



NAVIGATION, EARTH OBSERVATION,  
COMMUNICATION – ADDED VALUE AND ESA  
OPPORTUNITIES

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Video ESA IAP

ARTES applications: Space is open for business  
<https://artes-apps.esa.int/videos>

# PURPOSE OF ESA

“To provide for and promote, for exclusively peaceful purposes, cooperation among European states in **space research** and **technology** and their **space applications**.”



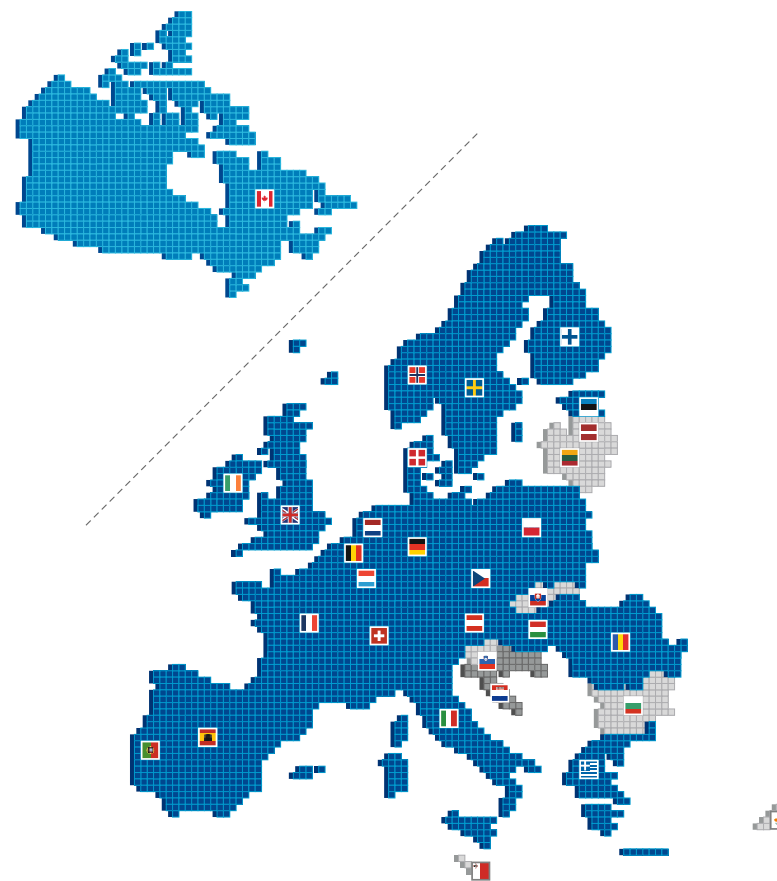
**Article 2 of ESA Convention**

# MEMBER States

ESA has 22 Member States: 20 states of the EU (AT, BE, CZ, DE, DK, EE, ES, FI, FR, IT, GR, HU, IE, LU, NL, PT, PL, RO, SE, UK) plus Norway and Switzerland.

Seven other EU states have Cooperation Agreements with ESA: Bulgaria, Cyprus, Latvia, Lithuania, Malta, Slovakia and Slovenia. Discussions are ongoing with Croatia.

Canada takes part in some programmes under a long-standing Cooperation Agreement.





## OPPORTUNITIES WITH

ESA's **Advanced Research in Telecommunications Systems (ARTES)** programme promotes the development of technology, products and systems in partnership with industry.

# ESA in Space Applications

ARTES Applications is a subset of the ARTES programme elements dedicated to funding and promoting the development of space-based downstream applications, services and solutions for the needs of European citizens and society at large.

service providers,  
industry



institutions, users,  
potential customers

Strong presence of  
SMEs prime (68%) and  
ESA newcomers (41%)



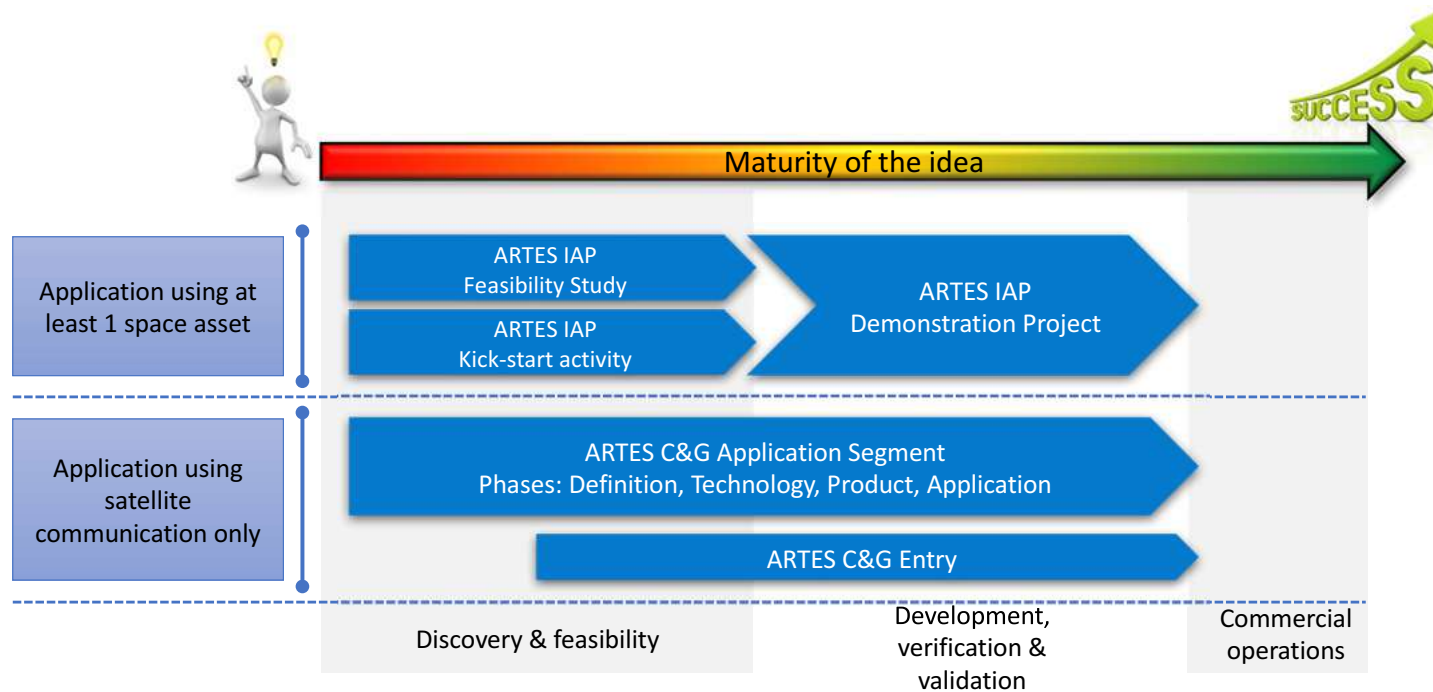
# ARTES APPLICATIONS SCOPE

To address global challenges in different thematic areas:



Project web pages:  
[artes-apps.esa.int/projects](http://artes-apps.esa.int/projects)

# ARTES Applications opportunities



Web site: [artes-apps.esa.int](http://artes-apps.esa.int)

Contact: [iap@esa.int](mailto:iap@esa.int)

Finland: [miranda.saarentaus@geowise.fi](mailto:miranda.saarentaus@geowise.fi)



# ESA's Integrated Applications Promotion Programme – ARTES IAP

## IAP ...

- starts not from **technology push**  
... but from **market demand**
- is not about **technology development**  
... but **business development**
- is not the **customer** of the studies and projets,  
... but **enabler, advisor, consultant**

# ESA's Integrated Applications Promotion Programme (ARTES IAP)

## Selection criteria for an IAP activity:

- **Strong user needs, interest & involvement**
- **Utilisation of one or more space assets**
- Evidence of a **clear added value**
- **Potential for sustainability**
- **Strength in background and experience** (credibility) of the bidding team with respect to proposed activity
- **Funding mainly for space** related activities
- And for Demonstration Projects:  
**Need for and the representativeness** of the future service (incl. scalability)

# ESA's Integrated Applications Promotion Programme (ARTES IAP)

## Ideal characteristics of involved parties:

- **User/customer:**
  - representing / leading broader markets (champion)
  - enabling the market access
  - communicator to spread the message
  - open for new solutions and systems
  - willing to engage as stakeholder / customer / client
- **Service provider:**
  - familiar with the market (already in the market)
  - provider of operational services (24/7)
  - various technologies to address the specific user demand
- **Industrial team:**
  - strong leadership and good management
  - right mix of know-how (completeness of the team)

# ARTES IAP – Programme Characteristics

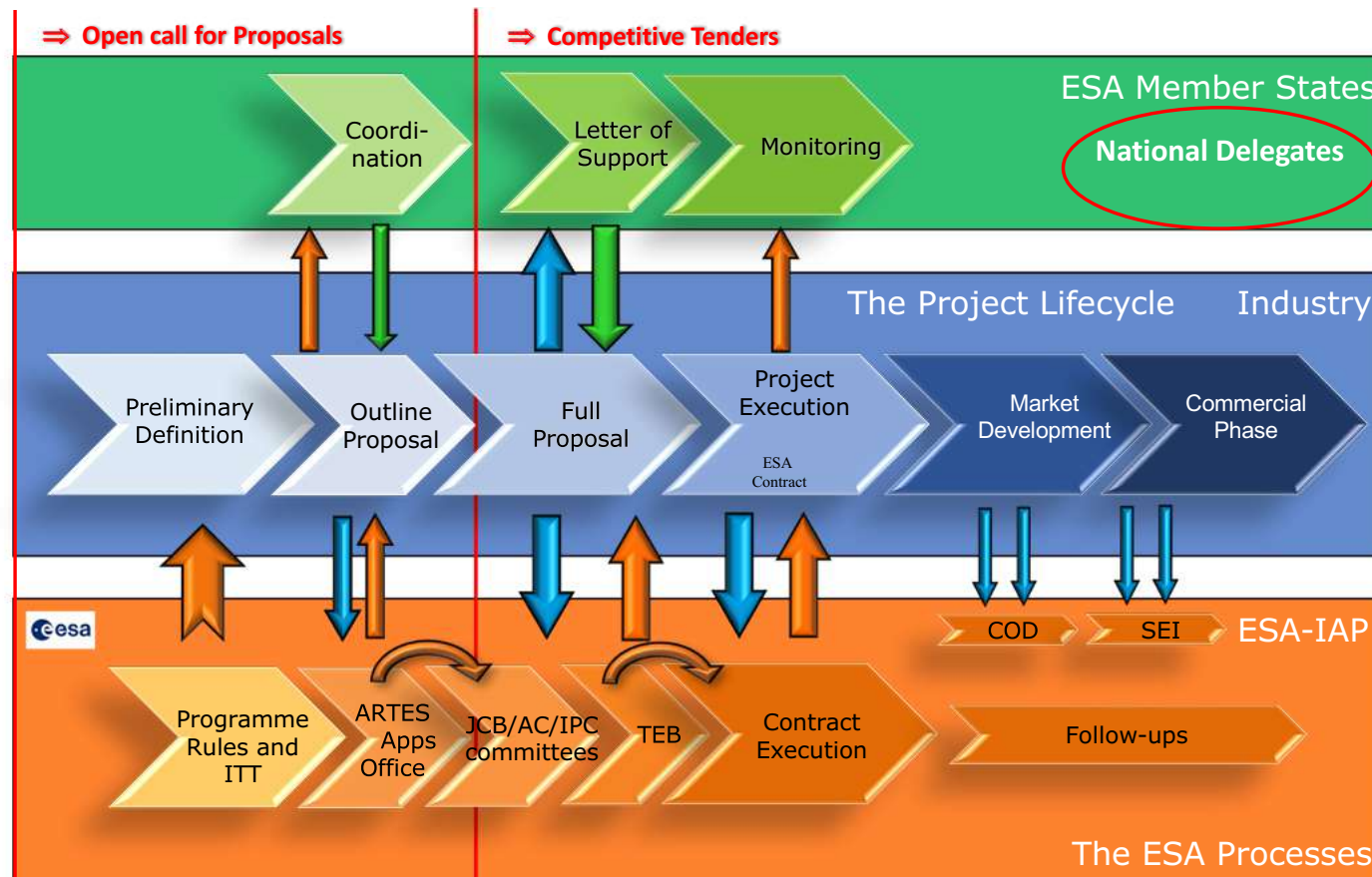
- **Objective:** Development, integration and pilot utilisation of **Integrated Applications based on space assets**
- **User driven activities aiming for sustainable services**
- **Scope:** Feasibility Studies & Demonstration Projects
- A) Ideas originated by ESA in collaboration with users
  - ⇒ Specific Open Competitive Tenders (**ITT – Feasibility**)
  - ⇒ fully funded
- B) Ideas originated by Industry in collaboration with users
  - ⇒ Continuous Open Call for Proposals (**AO 6124 – Feasibility & Demo**)
  - ⇒ Outline Proposal ⇒ JCB Approval ⇒ Full Proposal
  - ⇒ co-funded (typically 50%)
- Information under <https://artes-apps.esa.int> and on EMITS website [emits.esa.int](https://emits.esa.int)
- **‘Letter of Authorisation’ from National Delegation (Finland Tekes, Antti Tyrväinen)**

# ARTES Application Programmes

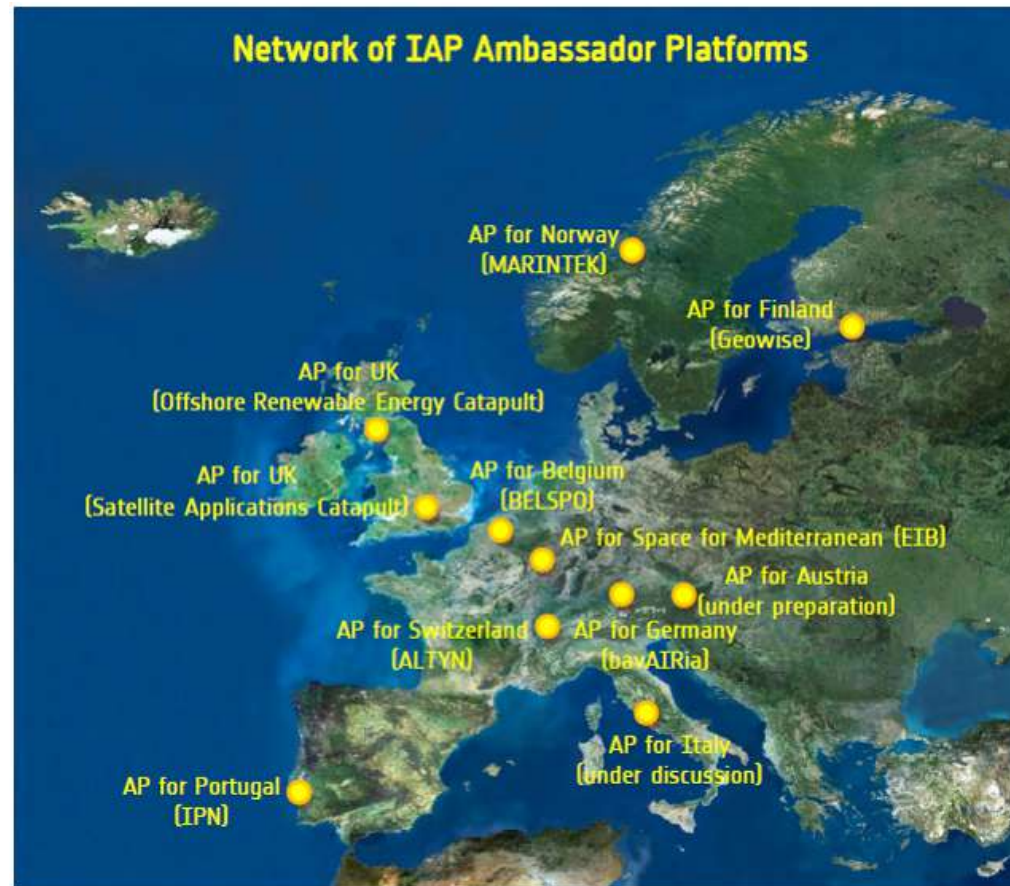
## Project Lifecycle & ESA Processes

### Legend

ITT: Invitation to Tender  
 TEB: Tender Evaluation Board  
 JCB: Joint Communication Board  
 AC: Adjudication Committee  
 IPC: Industrial Policy Committee  
 COD: Contract Outcome Data  
 SEI: Socio Economic Impact



# ARTES Applications Ambassador Platform Network





# Ambassador Platform Finland

- Increase awareness of Space Applications to Users
- Local Presence and Domain expertise
- Act as an “honest broker” between ESA, industry and user community
- Motivate stakeholders to submit viable proposals
- Prepare and run workshops (with ESA support)

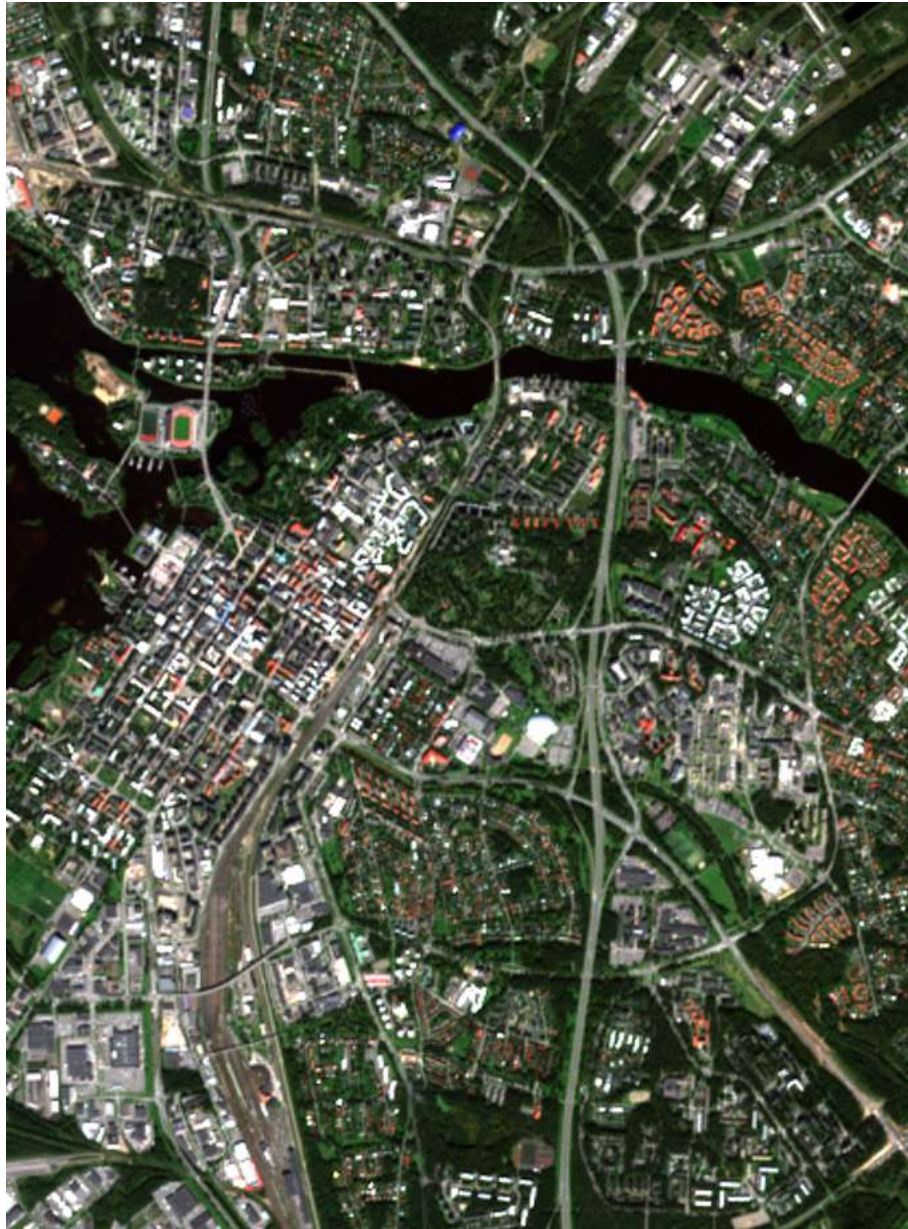
## Tekes (national delegate) involvement – **support letter**

- Tekes coordinates the Finnish ESA activity and provides funding for ESA programmes
- Finnish organisations shall contact Tekes in order to apply for authorisation of funding (“support letter”) for their proposals
- Contact in ARTES Programmes: Antti Tyrväinen, [antti.tyrvainen@tekes.fi](mailto:antti.tyrvainen@tekes.fi)



# NAVIGATION

- Autonomous applications
  - Maritime; ships
  - Air; drones & aircrafts
  - Land; cars
- Connectivity in open data and/or IoT
- Intelligent Transport Systems
- Applications with mobile phones
- Seamless GNSS indoor navigation
- Cutting edge innovation



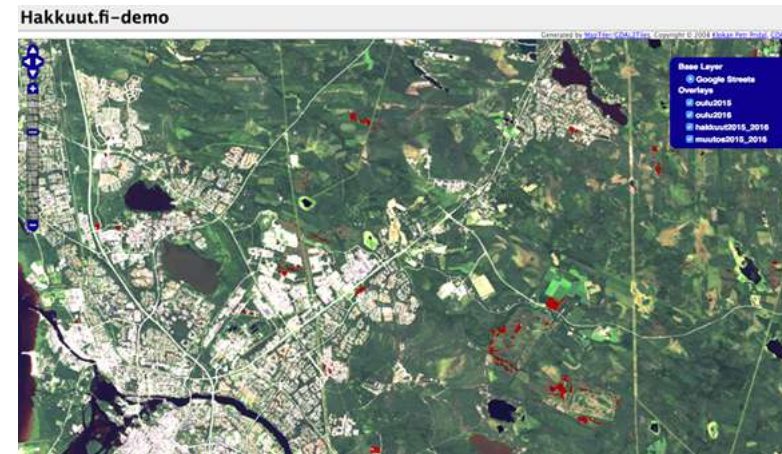
# EARTH OBSERVATION

Farming and forestry  
Wood industry  
Environmental changes  
Minerals  
Water and flooding  
Smart Cities, infrastructure

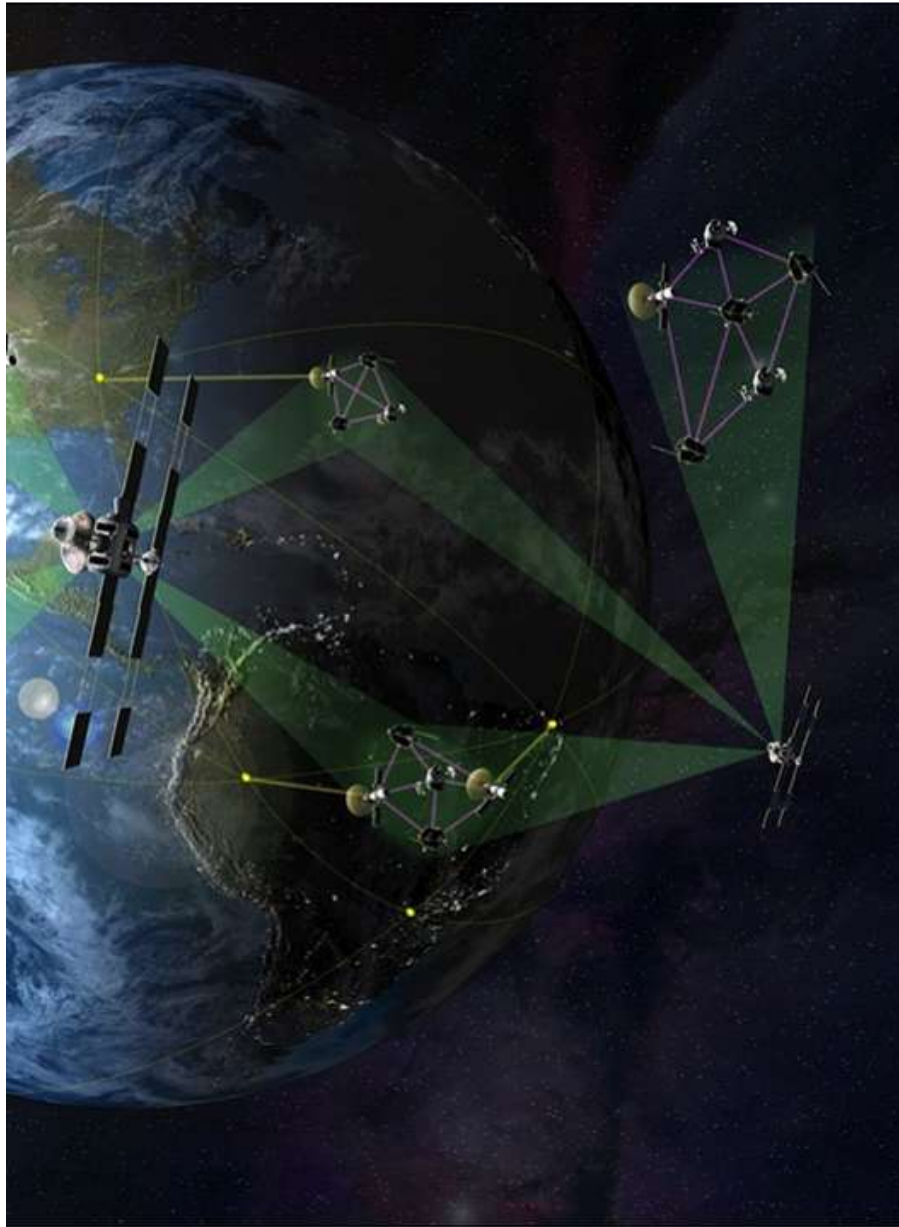
<http://www.hakkuut.fi>

Satellio Oy, VTT

Demo  
[http://46.101.134.238/  
mapdata/mmm-  
demo.php](http://46.101.134.238/mapdata/mmm-demo.php)







# COMMUNICATION

- Transport & logistics
  - Autonomous applications
    - Maritime; ships
    - Air; drones & aircraft
    - Land; cars
- Oil & Gas
- Arctic operations
  - SAR
- Communication in high north

# Nordic trend in transport

Autonomous



SAR



Arctic transport



Environmental  
energy



Digitalisation



Short sea shipping



# Nordic trend in environment

Water  
management



Environmental  
monitoring



Traffic monitoring



Agriculture  
monitoring



Arctic



Ice monitoring



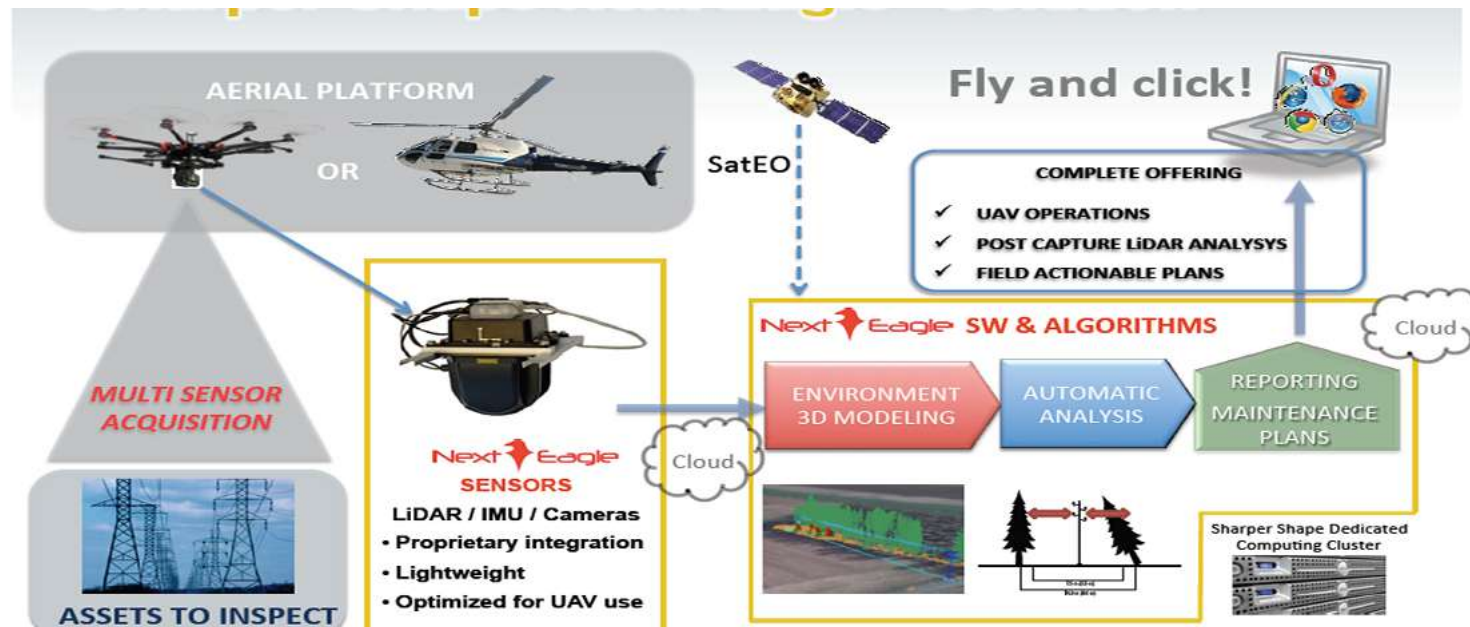


## Examples of ARTES Applications Projects

<https://artes-apps.esa.int/projects>

# SharperSAT – Sharper Shape

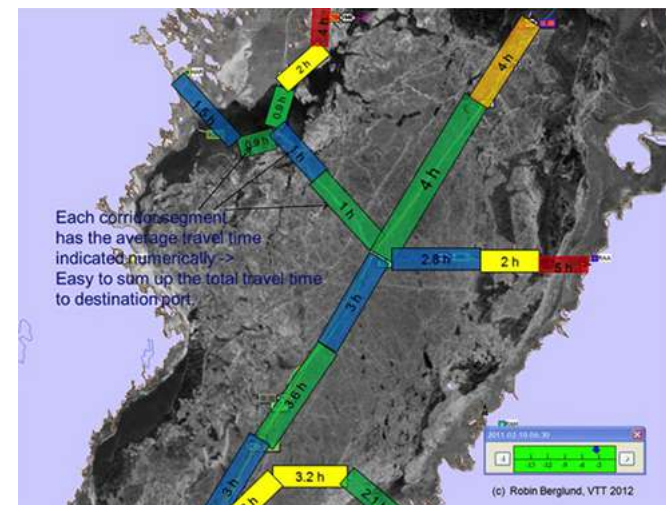
*Electricity grid maintenance services*



# ISABELIA – IAP (VTT)

Improvement of Maritime Safety in the Baltic Sea through Enhanced Situational Awareness

- Icebreakers already have access to satellite images and ice charts that show the overall situation, but this does not tell how difficult it is for a ship to go through the ice field
- ISABELIA web solution system utilises ship position from AIS network, combines it with numerical forecast data and creates a **traffic ability map, updated in near real-time**
- The dynamic information on difficult sea weather and ice conditions enables the ships to **optimize their speed and avoid difficult areas** where difficult ice conditions are expected
- Users: VTS centres, icebreakers, ship operators and companies



# CAESAR – OC (VTT)

## Special Meteorological Services for Maritime Search and Rescue

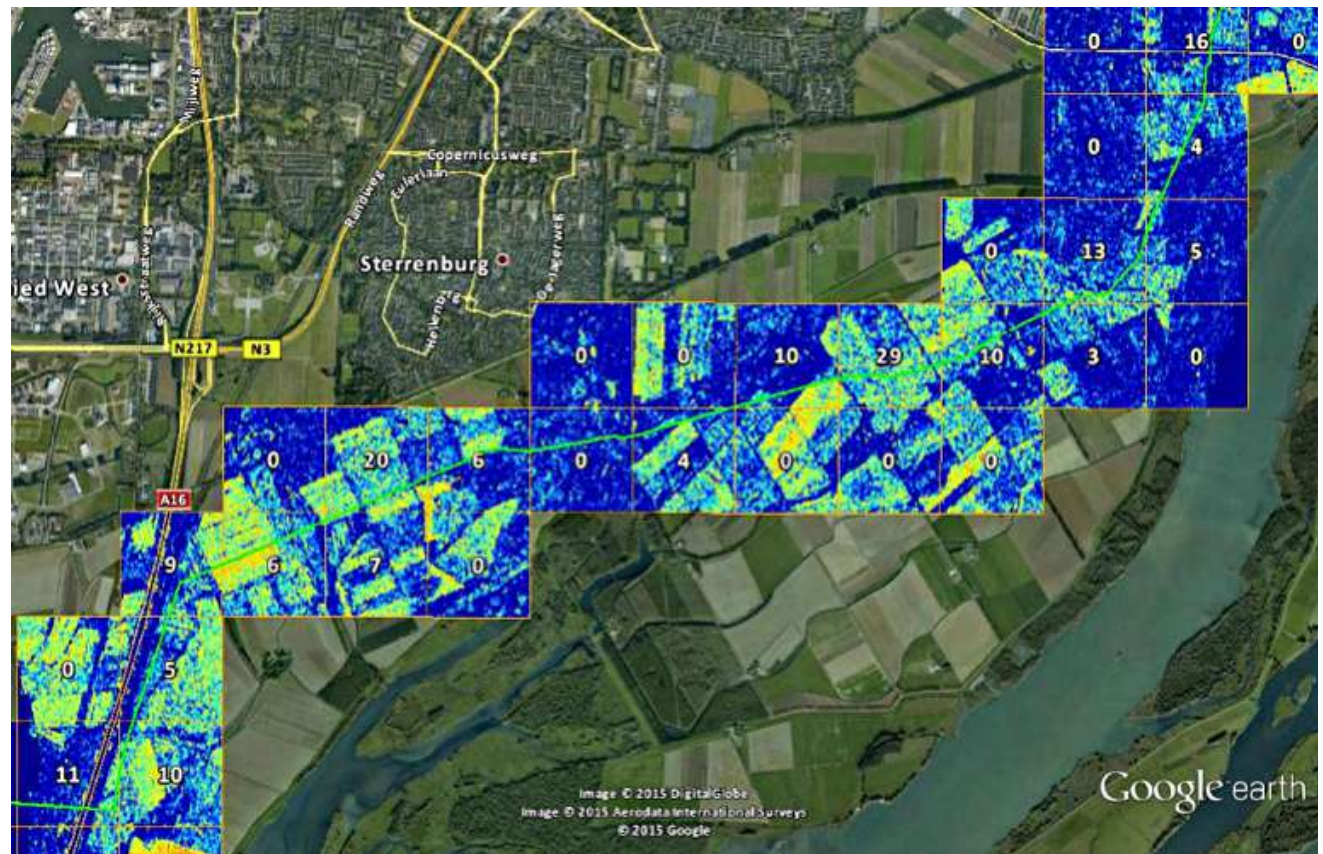
- In maritime rescue operations the location of a person or a ship is dependent on the sea currents and waves. **Available meteorological data does not have sufficient spatial resolution.**
- CAESAR integrates space assets (satcom, earth observation, navigation) with traditional air-borne helicopter, ship data, buoys and drifters
- Integration gives **increased situational awareness** leading to better utilization of the SAR assets, e.g. **to avoid areas or routes with difficult weather conditions**
- Maritime Rescue Co-ordination Center (MRCC)





# Monitoring pipelines from space

An enterprising Dutch startup is developing a viable business using Sentinel-1 SAR imagery to monitor oil and gas pipelines from space.



# Monitoring bridges from space

Long-term monitoring using historical Earth Observation data and short-term GNSS positioning is a potent combination for studying the health and well-being of complex structures such as bridges.





# Thank you!

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[www.geowise.fi](http://www.geowise.fi)

<http://artes-apps.esa.int/>

**GEOWISE**

