



ELEVATING THE FUTURE OF EUROPE

# ESA STRATEGY 2040

Edition 2025

→ THE EUROPEAN SPACE AGENCY

What does Europe dream of?  
What does every European hope for?

**Simple things, really.**

We, the citizens of Europe, want to be and feel safe.  
We want to live well, today and tomorrow.  
And we want to be confident that whatever the future holds, we will be ready for it.  
Ready to face any challenge that comes our way.  
Ready to seize every opportunity that arises.  
And in control of our destiny.

**Europe's prominence in space research, technology and applications is central to our ability to live up to this aspiration.**



**A STRONG  
EUROPEAN  
SPACE  
AGENCY  
MAKES FOR  
A STRONGER  
EUROPE.**

The European Space Agency has driven the European space economy for fifty years and will continue, for decades to come.

# THE 5 GOALS WE AIM TO REACH BY 2040

**01.**  
PROTECT  
OUR PLANET  
AND CLIMATE

**02.**  
EXPLORE  
AND DISCOVER

**03.**  
STRENGTHEN  
EUROPEAN  
AUTONOMY AND  
RESILIENCE

**04.**  
BOOST EUROPEAN  
GROWTH AND  
COMPETITIVENESS

**05.**  
INSPIRE  
EUROPE



## GOAL 01. PROTECT OUR PLANET AND CLIMATE

By giving Europe the eyes in the sky it needs to monitor and understand the changes and threats that profoundly impact our world, ESA helps anticipate and mitigate them, and makes Europe and the world more resilient and sustainable for everyone.

### Ready to tackle climate change? We're making a real difference.

Seeing the complete picture empowers meaningful progress. By understanding our world as it is now, we create opportunities to predict and manage what lies ahead. Some of the ways that visibility enables us to act: Monitor climate shifts, help anticipate extreme weather, track environmental changes and develop data-driven mitigation and adaptation strategies. In addition, the creation of state-of-the-art technology, especially fuelled by AI, is essential for creating digital replicas of our planet. These digital twins will enable scientists to better understand the significant changes affecting Earth's natural systems.

#### **Did you know?**

Copernicus collects 20 TB of Earth observation data daily, and distributes at least ten times more on a free and open basis.

### Taking on space debris. Work with us to reverse the course.

Treating space as an "out-of-sight, out-of-mind" domain is unsustainable. We have committed to stop adding to space debris by 2030, reducing the risks for our spacecraft and astronauts and ensuring successful end-of-life disposal of anything we launch. This will enable others to reduce what they add to Earth's orbital congestion, helping make our skies a safer place.

#### **Did you know?**

More than 1.1 million pieces of dangerous space debris larger than 1cm are in Earth orbit, of which just under 40 000 are regularly tracked.

### Worried about asteroids? We're working on it.

Asteroids have been getting a lot of headlines lately. But our efforts to develop solutions have been underway for a long time. A large part of what we do is working to mitigate the risk from asteroids threatening Earth. Watching the sky, we are developing asteroid deflection capabilities to help protect the Earth from any potential impacts.

#### **Did you know?**

There are about 1.3 million known asteroids, of which almost 1800 have a non-zero chance of hitting Earth.

## GOAL 02. EXPLORE AND DISCOVER

By constantly pushing the limits of human knowledge, by exploring the furthest reaches of the cosmos, by opening windows on its wonders, ESA brings us closer to answering some of the Universe's most fundamental questions – and will keep **inspiring an entire continent**, generation after generation.

### Drawn to explore Earth's constant companion?

We are shaping the future by developing essential infrastructure for lunar operations, including a large lunar lander, but also communication and navigation systems to sustain exploration and in-situ resource utilisation activities on and around the Moon. Exploring the Moon unlocks crucial scientific insights and resources for advancing human capabilities.



#### **Did you know?**

The Argonaut mission is set to deliver up to 1500 kilograms of payload to the Moon starting in 2031.

### Life beyond Earth? Let's find out.

In the Solar System, we know of only one body that has experienced the emergence of life: Earth. Is the origin of life unique to our planet, or could it occur elsewhere in our Solar System – or beyond? We are sending a spacecraft to investigate the hidden oceans on Jupiter's icy moons. Could these hold the ingredients for life? We are also developing and testing critical infrastructure for exploring Mars.

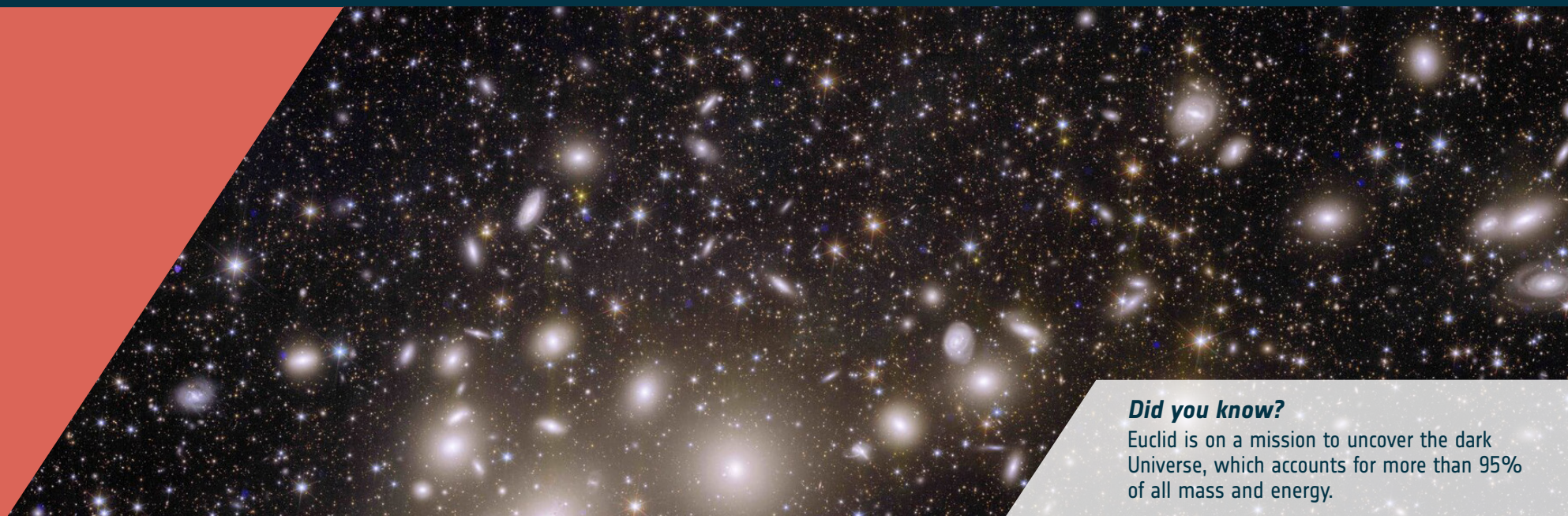


#### **Did you know?**

Our Juice mission is on its way to explore the fascinating Jupiter system and will become the first spacecraft to orbit a moon in the outer Solar System.

### On our way to master space's mysteries.

The Universe doesn't hide its secrets—it just writes them in a language we're still learning. We are launching world-class missions to map the structure of the Universe, detect gravitational waves, and explore Jupiter's ocean-bearing Moons, helping to solve fundamental cosmic mysteries and find planets around other stars that might be habitable.



#### **Did you know?**

Euclid is on a mission to uncover the dark Universe, which accounts for more than 95% of all mass and energy.

## GOAL 03. STRENGTHEN EUROPEAN AUTONOMY AND RESILIENCE

By developing advanced communications and best-in-class European observation and navigation solutions, ESA ensures Europe's **future independence** in an ever-shifting geopolitical landscape.

### Autonomy is strength.

A strong European Space Agency helps ensure that all of Europe's current and future space access needs are met by our own capabilities. Our aim is to reduce reliance on non-European transport means to the absolute minimum. We must have independent access to space on our own terms, whenever and wherever we want to go. One way we are addressing this challenge is by developing advanced reusable space transportation systems. Our future depends on this autonomy.

#### Did you know?

Ariane 6 and Vega-C are Europe's latest rockets, teaming up to ensure flexible access to space for Europe – with Ariane 6 launching heavy payloads to various orbits and Vega-C specialising in lighter satellites.

### Connected, protected and empowered.

By 2040, we will have contributed to strengthening Europe's connectivity, navigation and remote sensing capabilities by developing these systems and exploiting the quantum revolution. Using quantum technology makes our navigation, communication and security more precise and more independent. What does that mean on the ground? Better satellite technology will improve agricultural productivity for farmers, enabling greater food security. And it will make travel safer—and faster—by improving traffic flow and transforming road planning and delivery infrastructure.

#### Did you know?

IRIS<sup>2</sup>, the multi-orbit satellite constellation, will provide secure, high-speed satellite internet across Europe and beyond, revolutionising connectivity for remote areas.

### You can't predict everything, but you can be prepared.

Together with the EU, we are strengthening Europe's disaster readiness by advancing Earth observation, secure telecommunications and navigation systems to better predict natural disasters like floods or wildfires, giving people more time to prepare and stay safe.

These space-based technologies improve crisis prediction and management. Early warning capabilities—not only for climate-related disasters but also for natural hazards, industrial accidents and security threats—will make it easier for authorities to manage disasters, reducing the impact on communities and saving lives.

#### Did you know?

In 2024, Copernicus Emergency Management Service mapping was activated 89 times to support disaster response worldwide.

## GOAL 04. BOOST EUROPEAN GROWTH AND COMPETITIVENESS

By fostering and activating a vibrant educational, technological and industrial European space ecosystem across its Member States, ESA creates a lasting **uplift of expertise, competitiveness and prosperity** that will benefit all, today and tomorrow.

### We are taking the tech lead.

We're not waiting for the future, we're working on it every day. Our use of breakthrough performance technologies, like AI, quantum tech, and autonomous systems, can revolutionise space exploration, improving secure communications, disaster response, sustainable spaceflight, and the way forward for future deep space missions. The innovations we develop for space tech have far-reaching implications in other fields as well. For example, quantum computing has the potential to revolutionise industries like healthcare by enabling faster drug discovery and more precise diagnostics.

#### Did you know?

ESA is researching new materials like lightweight composites and self-healing metals to make space vehicles stronger, more efficient, and easier to build.

### An antidote to uncertainty.

We are building a stronger European industrial base by enabling cost-effective, scalable production of space technologies, fostering cross-sector partnerships, and supporting market access and innovation, turning global risks into local opportunities. Enhanced industrial capacity creates more job opportunities, delivers secure supply chains, and bolsters our economic resilience for when global markets fluctuate. This strengthens Europe as a whole.

#### Did you know?

Our programmes are estimated to create more than 250 000 job-years, driving innovation and growth in Europe's space sector.

### We grow investment.

We aim to position Europe as a leading commercial space hub by 2040 by attracting private investment—and the best of European talent. By nurturing public-private partnerships and accelerating innovation through R&D programmes, as well as providing access to cutting-edge research and development resources, the European Space Agency is creating a favourable environment for investors to get involved and flourish. We can turn our geographic proximity into Europe-wide strategic advantages.

#### Did you know?

The investments made today are paving the way for groundbreaking discoveries and capabilities in the years to come.

### Our formula for progress: The best science, labs and teachers.

By partnering with leading universities and research institutes, we cultivate the collaborative research that speeds up the development of new space technologies, such as satellite systems and space exploration tools. Strengthening Europe's position as a global space research hub by investing in world-class technical facilities and top STEM talent, we ensure Europe is better positioned to prosper, lead, and secure our joint future in a technology-driven world.

#### Did you know?

With investments in technical facilities like the European Space Research and Technology Centre (ESTEC), we are attracting top STEM talent to maintain Europe's competitive edge.

## GOAL 05. INSPIRE EUROPE

Together, **ESA's 23 Member States** chart an ever-more ambitious trajectory for the future of Europe. A Europe that chooses to keep rising.

And together, they work as one to combine the best from each other, and bring out the best in each other. For all of Europe, and beyond.

At ESA, every look up to the skies is a look forward, a look ahead. A glimpse of the shared European future we aspire to build – and elevate.

### Europe is stronger when united.

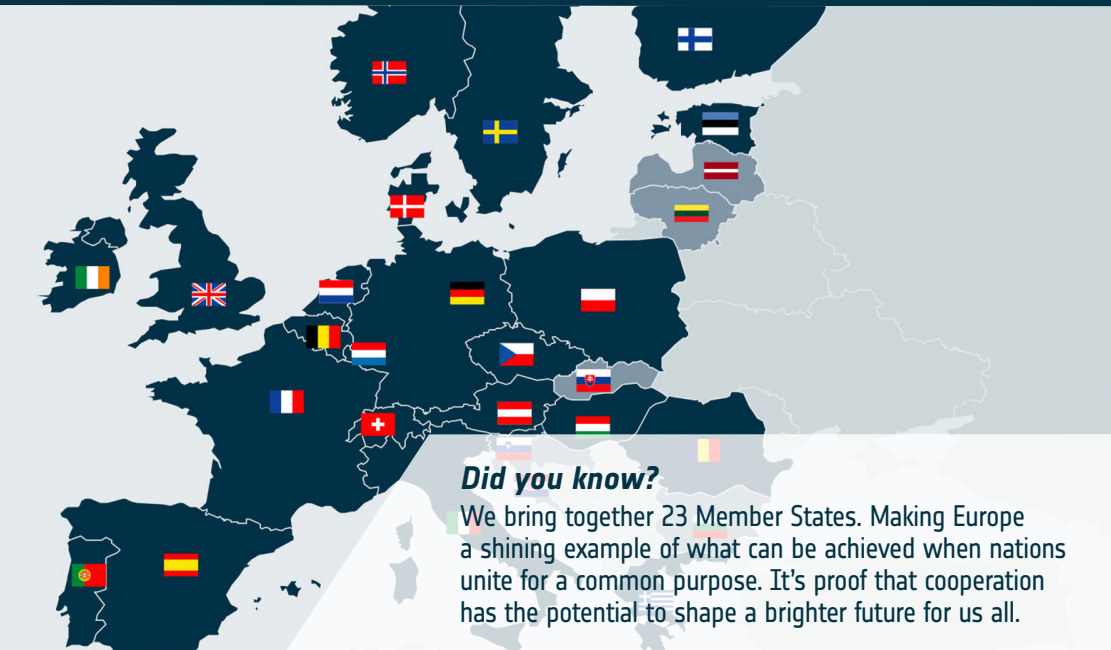
We strengthen European unity by consolidating close collaboration between Member States, the EU, and key stakeholders, delivering effective execution of pan-European space programmes, like Earth observation and satellite navigation, possible for the benefit of all Europeans. This teamwork is a virtuous circle, empowering projects beyond the reach of individual countries alone.



**Did you know?**  
Since our creation in 1975, Europe has significantly increased its space capabilities, launching missions and developing world-leading satellite technologies for climate, security, and deep space exploration.

### Collective power. Limitless possibility.

Europe can leverage space as a unifying and inspiring force by creating a shared vision of exploration, innovation, and progress. This collective possibility—with clear, everyday benefits to their lives—engages all Europeans in a concrete, ambitious, and forward-looking narrative that brings people together, making them feel part of something bigger, greater and hopeful.



**Did you know?**  
We bring together 23 Member States. Making Europe a shining example of what can be achieved when nations unite for a common purpose. It's proof that cooperation has the potential to shape a brighter future for us all.

### A strong Europe influences diplomacy.

We are an international organisation fortifying Europe's global influence by leveraging space capabilities for diplomacy. Through our collaborative international partnerships, and by aligning space programmes with international priorities, we are effectively equipped to respond to global challenges, securing Europe's role in shaping global outcomes.



**Did you know?**  
Our international partnerships strengthen Europe's global influence, using space technology for diplomacy and tackling global challenges like climate change and security.



**EUROPEAN  
SPACE  
AGENCY  
ELEVATING  
THE FUTURE  
OF EUROPE**

*OUR VISION FOR 2040*

**UPLIFTING EUROPEAN ASPIRATIONS  
FOR A BETTER TOMORROW.**

*OUR MISSION FOR 2040*

**LEAD AND ORCHESTRATE EUROPEAN  
SPACE EXCELLENCE TO BUILD  
A MORE PROSPEROUS, RESILIENT,  
INDEPENDENT AND INSPIRING LIFE  
FOR ALL OF EUROPE.**

*OUR AMBITION FOR 2040*

**EUROPEAN SPACE AGENCY.  
ELEVATING THE FUTURE OF EUROPE.**

