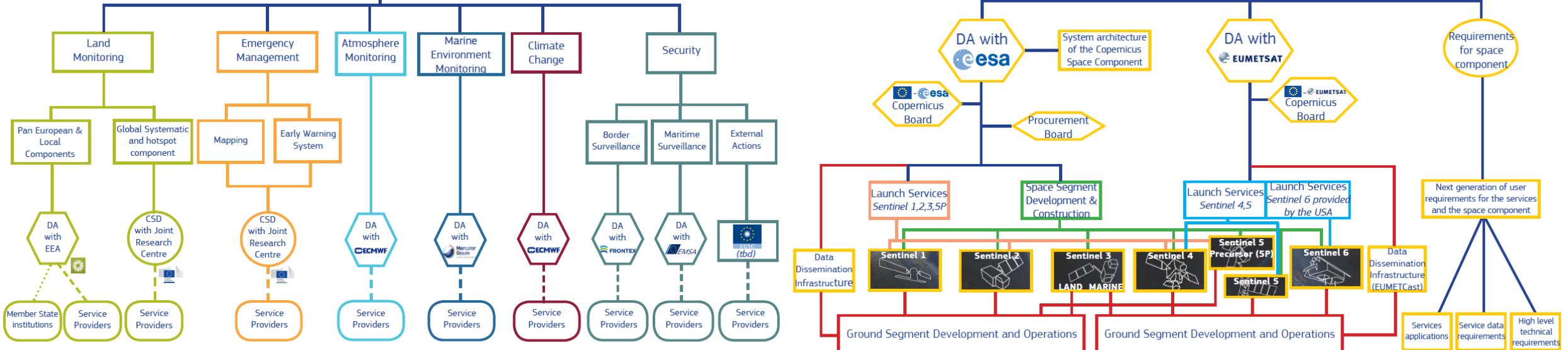
Copernicus
Committee

User Forum

In-situ Component*

Copernicus
Services

Copernicus
Space Component



Copernicus programme

- A significant impact on job creation
- Generated more than 20,000 jobs across Europe
- 16.000 jobs years for building the space infrastructure
- **3000 – 12,000 across the EO downstream and end users markets**
- Space engineering, satellite operations, data analysis and IT, environmental monitoring, emergency management, agriculture, ...
- Germany, France, and the UK have significant job creation – advanced space and technology sectors
- Italy, Spain, Scandinavian countries benefit from jobs in environmental monitoring and agricultural applications, environmental and marine monitoring
- Poland growth in data analysis and IT services

Recently published

- European Space Agency (2024): *Earth Science in Action for Tomorrow's World*. ESA Earth Observation Science Strategy. European Space Agency. Rome, Italy. Available online at https://esamultimedia.esa.int/docs/EarthObservation/ESA_Earth_Observation_Science_Strategy_issued_Sept_2024.pdf
- Federal Geographic Data Committee (2024): *Building the geospatial future together*. The NSDI strategic plan 2025-2035. The NSDI strategic plan 2025–2035. Reston, Virginia. Available online at <https://www.fgdc.gov/nsdi-plan/nsdi-strategic-plan-2025-2035.pdf>

The need to study interconnected Earth system

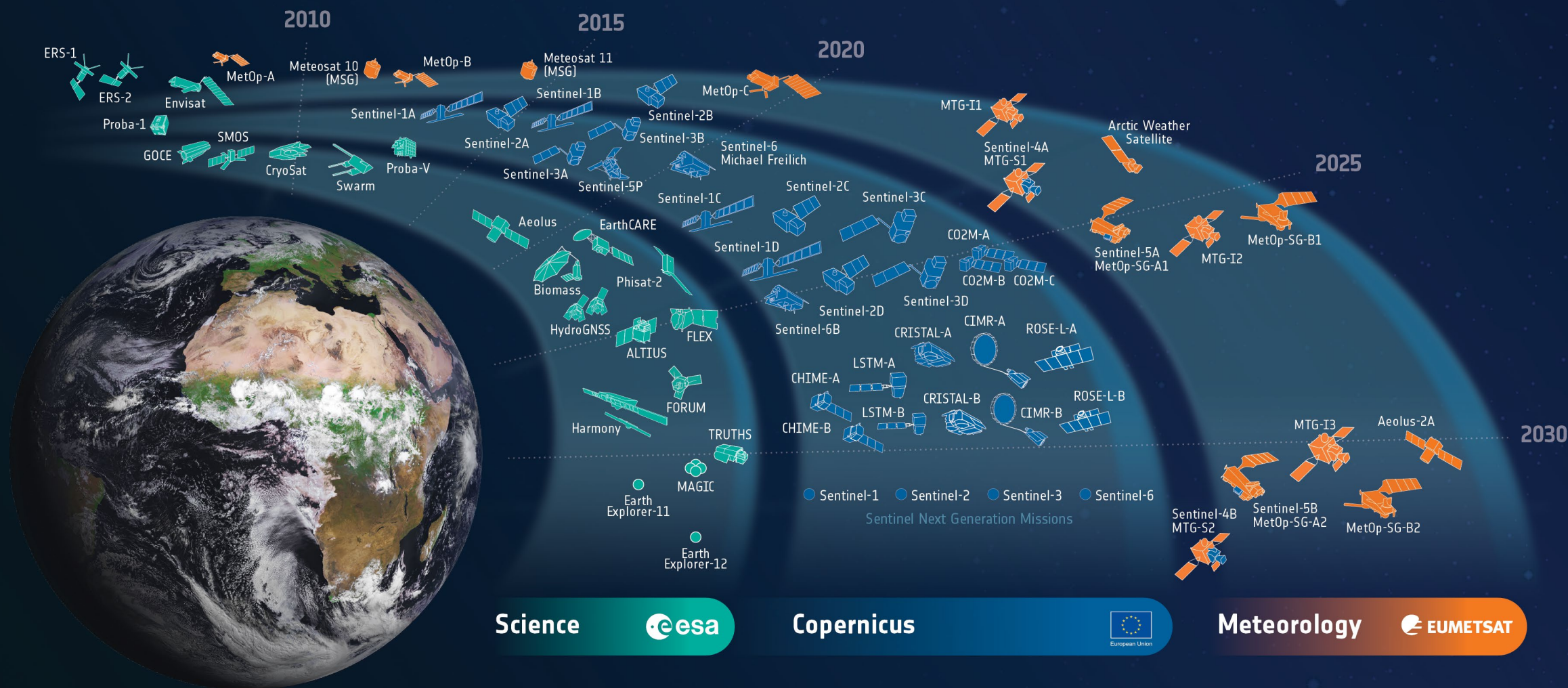
- Water Cycle
- Carbon Cycle and Chemistry
- Energy Fluxes
- Ecosystem Health
- Extremes and Hazards
- Interfaces and Coupling



ESA – Vision

- Measure
- Understand
- Predict
- Decide
- Act





ESA – strategic objectives

- Foster a **community approach** to though dedicated mechanisms (e.g., ESA Science Clusters, Earth System Science Hub)
- Promoting a **continuous dialogue and wide participation** of the community to ESA activities at both European and international level
- **Building Strong STEM Education, Training and Outreach**
- To prepare the next generation of EO scientists and practitioners, and to engage early-career professionals in R&D activities, it is essential to **strengthen education and training programmes in Science, Technology, Engineering, and Mathematics (STEM)** at all educational levels.

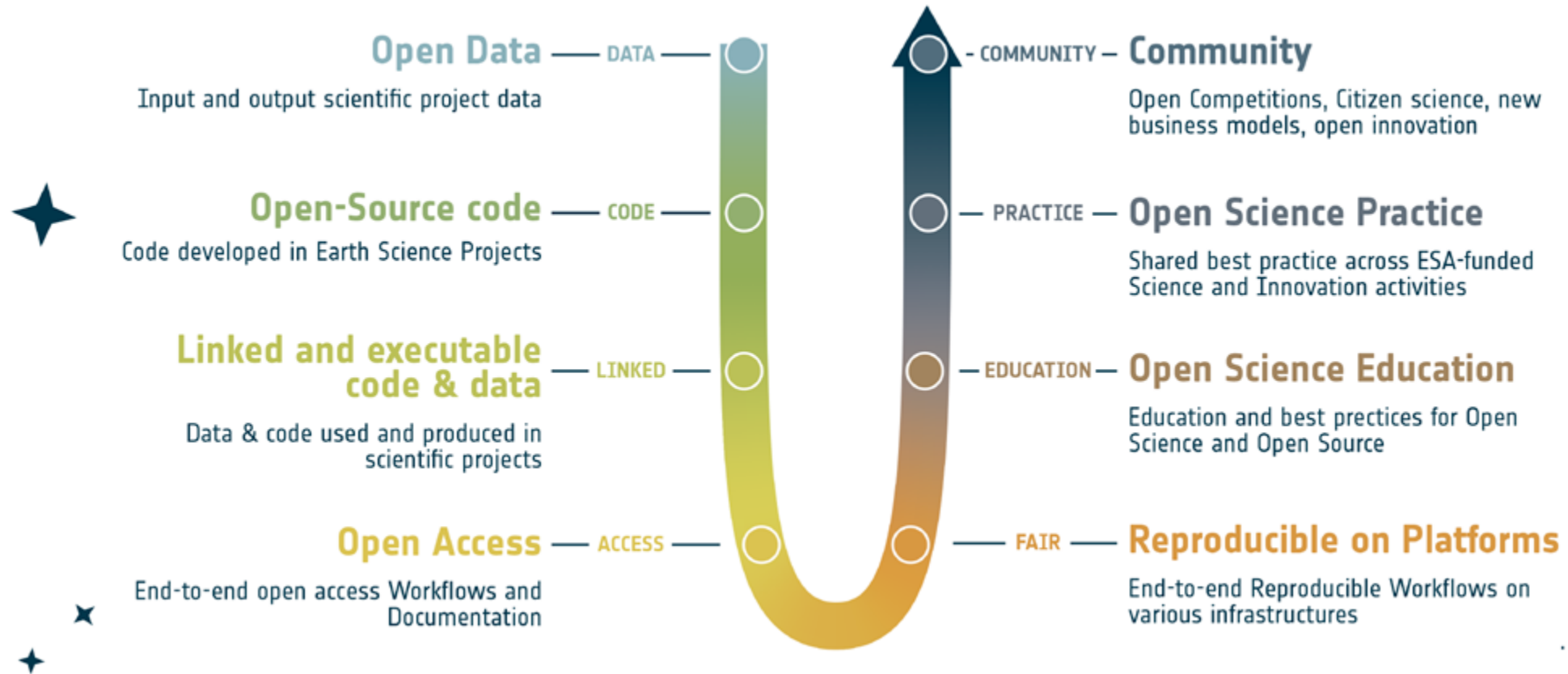
ESA – strategic objectives

- Dedicate **appropriate level of support** to the preparation of the next generation of European EO expert through **dedicated training and education activities**.
- ESA should **maximise the outreach and dissemination of EO** science results not only towards the scientific community (e.g., by advanced open science tools), but **mainly towards the general public, policy-makers, non-space experts and stakeholders**, and especially towards the young generation through advanced **immersive visualisation capabilities, interactive dashboards, and novel communication means**.

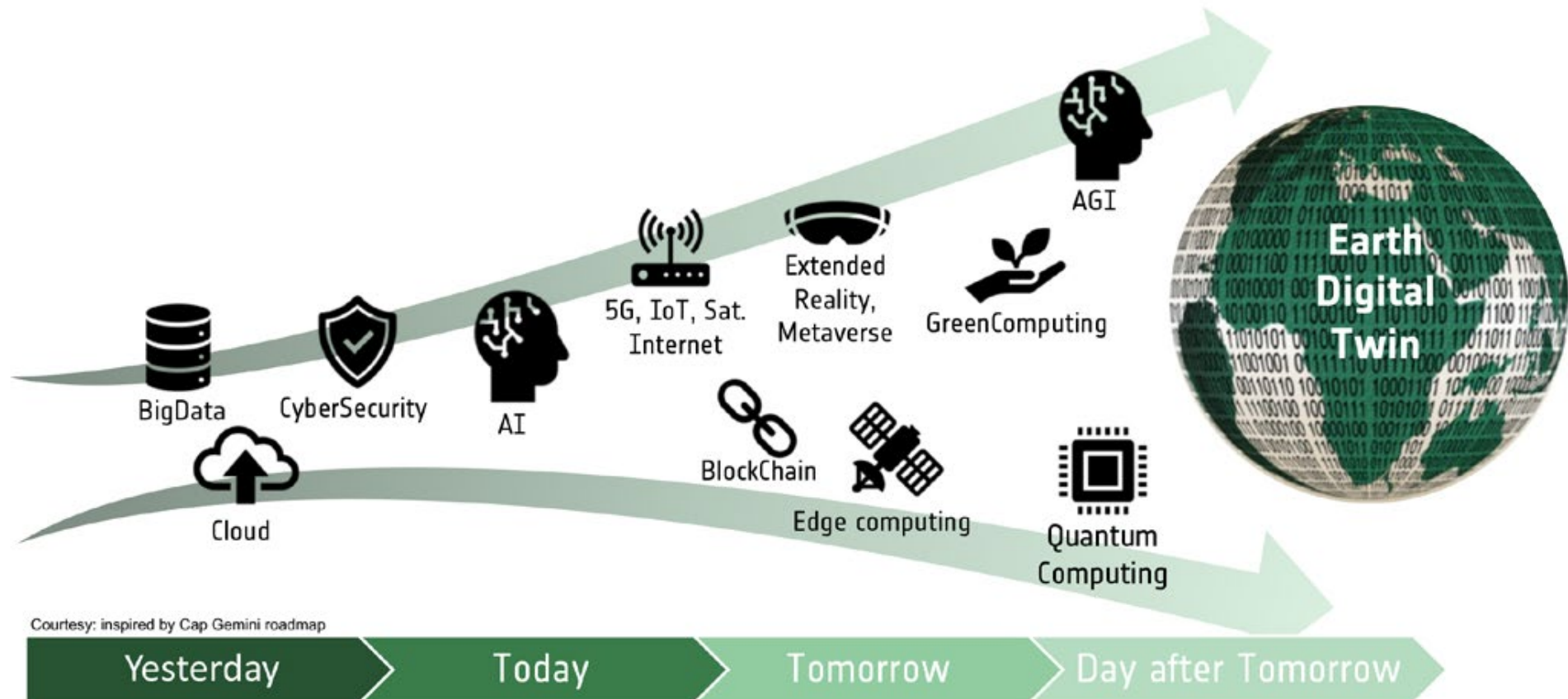
ESA – strategic objectives

- Harnessing **Open Science** through Digital Innovation
- Building such solutions with a long-term perspective, supported by capacity building and wide and open education on **FAIR and open science**, fosters institutional and scientific collaboration and promotes a scientific process that is both equitable and inclusive.

Application of open science principles



Earth system as input to the digital twin framework

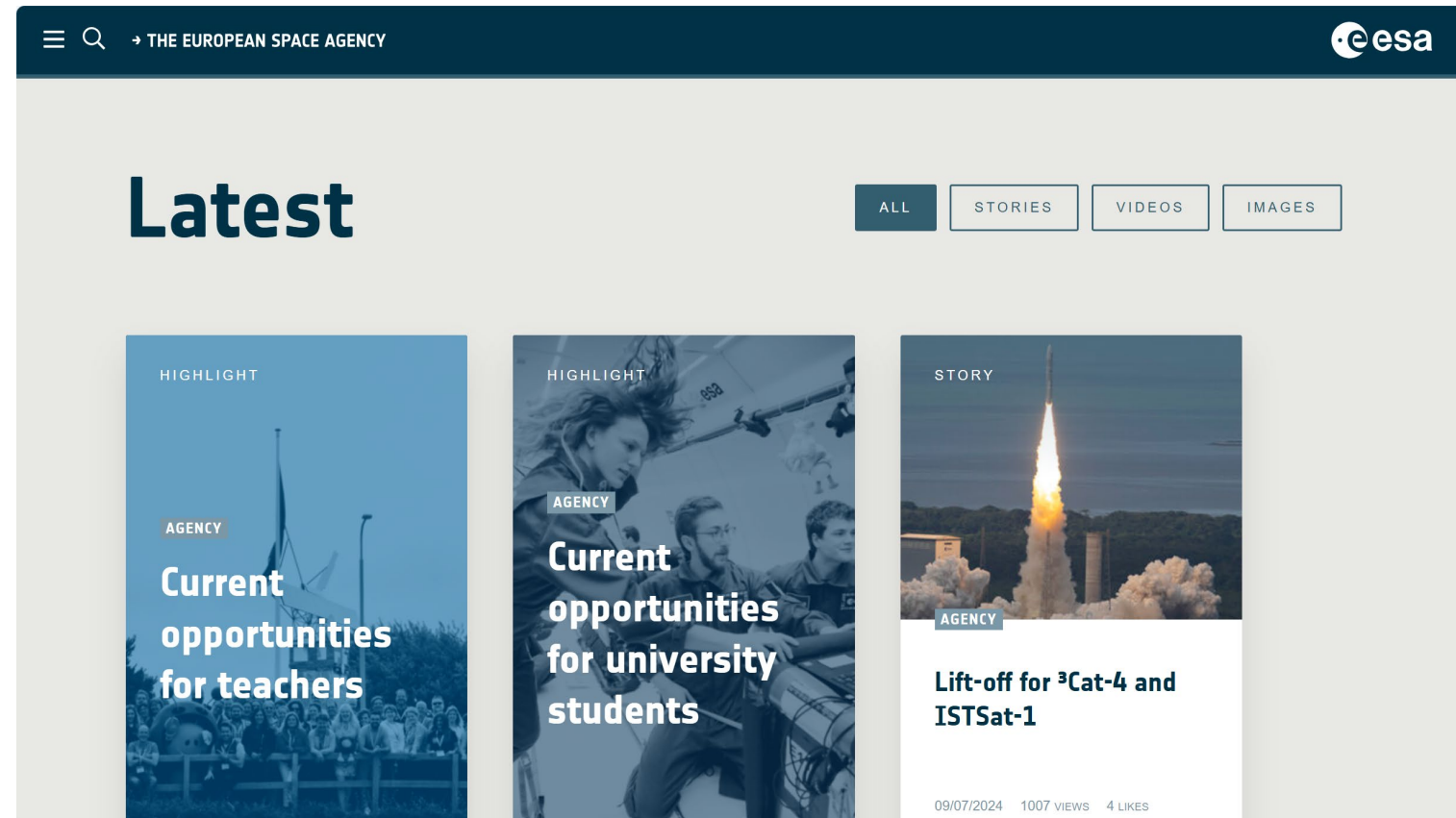


Building a skilled geospatial workforce

- **Multisectoral and multidisciplinary** partnerships
- Governmental and the private sector, academic institutions, nonprofit organizations
- International partnerships
- Promoting **networks and communities** of practice where individuals can share knowledge, expertise, and best practices, as well as collaborate on joint projects and initiatives.
- Promoting **continuous learning** within the geospatial community, and actively promoting the use and **understanding of geospatial data and technologies**.

ESA – Education

- <https://www.esa.int/Education>
- Teachers' corner
- Teach with space
- School Projects
- ESA Academy
- Hands-on space projects
- Training
- Engagement
- Career opportunities



European Space Education Resource Office (ESERO)

- Uses **space related themes** and the genuine **fascination** felt by young people for space to enhance school pupils' literacy and competence in **STEM-related** subjects.
- Currently ESA has established ESERO national offices in twenty-two countries – twenty-one ESA Member States and one Associate State



EO training & education - eo science for society

- Online EO for **everyone**: MOOCs, webinars and video tutorials
- **Secondary schools**: EO basics
- **Universities** and **young professionals**
- **Scientists**: advanced training by theme (ocean, land, atmosphere, cryosphere)
- Introductory courses – 1-2 per year
- Advanced schools – 2-4 per year
- Challenges – 2 per year
- World reaching – Africa, Americas – 2+ per year



📅 22 APRIL - 4 JUNE 2025 📍 TROMSØ, NORWAY TO NICE, FRANCE VIA REYKJAVIK, ICELAND

DEPART TROMSØ, NORWAY
22 APRIL 2025

ADVANCED TRAINING COURSE ON OCEAN SYNERGY REMOTE SENSING 2025

DEPART REYKJAVIK, ICELAND
8th MAY 2025

ARRIVE NICE
5th MAY 2025

Our Ocean, Our Future, Our Responsibility

NASA

ONE
OCEAN
EXPEDITION
2025 - 2026
SEYOND SAIL FOR THE FUTURE

NERSC

NICE

MAHON

ARRIVE NICE FRANCE
4th JUNE 2025

(pickup of VIP on 2nd June
from Mahon)

OceanDataLab



TPS
FOUNDATION

Education in Earth observation

- **Enhance Interdisciplinary Learning**
 - Remote sensing integrates various fields such as geography, environmental science, and data science, promoting a holistic understanding of complex systems.
- **Foster Critical Thinking**
 - By analysing real-world data and imagery, students develop critical thinking and problem-solving skills.
- **Provide Hands-On Experience**
 - Education in remote sensing emphasizes practical, hands-on learning, allowing students to engage directly with the technology and its applications.
- **Prepare for Advanced Applications**
 - It equips students with the scientific and technical foundations necessary for advanced studies and professional careers in remote sensing and related fields.
- Overall, remote sensing education aims to inspire students, provide them with essential skills, and prepare them for future challenges in various scientific and technical domains.

<https://eu-careers.europa.eu/en/scientific-research-administrators>

Do you have **experience in scientific research**? Would you like to start an international career within a multicultural and diverse team? If yes, then read on.

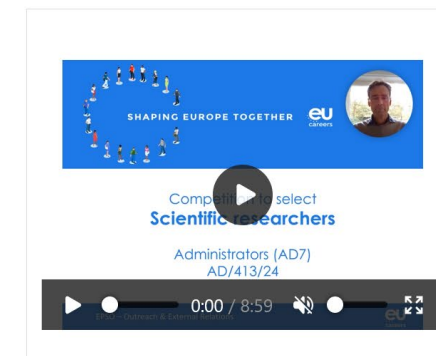
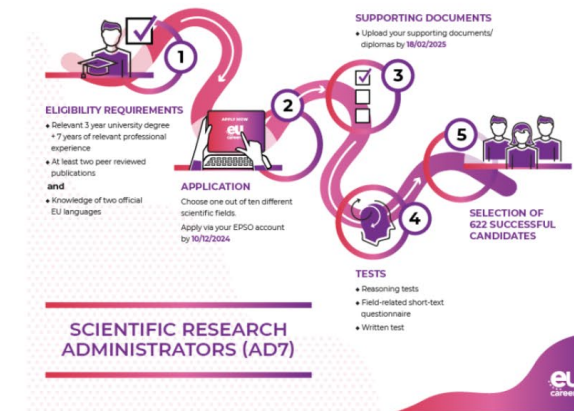
The European institutions are looking for **scientific research administrators**. Recruited officials (grade AD 7) will work mainly for the European Commission's **Joint Research Centre (JRC)**. Most posts will be in various JRC sites (Brussels, Belgium; Geel, Belgium; Karlsruhe, Germany; Seville, Spain; Ispra, Italy; and Petten, The Netherlands).



We offer opportunities to candidates who specialize in **ten different fields**, as listed below. Please note that **you may only apply for one field**.

1. Environmental and climate sciences, engineering, and economics
2. Energy science and sustainability
3. ICT and (cyber)security
4. Data analysis, research, and applications for evidence-based decision-making
5. Research and applications in artificial intelligence, machine learning, and complex systems
6. Space applications and geo-information technologies
7. Health and consumer protection
8. Transport science and sustainable mobility
9. Social, economic, and political sciences
10. Behavioural science, economics, and education

Detailed information on the specific duties that successful candidates can expect to perform is included in the Notice of Competition (see Annex II – Typical duties).



Skills for tomorrow, are we ready?

- Technologies that have not yet been invented
 - Methods that have not been developed
 - Solving the problems that have not yet emerged
-
- The answer lies not in our current capabilities, but in our willingness to adapt, learn, and innovate.
 - The skills for tomorrow are not just about mastering new tools, but about cultivating a mindset of curiosity, resilience, and continuous growth.

Bridging the Gap

