

Space Benefits for Earth

Understanding the remarkable value of Europe's achievements in space

2025

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→ Examples from the remarkable value of Europe's achievements in space

Impact of space

Impact of ESA

Impact of ESA programmes

→ A space infrastructure that is still based on a rather limited public investment



Seville from Copernicus Sentinel-2C

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Examples from the remarkable value of Europe's achievements in space

- Impact of space
- on critical infrastructure
- on Europe's policies

Space-based systems already support more than half of critical infrastructures

- Space technologies today support 11 of the 16 most frequently designated critical infrastructures in OECD countries, which include transport, energy and food supply, but also health, defence and public safety.
- In several countries, such as Belgium, France, Spain, and the United Kingdom, the space sector itself is classified as critical infrastructure.

Space-based observations are essential support to Europe's policies

- Europe's space assets and capabilities support critical policies, addressing global challenges in the face of climate change and extreme environmental events.
- Space-based observations provide more than half of the essential climate variables that are used to monitor climate change.



Europe's Columbus

 laboratory on the

 Space Station

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Examples from the remarkable value of Europe's achievements in space

→ Impact of ESA

- on Europe's economy
- on Europe's employment

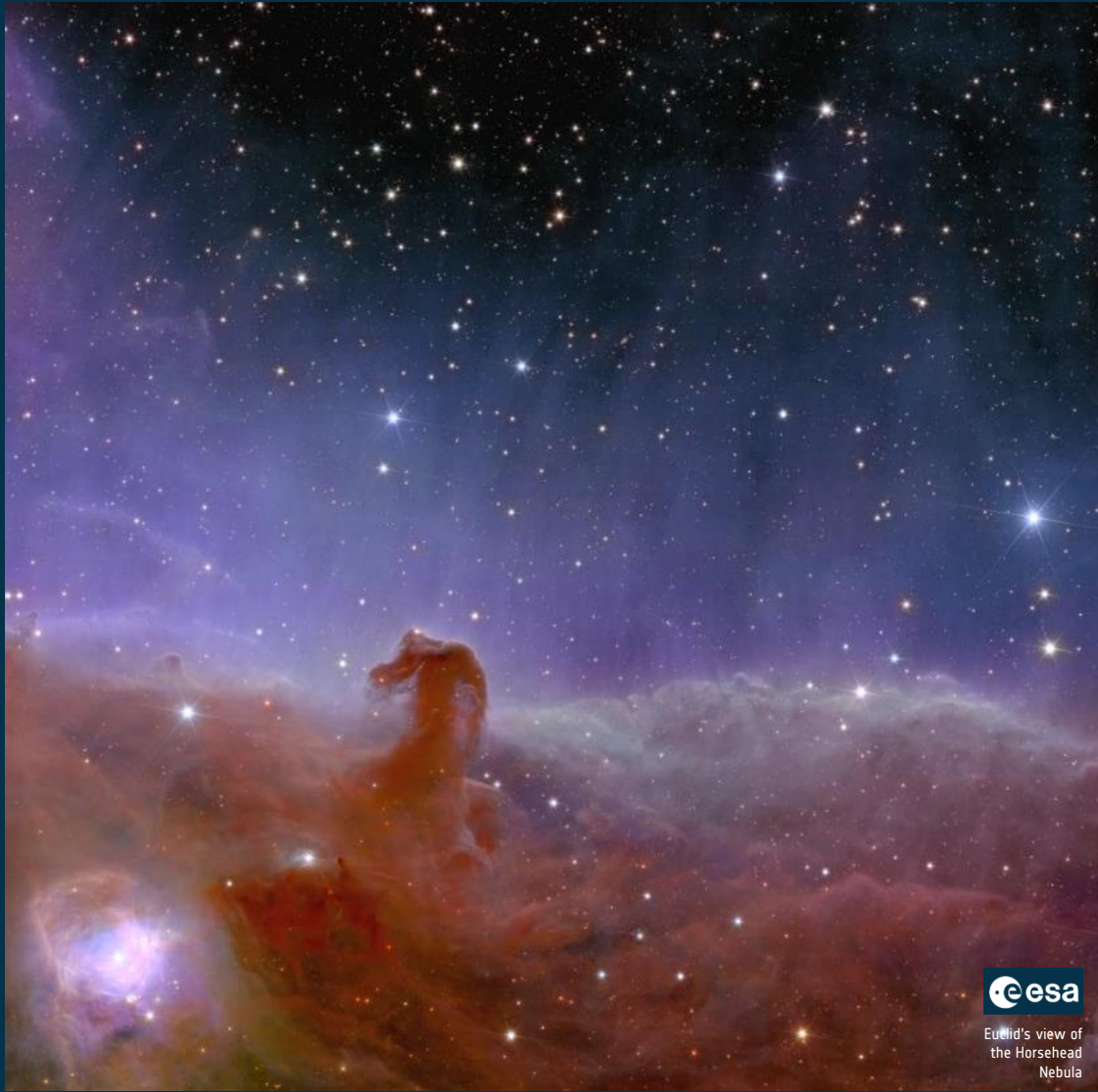
Europe's space programmes contribute to Europe's economic growth

- Subscriptions to ESA programmes at Ministerial Council 2022 of €17 billion are projected to contribute €22 billion to Europe's GDP and generate €6 billion of taxes across ESA Member States, Associate States and Canada, not accounting for the additional value generated from the use of the assets developed through the programmes.

Europe's space programmes support

high value-added jobs in European economies

- Subscriptions to ESA programmes at Ministerial Council 2022 of €17 billion are estimated to support >260,000 job-years across ESA Member and Associate States, not accounting for the additional value generated from the use of the assets developed through the programmes.
- The economic sectors in Europe receiving ESA funding are primarily R&D and manufacturing, which show significantly higher productivity than Europe's average.



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Examples from the remarkable value of Europe's achievements in space

→ Impact of ESA programmes

- on Europe's research
- on climate action
- on Europe's strategic autonomy
- on Europe's resilience and public safety
- on Europe's competitiveness

Advancements achieved through ESA space science, exploration and Earth Observation missions are highly valuable to Europe's generation of research

- The scientific research based on data from ESA-led space science missions has posted growth of >80% in the past decade.
- In 2024, nearly 1,800 scientists conducted research through ESA's Terrae Novae SciSpacE investigations on the ISS and analogue platforms.
- In 2024, >4,250 scientific publications were based on European EO missions' data, essential to address knowledge and observation gaps as identified in the ESA EO Science Strategy.

ESA's Earth Observation programme has an overarching impact on Europe's capability to empower **climate action**

- EOP implements activities that develop climate-relevant capabilities in Europe's industries, supporting 30,000 job-years, associated to more than €2.4 billion of GDP and €780 million of taxes, not accounting for the additional value generated from the use of the assets developed through the programmes.
- For example, the value of Aeolus data and information, ESA's 5th Earth Explorer mission developed as part of FutureEO, was estimated at €3.5 billion over its lifetime. The value of EPS-Aeolus data and information, the follow-on mission of EUMETSAT in development with ESA, was estimated at €13.6 billion over its lifetime.

The independent capability to fly Europe's missions through ESA space transportation and space operations is essential to Europe's strategic autonomy as a space power

- ESA's Space Transportation activities subscribed to at CM22 develop critically enabling capabilities in Member States' industries, supporting nearly >40,000 job-years, of which 19,000 for Ariane 6 and Vega activities, not accounting for the additional value generated from the use of the assets developed through the programmes.
- ESA's Mission Operations Infrastructure (MOI), is a key strategic asset for ESA and its Member States. During Covid lockdowns across the world, ESA's mission controllers continued to operate Europe's space missions, overseeing critical manoeuvres and safeguarding the continuous delivery of data and vital services.

ESA's Space Safety activities contribute to Europe's resilience and public safety

- ESA's Space Safety activities protect critical space infrastructure and terrestrial market segments such as resource exploitation, aviation or power grids operations from potentially devastating damages that could result from catastrophic events.
- According to the OECD, the global value of economic activity at risk is estimated at >\$190 billion. Orbits with the highest exposure to debris are occupied by publicly funded satellites, vital for scientific research, climate monitoring, weather forecasting and national security.

ESA's
commercialisation
activities contribute
to Europe's
competitiveness

- Commercialisation activities implemented through several ESA directorates support the European space industry to:
 - Develop products fit for the commercial and export market;
 - Secure highly skilled workforce;
 - Leverage additional funding;
 - Develop essential intellectual property;
 - Build foundational partnerships.



PariSat experiment
on Ariane 6 - GAREF
AEROSPATIAL

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The development of space infrastructure is based on a rather limited public investment, representing:

- A small share of Europe's GDP
- A small share of European public expenditures

Governments remain the foundation of space infrastructure, and its primary customer

- In Europe, government demand accounted for >70% of space infrastructure in 2024, with the European Space Agency as its largest single customer (>40% of total sales).
- Globally, governments accounted for nearly 80% of the demand for space infrastructure in value in 2024, mainly driven by the US and China's ambitious defence and spaceflight programmes.

Europe's public expenditures in space still account for a limited share of GDP

- In 2024, Europe's public space expenditures in space accounted for 0.07% of GDP, dropping from third place to China, with 0.11% of GDP. The US leads with public space expenditures at 0.27% of GDP, followed by Russia at 0.18%.

ESA Space Economy

space-economy.esa.int