

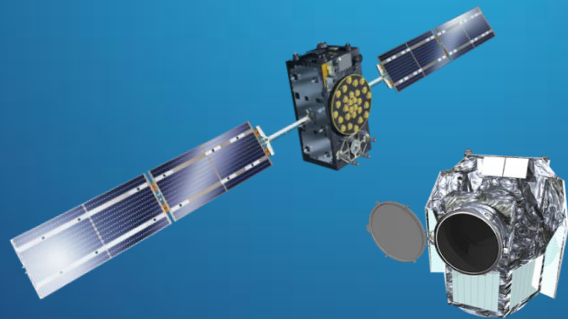
R&D WITH ESA - OPTIONS AND OPPORTUNITIES FOR SLOVAKIAN INDUSTRY AND ACADEMIA

26 November 2024

Leopold Summerer

DIRECTORATE OF TECHNOLOGY, ENGINEERING AND QUALITY

The European Space Agency



Through European cooperation and with international partners

ESA Workforce
6000

Implements 60% of the European space budget
120+ unique missions
40+ missions upcoming

22
Member States

4 Associate Members
1 Cooperating State

2024 Budget

€ 7.79bn =
12 per European



The global context for space is shifting ...

Space sector is undergoing a profound & accelerating transformation

- **New Actors & private investment:**
 - new players, increasing budgets, entrepreneurial approaches
- **Disruption/ industrialization/ risk taking:**
 - reusability, mega-constellations, connectivity, AI, quantum...
- **Space race:**
 - in exploration and security & dual use
- **Importance of Space assets:**
 - climate, security, competitiveness, energy, digital, autonomy...



Disruptive Ideas

- Taking risk
- Low budget
- Fast and Open
- Novelty driven
- Commercialisation
- Research, studies and tech.dev
- Outside driven (OSIP)
- Open competitive

Discovery

Future Missions

- Solid baselines
- Smart Customer
- For all domains
- (Pre-)Phase A
- MBSE, ODebris, LCA
- Commercialisation
- ESA driven
- Open competitive

Preparation

Technology

- low TRL
- Generic
- Missions enabling technology
- 2yr Work plans
- SME focus
- ESA driven
- Open competitive

TDE

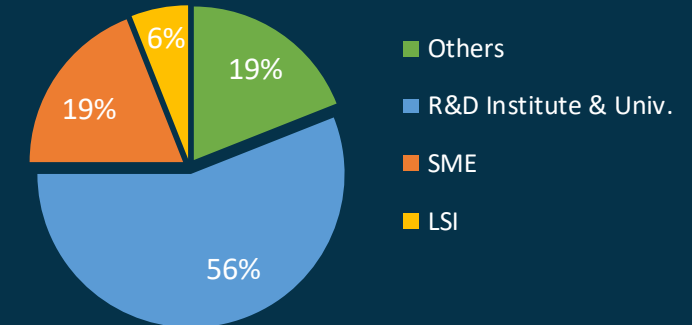
- higher TRL up to 9
- Support
- Competitiveness
- Work plans and industry-driven
- SME focus
- Delegation support
- 3 Elements:
develop, make, fly
+ Components

GSTP

Discovery Element

- **Open Science** – Open innovation to discover and explore the disruptive innovation of tomorrow
- **Activities via Open Space Innovation Platform (OSIP)**
 - External driven - Reaching out for best ideas from anybody
 - Lowest ever entrance barrier to space innovation
 - Inverted logic: first smart idea, then the process
 - Fast feedback, engagement and decisions
- **Exploratory first steps funded:**
 - co-sponsored research, studies and early technology development activities
- Integrates Commercialisation objectives of Agenda 2025

→ DISCOVERING TOMORROW'S INNOVATION



Discovery year in numbers:

~150 activities	100% Industry/Academia driven Open Competition	~15m€ contracts	~75% SME's, R&D inst. and academia
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FIRST STEPS FOR NOVEL IDEAS – DISCOVERY ELEMENT PROCESS STEPS



Your Novel Idea

Your action

- You focus on describing your idea in form of an abstract
- No need for formalities
- Submit any time to Open Discovery Channel on OSIP
- Ideas for future commercially viable activities welcome

OSIP Channel

- Permanently open
- All novel space ideas welcome

OSIP Campaigns

- Time limited
- ESA defined challenges / topics



OSIP (ideas.esa.int)

- ESA gives you feedback
- ESA channels ideas to best implementation path
- Monthly evaluation for Discovery channel ideas
- Best ideas invited to be matured into proposals

<https://ideas.esa.int>



Discovery Contracts

- Following competitive evaluation
- Co-sponsored research (<90k)
- Study (<100k)
- Early Technology Development (<175k)

GSTP, InCubed, ARTES, NAVISP, ScaleUp, BASS, ...

- Programme specific

DISCOVERY AND PREPARATION VIA OPEN INNOVATION

LATEST CAMPAIGNS

3575 IDEAS



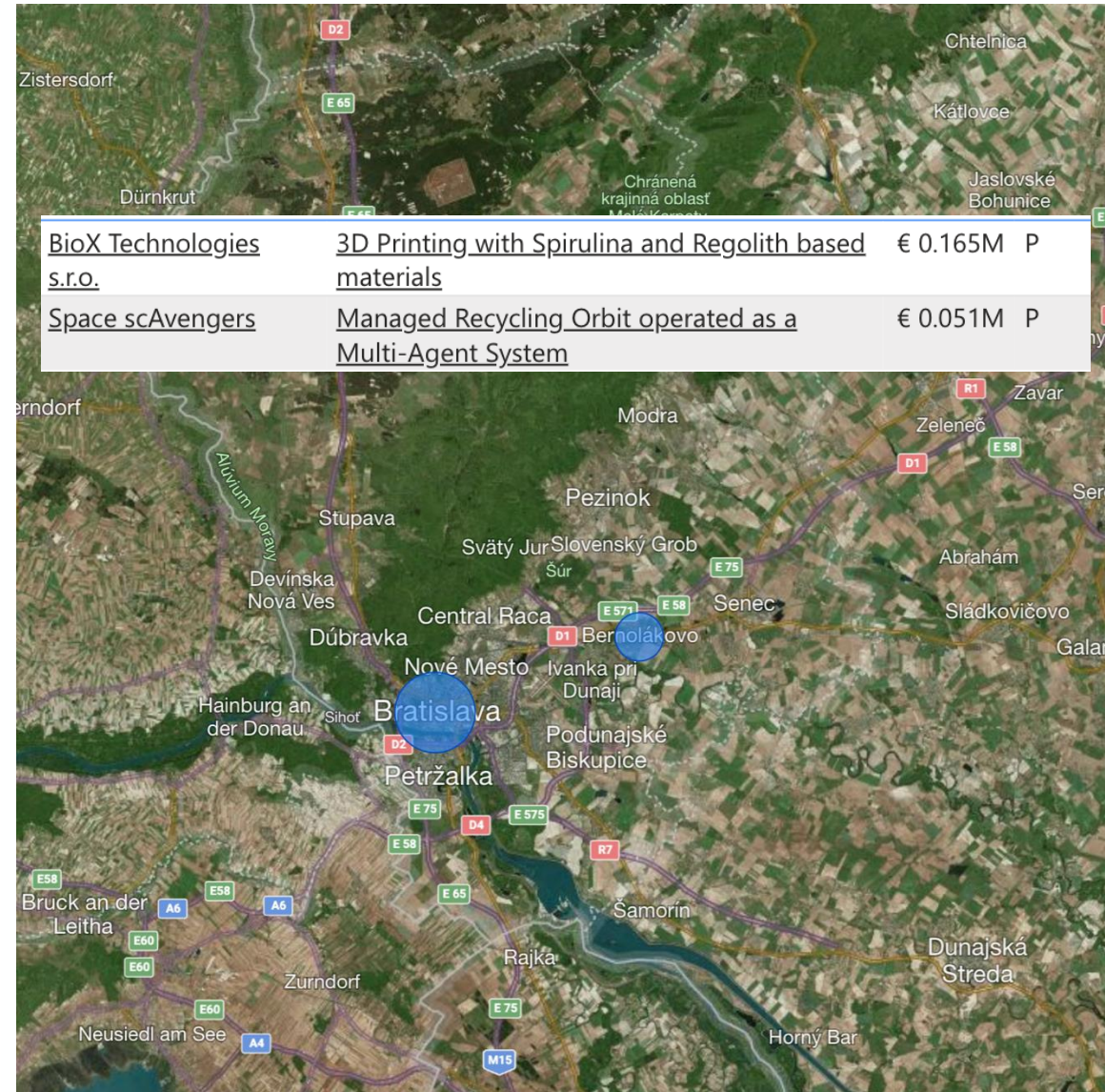
<https://activities.esa.int>

<p>SWARMS OF CUBESATS</p> <p>74 7</p>	<p>ONBOARD SOFTWARE</p> <p>106 14</p>
<p>SPACEWEATHER NANOSATS</p> <p>47 5</p>	<p>SPACE 4 GREEN FUTURE</p> <p>75 3</p>
<p>NEW MISSION CONCEPTS</p> <p>201 8</p>	<p>COGNIT. CLOUD COMP.</p> <p>68 12</p>
<p>RFI FOR IOS MISSION</p> <p>17 4</p>	<p>COMMERC. OF PATENTS</p> <p>15 7</p>

6 IDEAS



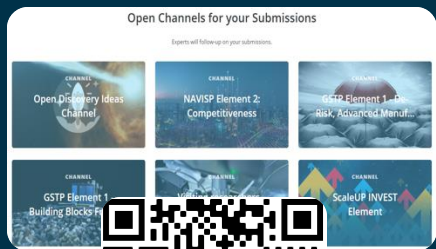
<https://activities.esa.int>



Useful links



- Channel and Campaign.
- Entry to Discovery Element
- Submission of pre-proposals and outline proposals for GSTP.



ESA UNCLASSIFIED - For ESA Official Use Only



- Registration of new companies
- Invitations to tenders.
- News/Procurement related announcements: TDE WP, GSTP Compendia Publication



Activities Portal

- Running activities
- Visibility on interim results and publications
- Updated by contractor
- Simplified interaction with ESA



Discovery and Preparation

- Discovery & Preparation
- Highlights



shaping the future

- TDE/GSTP information
- TDE/GSTP achievements
- Reports & highlights



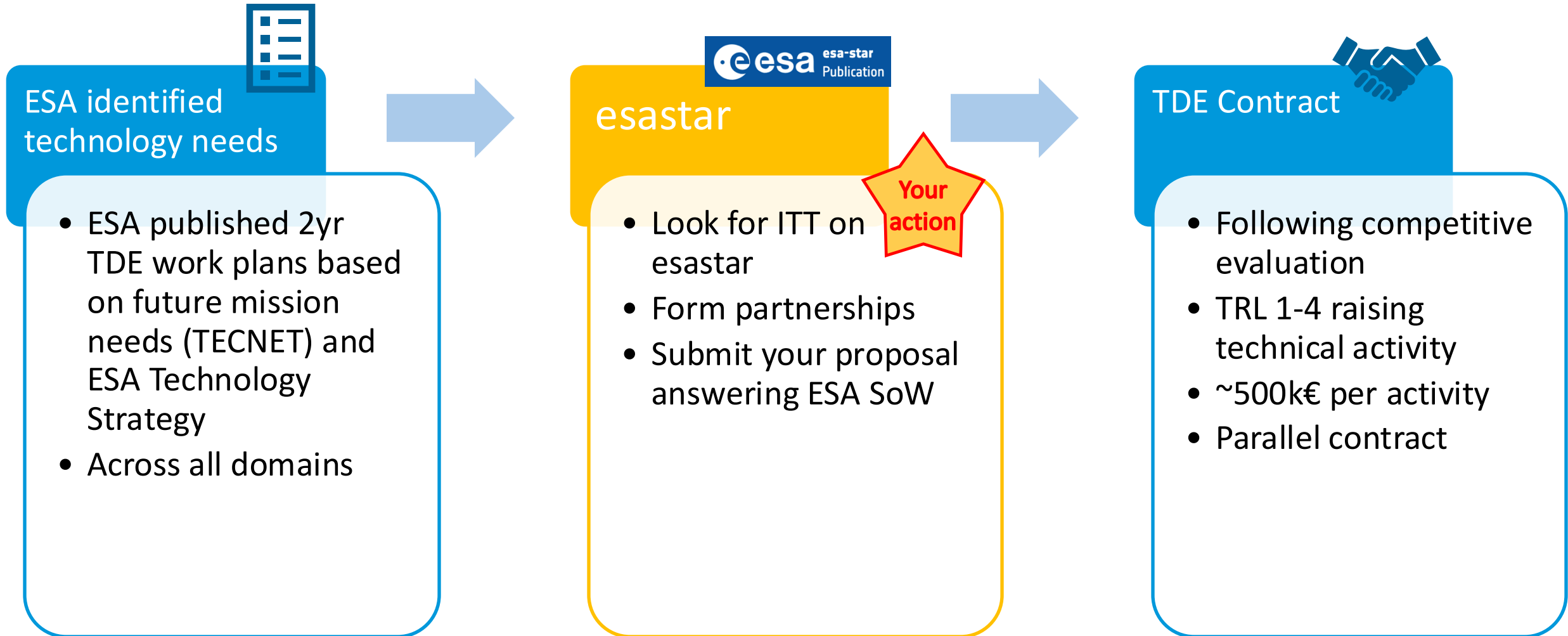
Nebula Public Library

The knowledge bank of ESA's R&D programmes

- Discovery, Preparation activities achievement summary
- TDE and GSTP coming soon.



Backup Slides



GSTP Structure



Element 1: Develop

Supports technology developments up to qualification, capacity building & ESA technology aims.



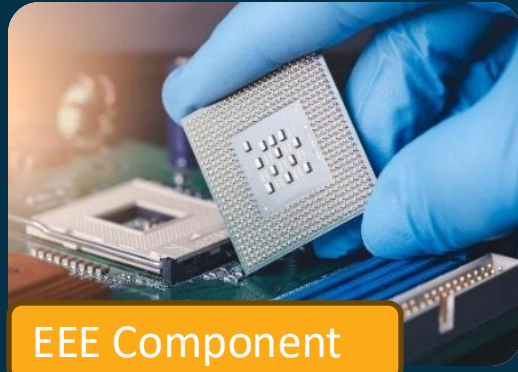
Element 2: Make

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



Element 3: Fly

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



EEE Component

Space Component Sovereignty for Europe



ENDURE Component

EuropeaN Devices Using Radioisotopes



Precise Formation Flying Component

Implementation of phases C/D/E of the PROBA-3 mission



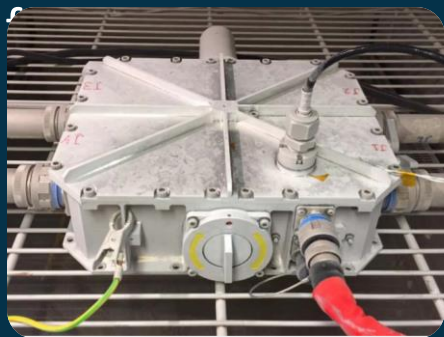
GSTP Element 1 - Workplan



Maturing technology from proof of concept to qualification

- Technologies for space and ground segment payload, platform, ground equipment, engineering tools
- Mainly ESA driven
- Procurement in Competition and in Direct Negotiation
- 100% funded, co-funding possible
- Activities draw from Compendia
- ad-hoc activities from delegations/industry and

- **2023: 80 new technology development activities (70M€)**
- **~75 new activities per year presented to IPC**



GSTP Element 1 "Develop" Compendia 2022

- **ESA Driven:**
 - Generic Technologies
- **Industry proposed:**
 - Artificial Intelligence
 - Digitalisation
 - Quantum Technologies
 - Cybersecurity





GSTP Element 1 Frameworks

De-Risk

[De-risk] - GSTP Element 1 "Develop" Call for Proposals: Assessments to Prepare and De-Risk Technology Developments Framework (G617-241TA)

Submit Your Idea

OSIP Channel GSTP De-Risk



Procurement using a template

- Max 250k€
- Max 9 months

Follow-on using a template

- No budget limit
- No duration limit
- ~ 35% de-risk are continued

~40 de-risk initiated / year

> 200 de-risk so far
~ 35M€ total budget

Building Blocks

[Building Blocks] - GSTP Element 1 "Develop" Standard Call for Proposals: Preparation of enabling space technologies and Building Blocks (GT17-500TI)

Submit Your Idea

OSIP Channel GSTP BB



Procurement using a template

- Max budget: €1 M
- Max duration: 24 months

~20 activities initiated / year

100 activities so far
~ 43M€ total budget

EEE Framework coming soon in OSIP





GSTP Element 2



Announcement Of Opportunity

→ GSTP Element 2 dedicated towards industry driven co-funded activities enabling the development of technologies and products for market competitiveness and sustainability

→ Industry is invited to submit proposals addressing one of the 3 technology and product development segments:

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

The image shows a screenshot of the ESA OSIP (Open Space Innovation Platform) website. The main heading is 'Market Oriented Activities - GSTP Element 2 "MAKE"'. Below it, there is a 'Submit Your Idea' button. To the right of the screenshot is a QR code. Above the screenshot is the OSIP logo and the text 'OPEN SPACE INNOVATION PLATFORM'. Below the screenshot is a white box with the text 'OSIP Channel GSTP Element 2'.

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





GSTP Element 3

Facilitate Technology Demonstrations

The main objectives related to Element 3 are to:

- Ensure the successful implementation of the **Missions** and **In-Orbit Demonstrations**
- 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

