




In collaboration with  Save the Children. | 

# GRAND MARATHON 2025

## AI-Enabled EO Concepts for Civilian Protection

**APPLY NOW**

# ESA $\Phi$ -lab explores innovative technologies to revolutionise and accelerate the future of Earth Observation

ESA  $\Phi$ -lab provides an open and dynamic innovation ecosystem designed to transform visionary ideas into market-ready solutions, enhancing Europe's global competitiveness.

$\Phi$ -lab accelerates the future of Earth Observation (EO) through disruptive innovation & commercialisation actions by managing the full innovation cycle, from nurturing blue-sky concepts to delivering tangible impact across commercial, scientific, and NGO communities.

By offering financial, technical, and business support,  $\Phi$ -lab helps to bridge the gap between innovative ideas and the market by helping to scale up the commercialisation potential of projects.

# What is the Grand Marathon?

The ESA  $\Phi$ -lab Grand Marathon is an innovation challenge inviting participants to harness **Earth Observation and AI to detect short-lived hazards and deliver near-real-time, trusted insights for civilian protection.**

Running from **October 22<sup>nd</sup> 2025 to June 12<sup>th</sup> 2026**, the Grand Marathon follows a milestone-based progression:

## Km 0-10

Applicants submit a concise, 5-page idea outline proposal including a Lean Business Plan.

## Km 30-40

The 3 runners further develop the proposed concepts using Earth Observation test data & develop a first MVP.

## Km 10-30

The 3 runners develop a detailed, 25-page proposal with a comprehensive business plan.

Runners propose novel EO concepts leveraging event-based sensing + AI computing, displaying them at an upcoming Official ESA Event.

## Km 40-42

2 Finalists deliver a high-fidelity prototype of the full solution, demonstrating real-case scenarios.

The Grand Winner will be nominated after a final pitching session at the **Hello Tomorrow Summit** in Amsterdam (11<sup>th</sup>-12<sup>th</sup> June, 2026).

# You are the perfect fit for this opportunity, if

## YOU'RE DEVELOPING A SOLUTION TO:



LEVERAGE **COMPACT, AI-ENABLED EO CONCEPTS** CATCHING FAST, UNPREDICTABLE PHENOMENA THAT CURRENT & CONVENTIONAL SYSTEMS MISS



DETECT, CHARACTERISE OR CONFIRM **SHORT-LIVED THREATS TO CIVILIANS**



DELIVER **NEAR-REAL-TIME, TRUSTED INFORMATION LAYERS** HUMANITARIAN AGENCIES, NGOs, UN & CIVIL PROTECTION TEAMS CAN ACT ON



You want to tap into a total prize pool of **€295k** while exploring new operational concepts leveraging event-based sensing + AI edge computing for crisis monitoring, going beyond traditional satellite tasing-processing pipelines



**You are working on a project** with a clear humanitarian impact, scalability and real-world application.\* Solutions with a clear potential for business & real-life applications will be prioritised.

# You are developing technologies linked to:

AI-Enabled EO Concepts for Civilian Protection

## DATA COLLECTION

- Sensing & Acquisition -

Technologies enabling the *capture of raw event data* from space, air, or ground sources

### EVENT FOCUS SENSORS

- Detection of heat flashes, fire fronts & and chemical/plume signatures (SO<sub>2</sub>/NO<sub>2</sub>/VOCs) with thresholds for ignition and emissions
- Identification of structural change, debris fields, surface deformation combined with ground/IoT inputs (gas, particulate, seismic, microphones) for data confirmation

### SENSING PLATFORMS

- Tiered satellite coverage to persistent regional (HAPS) to rapid, high-res local (UAVs) for detection & verification in near-real time

## DATA ANALYSIS

- Processing & Fusion -

Technologies *transforming raw signals into meaningful information* through integration & intelligent analysis

### EDGE PROCESSING

- Burst detection & quick triage to reduce alert times on low-latency inference models ran on-satellite, on-UAV or other edge computing devices

### DATA FUSION & SMART INFORMATION

- Combination of orbital optical/IR/SAR/RF data with in-situ streams to reduce error margins & raise reports confidence
- Creation of reports containing streamlined, actionable information for on-field & non-technical users
- Low-latency solution for false-alarms handling & recalls

## DATA ELABORATION

- Insight & Reports -

Technologies *turning processed data into trusted, near-real-time info layers* to support humanitarian & civil protection missions

### AI/ML-BASED MONITORING

- Detection and tracking of short-lived signals (flashes, hotspots, plumes) in noisy or dynamic environments
- Confidence estimation, uncertainty calibration, and continual learning for robust performance across different regions and sensors

### AUTOMATED REPORTING & VISUALISATION TOOLS

- Smart tasking, event-driven workflows, and automated dissemination of alerts or risk maps
- Integration into humanitarian decision-support systems for rapid situational awareness

# Why should you apply to the program?

## Societal Impact:

Develop scalable, impactful solutions related to **event-driven space sensing with AI features** to spot **explosions, fires or toxic releases** and turn them into **actionable, reliable intelligence** for humanitarian responders.

The Project's winning solutions will collaborate with ESA  $\Phi$ -lab & its network to explore opportunities for implementing these solutions in future initiatives.

## Unparalleled Networking:

Network with ESA  $\Phi$ -lab's network of Earth Observation experts.

## Global Exposure:

Pitch on stage at the **Hello Tomorrow Summit** in Amsterdam (June 11<sup>th</sup>-12<sup>th</sup> 2026).

## International Presence:

Showcase your innovative solution at an upcoming official ESA Event.

## Expert Coaching:

Receive **exclusive coaching** from Hello Tomorrow's experts.



## Substantial Prize Pool:

Up to:

2<sup>nd</sup> runner

€65k

Winner

€215k

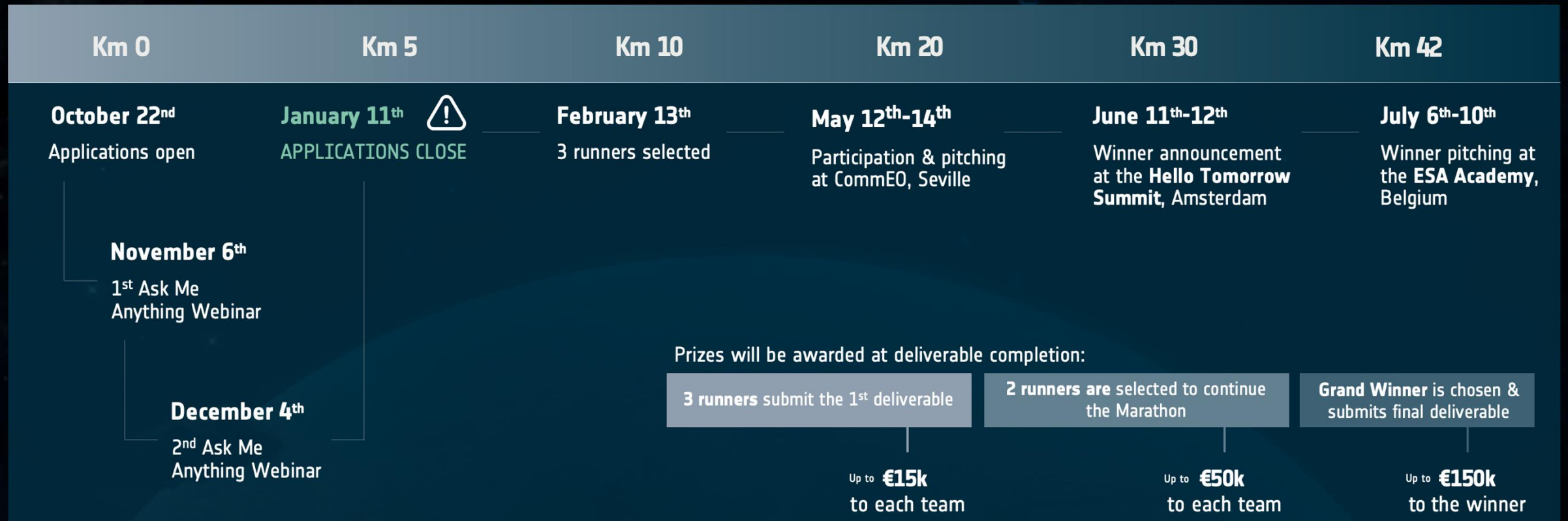
3<sup>rd</sup> runner

€15k

# What's next?

The Grand Marathon is structured as a progressive competition with cumulable prizes, beginning on October 22<sup>nd</sup> 2025 (Km 0) and lasting until June 12<sup>th</sup> 2026 (Km 42).

Each milestone marks a new stage of the challenge, just like checkpoints in a marathon.



# Join the Grand Marathon: AI-Enabled EO Concepts for Civilian Protection

**APPLY BY JANUARY 11<sup>TH</sup>**

For more information or for any questions you might have,  
do not hesitate to contact:

**Federico Mentoni** - [federico.mentoni@hello-tomorrow.org](mailto:federico.mentoni@hello-tomorrow.org)

