

# Information Session: General Support Technology Programme (GSTP)

---

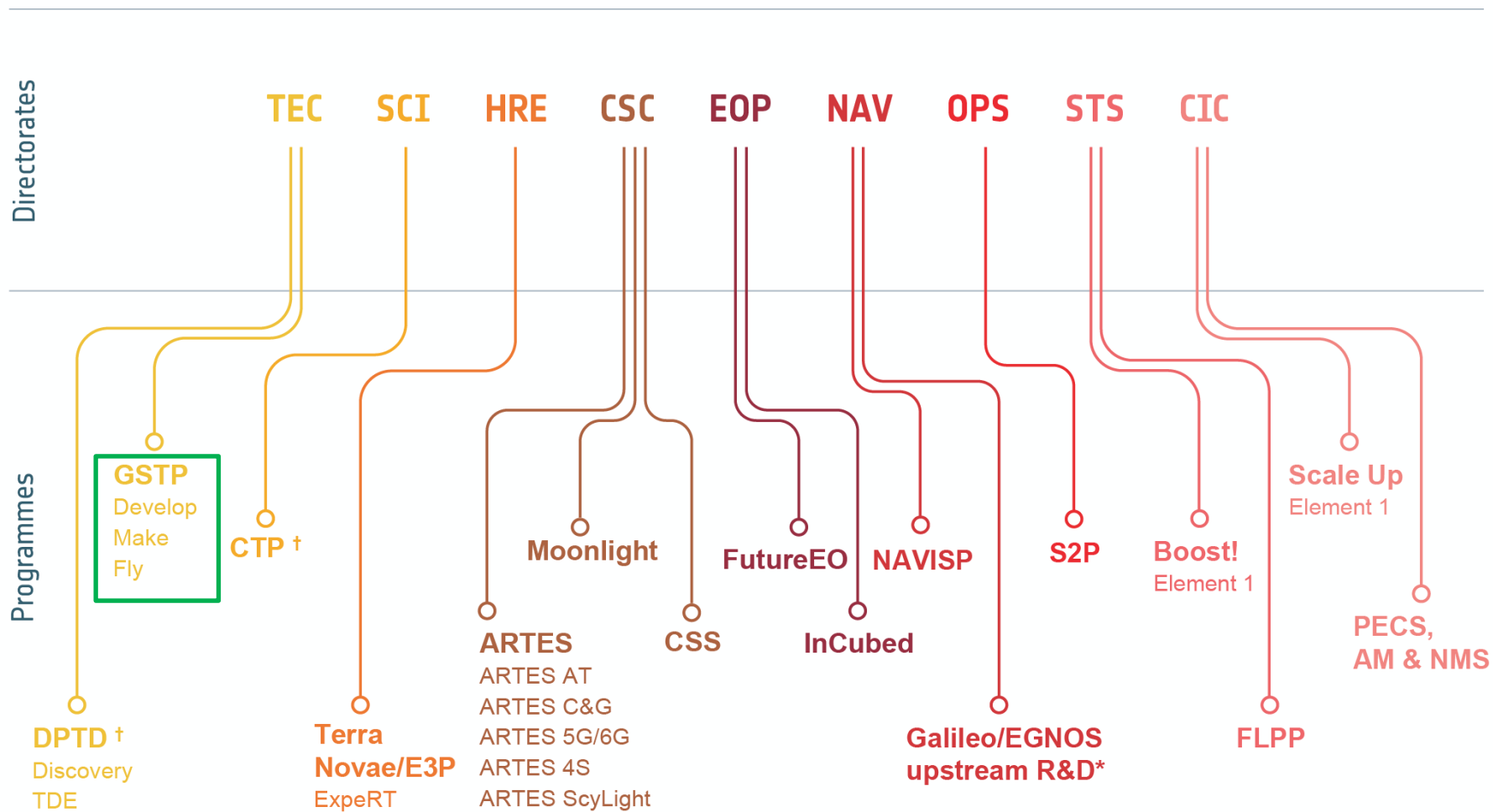
Noelia Peinado, Viktorija Piaulokaite (TEC-TI), Pol Ribes (TEC-MME)  
Directorate of Technology, Engineering and Quality

Vilnius, March, 2024



- **ESA Technology R&D Programmes overview**
- **General Support Technology Programme (GSTP)**
  - General Overview
  - Element 1 (Compendia, Frameworks...)
  - Element 2
  - Element 3
- **Technology needs**
  - Photonics for space applications
- **GSTP De-risk Call**
  - Call objectives
  - Timeline
  - How to participate

# ESA DIRECTORATES AND TECHNOLOGY R&D PROGRAMMES



**TEC** Technology, Engineering and Quality  
**SCI** Science  
**HRE** Human and Robotic Exploration  
**CSC** Connectivity and Secure Communications  
**EOP** Earth Observation Programmes  
**NAV** Navigation  
**OPS** Operations  
**STS** Space Transportation  
**CIC** Commercialisation, Industry and Competitiveness.

# ESA'S TECHNICAL HEART

**ESTEC** is the incubator of the European space effort, where most ESA projects are born and where they are guided through the various phases of development.

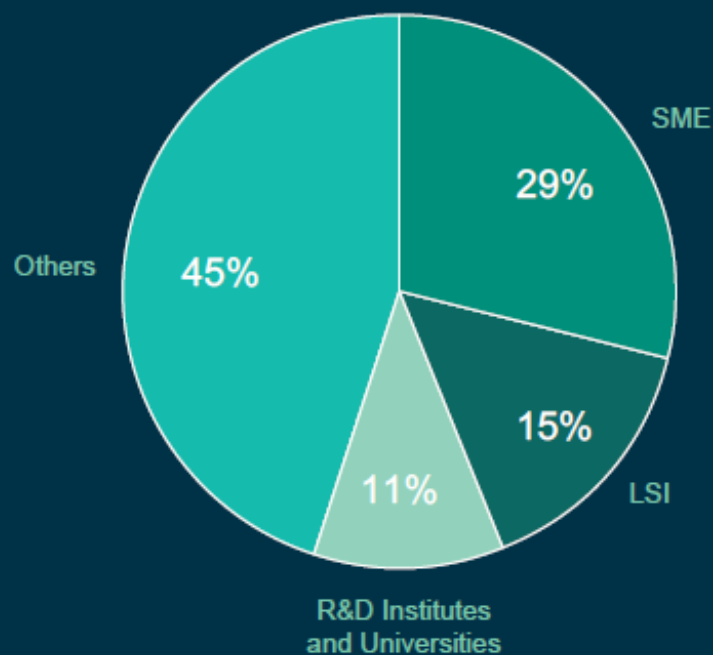
This is home to the Directorate of Technology, Engineering and Quality, responsible for longer-term technology development for new ESA and European missions.

## TEC Directorate

**800** EXPERTS WORKING TOGETHER IN A MULTICULTURAL ENVIRONMENT



# GSTP's mission



- For more than 30 years, the GSTP has been developing leading-edge space technologies that enable missions and support the competitiveness of European industry
- GSTP allows companies of all sizes as well as research and academic organisations to perform technology developments and demonstrations
  - Building capacities, fostering innovation and creating and improving products and services
- GSTP is an optional ESA programme with the participation of all ESA Member, Associate and Co-operating States
  - 27 Participating States in total

Aerodynamics, Space Debris and Space Environment

2

EEE Components, Photonics, MEMS

8

Structures, Mechanisms,  
Materials, Thermal  
26

Avionic Systems  
18

Electric Architecture,  
Power and Energy, EMC  
8

21  
Radiofrequency & Optical  
Systems and Products

26  
Propulsion, Space Transportation  
and Re-entry Vehicles

8  
Ground Systems and Mission Operations

4  
Digital Engineering

11  
Other

Completed activities per competence domain

# GSTP: 2023 at a glance

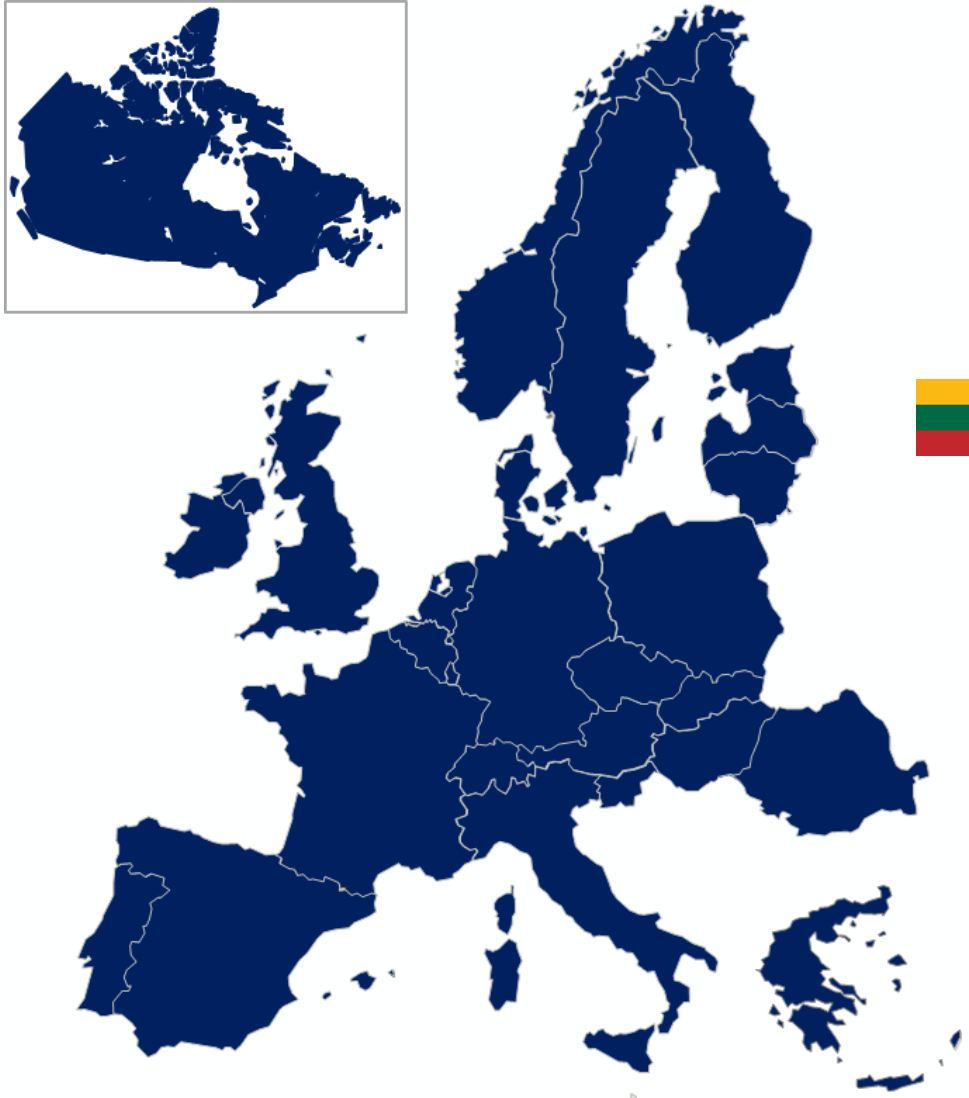
- Around 600 running activities
- 110 activities completed
- 140 technology development and demonstration activities initiated, representing over 110 MEuro in contracts



# GSTP 30<sup>th</sup> anniversary

- GSTP celebrated 30 years anniversary at an event co-hosted by the Polish Space Agency (POLSA) in Sopot, Poland.
- Keynote presentations, discussion panels, final presentations, industry exhibition
  - **21** final presentations done by companies from different countries in the domains of Power, Materials, Structures and Thermal, Robotics, Human Spaceflight, and Space Safety – (CD2, CD4, CD6, CD10).
  - **180** participants from industry, academia and space agencies in Europe.
  - **11** Delegates (IT, DE, UK, PL, SI, RO, EE, AT, BE, NL, PT).
  - **Over 80** companies and research institutes (from ~ 22 GSTP participating states).
  - **18** companies highlighting their products in the event exhibition area.

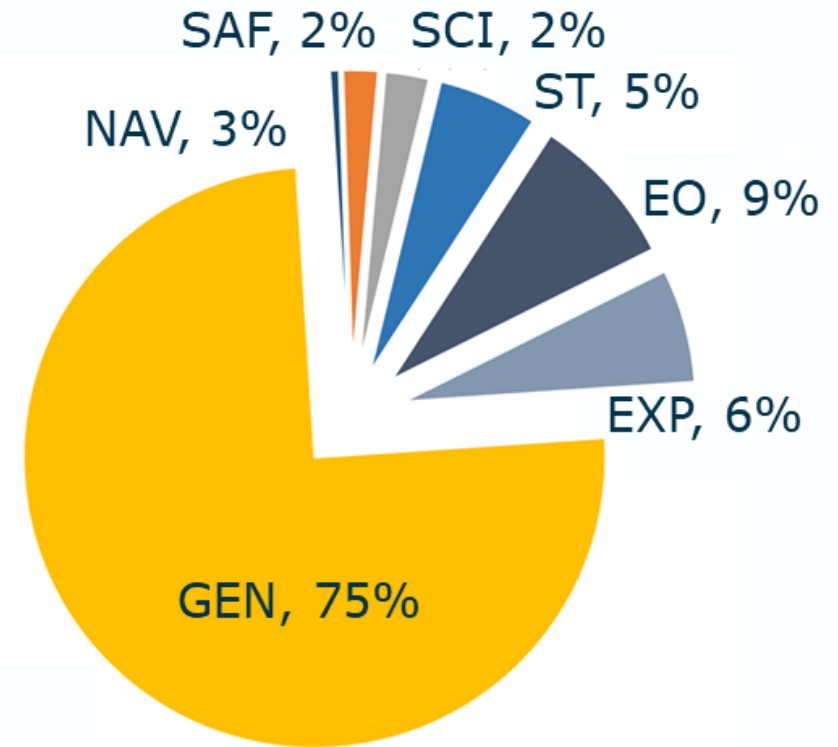
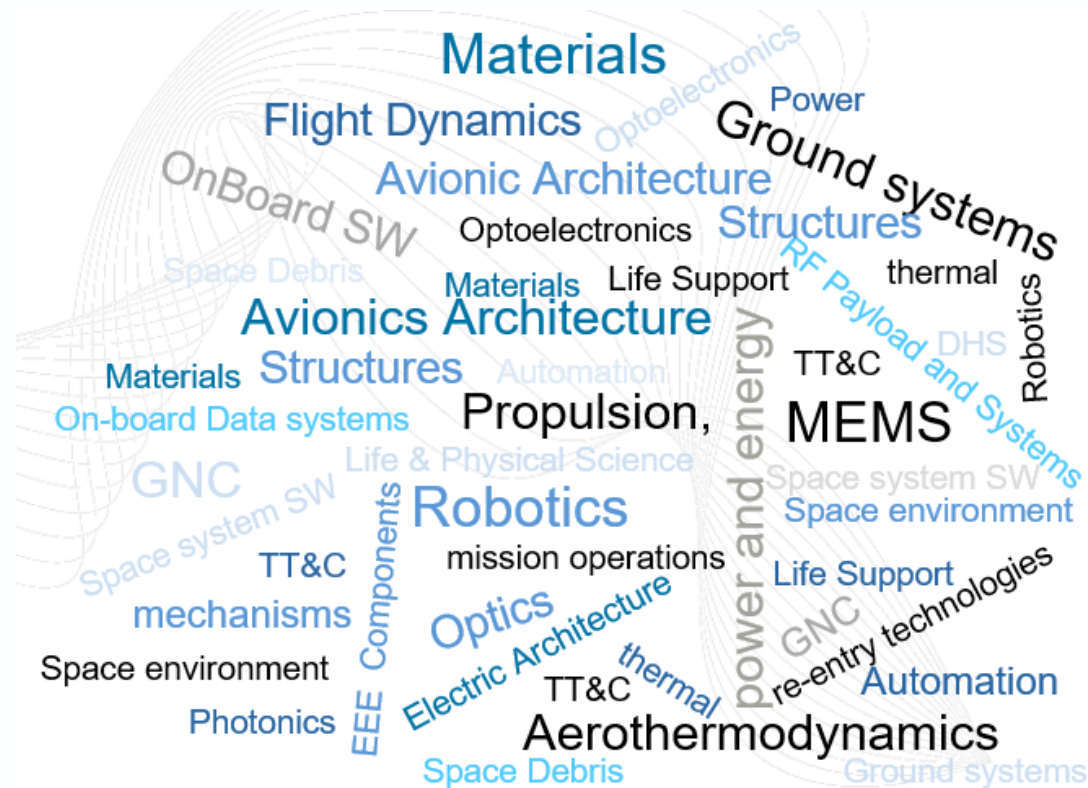




- 27 ESA Member, Associate and Co-operating States are subscribed to GSTP
- It is possible to propose activities and to bid for activities with partners from these States
- Lithuania's participation in GSTP over the 2021-2023 period:
  - 1 activity committed with a Lithuanian entity as a subcontractor, 1 activity is currently under procurement. Representing 350 KEuro for Lithuanian entities.
  - Total subscription of Lithuania: 2,5 MEuro
  - Complements the RPA (Requesting Party Activity) in Lithuania

GSTP activities will help the participation of Lithuanian entities in ESA Programmes (EO, Telecom...)





GSTP addresses practically all technology areas for generic or specific application needs for the space segment as well as the ground and space transportation segments

# GSTP Achievements



Mini space Thruster that runs on water (URA Thrusters)



Compliant Mechanism Based on Additive Manufacturing (CSEM)



Miniature Active Pixel Sensor based Star Tracker to support PLATO mission (TERMA)



Additive manufacturing for novel structural components (demonstrated in JUICE)

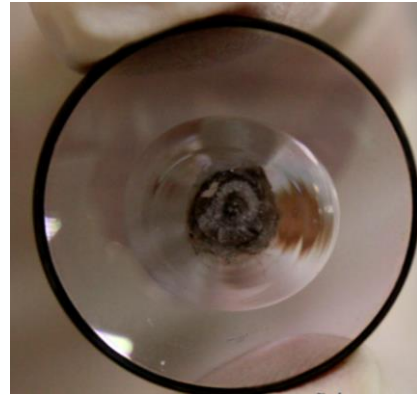


Reconfigurable telemetry transmitter for Earth observation satellites (TESAT)

# PECS activities led by Lithuanian entities



Motorized Positioning Device for Space



ESPRESSO - ESsential PREparation Steps for qualification longevity of Space Optics II



BALTIC INSTITUTE OF ADVANCED TECHNOLOGY



Ultra-wide Band, Highly Sensitive Receiver System

# GSTP STRUCTURE



**ELEMENT 1: DEVELOP**



- Supports technology developments up to qualification, capacity building & ESA technology aims.
- Compendia, Work Plan.
- Frameworks: De-risk, BB



**ELEMENT 2: MAKE**



- Industry initiated and driven co-funded activities to strengthen competitiveness.

## COMPONENTS

PRECISE FORMATION FLYING COMPONENT  
EEE Space Component Sovereignty for Europe  
EuropeanN Devices Using Radioisotope Energy  
(ENDURE)



**ELEMENT 3: FLY**

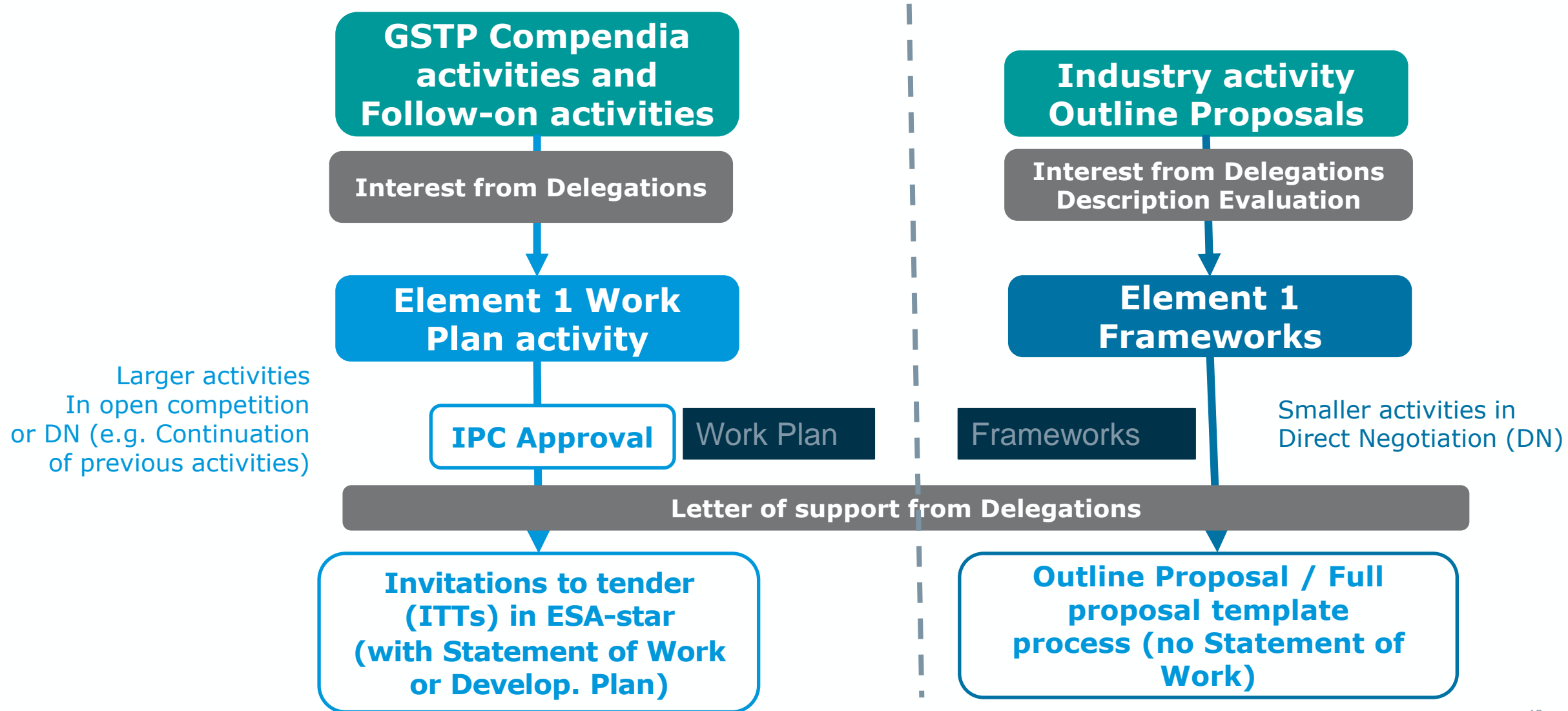


- On-ground and in-orbit demonstrations of technologies in need of acquiring in-orbit validation.



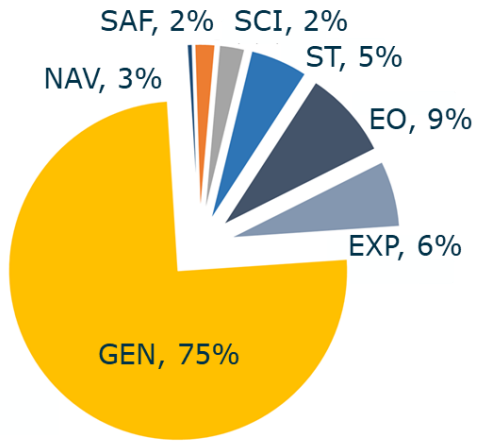


# GSTP ELEMENT 1





# GSTP ELEMENT 1 : WORK PLAN



## Competence Domain

- CD1 - EEE Components, Photonics, MEMS
- CD 2 - Structures, Mechanisms, Materials, Thermal
- CD 3 - Avionic Systems
- CD 4 - Electric Architecture, Power and Energy, EMC
- CD 5 - Radiofrequency & Optical Systems and Products
- CD 6 - Life & Physical Science Payloads, Life Support, Robotics & Automation
- CD 7 - Propulsion, Space Transportation and Re-entry Vehicles
- CD 8 - Ground Systems and Mission Operations
- CD 9 - Digital Engineering
- CD 10 - Astrodynamics, Space Debris and Space Environment

## WORK PLAN

- **Maturing Technology from proof of concept to qualification**
- Technologies for space and ground segment payload, platform, ground equipment, engineering tools
- All domains and technology areas
- **Building industrial capabilities**
- Procurement of activities in **Competition and in Direct Negotiation**
- **100% funded but co-funding possible**

**Work Plan Activities, presented to IPC (~75 new activities per year)**

Mainly ESA driven, but increasing industry driven activities.

Using a Statement of Work, draw from the Compendia, ad-hoc activities from delegations/industry and Frameworks

**In 2023: 80 new technology development activities (€70m)**





# GSTP ELEMENT 1: WORKPLAN



## Compendia 2022: under execution

### ESA Driven:

- Generic Technologies

### Industry Driven:

- **Artificial Intelligence** - Edge/AI on Board, GNC, Mission Operations
- **Digitalisation** - Data Management, MBSE, Simulation, Digital Twin
- **Quantum Technologies** – Quantum Sensing, Atom interferometers, Atomic frequency standards, Quantum Computing, Quantum Memories...
- **Cybersecurity**



- Publication in November 2022
- Since Feb 2023, 35+ activities have been included in GSTP WP
- Targeting implementation 2023/25





# GSTP ELEMENT 1 DEVELOP



Publication Date: 28/10/2022  
 Last Update On: 08/11/2022 09:00 CET  
 Classification: Procurement Related News

Restricted by Entity Codes: NO  
 Restricted by Countries: YES  
 Restricted to SME Entities: NO  
 Restricted to LSI Entities: NO  
 Visible to National Delegates: YES

The GSTP Element 1 "Develop" Compendia 2022 includes a list of candidate activities for the GSTP E1 "Develop" Work Plan in the following technology themes:

- Generic Technologies ... Read more

**Attachments**

- Cover letter GSTP E1 Develop Compendium 2022.pdf
- GSTP Element 1 Develop Compendium 2022 - Generic Technologies.pdf
- GSTP Element 1 Develop Compendium 2022 - Artificial Intelligence.pdf**
- GSTP Element 1 Develop Compendium 2022 - Digitalisation.pdf
- GSTP Element 1 Develop Compendium 2022 - Quantum Technologies.pdf
- GSTP Element 1 Develop Compendium 2022 - Cybersecurity.pdf

ESA UNCLASSIFIED - Releasable to the Public

GSTP ELEMENT 1 "DEVELOP" COMPENDIUM 2022: ARTIFICIAL INTELLIGENCE

ESA UNCLASSIFIED - Releasable to the Public

## 2. LIST OF ACTIVITIES

### GEN - Generic Technologies – Artificial Intelligence

#### CD3 - Avionic Systems

Programme Reference	Activity Title	Budget (k€)
<b>Guidance Navigation and Control (GNC)</b>		
GT11-601SA	Machine learning for attitude and orbit control systems failure detection isolation and recovery applications	650
GT11-602SA	Artificial intelligence techniques for spacecraft attitude control and estimation	750
GT11-603SA	Advanced verification and validation techniques for neural network-based AOCS/GNC systems	600
GT11-604SA	Deep neural network for robust satellite model matching	500
GT11-605SA	Robust real-time constrained optimal control using machine learning	600
GT11-606SA	AI-based GNC/AOCS systems validation and verification evolution	1,000
<b>AI on the Edge</b>		
GT11-607ED	On-board detection of space weather events	500
GT11-608SW	Qualified software machine learning toolkit for space hardware	900
GT11-609ED	Architecture for offline processing and machine learning in mass-memories	800
GT11-610EF	Reference onboard datasets for evaluation of machine learning models	800
GT11-611EF	Closed loop AI cognitive synthetic aperture radar	1,200
GT11-612ED	AI based end-to-end satellite failure management and prognostic	1,400
GT11-613ED	On board processing enablers for AI for operations	500
GT11-614ED	Advanced heterogeneous inference data processing module	2,000
<b>Total CD3</b>		<b>12,200</b>

Page 6/47  
 GSTP Element 1 Develop Compendium 2022 - Artificial Intelligence  
 Date of issue: 28/10/2022 Issue: 1 Revision: 0

THE EUROPEAN SPACE AGENCY

<https://esastar-publication.sso.esa.int/news/details/737>



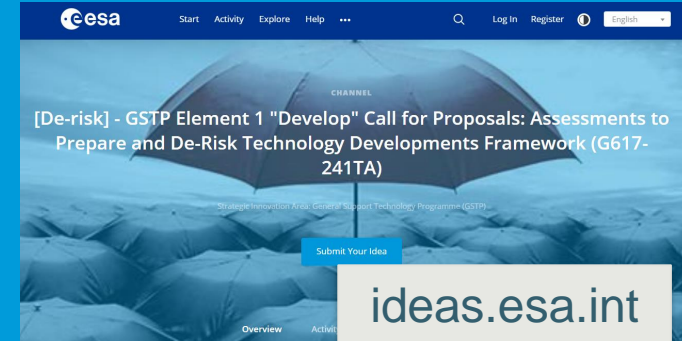




# GSTP ELEMENT 1 - De-risk framework

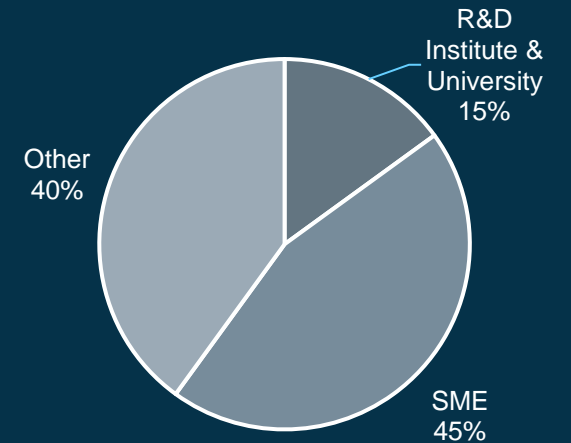
G617-241TA, Assessments to prepare and de-risk technology developments

Approved by IPC in November 2016 "...to allow for assessments that will help prepare and de-risk potential development activities".



Procurement using a template	Follow-on using a template	<u>~40 de-risk initiated / year</u>
<ul style="list-style-type: none"> <li>Max budget: €250 K</li> <li>Max duration: 9 months</li> </ul>	<ul style="list-style-type: none"> <li>No budget limit</li> <li>No duration limit</li> <li>~ 35% de-risk are continued</li> </ul>	<ul style="list-style-type: none"> <li>&gt;200 de-risk so far</li> <li>~ €35 M overall budget</li> </ul>

Company Type



Permanent Open Call in ESA-Star





# GSTP ELEMENT 1 - De-risk: Procurement



[Building Blocks] - GSTP Element 1 "Develop"



[De-risk] - GSTP Element 1 "Develop"

*Initial contact between bidder and National Delegation (no ESA involvement)*

ideas.esa.int

**Not-Official ESA procurement**

*Communications allowed with ESA Technical Officer and GSTP*

Outline Proposal in OSIP

Outline Proposal evaluation

Activity scope refinement

**Official ESA procurement**

*Communications allowed only through ESA assigned Contract Officer*

Proposal submission using ESA-Star

ESA-star

TEB & Negotiation

**Commitment**





# GSTP ELEMENT 1 - De-risk: Procurement



## Outline Proposal Review Criteria

- Clear and credible definition of the technical objectives, key requirements, technical steps and risks to be addressed in this activity.
- Clear indication of the application and potential users of the technology.
- Clarity of the management approach and the adequacy of the proposed costs with the work to be performed
- Clear information about Cost to Completion



[Building Blocks] - GSTP Element 1 "Develop"



[De-risk] - GSTP Element 1 "Develop"



# GSTP ELEMENT 1 - De-risk: Follow-on

Mid term review (~6<sup>th</sup> month)

Activity Kick-off

De-risk phase

De-risk phase closure and decision point about Follow-on phase initiation

Submission to ESA of the Development Plan (DP)

at least as detailed draft version

Follow-on preparation

**If any Follow-on, the Development Plan will be considered as Technical Document for the procurement – no SoW**

Follow-on phase

Any Follow-on must be approved by Industrial Policy Committee (IPC) – 5 IPCs every year (~2 months)



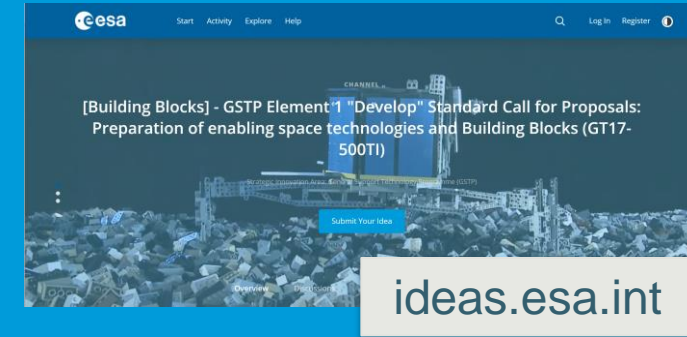
# GSTP ELEMENT 1 – Building Block framework



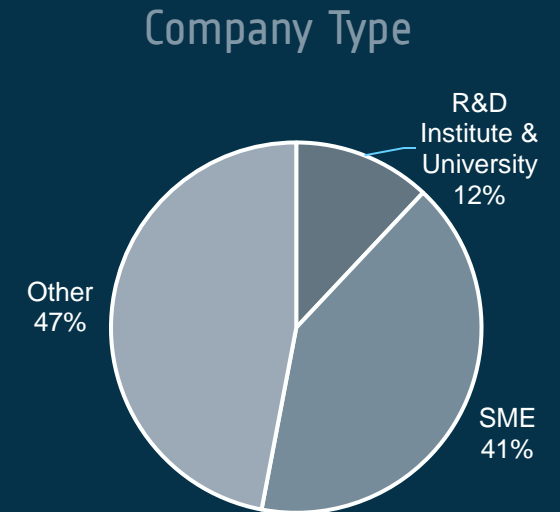
## GT17-500TI, Preparation Of Enabling Space Technologies And Building Blocks Framework

Approved IPC April 2018 and updated October 2022 (operative from mid March)

“...to prepare and to develop enabling capabilities and the associated building blocks for space related systems and the associated sub-systems.” Targeted and coordinated development of capabilities across different GSTP Participating States



<b>Procurement using a template</b> <ul style="list-style-type: none"> <li>• Max budget: €1 M</li> <li>• Max duration: 24 months</li> </ul>	<b>~20 activities initiated / year</b> <ul style="list-style-type: none"> <li>• 100 activities so far</li> <li>• ~ €43 M overall budget</li> </ul>
---	--



Permanent Open Call in ESA-Star



# GSTP ELEMENT 2 MAKE

## Announcement Of Opportunity

2020: First full year with the current structure

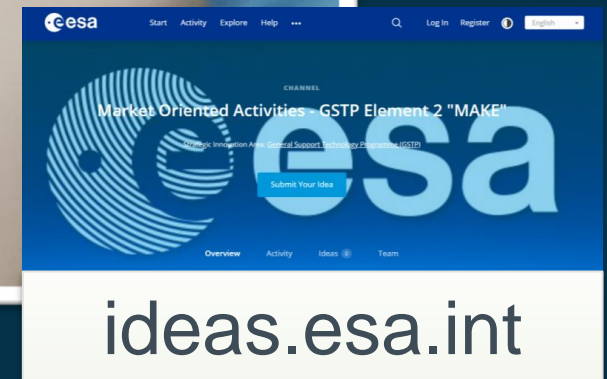
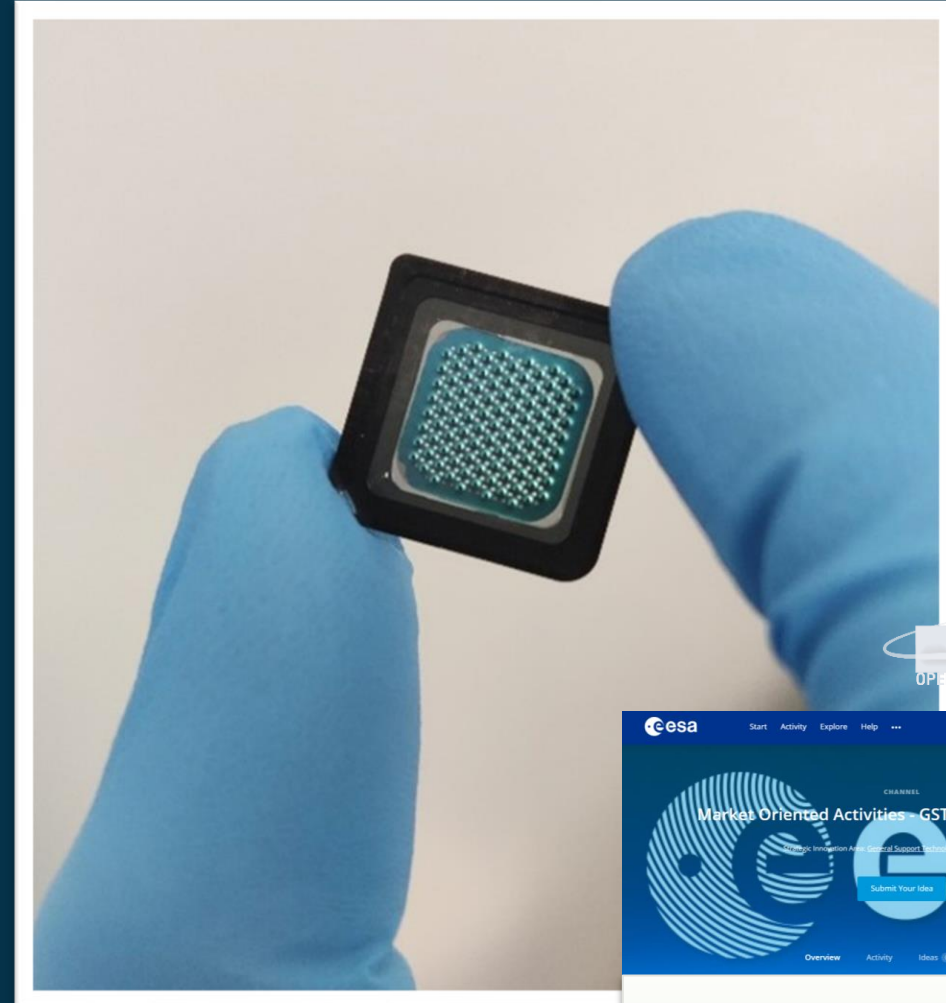
3 segments:

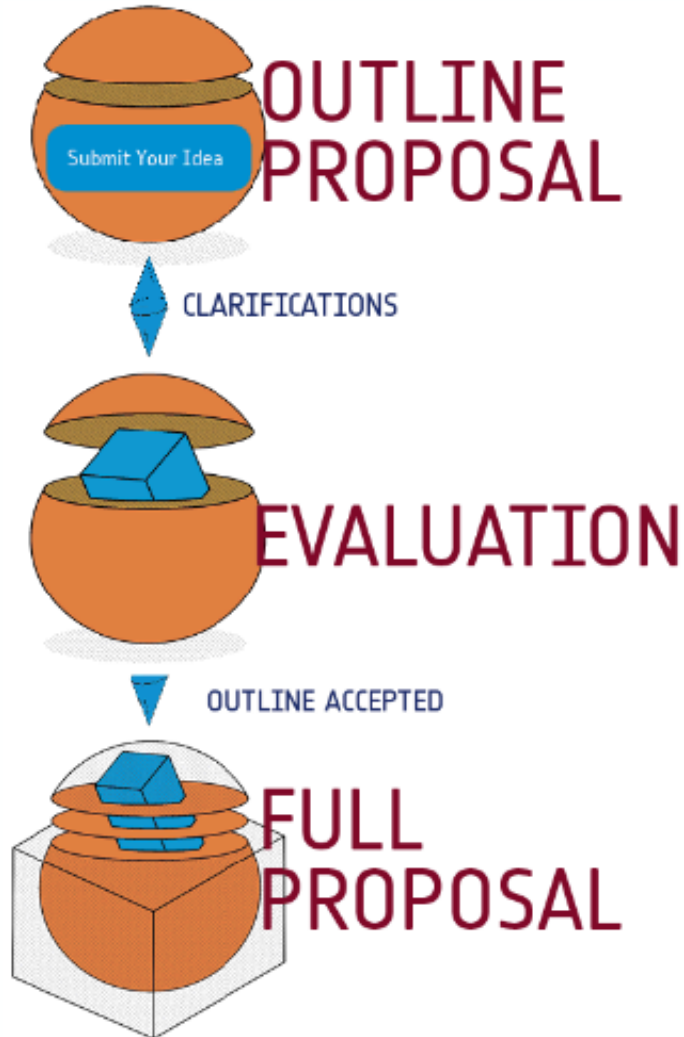
- Market Oriented Opportunities,
- Strategic Opportunities and
- Implementation of National Priorities

Use of OSIP channel ([ideas.esa.int](https://ideas.esa.int)) for outline proposal evaluations.

2020 – 2023: significant increase in proposals received

25-30 activities committed per year (€30 M - €35 M)





ideas.esa.int

## OUTLINE PROPOSAL EVALUATION CRITERIA

- Clarity and credibility of the business opportunity and market context (for segment 1) or the strategic opportunity and market context (for segment 2)
- Credibility and quality of the technical requirements, technical solutions versus activity objectives
- Credibility and quality of the proposed development plan, deliverables and schedule
- Credibility and quality of the bidder's background, experience and facilities
- Credibility and quality of the cost breakdown



# GSTP ELEMENT 3 FLY



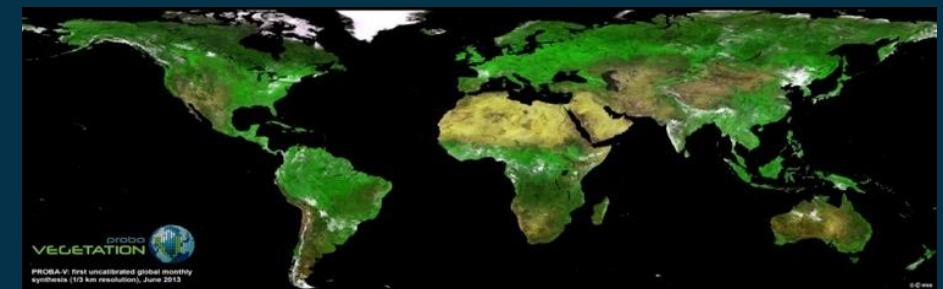
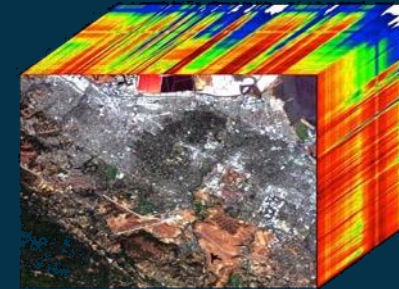
## Facilitate Technology Demonstrations

The main objectives related to Element 3 are to:

- Ensure the successful implementation of the Missions and In-Orbit Demonstrations currently in preparation.
- Identify/prepare new mission/IOD opportunities.
- Expand and enhance the demonstration approach.

Opportunities cover:

- Demonstration of technology (e.g. platform units, Li-ion batteries).
- Demonstration of techniques (e.g. ADS-B, hyper-spectral, ...).
- First demonstrations of potential capabilities.

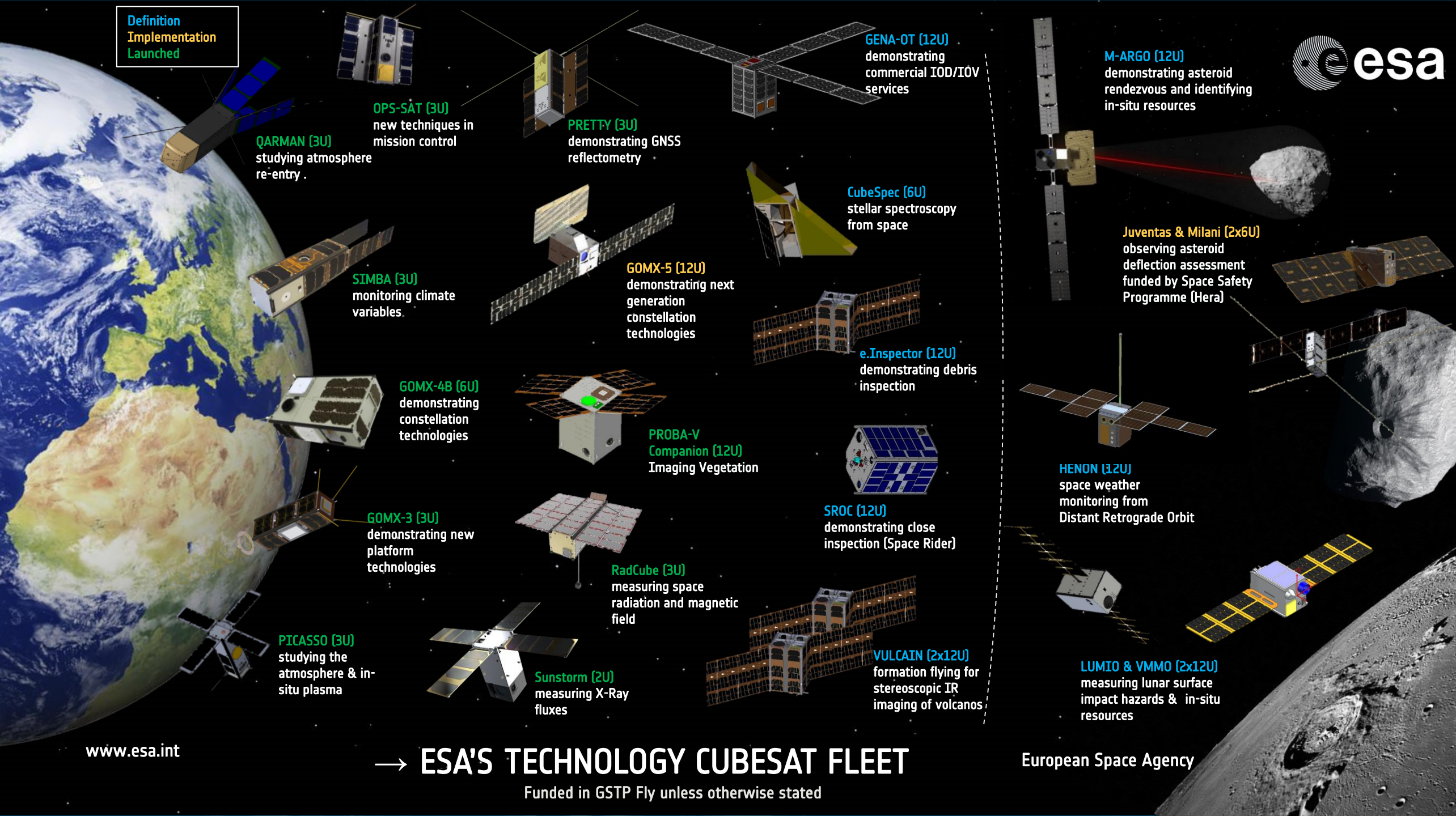


## Cubesat framework





Definition  
Implementation  
Launched



**QARMAN (3U)**  
studying atmosphere re-entry

**OPS-SAT (3U)**  
new techniques in mission control

**PRETTY (3U)**  
demonstrating GNSS reflectometry

**GENA-OT (12U)**  
demonstrating commercial IOD/IOV services

**M-ARGO (12U)**  
demonstrating asteroid rendezvous and identifying in-situ resources

**SIMBA (3U)**  
monitoring climate variables

**GOMX-5 (12U)**  
demonstrating next generation constellation technologies

**CubeSpec (6U)**  
stellar spectroscopy from space

**Juventas & Milani (2x6U)**  
observing asteroid deflection assessment funded by Space Safety Programme (Hera)

**GOMX-4B (6U)**  
demonstrating constellation technologies

**PROBA-V Companion (12U)**  
Imaging Vegetation

**e.Inspector (12U)**  
demonstrating debris inspection

**GOMX-3 (3U)**  
demonstrating new platform technologies

**RadCube (3U)**  
measuring space radiation and magnetic field

**SROC (12U)**  
demonstrating close inspection (Space Rider)

**HENON (12U)**  
space weather monitoring from Distant Retrograde Orbit

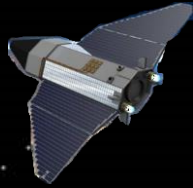
**PICASSO (3U)**  
studying the atmosphere & in-situ plasma

**Sunstorm (2U)**  
measuring X-Ray fluxes

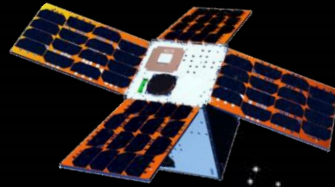
**VULCAIN (2x12U)**  
formation flying for stereoscopic IR imaging of volcanos

**LUMIO & VMMO (2x12U)**  
measuring lunar surface impact hazards & in-situ resources

# SMALLSAT MISSIONS



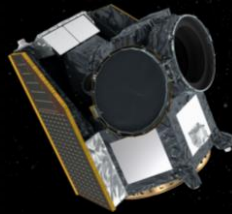
**SkimSat (VLEO)**  
electric propulsion



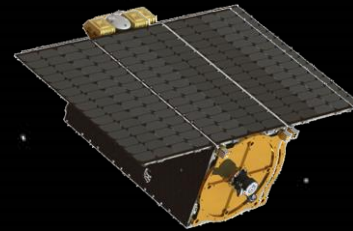
**PVCC**  
Earth Vegetation



**PCDSat**  
Electric propulsion  
Flying Deployer IOD



**CHEOPS**  
CHaracterising ExOPlanet Satellite



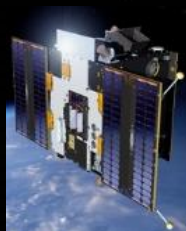
**uHETSat**  
electric propulsion



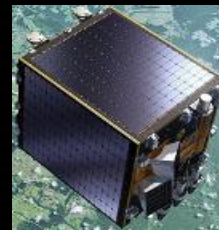
**Proba-3 (HEO)**  
Sun Corona study  
& Formation Flying



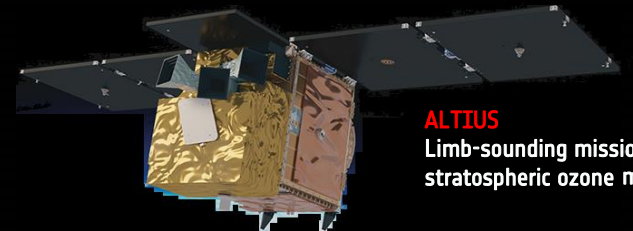
**Proba-1**  
Autonomous operations



**Proba-2**  
Solar observation



**Proba-V**  
Earth Vegetation



**ALTIUS**  
Limb-sounding mission measuring stratospheric ozone measuring

Launched

To be launched 2024

To be launched

# GSTP – HOW TO PARTICIPATE



	Objective	Letter of support	Type of Procurement	Max Budget	Max Duration	Co-fund	First Step	Main Proc Doc
<b>GSTP E1 Workplan</b>	To develop space technologies up to qualification. Mainly ESA coordinated. Compendium and continuation of framework activities.	Yes	Competition and Direct Negotiation	No limit	No limit	Not Mandatory	ESA Star	SoW / Develop. Plan
<b>GSTP E1 De-risk fr.</b>	To reduce funding and technical risks linked with new technologies/applications and to facilitate collaboration with new industrial players	Yes	Direct Negotiation	€250 K	9 months	Not Mandatory	OSIP	Template
<b>GSTP E1 BB fr.</b>	Develop enabling capabilities and the associated building blocks for space related systems and the associated sub-systems	Yes	Direct Negotiation	€ 1,000 K	24 months	Not Mandatory	OSIP	Template
<b>GSTP E2</b>	Industry initiated and driven, co-funded activities to strengthen competitiveness	Yes	Direct Negotiation	No limit	No limit	Mandatory	OSIP	Template



[ideas.esa.int](https://ideas.esa.int)



[esastar-publication-ext.sso.esa.int](https://esastar-publication-ext.sso.esa.int)





# Optoelectronics in ESA programmes

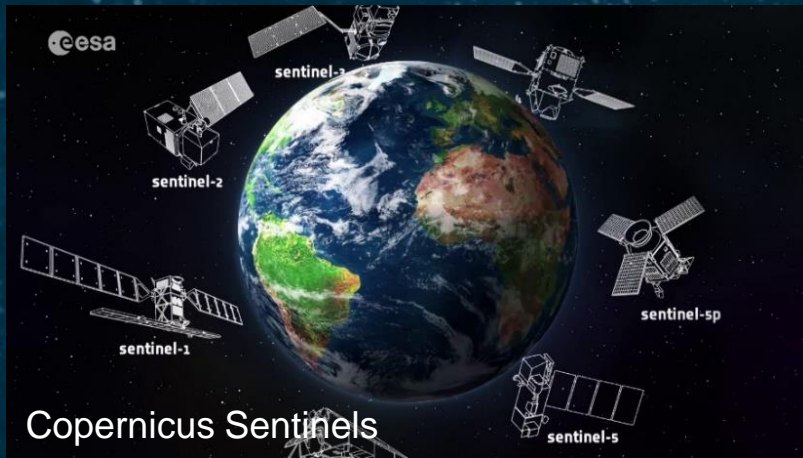
## Achievements and needs

---

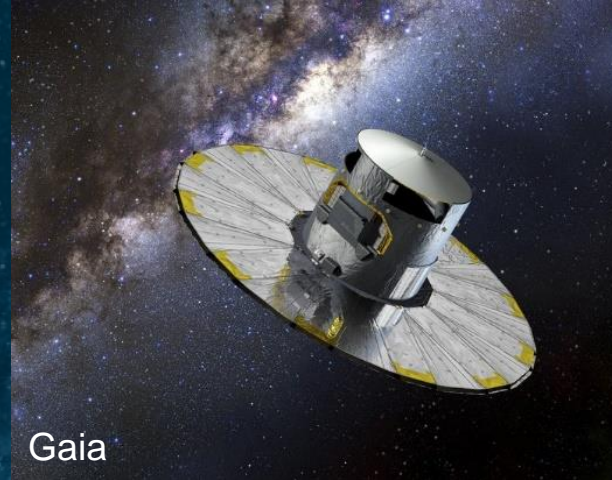
Dr. Pol Ribes Pleguezuelo  
on behalf of the ESA Photonics Section TEC-MME  
Mechatronics & Optics Division

19/03/2024

## Earth Observation



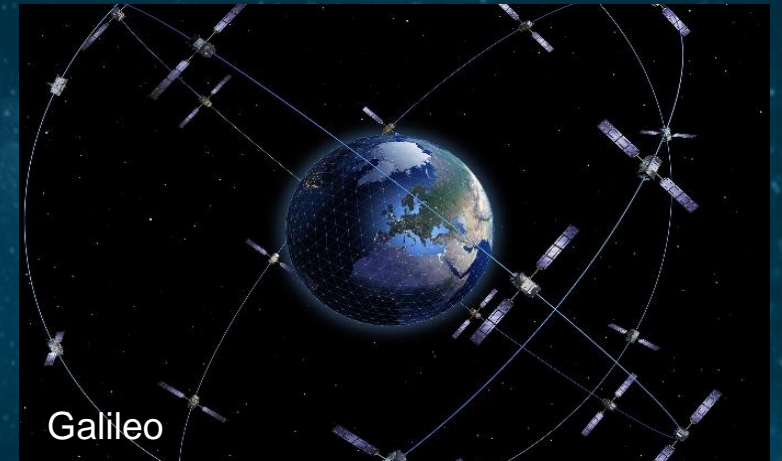
## Science & Exploration



## Telecommunications – Optical & Quantum Communications



## Navigation



Broad range of components and subsystems

## Light generation

LEDs  
LASERs  
Single and entangled photon sources  
Lamps

## Light manipulation

Optical fibres  
Fibre cables and connectors  
Fibre couplers, splitters, combiners  
Modulators  
Optical switches

Optocouplers  
Optical encoders  
Photonic Integrated Circuits (PICs)  
LIDARs  
Calibration systems  
Optical gyroscopes  
Optical clocks  
Optical transceivers

## Light detection

Detectors (CCDs, CMOS image sensors, MCT, InGaAs, ...)  
Photodiodes  
APDs, SPADs  
Phototransistors  
Star trackers, sun sensors

## TECHNICAL Challenges

- ❑ Components and subsystems
  - ❑ Performance (wavelength, speed, power)
  - ❑ Materials
  - ❑ Technologies
  - ❑ Assembly & Packaging
- ❑ Space Environment
  - ❑ Radiation
  - ❑ Vacuum
  - ❑ Thermal
  - ❑ Lifetime
  - ❑ Long storage times prior to launch
  - ❑ Launch (vibration, shock)

## PROGRAMMATIC Challenges

- ❑ Funding
- ❑ Availability / Timing
- ❑ Continuity
- ❑ Reliance on COTS

# Detector developments

**GAIA**  
Mapping the stars



1966 x 4500 pixels

**EUCLID**  
Dark energy mapping



4096 x 4132 pixels

**CHEOPS**  
Characterizing Exoplanets



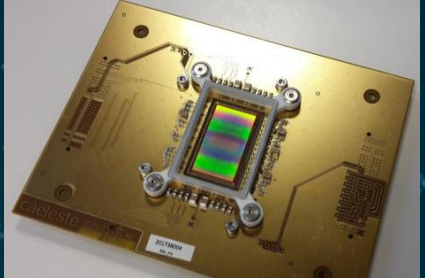
1024 x 1024 pixels

**CO2M**  
Anthropogenic CO2 monitoring



2000 x 1100 pixels

European CMOS detector

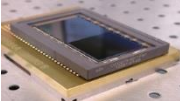


**EarthCARE – ATLID**  
Atmospheric LIDAR



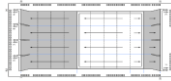
6 x 8 pixels

**Tropomi**  
Monitoring the troposphere



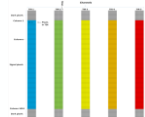
1024 x 1024 pixels

**Sentinel-4**  
Atmospheric chemistry & air quality monitoring



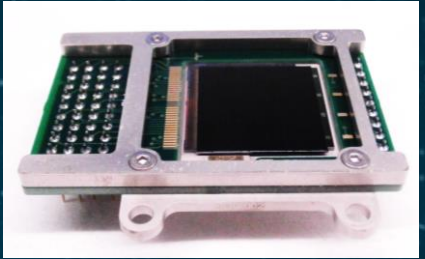
1250 x 600 pixels

**LSTM**  
Thermal monitoring

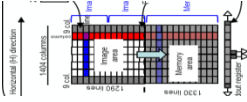


1088 x 592 pixels

Hybrid Silicon Detector



**Sentinel-5**  
Ozone profiling & climate monitoring



1404 x 1360 pixels

**Sentinel-3**  
Sea and land mapping



814 x 1152 pixels

**PLATO**  
Exoplanet Finder

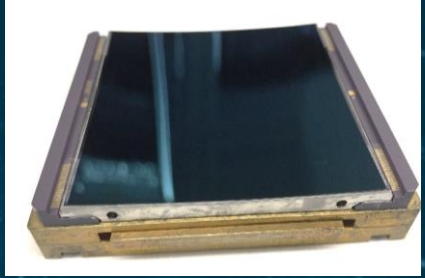


4510 x 4510 pixels

**Sentinel-5 NGP**



Curved CCD



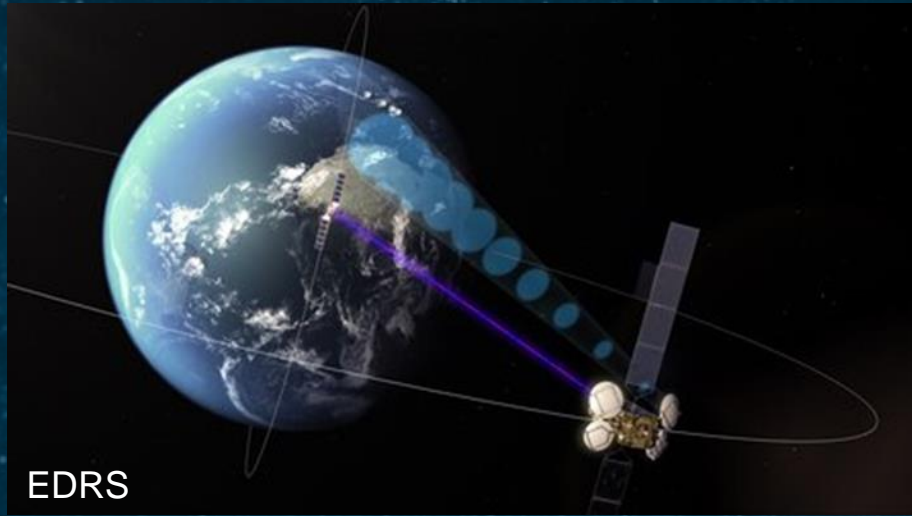
## CCDs and CMOS image sensors

## IR detectors

## R&D

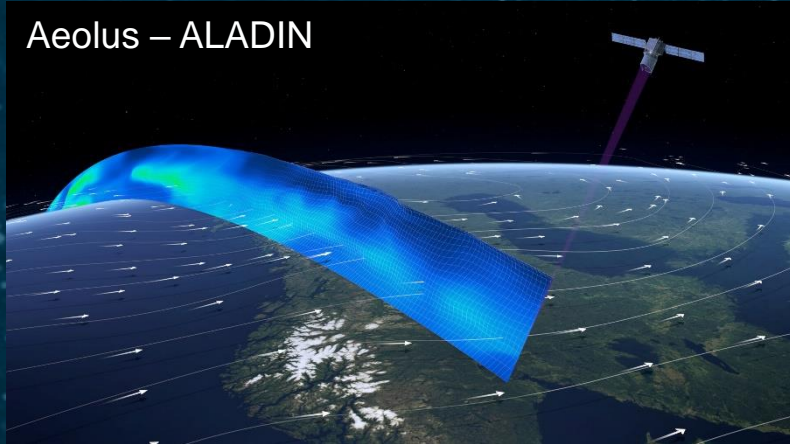


# Optical communications and photonics



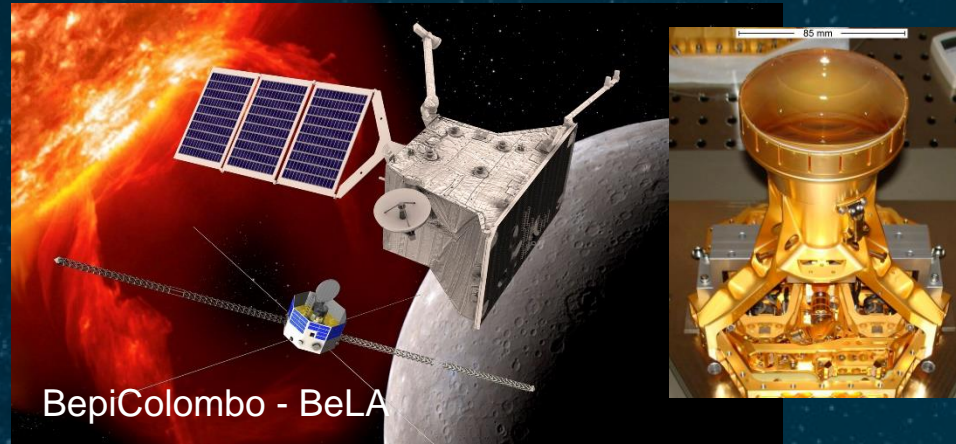
## Atmospheric LIDARs

Aeolus – ALADIN



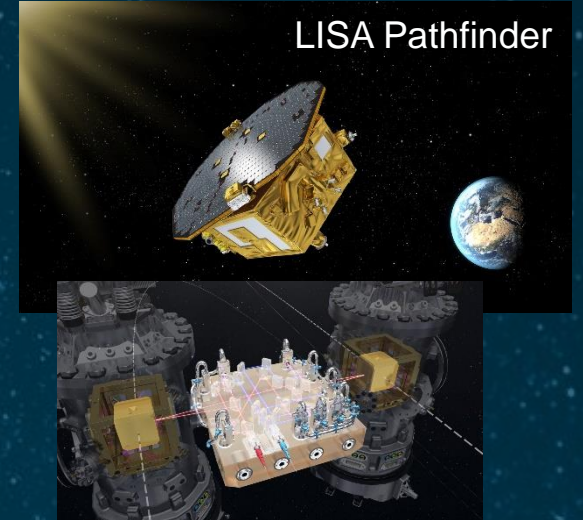
## Laser Altimeters

BepiColombo - BeLA



## Laser metrology

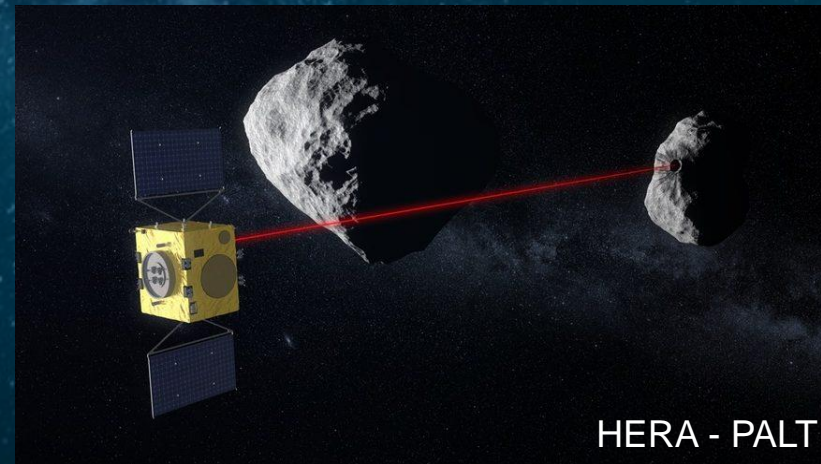
LISA Pathfinder



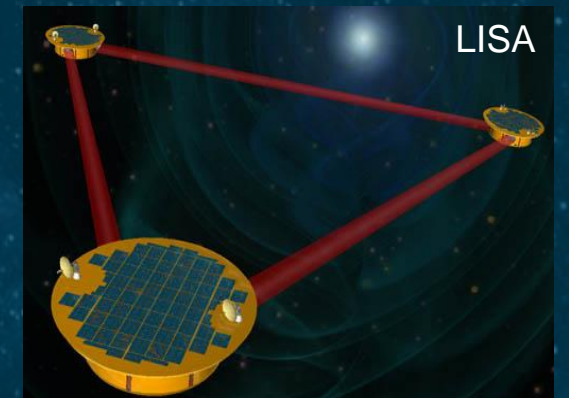
EarthCARE - ATLID



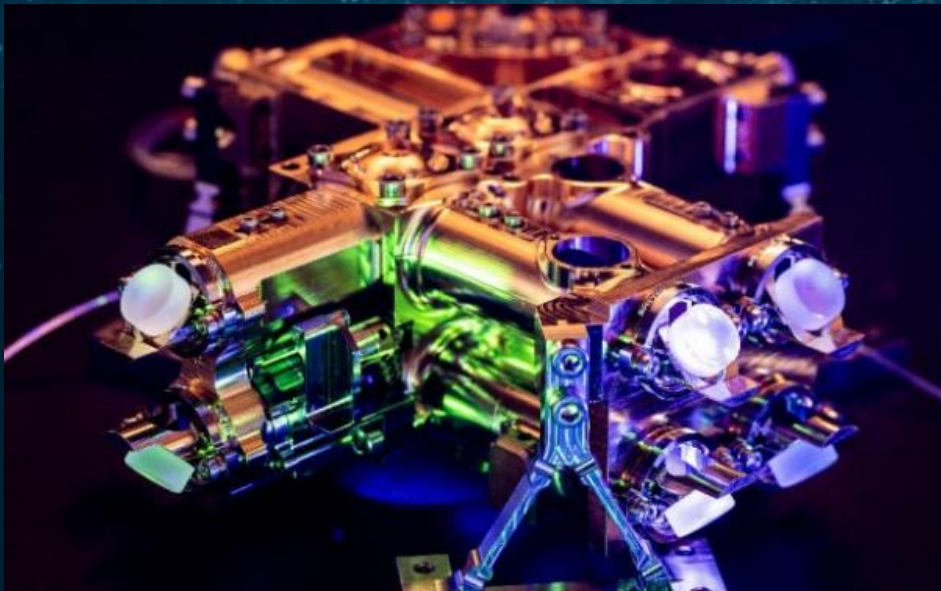
HERA - PALT



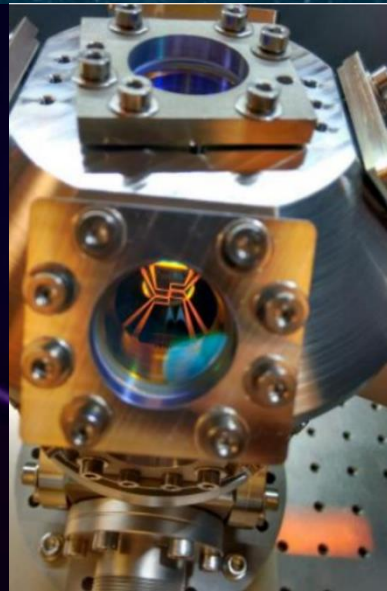
LISA



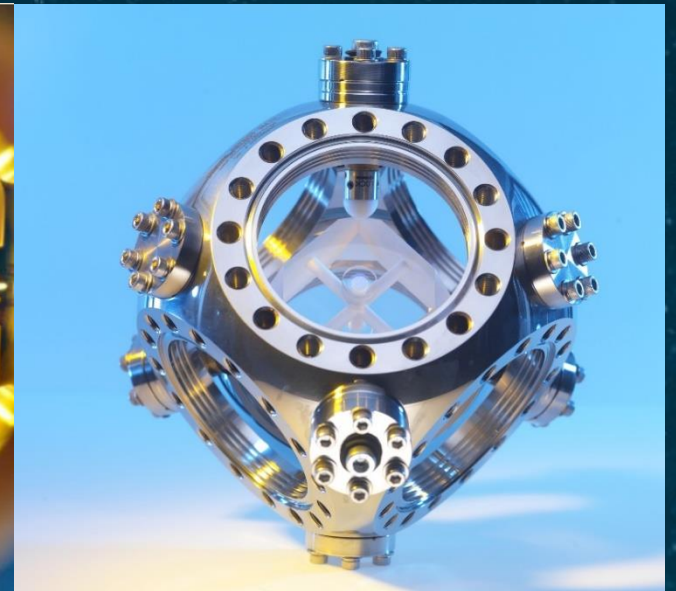
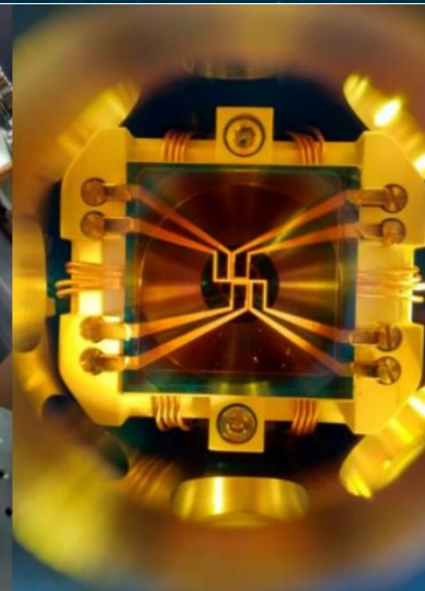
- ❑ Quantum Key Distribution (QKD) for secure communication
- ❑ Cold Atom Interferometers for precise gravity measurements and fundamental physics
- ❑ Optical Clocks using Cold Atoms or Ions



Entangled photon source (ARTES contract with Fraunhofer IOF Jena)



Atom interferometry vacuum chamber with atom chip (TDE contract with RAL Space/IQO Hannover)



Optical reference cavity inside vacuum chamber (TDE contract with NPL)

# Harmonisation dossiers relevant for: Optics, Lasers and their Applications

## ESA Harmonisation Database

Elaborated together with European stakeholders including Space agencies, research organisations, universities and the private sector. Technologies are grouped into **47 topics** covering a large part of the ESA Competence Domains. For this session, find below a list of the main relevant topics:

Topic title	Reference
Optical Communications for Space	ESA/IPC/THAG(2022)10
Frequency and Time Generation and Distribution	ESA/IPC/THAG(2023)4
Photonics	ESA/IPC/THAG(2023)8
Technologies for Optical Passive Instruments - Mirrors	ESA/IPC/THAG(2019)12
Coatings	ESA/IPC/THAG(2023)3
Lidar Critical Subsystems	ESA/IPC/THAG(2022)6
Optical Detectors	ESA/IPC/THAG(2022)5



European and Canadian space sector stakeholders can request an access to the ESA Harmonisation Database (<https://tec-polaris.esa.int/eclipse>) by sending an email to [harmo@esa.int](mailto:harmo@esa.int) from a corporate account and providing business affiliation.

Any questions? → [pol.ribes@esa.int](mailto:pol.ribes@esa.int)

# Some additional keywords

Integrated photonics

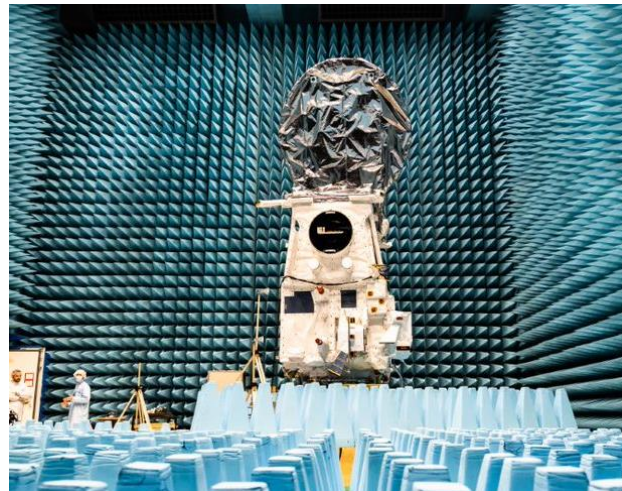
Lack of crystal growth – rad-hard components

Broad range of emission (tuneable) wavelengths (non-standard) and by obtaining a high-pulse power and repetition rate

Spin-in of terrestrial technologies

Miniaturization for in CubeSat adoption

Coatings with high damage threshold at shorter wavelengths as UV



# Thank you for your attention!

Pol.Ribes@esa.int



# GSTP De-Risk Call in Lithuania

---

Noelia Peinado, Viktorija Piaulokaite (TEC-TI), Pol Ribes (TEC-MME)  
Directorate of Technology, Engineering and Quality

Vilnius, March, 2024





# Didžiausia

rizika gyvenime - nerizikuoti

Demotyvacija.lt



# GSTP De-Risk Call in Lithuania: Objectives



- **Call objectives**

- To prepare and de-risk new technology development activities and to reduce the risk associated to these developments.
- During the activity ESA will help to assess potential added value of the development and will **address critical issues**.
- The results of this phase are intended to **help orienting a follow-on development activity**.

- **Activities include a combination of the following tasks:**

- Identification and analysis of specifications for one or more space applications and the technical assessment of the development actions and associated schedule and cost.
- Assessment of the potential benefits (performance, cost, lead time, risks...) and disadvantages of the potential solution with respect to the state-of-the-art.
- Assessment of potential critical issues related to using a given technology for a specific application, using analysis/simulation and/or breadboarding and testing.
- Preparation of the Development Plan. Define the full development activity with respect to a targeted application, refining the associated specifications and work programme and estimating the cost and establishing the schedule.



# GSTP De-Risk Call in Lithuania: Outline



- **ESA technology programme:** General Support Technology Programme (GSTP)
- **Objective of the call:** to build and expand space technology capabilities in Lithuania. The call offers the possibility for Lithuanian entities to build products and services that can be used in the context of ESA or non-ESA space related activities.
- **Constraints:** maximum budget 250 Keur per activity; maximum 9 months duration; up to 4 activities to be selected in the call.
- **Timeline:**
  - Launch of the call on 19 March 2024
  - Submit the outline proposals by 6 May 2024
  - Outline proposal evaluation
  - Outline proposal pre-selection by mid-June 2024
- **Proposal template & framework:** De-risk framework and outline proposal template (ideas.esa.int – De-Risk channel [link here](#))
- **Potential subjects:** Development of technologies for Platform, Payload, Ground Segment and Engineering tools, for applications in Earth Observation, Science, Navigation, Space Transportation, Exploration, Space Safety.

# GSTP De-Risk Call in Lithuania: Outline



Date	Description	Who
19th March 2024	GSTP De-Risk Call Information Session	ESA / LT Innovation Agency / Entities
20th March 2024	Info package distributed to interested entities	LT Innovation Agency
6th May 2024	<b>Submission of De-Risk outline proposals deadline</b>	<b>Entities</b>
1st June 2024	Pre-selection	LT Innovation Agency with technical recommendation from ESA
mid-June 2024	Notification to companies/entities	LT Innovation Agency
mid-June 2024	Technical discussion meetings (teleconference)	ESA (Organiser)/ LT Innovation Agency/ Preselected Entities
July 2024	Official ESA- Request for full proposal (RFP)	ESA
August 2024	<b>Submission of full proposal</b>	<b>Entities</b>
September 2024	Negotiation meetings	ESA/Entities
September/October 2024	Kick-off	ESA/Entities
October 2024 – June 2025	<b>Activity execution</b>	<b>Entities</b>





# GSTP ELEMENT 1 - De-risk: Procurement



## Outline Proposal Review Criteria

- Clear and credible definition of the technical objectives, key requirements, technical steps and risks to be addressed in this activity.
- Clear indication of the application and potential users of the technology.
- Clarity of the management approach and the adequacy of the proposed costs with the work to be performed
- Clear information about Cost to Completion



[De-risk] - GSTP Element 1  
"Develop"



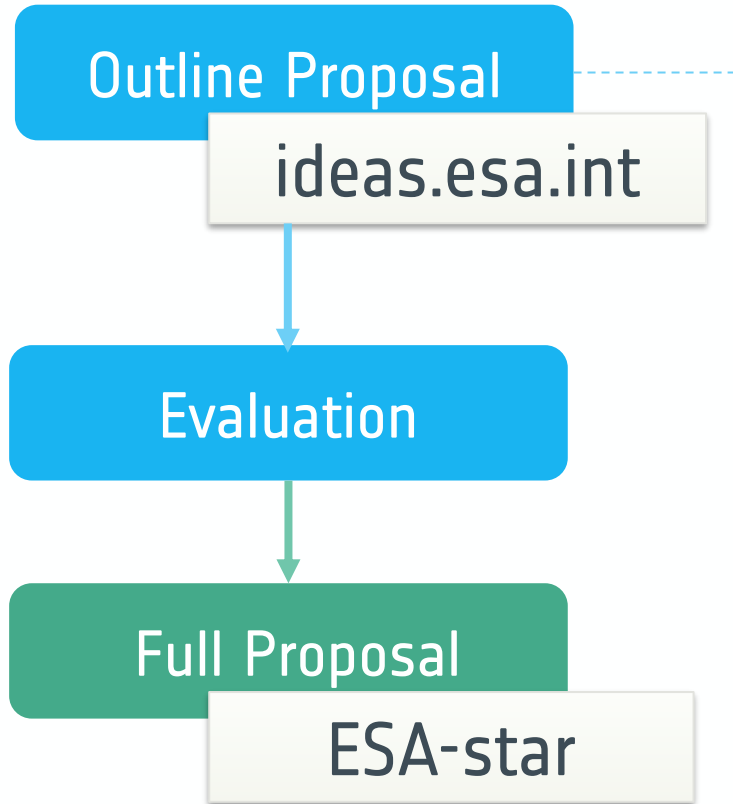
# GSTP ELEMENT 1 - De-risk: Outline Proposal template

Outline proposal consists of :

- **Technical Proposal**: Application, technical objectives and requirements, Technology Readiness Level, engineering approach, technical feasibility/risks, technical implementation (tasks, work logic, Work Breakdown Structure, Work Package Description)
- **Management Part**: Background of the company(ies), facilities, Planning, Long lead time impacts,
- **Financial Part**: Total cost, price breakdown, cost to completion for potential follow-on

**[Outline Proposal template: Link here](#)**

Suggested outline proposal length  
~ 30 pages  
inc. ~ 4-6 pages for Work Breakdown Structure,  
Work Packages Description





# GSTP ELEMENT 1 - De-risk: Follow-on

Mid term review (~6<sup>th</sup> month)

Activity Kick-off

De-risk phase

De-risk phase closure and decision point about Follow-on phase initiation

Submission to ESA of the Development Plan (DP)

at least as detailed draft version

Follow-on preparation

**If any Follow-on, the Development Plan will be considered as Technical Document for the procurement – no SoW**

Follow-on phase

Any Follow-on must be approved by Industrial Policy Committee (IPC) – 5 IPCs every year (~2 months)



# GSTP ELEMENT 1 - De-risk: Follow-on

- Before the end of the activity, is mandatory to deliver the Development Plan that will be considered as technical base for the procurement of the follow-on.

Development Plan consists of :

- **Technical and Application Part**: Application, technical objectives and requirements, Technology Readiness Level, De-Risk achievement, Technical Feasibility, remaining Problem Areas and Development Risks, engineering approach, Work Breakdown Structure, Work Package Description, deliverables, target mission classification.
- **Management, Planning and Costing**: Background of the company(ies), facilities, Proposed schedule and milestones, Bar chart, Key personnel, follow-on cost and total cost to completion, further steps needed to complete the development.

Mandatory deliverable during the activity implementation

[Development plan template: Link here](#)

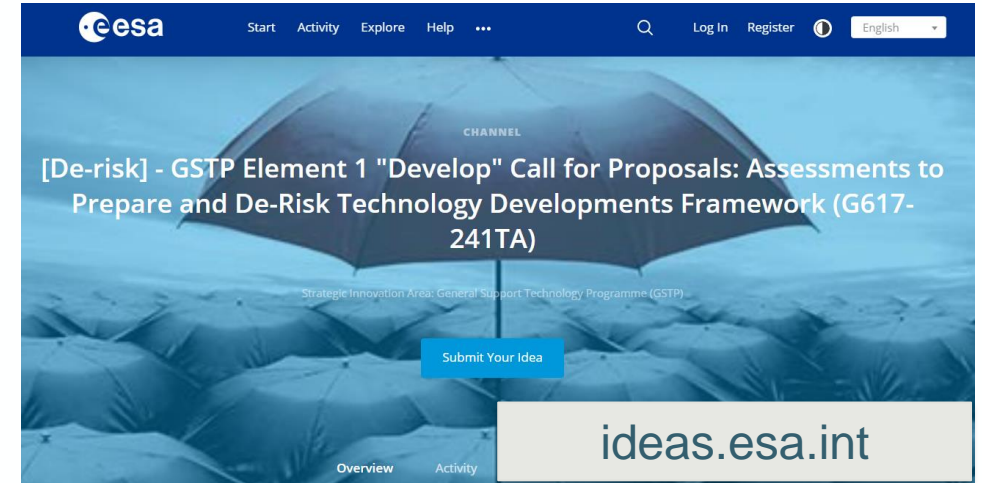
# GSTP De-Risk Call in Lithuania – some considerations:

- **Ensure you're registered in ESA Star** (<https://esastar-emr.sso.esa.int/>) RFP – Request For Proposal issued; notification from ESA-Star.
- Take into consideration the preliminary assessment. Feedback: points of concerns, of attention; recommendations, suggestions. **Full proposal builds on the outline proposal** → earlier feedback: avoid “bad” surprises (scope, tasks...); mutual understanding on objectives & critical issue(s) → avoid procurement delays, additional work...
- Negotiation meetings will be done following positive evaluation of Full Proposals. Contracts signed by ESA.
- At the end of the activity, potential follow-on for further technology maturation can be considered in the frame of the GSTP. Before the end of the activity, is mandatory to deliver the Development Plan (& Business Plan for De-risk Portfolio) that will be considered as technical base for the procurement of the follow-on.



# GSTP De-Risk Call: Takeaway

- **GSTP** De-Risk Call is open for proposals till **6 May 2024**
- Applications shall be submitted in Open Space Innovation Platform (OSIP), De-Risk Channel following Outline Proposal template
- Maximum budget 250 Keur per activity; maximum 9 months duration
- Development of technologies for Platform, Payload, Ground Segment and Engineering tools, for applications in Earth Observation, Science, Navigation, Space Transportation, Exploration, Space Safety.
- Address to all type of entities, Research institutes are encouraged to partner with industrial entities.



## Additional considerations:

- **GSTP** is complementary to the RPA scheme
- Consult the GSTP Element 1 Compendia for ideas

You will be provided with an info package which includes:

- Info session presentation slides
- Application guide
- De-Risk outline proposal template

# Thank You

---

