esa

Φ-lab

The ESA InCubed Programme: Investing in Industrial Innovation

for the Preservation, Monitoring and Enhancement of the Cultural Heritage

EO for Cultural and Natural Heritage | ESRIN

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ESA EOP Commercialisation and New Space

ESA EOP as an **ENABLER**

Fully funded by ESA

FutureEO
- ***Block 4 : Enabling downstream applications***
- ***Block 3: Enabling commercialisation with GS & data management***
- ***Block 1 : Commercialisation with upstream technology***

ESA EOP as a **PARTNER**

Co-funded
(industry-led)

InCubed
(Earth Watch)

ESA EOP as a **CUSTOMER**

Funded by ESA and/or
with a third-party partner

Commercialisation through
EO Data Buy
for science (TPM)
& for operations (CCM)

"Traditional" EOP R&D procurement agency role

Fully funded by ESA
" New Space approach"

Scouts
(FutureEO Block 2)

Arctic Weather Satellite
(Earth Watch)

ESA EOP Commercialisation and New Space

ESA EOP as a **PARTNER**

Co-funded
(industry-lead)

InCubed
(Earth Watch)

Φ-lab run Investing in Industrial Innovation (InCubed)

€225M
InCubed fund size

140
Activities
@62% co-funding rate

100k€ to >15m€
Project size

NATIONAL DELEGATIONS

ESA

INDUSTRY

Personalised technical and commercial guidance

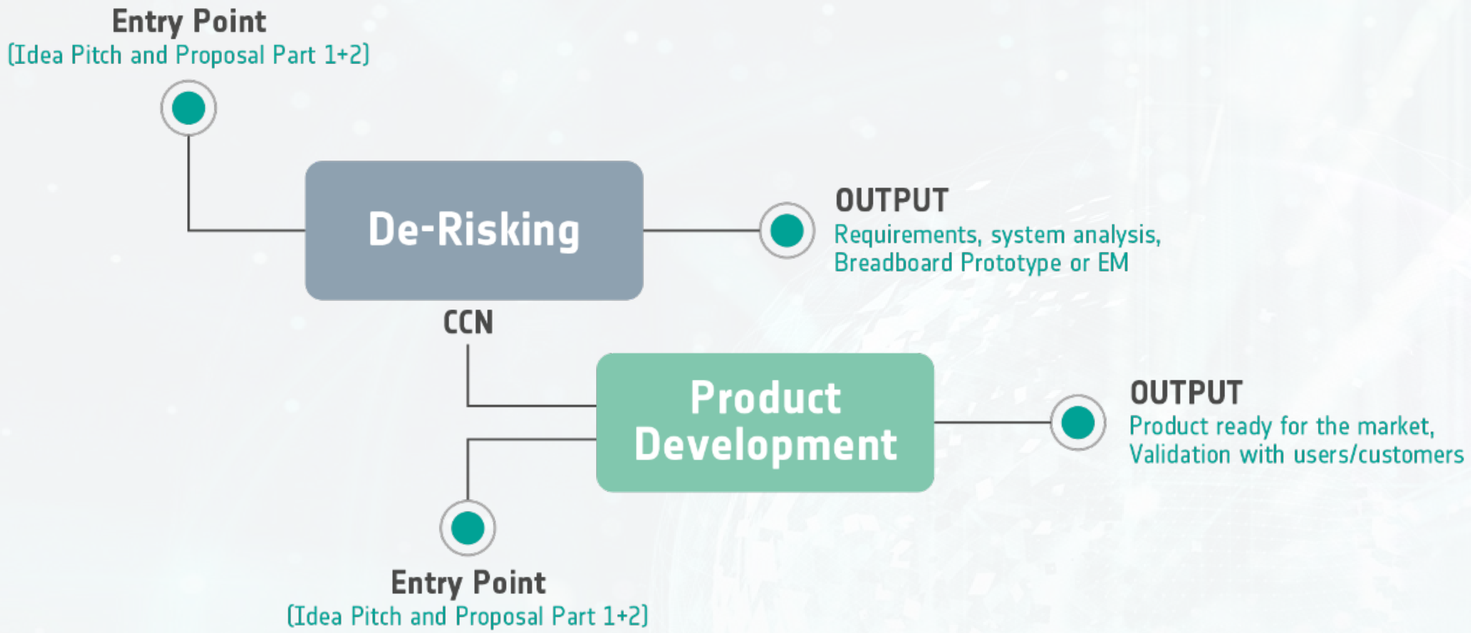
Zero-equity and zero-IPR

ESA stamp of credibility

Privileged access to commercial services enabling your development

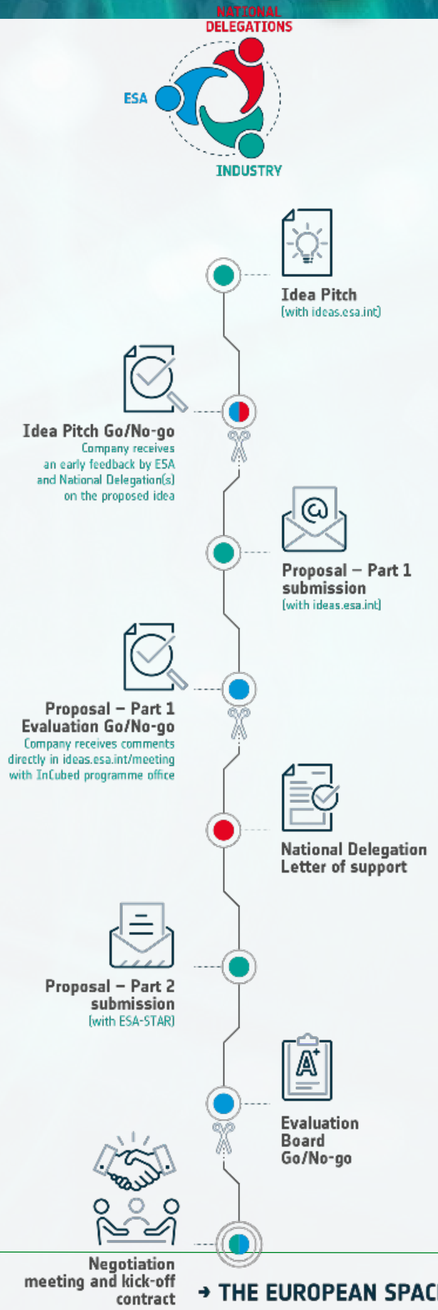
Access to ESA EO facilities and Φ-lab community

InCubed process



Cycle	TRL	ASRL	Funding Level up to % (of total allowable cost)		Funding level for Universities or Research Institutes with no commercial Interest in the Product
			Large Companies	SME	
De-risking	Up to 4-6 [1]	Up to 3	Up to 75%	Up to 80%	Up to 100% of maximum 30% of the cycle costs
Product development	Up to 7 (8 for IOV)	4 Up to 8	Up to 50%	Up to 80%	Up to 100% of maximum 30% of the cycle costs

[1] Depending on the technological or market risks as assessed by the Agency



ESA as a Partner – InCubed – What ESA offers

- **Risk sharing**
  - Equity and IPR free co-funding

- **Personalised technical and commercial guidance**
  - ESA technical and business development expertise

- **Strong connection with private investors**
  - In coordination with the ESA Directorate of Comercialisation Industry and Competitiveness (D/CIC)

Supported InCubed Upstream Companies

mbryonics
INGENIArs
D-ORBIT NEW SPACE SOLUTIONS
planetek italia
ThalesAlenia Space a Thales / Leonardo company
UNIVERSITY OF SURREY
lusospace
gmv INNOVATING SOLUTIONS
KUVA SPACE
CRAFT PROSPECT
SURREY
MEC s.r.l MICROWAVE ELECTRONICS FOR COMMUNICATIONS
OHB
constellr
reorbit
SENER Aeroespacial
cosine | hyperscout
OPEN COSMOS
VTT
FOTEC Forschungsunternehmen der FH Wiener Neustadt
spire
ORORA TECHNOLOGIES
SATLANTIS
omnidea AEROSPACE TECHNOLOGY AND ENERGY SYSTEMS
aerospacelab
ENPULSION SPACECRAFT TECHNOLOGY
Fraunhofer IOF
beyond gravity
NTNU Norwegian University of Science and Technology
AIRBUS
vista
ARCA DYNAMICS
deimos elecnor group
EDISOFT DEFENCE & AEROSPACE TECHNOLOGIES
TELEDYNE e2v Everywhereyoulook™
Fraunhofer IST
intecs solutions
UNIBAP
Spaceit
SPACEMIND a brand of NPC

Supported InCubed Downstream Companies

ESA InCubed Missions

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HIVE
Constellr

MICROLIDAR
AIRMO

FOREST-3
OroraTech

AIX
Planetek

HYPERFIELD
KuvaSpace

UKKO
ReOrbit
with SatSure
(KaleidEO)

SEMOVIS
Marble Imaging

PROGRES
Spire

MANTIS
Open Cosmos

RAINBOW
Airbus

ROOCS
Beyond
Gravity

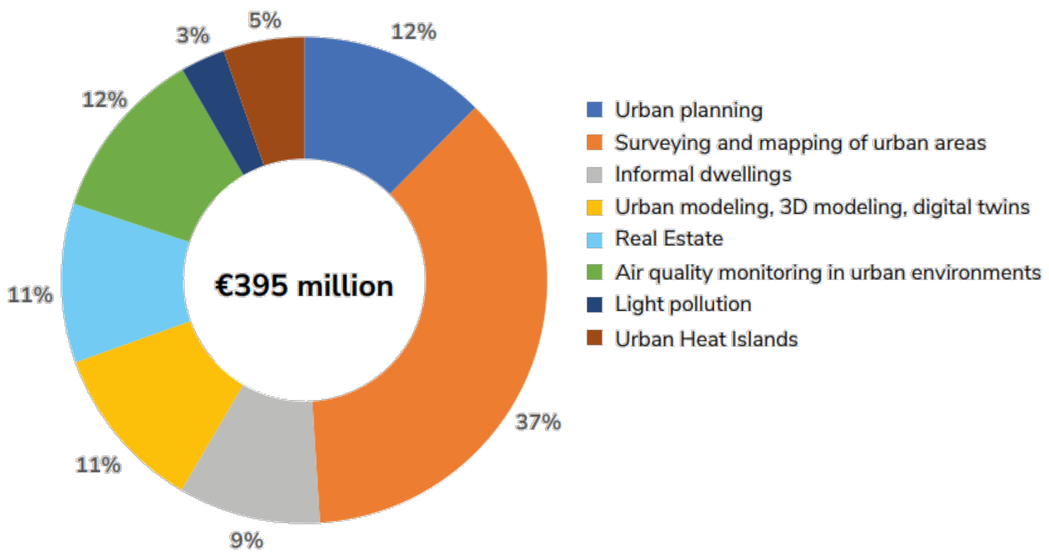
TALISMAN
SATLANTIS

LEGEND
- Radio Occultation
- Hyperspectral
- Lidar
- Thermal Infrared
- Multispectral

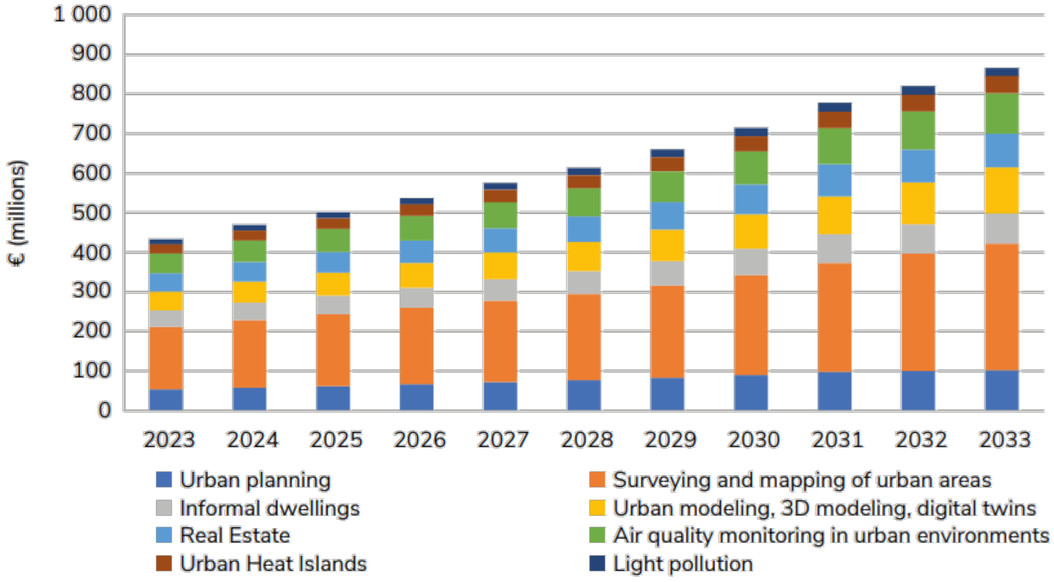
EO market on Cultural Heritage

- EO provides valuable information in support of urban planning, monitoring of informal dwellings, and informing the progress and state of urban greening. Moreover, EO-based services provide essential information on air quality in urban environments, measuring particles that might affect the heath of citizens and monitoring greenhouse gas emissions. This is also critical when monitoring cultural heritage sites, whereby the impact of air quality and **potential ground subsidence** may endanger these sites[1] .EO also contributes to the **restoration of cultural heritage** in conflict areas. An emerging EO application is the creation of **digital inventories** of cultural heritage sites in war zones (which UNESCO is currently doing to keep track of damage to Ukraine's cultural heritage sites). The comparison of satellite images before and after malicious acts in areas affected by conflicts, enables the **identification of damaged or destroyed areas** as well as the assessment and classification of the level of degradation.
- Market revenues:
  - For 2022, revenues from EO data & services sales have reached almost €400 million.
  - Estimated revenues from EO data and services sales are expected to grow from about €430 million in 2023 to up to €870 million in 2033

Revenues from EO data & services sales by application 2022



Revenues from EO data & services sales by application



[1] Earth Observation Market

InCubed activities

InCubed had a specific Open Call campaign dedicated to Archaeology in 2023, but our **permanent open call** scheme allows any **new idea to be submitted any time**, independently of having individual open call.

We have currently activities specifically dedicated to support Archaeological prospection, monitoring and surveillance in support of the *Italian Ministry of Culture (MiC)*

Additionally, many of the InCubed activities could be also be used for supporting activities, such as preservation and monitoring of Cultural and Natural Heritage sites:

- Design of VHR hyperspectral and thermal sensors/satellites and constellations
- Development of continuous monitoring platforms and services:
  - Hazard/vulnerability risks for critical infrastructure (also archaeological sites)
  - Asset structural stability monitoring/assessment and early warning systems.
  - Environmental pollution (air, water)
  - Dedicated solutions for coastal monitoring, forest, agriculture and biodiversity analysis
- Multi-hazard climate risk evaluation of assets, including floods, seismic hazards, and extreme weather events

Relevant activities

SMARTDIG

AI-Driven Preventive Archaeology through Multi-Seasonal Remote Sensing

SEE →

MANTIS

Mission and Agile Nanosatellite for Terrestrial Imagery Services...

SEE →

TREE SPECIES

Development of an EO-based tree species classification methodology and connected

SEE →

INFOSEQUIA-4CAST

Towards an operational satellite-based Drought Early Warning and Forecasting

SEE →

SIG4EO

Integration of Object Based Signal Generators for Change Detection in EO data...

SEE →

EOSMART

EOSmart: Smarter Mapping and Monitoring of Water Quality

SEE →

BRIGHTSKIES

BrightSkies Methane Emissions Service

SEE →

[Many more at: https://incubed.esa.int/activity-portfolio](https://incubed.esa.int/activity-portfolio)

ORORATECH'S GLOBAL WILD...

OroraTech's Global Wildfire Warning

SEE →

COASTEO

CoastEO: Coastal Ocean Assessment using Earth Observation

SEE →

SATFORCERT-CCN

SATFORCERT: Supporting Forest Certification

SEE →

FLOODSENS

FloodSENS: Smart Sensing of Floods

SEE →

EOLIANN CLIMATE RISK ASSE...

Eoliann API for Banking Climate Change Physical Risk: global forecast of natural

SEE →

BODIS

BODIS

SEE →

DEEP PROPERTY

Deep Property

SEE →

Thank you for your attention

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https://philab.esa.int

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