# ESA Phi-Lab Sweden

## *Opportunities for 2026*
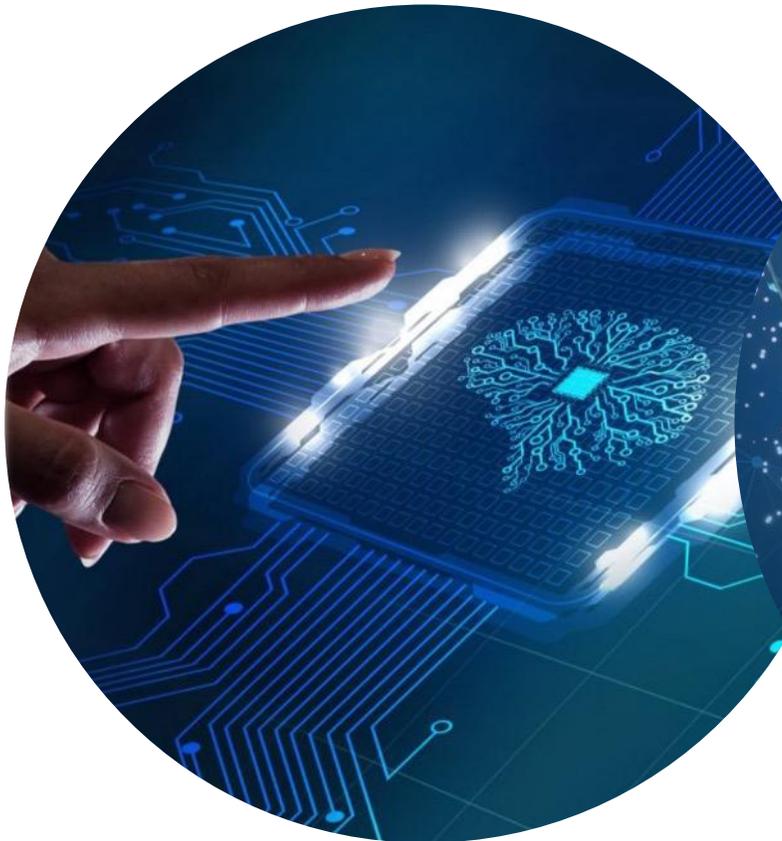
February 17, 2026

→ THE EUROPEAN SPACE AGENCY

# ESA Phi-Lab Sweden

Empowering Space
by enabling disruptive
AI and Edge Learning
solutions

VINNOVA  RI.SE

Rymdstyrelsen
Swedish National Space Agency

IRF  KTH VETENSKAP OCH KONST  SSC

# Phi-Lab SWEDEN



ACCELERATE THE FUTURE OF SPACE VIA TRANSFORMATIVE INNOVATION

GENERATING COMMERCIAL COMPETITIVE ADVANTAGE

COLLABORATE VIA "UNDER-THE-ROOF" APPROACH

FOCUS ON: **AI and Edge Learning**

**Phi-Lab SE**

→ THE EUROPEAN SPACE AGENCY

# ESA Phi-LabNET

*bringing research closer to commercialisation*

**Austria**
Industrial innovation for the upstream domain

**Switzerland**
Deep Tech innovation

**Poland**
Robotics and AI for autonomy

**Italy***
EO, first Phi-lab

**Norway**
Artic requirements and needs

**Spain**
Space technologies and their application to boost climate resilience

**Netherlands**
EO, critical PNT infrastructure, secure satcom

**Finland**
Sensors & Geospatial innovation

**UK**
Space-enabled sustainability technologies

**Ireland**
Advanced manifacturing

## ESA Phi-Lab Sweden

AI and Edge Learning    **since April 2025**

**esaphilab.se**

# First Open Call 2025

- 1 call

- Approx. 13 MSEK
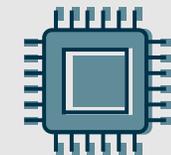
- 3 projects funded

**AI**
ACCELERATING AI FOR SPACE APPLICATIONS

**EDGE LEARNING**
INNOVATIVE CROSS-SECTOR EDGE LEARNING SOLUTIONS APPLIED TO THE SPACE DOMAIN

**HARDWARE**
OPTIMIZED HARDWARE FOR AI IN SPACE TECHNOLOGY

**CLIMATE AND SUSTAINABILITY**
STRIVE FOR SUSTAINABLE SPACE MARKET DEVELOPMENT

# ESA PHI-LAB SE Projects 2025-2027

## ALERT-IOD

Edge-AI for time-critical decision support from space

Consortium: PandionAI, Ubotica Technologies Limited, Mimir Space Technologies, Vinterstellar

Total budget: 5.2 MSEK
Duration: Dec 2025 - Feb 2027

## VAIAS

Validation of an AI accelerator for space

Consortium: Frontgrade Gaisler, Rapidity

Total budget: 7.6 MSEK
Duration: Nov 2025 - Nov 2027

## SPEED

**Space processing on edge**

Consortium: Spacemetric, AAC Clyde Space, KTH

Total budget: 6.2 MSEK
Duration: Nov 2025 - Dec 2026

# ALERT-IOD

**ALERT-IOD** is a project led by PandionAI AB, in collaboration with Vinterstellar AB, Mimir Space Technologies AB (Sweden), and Ubotica Technologies Ltd (Ireland). The project focuses on developing edge-AI capabilities for Earth Observation (EO) satellites to enable faster and more efficient data utilization.

The core concept is to process EO data directly onboard satellites using AI algorithms, rather than downlinking full datasets. This approach allows the system to transmit only relevant Alerts - such as object detections or event indicators - significantly reducing data volume and latency. The solution is designed to support time-critical applications in sectors such as civil protection, disaster response, and environmental monitoring.

The project will validate onboard inference within 5 minutes and end-to-end Alert delivery within 15 minutes, demonstrating a scalable and autonomous EO platform. ALERT-IOD represents a downstream innovation aligned with European priorities for near-real-time decision support from space.

→ THE EUROPEAN SPACE AGENCY

# VAIAS

The VAIAS project is a collaboration between Frontgrade Gaisler AB and Rapidity Space AB, with STMicroelectronics (France) as a key supplier. Frontgrade Gaisler is a global leader in radiation-hardened processors for space, while Rapidity Space specializes in AI-based software for low-power space platforms.

The objective is to validate and commercialize GR801, a neuromorphic AI accelerator designed for onboard autonomy in space missions. GR801 combines Brainchip's Akida neuromorphic core with Frontgrade Gaisler's fault-tolerant NOEL-V RISC-V processor, enabling intelligent, energy-efficient inference under radiation-prone conditions.

The project focuses on upstream hardware innovation to support real-time onboard processing. GR801 addresses current limitations of missions that depend on ground-based analysis or power-intensive accelerators, offering a disruptive alternative for Earth Observation, deep space, and robotic exploration. Key activities include radiation validation and software ecosystem development, such as event-based semantic segmentation.

By reducing data transmission needs and enabling onboard autonomy, GR801 strengthens European strategic autonomy in space, aligns with Phi-Lab Sweden's objectives, and opens new markets for AI-on-the-edge applications in space and beyond.

→ THE EUROPEAN SPACE AGENCY
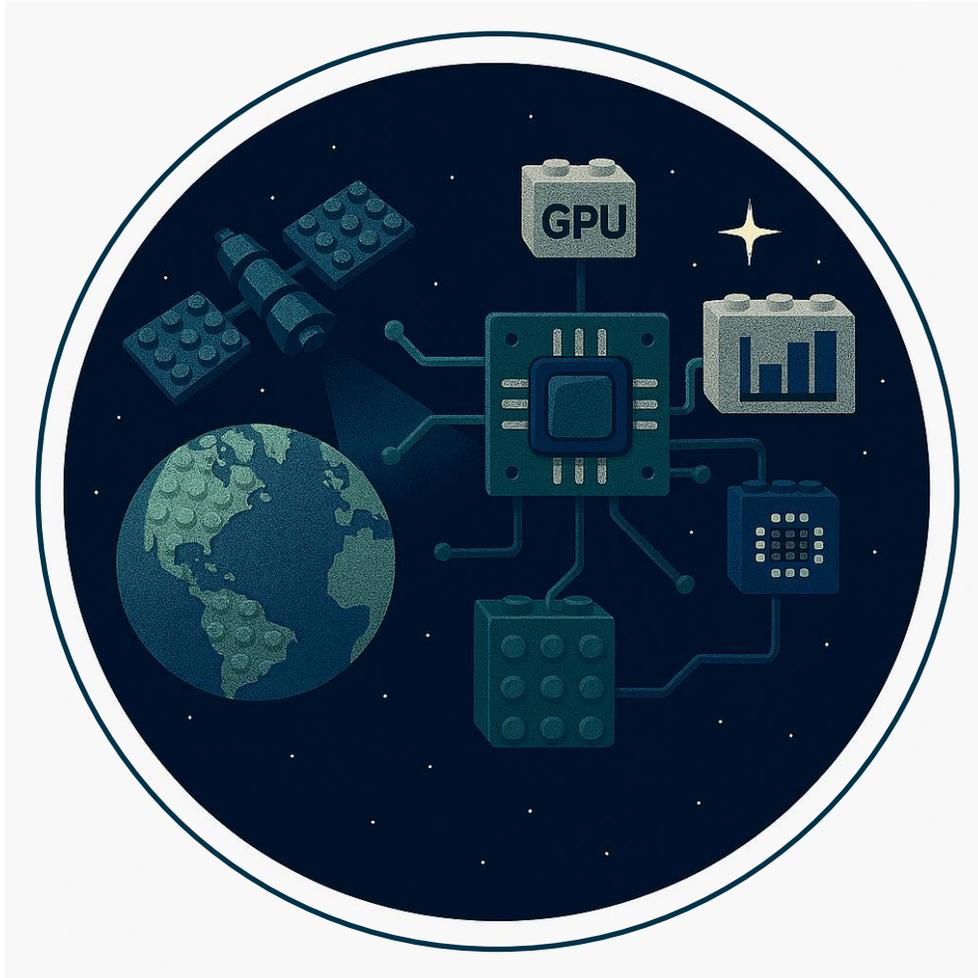
# SPEED

The **SPEED** project is a feasibility study led by Spacemetric AB (Sweden) in collaboration with the SiLago group at KTH (Sweden) and AAC Clyde Space (Sweden). The project explores energy-efficient onboard processing architectures for Earth Observation (EO) satellites and UAV platforms.

The goal is to reduce downlink data volume and latency for satellite operators while enabling near-real-time, product-level outputs for mission end-users. SPEED addresses these needs by integrating CPU/GPU hosts with FPGA acceleration and evaluating a future path toward ASICs using KTH's SiLago framework.

The study will implement a flat-sat demonstrator and benchmark image pre-processing algorithms using Spacemetric's Bluestone software. Key performance indicators include latency, energy per inference, throughput, and accuracy. The results will support the development of the Sirius EDGE Platform (SEP)—a modular, scalable solution for onboard edge-AI processing in satellites and UAVs. This approach enables more autonomous, responsive space systems and reduces reliance on ground infrastructure, aligning with European goals for strategic autonomy and efficient space data exploitation.

→ THE EUROPEAN SPACE AGENCY

# Call for ideas, February 2026 – Phase 1

- **Online form to propose ideas**, not solutions → https://esaphilab.se/call-for-ideas/

- The domain areas for these _ideas should be connected with the Phi-Lab expertise_, i.e. RISE's research groups and support partners and under the broader umbrella of the Phi-Lab SE focus, i.e. <u>AI and edge learning/computing</u>

  - AI-driven earth observation for climate resilience and actionable earth intelligence
  - Next-generation pipelines for onboard data processing and management, ensuring data quality, value, and integrity
  - Leveraging cognitive cloud computing to enhance the performance and autonomy of onboard AI models
  - Resilient and trustworthy space systems, including non-terrestrial 5G/6G networks and inter-satellite communication architectures

- _No fundings will be distributed at this stage!_

# Call for ideas, February 2026 – Phase 1

- **Online form to propose ideas**, not solutions → https://esaphilab.se/call-for-ideas/

- The domain areas for these *ideas should be connected with the Phi-Lab expertise*, i.e. RISE's research groups and support partners and under the broader umbrella of the Phi-Lab SE focus, i.e. AI and edge learning/computing

  - AI-driven
  - Next-gene... ...lity, value, and integrity
  - Leveraging ...rd AI models
  - Resilient a... ...r-satellite communica...

- *No fundings w...*

**WHY?**

- Receive **feedback from ESA Phi-Lab Sweden** on your proposed challenge.

- **Engage with Phi Lab Sweden** to understand how its expertise and resources can help you tackle the challenge and to define potential Phi-Lab contributions to your solution

→ THE EUROPEAN SPACE AGENCY

# From Phase 1 to Phase 2

Remember that general key acceptance factors ***also*** need to be satisfied to be eligible for evaluation:

- The submitting entity needs **to address the campaign topic(s)** as described above

- **Potential for commercialisation** – when resolved, have the potential to drive innovative changes for commercial applications in space and on Earth.

- The submitting entity needs to address the constraints and requirements as described above, particularly with respect to the fields and with respect to the **integration and leveraging of Swedish capabilities**

- All submissions shall be in **English**

- The entity identified as **main author** will be the main interface with ESA and needs to **have a Swedish affiliation or a proved collaboration with a Swedish organization** (industry, academia or public sector).

# From Phase 1 to Phase 2

The proposed ideas will be evaluated by a committee based on the following criteria:

- Relevance to the fields of interest (25%)

- Addressing technology challenges of interest for space (25%)

- Leveraging Sweden's capabilities (20%)

- Requirement for novel interdisciplinary collaboration (15%)

- Potential for commercialisation, if solved (15%)

The selected ideas will be the focus areas of the next phase
– Call for Proposals 2026

# Call for proposals 2026 – Phase 2

- **Opens Mach 31, Closes June 30  tentatively**

- **Total Budget: ~8MSEK**

- **Funding distribution: 2-3 projects for max 2 years**

- **Parallel submission**: Vinnova's portal + complete pdf to be sent to application@esaphilab.se

- **Assessment - End of August/September**: short interview and Q&A with TEB and decision

- **September-October**: negotiations and signature of contracts

- **November**: projects start

# Questions?

→ THE EUROPEAN SPACE AGENCY