

## ESA Major Objective: Accelerating the use of space in Europe

Budapest, 7-8 March 2023 European Space Agency

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### Key milestones: achievements & next steps



ESA Agenda 2025 Matosinhos Manifesto 18 & 19 November 2021 Space Summit 2022, Toulouse (Fr) 16 February 2022 Tallinn workshop, 12-13 July 2022 CM22, Paris 22-23 November 2022 ESA Security Conference, Brussels 16-17 May 2023 CSS/R3 event, end of 2023 Space Summit 2023, Seville 6-7 November 2023

# ESA Agenda 2025 5 priorities with targets for 2025 (\*)

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ESA-EU relations · Commercialisation · Safety & security · Programme challenges · ESA transformation ·

Common European Space Vision for 2035+ Starting today: 3 Accelerators 2 Inspirators

### **Strengthen ESA-EU relations**



### "Time for a fresh start based on trust and stronger cooperation"



17 March 2021

JOSEF ASCHBACHER DIRECTOR GENERAL

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Dear Minister

We strongly believe it is the right time to have a fresh start for Europe as space power

Over the past two years, we have reshaped the European Space Policy, with two important decisions that we will implement. First, the adoption of the EU Space Regulation and the largest ever EU budget for space for 2021-2027, and second the funding decision by ESA Member States in November 2019 on the most ambitious set of mandatory and optional programmes since the creation of the Agency

Europe has now all it takes to be a global space leader: it has talents, industrial capacity technological leadership and the experience of ambitious space missions and programmes

But considering the massive transformation process of the space sector, we must collectively adapt and react to these evolutions

Only by collectively joining our forces -EU, ESA and Member States- we will be able to develop an ambitious Space Agenda for Europe. EU and ESA must and will work hand in hand to make sure we are responding to the challenges ahead of us

We will enhance the performance of existing EU flagships Galileo, Copernicus; join forces to launch new initiatives, such as the space based connectivity initiative; reinforce our strategic autonomy; position Europe as a hub of space entrepreneurship in the world; secure an autonomous access to space for Europe and prepare an ambitious set of optional and mandatory programmes to be decided during the next ESA Council at Ministerial level.

To deliver on this agenda and in the context of the 2004 EU - ESA Framework Agreement, we want to reinforce our cooperation and the dialogue between the EU, including EUSPA, and ESA with its unique managerial, technical, engineering and science expertise

Joint letter Commissioner Breton and ESA DG Aschbacher



"Only by collectively joining our forces – EU, ESA and Member States – we will be able to develop an ambitious Space Agenda for Europe."

### **Boost Green & Digital Commercialisation**



ESA is launching 3 lines of action:

Speed

Capital

### Talent

### **Key Actions**

- ESA as first buyer / anchor customer
- ESA as technical adviser in VC setting
- Simplified access to ESA programmes
- Use of prizes and grants
- Faster time-to-contract <1M€</li>
- Network of φ-labs across Europe
- More spending and faster development of game-changing tech.

### Strengthen Space for Safety & Security



Secure

### **IN SPACE**

- Space traffic management
- Debris removal • & mitigation
- Space weather monitoring
- Space logistics •
- Planetary  $\bullet$ defence
- Cyber security  $\bullet$





### **Solve Programme Challenges**





### **Complete ESA Transformation** Keep on attracting the best talents in Europe



Streamline Establish Embrace processes open technology communication EFFICIENC Build Redesign Prioritize a strong tasks your team workflow

Modern & dynamic ESA

diversity@work Climate neutrality

### Accelerating the Use of Space in Europe



### **3 Accelerators**

## **2** Inspirators

Icy Moon Sample Return Mission Rapid and **Protection of** European Space for a Human Space **Resilient** Crisis **European Space** Green Future Exploration Response Assets

### Urgency to act



- Climate change crisis
- Carbon neutrality
- Missed business opportunities



### Climate change: we need to act now





*"We are on the edge of an abyss, moving in the wrong direction ... our world faces the greatest cascade of crises in our lifetimes"* 

UN Secretary-General António Guterres, 2021

INTERGOVERNMENTAL PANEL ON CLIMBTE CHARGE Climate Change 2021 The Physical Science Basis Summary for Policymakers



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### Accelerators: a new concept of action for Europe



- Focus on responding to urgent societal needs
  - Upscale existing space
    investments to the next level
  - Users at the centre
  - Strengthen European leadership and STEM
  - Attract new funding sources
  - Combine strengths of ESA, EU, Member States and the commercial sector

### What is the added value of Accelerators?



### Shortcut to a better future

- Upscale existing space investments to the next level
- Accelerate ongoing technological space developments and R&D
- Create new applications and services through stronger links & synergies
- Stronger cooperation between various existing and new European actors

# Analogy of the Covid-19 vaccine development



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### **ESA Intermediate Ministerial Meeting 2021**



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COUNCIL RESOLUTION on Accelerating the Use of Space in Europe ("The Actosnitos Manifesto")

ESA/C-M/CCCli/Res 1 (Draft

The Council, meeting at ministerial level, CONVINCED that in times of unprecedented challenges facing Europe and the wi at large, it is the moment to contribute with bold, shared ambitions to solutions enable

by space, a sector rule is over more independable for our common value, HAVING REGARD to the ESA Director General's 'Agenda 2025' (ESA/C(2021)51) as using the Tearran to memory and the sector of the sector of the the biorder of

everyone on carm and in Europe in particular, HAVING REGARD to the Report of the High-Level Advisory Group on Accelerating the Use of Space in Europe (ESA/C)2021/I473 and in particular the recommendation contained therein to entrank on a new "Acceleration" approach in selected arises of

urgency and societal relevance, HAVING REGARD to the Convention for the establishment of a European Space Agency determative the ESA Convention) which entered into force on 30 Octube 1980, and RECALLINS the purpose of ESA stabilities in Article I thereot,

HAVING REGARD to the Resolutions adapted by Council, meeting all ministerial level in Lucern in 2016 (EBAC-MCCLXVVRes 1 (Phatt), in Madrid in 2018 (EBAC-MCCLXVVRRes 1 (Phatt)) and in Sevilla in 2019 (ESAC-MCCLXXXVVRRes 1 (Phatt)) RECLLLING in profiles if the ESA Minister States shall continue to ad, notably within

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18-19 November 2021

Intermediate Ministerial Meeting

### Space Summit 2022

European leaders confirm ambitious plans to work closely together to accelerate Europe as a world leader in space

Toulouse 16 February 2022

FRANCE22



### **ACCELERATING**



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## Space for a Green Future

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### **Accelerator 1: Space for a Green Future**







### Accelerating **Decarbonisation**

Commercial solutions with Industry for net zero emissions by 2050















**Quantum Gravimetry** Mission



### What is the cost of not accelerating?



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The global economy stands to lose 'at least \$150 trillion to as much as \$792 trillion by the end of the century' if we don't mitigate climate change.





## ACCELERATING Rapid and Resilient Crisis Response



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### Moving from monitoring to action



### **Floods in Germany**



Copernicus Sentinel-1 16 July 2021

### **Forest fires in Greece**



Copernicus Sentinel-2 11 August 2021

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### What is needed?



Provide **much faster** crisis responses, moving from reacting towards **real-time** management and automated **pro-active risk mitigation**.

### What is Europe lacking?

- Synergies: cognitive cloud computing artificial intelligence network to connect and enrich Copernicus and Galileo capacities, using the upcoming Secure Connectivity flagship
- Gap fillers: interconnected, fast programmable commercial EO constellation (VHR) and Internet of Things



### **Accelerator 2: Rapid and Resilient Crisis Response**



# Linking all key information

Earth Observation HAPS In-situ

User-ready
 integrated
 information

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6G

Into one integrated smart network

Fully utilising Secure Connectivity EU flagship



### ACCELERATING

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# Protection of Space Assets

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### What is the problem? Space debris Today in orbit 34.000 objects 900.000 objects

128 million objects



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Threatening the use of space by current and the next generations

### **Accelerator 3: Protection of Space Assets**





# **Beyond the 3 Accelerators ...**



# **2 Inspirators** To boost inspiration and expand European leadership in science and technology

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### Inspirator: European Human Space Exploration

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- Adequately position Europe in next space exploration frontiers – Low Earth Orbit, Moon, Mars
- Freedom of action in space
- Unlock the commercial potential in Europe

### **Inspirator: Icy Moon Sample Return Mission**



Outstanding science return Breakthrough technology development Profound source of inspiration

### Is there life out there?

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### Tallinn workshop, 12-13 July 2022



Informal Heads of Delegations workshops on ESA in the security context & the evolution of ESA

Security was considered an important and opportune topic to reflect on, albeit one that, at its core, "belongs to the Member States", i.e., that is dominated and driven by national / governmental interests, including through foreign and security policies; at the same time, it was viewed as being closely connected to the evolution of ESA.

ESA would focus on delivering excellence through programmes with the potential to be security-relevant, rather than on assuming a role as a security actor

Exchange between ESA and relevant security actors could be strengthened

The perimeters for doing so would be set by the Convention : R&D DNA, to provide technology blocks, definition of technical standards and user interfaces, ESA to focus on its core strengths, respecting the respective competences and responsibilities of security actors

Delegations emphasised ESA's technical leadership role in that context

### CM22, Paris 22-23 Nov 2022: Civil Security from Space



12 contributing Member States, 29 M euros (100 M euros)

Austria (2.5), Belgium (10.5), Czech Rep. (0.75), Denmark (0.5), Estonia (0.5), Finland (5.5), Hungary (1.5), Poland(1), Portugal (0.4), Romania (0.3), Spain (5), Switzerland (0.5)

### ESA Security Conference, Brussels 16-17 May 2023



The main purpose of this conference is to discuss **how space assets**, whether public or **private**, **national or multilateral**, **can best tackle contemporary security challenges**, which are increasing in number and intensity. The Conference will be opened by Thomas Dermine, Belgian Minister for Space, and Josef Aschbacher, ESA Director General, followed by the HR/VP, Josep Borrell keynote (not yet confirmed).

The targeted audience (around **250 participants**) will be composed of decisions- and policymakers from EU institutions and Member States, European Industry, user communities, as well as international actors.



Current programme for the Space Summit: ESA Council; informal EU COMPETITIVENESS Council followed by joint informal meeting of the two Councils;

### Increasing security challenges: Urgency to ACT



Increasing in intensity and number

Floods, Fires, Droughts, Earthquakes, Extreme weather events, famine, ...migration, illegal trafficking, terrorism, local conflicts.....

Direct consequences of Climate Change & Geopolitical tensions

**CRISIS MANAGEMENT** 

### **Urgency to Act NOW – Security Events are Escalating**



### **Climate Induced Crises**

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### **Climate Induced Crises**





### Refugees fleeing Ukraine (since 24 February 2022)\*

**5,757,014** Last updated 5 May 2022

Source: UNHCR

### **Climate Induced Crises**



### **Geopolitical Instability**



### Flood Analysis: Mobility Impact





## Wildfires in Russia



### Sentinel-2 Amur Oblast 9 May 2018

**European Space Agency** 

### Damage assessment – SOLEDAR, 10 January 2023





### **Maxar Technologies**

### World View 3 – 30 cm Resolution



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### **Towards real-time HD Video?**



Buenos Aires Time, context and layers of data

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European Space Agency

### **3D Models for Operational Use**







### **European Union Satellite Centre**





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# **IMINT (R)EVOLUTION**

### "Introducing disruptive innovation into European EO"



# Key features of a Data Space (anewgovernance / spacecoop / onecub)



A secure and privacy preserving IT infrastructure to pool, access, process, use and share data

A data <u>governance mechanism</u>, comprising a set of rules of legislative, administrative and contractual nature that determine the rights to access, process, use and share data in a trustful and transparent manner

Data holders are in <u>control of who can have access to their data</u>, for which purpose and under which conditions it can be used

Presence of vast amounts of data that can be reused under certain conditions against remuneration or for free, depending on the <u>data holder's decision</u>

Participation by an open number of organizations/individuals

### Common European data spaces





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## **#SpaceAmbition**

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