Space for Hazardous Materials Monitoring

European Space Agency

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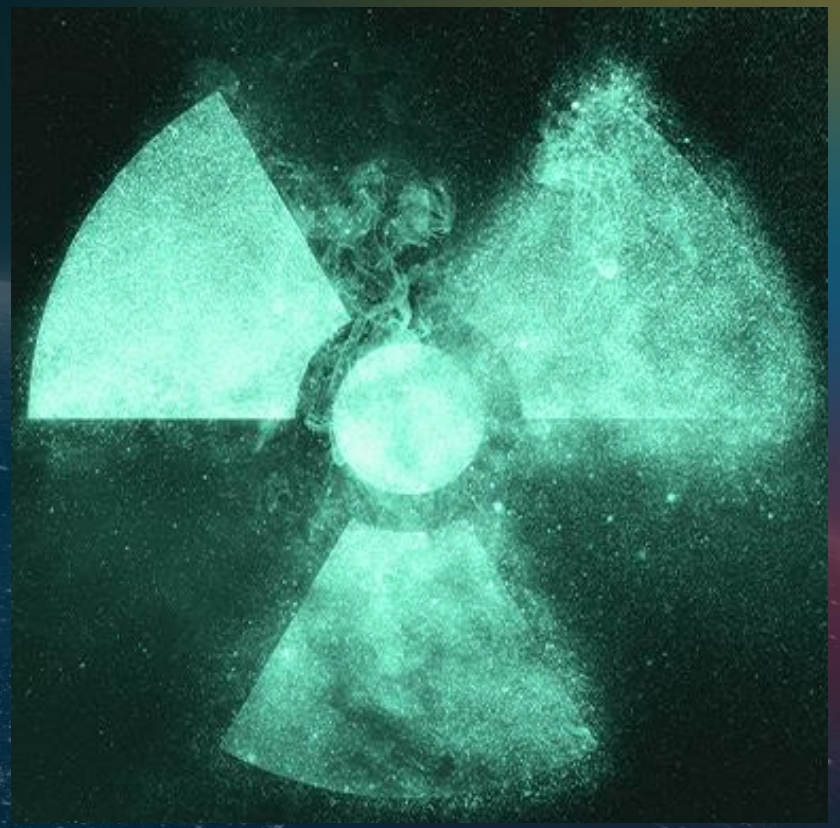
Welcome to the Webinar!

Before we start...

- Please keep your microphones muted during the webinar and make sure your webcam is switched off.

- You can use the conversation function anytime to submit your questions. They will be addressed during the Q&A at the end of the webinar



Agenda

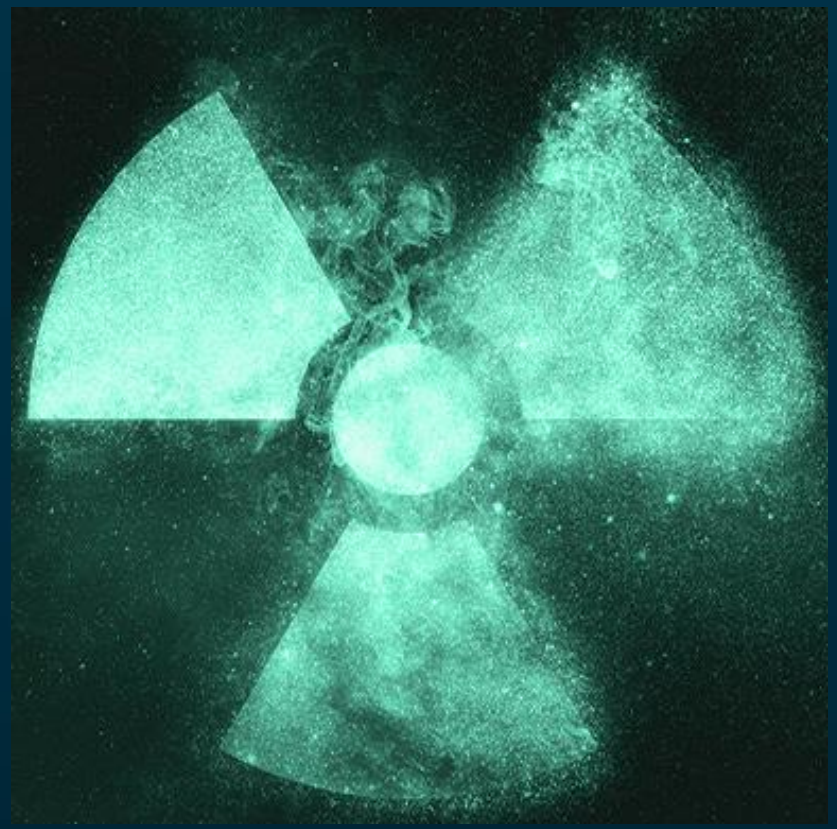
ESA Welcome and Introduction

About ESA's Space for Hazardous Materials Monitoring competition

Hazardous Materials Monitoring and Space

How to Apply to the competition

Q&A Session



We are ESA

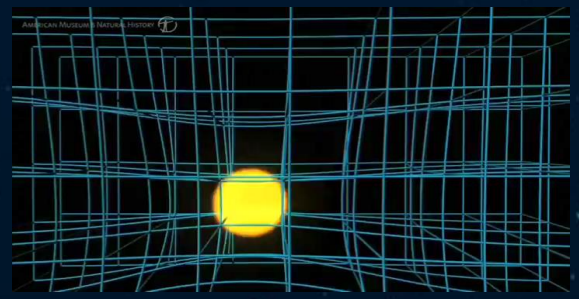
EUROPE'S GATEWAY TO SPACE

WHAT	23 Member States, 5000 employees
WHY	Exploration and use of space for exclusively peaceful purposes
WHERE	HQ in Paris, 7 sites across Europe and a spaceport in French Guiana
HOW MUCH	€7.68 billion in 2025

esa space solutions

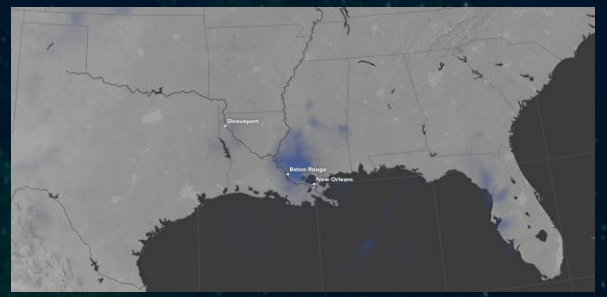
Applications

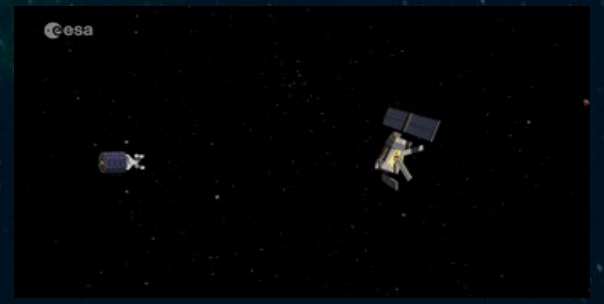
Science and Exploration

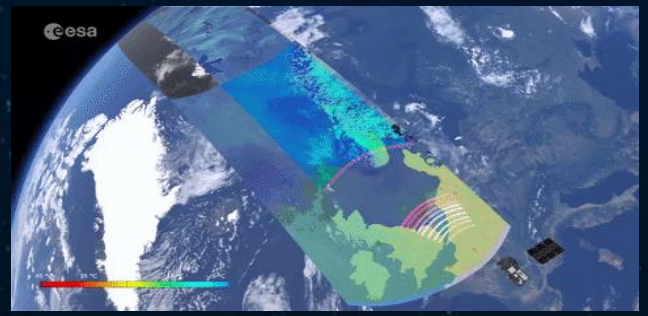


Enabling and Support

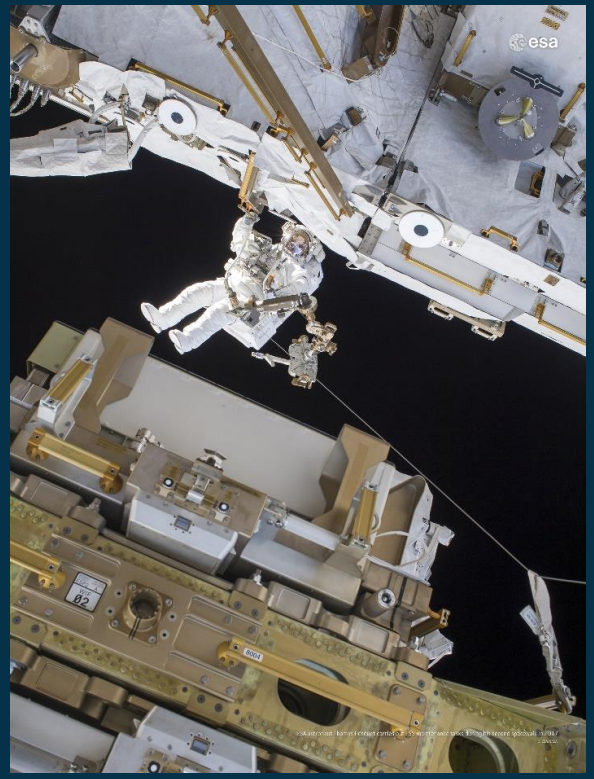
Safety and Security



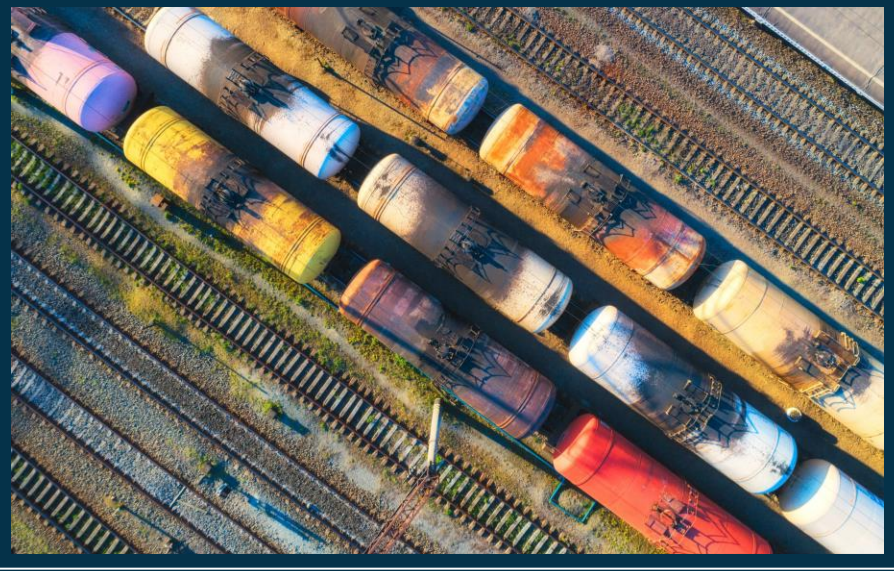




What do you picture when you think of space?



But space can also be this…

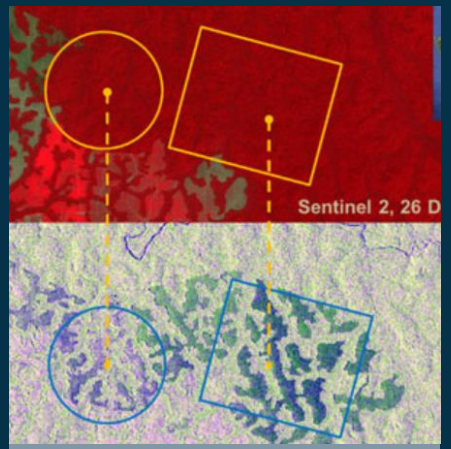


How?

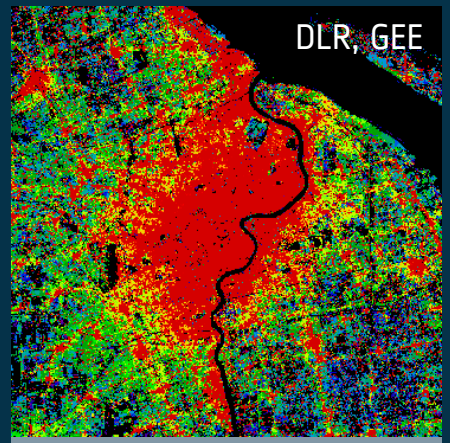
What we can ‘see’ from space

Deforestation monitoring

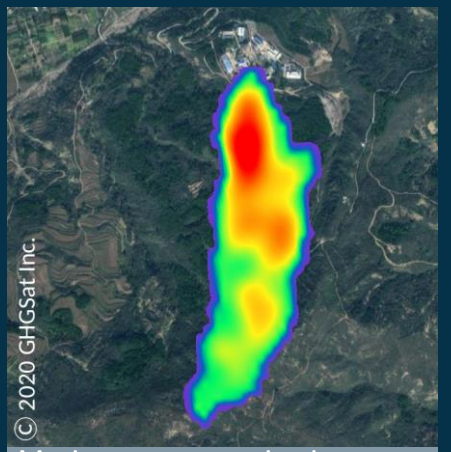
Land cover and vegetation growth



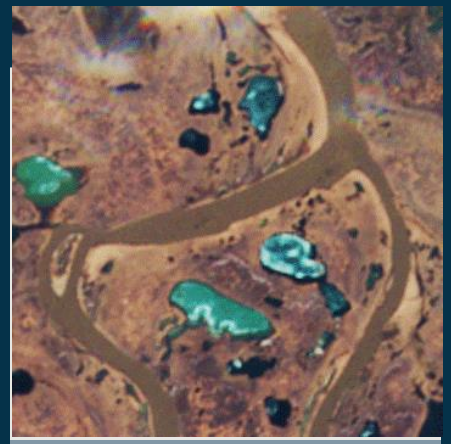
Change detection



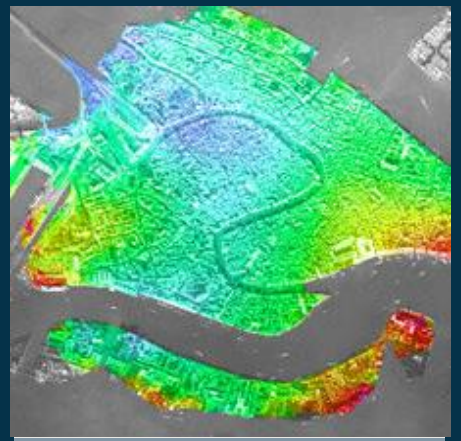
Urbanisation



Methane over coal mine, China

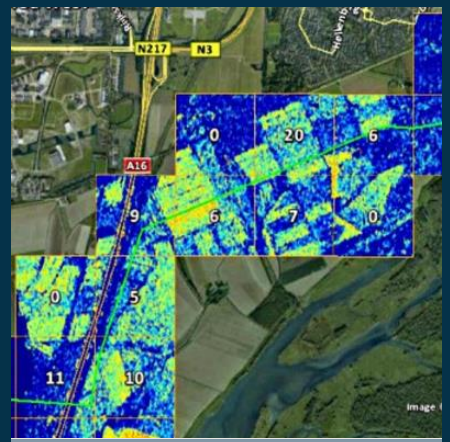


Water pollution

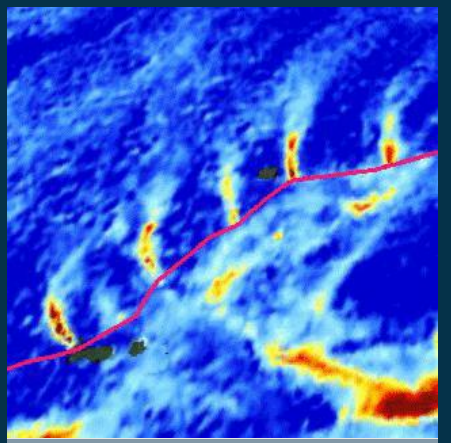


Ground subsidence in Venice

Crop identification



Monitoring pipelines



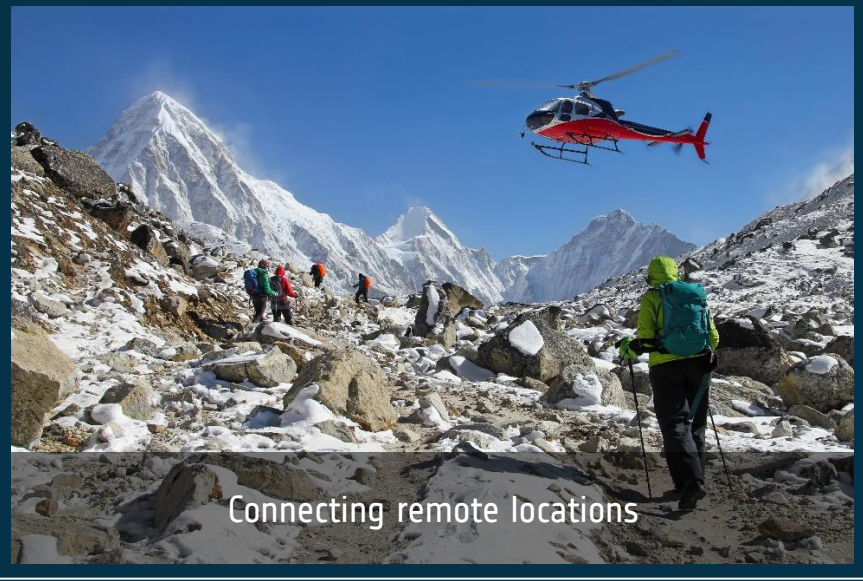
Nitrogen dioxide over Siberian pipelines

Space as a connectivity solution

Space can act as backup to terrestrial infrastructure

Reliable and secure communication

Transmitting data from in-situ sensors



Connecting remote locations

Space as a positioning and tracking solution


Tracking of resources/goods

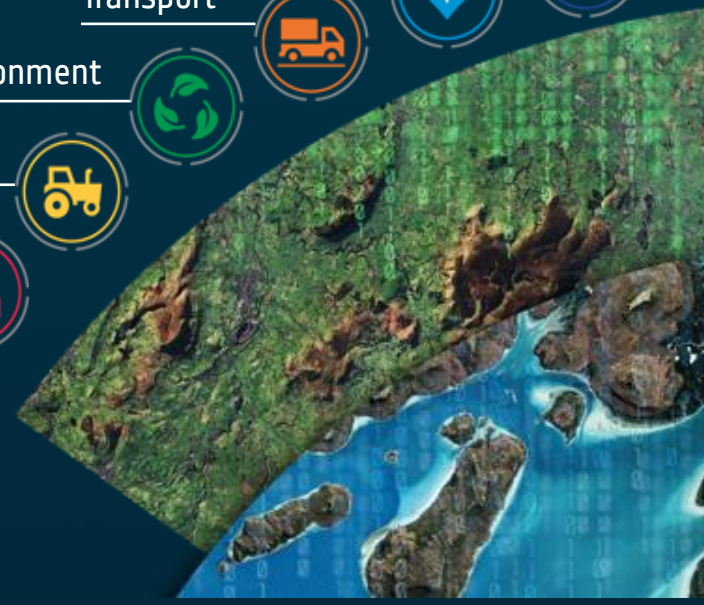

Mobility and connected cars


Navigation of autonomous or remotely piloted vehicles.

Synchronisation and Time Stamping can be supported by GNSS solutions

Business Applications: space-enabled services

Supporting European companies to develop innovative & commercial services in any market sector, using space.



- Space Weather
- Earth Observation
- Satellite Navigation
- Satellite Communication
- Aviation
- Financial
- Maritime
- Healthcare
- Transport
- Environment
- Agriculture
- Media
- Energy
- Education

https://business.esa.int/

What can BASS offer to companies?

Our aim is to work together to make your idea commercially viable, with:

- Zero-Equity Funding (€50K-€2M+)
- Tailored Project Management Support
- Access to our Network and Partners
- Use of ESA Brand for Credibility

Space Supporting Hazardous Materials Monitoring Kick-Start

Introduction: Hazardous Materials Monitoring

Persistent threats to health, environment, and industry from asbestos, heavy metals, and toxic pollutants

- Hazardous materials: asbestos, heavy metals, chemical pollutants, radioactive waste
- Health risks: cancer, respiratory diseases, organ damage

Space-based technologies such as Earth Observation, Global Navigation Satellite System and Satellite Communications enable the detection, tracking, and analysis of hazardous materials across large, remote, or complex areas.

Why Monitoring matters

- **Early detection** of contamination prevents long-term health crises and environmental degradation
- **Supports compliance** with evolving EU and international safety regulations
- **Enables faster response** and risk mitigation in industrial, urban, and post-disaster settings
- **Improves planning** for urban redevelopment, land use, and waste management
- **Protects vulnerable populations** exposed to legacy pollution or illegal disposal activities

Introduction: Hazardous Materials Monitoring

Regulatory drivers

- Stricter rules on handling and monitoring hazardous materials, especially asbestos
- Affects multiple sectors: construction, renovation, demolition, manufacturing, shipbuilding, waste management, mining, and transport
- Businesses respond by adopting advanced monitoring technologies
- Goal: compliance and worker safety

EU Asbestos Directive (2009/148/EC) amended by Directive EU 2023/2668
REACH Regulation (EC No 1907/2006)

Topics of relevance

1. Environmental and Public Health Management

Exposure to asbestos-containing (or other) materials in air, soil, or water can lead to severe health conditions, including respiratory diseases and cancers.

Hazardous substances pose serious risks to nearby populations, particularly in areas with legacy contamination or improper disposal practices.

Vulnerable groups — such as children, the elderly, and those with pre-existing health issues — are especially at risk from environmental exposure to hazardous materials.

Environmental agencies and waste management companies are increasingly seeking monitoring solutions that support sustainability, improve safety, and reduce environmental impact.

Examples of application:

- Community Health Programmes
- Lifecycle Management Systems
- Early Warning Systems
- Environmental Monitoring Networks
- Cleanup Strategies

Topics of relevance

2. Workplace and Occupational Safety

Workers in environments with hazardous materials face serious health risks, especially during construction, demolition, or industrial operations.

Real-time monitoring and risk management tools are essential to protect employees from exposure to dangerous substances.

Space-based technologies, such as satellite air quality monitoring and drone inspections, provide continuous oversight of hazardous work environments.

These innovations help ensure compliance with workplace safety standards and support proactive health protection strategies.

Examples of application:

- Drone Inspections
- Predictive Analytics for Risk Mitigation
- Real-Time Exposure Alerts
- Working Tracking and Safety Systems
- Satellite-Based Air Quality Monitoring

Topics of relevance

3. Regulatory Compliance and Risk Management

Strict regulatory frameworks govern the handling, monitoring, and disposal of hazardous materials like asbestos to protect public health and the environment.

Continuous monitoring and robust reporting mechanisms are essential for ensuring compliance at workplaces, industrial sites, and waste disposal areas.

Space-based and ground-based technologies enable large-scale, data-driven monitoring that supports proactive risk management and regulatory adherence.

These solutions are valuable to environmental regulators, compliance officers, and waste management firms seeking to manage legacy contamination and uphold safety standards.

Examples of application:

- Large Scale Environmental Monitoring
- Geospatial Analysis and AI-Driven Mapping
- Post-Disaster Monitoring
- Digital Compliance Platforms

Topics of relevance

Summary

1. Environmental and Public Health Management
   - Demand is rising for solutions that ensure safety and support sustainability
   - Organisations need smart tools to monitor hazardous materials and protect health
2. Workplace and Occupational Safety
   - Workers face serious health risks from hazardous materials during industrial activities
   - Real-time and space-based monitoring helps ensure safety and regulatory compliance
3. Regulatory Compliance and Risk Management
   - Advanced tech helps regulators and companies manage risks and stay compliant
   - Strict rules require constant monitoring of hazardous materials to protect health and the environment

Value-added from space

Satellite Earth Observation

- Provides large-scale, regular monitoring of air, soil, and water quality, identifying contamination hotspots, including former industrial sites or demolition zones.
- Identifies asbestos fibres and ACMs by detecting their unique spectral signatures from hyperspectral imagery, and optical imagery to monitor suspected contamination areas.
- Supports regulatory compliance by verifying safety standards and reducing on-site inspections, helping industries and financial institutions validate sustainability claims and monitor value chain activities.

Global Navigation Satellite System

- Provides accurate location data for contaminated areas, ensuring efficient targeting of high-risk zones and effective environmental assessments.
- Optimises positioning of monitoring devices and supports compliance with regulatory requirements.
- Enhances real-time data tracking and mapping for better management of hazardous materials and legacy contamination sites.

Satellite Communication

- Enables seamless data transmission from remote monitoring sensors, particularly in areas with limited communication infrastructure, facilitating rapid responses to risks.
- Supports communication between monitoring teams, regulatory bodies, and health agencies, ensuring timely actions and effective risk management.
- Offers reliable and high-bandwidth communication for continuous environmental monitoring and data handling

How to Apply

Hazardous Materials Monitoring

Successful companies will run a 6-month study to investigate the technical feasibility and commercial viability of their idea.

Kick-Start activities are funded at 75% by the European Space Agency for a maximum of €75K per contract.

After the study there is the opportunity for further funding and support from ESA.

Visit: Space for hazardous materials monitoring

Who can apply?

To be **eligible for funding**, your team must be based in one of the **following countries**:

Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Romania, Slovenia, Sweden, Switzerland and United Kingdom.

If you are considering applying, you must **inform your National Delegation** to obtain a **letter of authorisation** allowing the funding of the proposed activity. Contact details of each National Delegate can be found here: https://business.esa.int/national-delegations-0

How to apply?

1. **Register your team** on esa-star Registration today!
   https://esastar-emr.sso.esa.int

2. On **16th of June 2025** visit esa-star Publication and search for this opportunity to download the official competition documents.
   https://esastar-publication.sso.esa.int

3. Use the official documents to prepare your proposal

4. Contact details of each National Delegate can be found here:
   https://business.esa.int/national-delegations-0

5. Submit your proposal via esa-star Tendering by **18th of September 2025.**
   https://esastar.sso.esa.int

6. Your proposal should ideally include a **Letter of Support** from the user/customer representative

Opening dates: 16th June - 18th September 2025

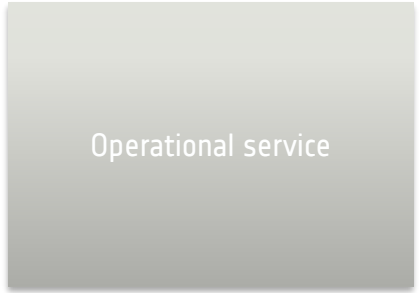
Kick-Start Study Tasks

	Study Kick Off Month 0	Mid-Term Review Month 3	Final Review Month 6	<u>Study Outputs</u>
Task 1	Engage with Users and Customers			Service Requirements
Task 2	Investigate Technical Feasibility			Service Architecture Definition
Task 3	Explore Economic Viability			Business Plan

Overall Aim of the Kick-start Activity

Explore the technical feasibility and commercial viability of a service

Develop the application and pilot the service with end users on board.



Ultimate aim is to have an economically sustainable service

Thank you for your attention: Q&A

Opening Date: 16th June 2025

Closing Date: 18th September 2025

Click here and visit

Space for hazardous materials monitoring