



MEDIA INFORMATION

Bruxelles, 28 January 2025

The winners of the sixth edition of the Telespazio Technology Contest #T-TeC

CATEGORY: IDEA

1st Place: **LiNbO₃-based Photonic FFT Processor**

Theme: Innovative Electro-Optical Technologies and Solutions for Remote Sensing

Team: **Annarita di Toma, Giuseppe Brunetti (Optoelectronics Laboratory of Politecnico di Bari)**

Description: This project focuses on developing an innovative optical processor for Synthetic Aperture Radar (SAR) data, leveraging lithium niobate technology. The solution ensures greater compactness, lightness, and higher performance compared to traditional SAR systems, aligning with the constraints of the New Space Economy.

Award: €5,000 and participation in a pre-incubation program offered by cesah GmbH, with the potential to join the ESA Business Incubation Centre selection process.

Pre-Incubation Program: **GHOST – Geostationary Hazard Observation and Surveillance Technology**

Theme: Space Domain Awareness for the Protection of Space and Ground Infrastructures

Team: **Tom Love, Gianluca Borgo, Angelika Kochajkiewicz, Harry Johnson, Georgia Skelton, Kian Patel (University of Southampton, UK)**

Description: The GHOST project proposes an innovative payload that enhances imaging and tracking capabilities in geostationary orbit without requiring the satellite to perform maneuvers.

Note: Due to its strong commercial potential, the GHOST team will also participate in the pre-incubation program by cesah GmbH.

Special Mention: **Graphene-gold nanostructures for innovative optical propulsion systems**

Theme: Space Exploration and Extra-terrestrial Exploitation

Team: **Teresa Crisci (Università degli Studi di Napoli Federico II, IT), Sergio Balestrieri (CNR - Istituto di Scienze Applicate e Sistemi Intelligenti, IT)**

Description: The project explores an innovative optical propulsion system for CubeSats, using plasmonic nanostructures made of graphene and gold.

Sustainability Mentions:

1. **Making the future of Space Exploration sustainable with a circular economy system**

Theme: Space Exploration and Extra-terrestrial Exploitation

Team: **María Paula Pulido González, Diana Andrea Espitia Torres, Luis Alejandro Riaño Molina (Universidad de la Sabana, Colombia)**

Description: Aims to produce zero-emission rocket fuel by reusing all by-products in a closed circular system, integrating water desalination, green hydrogen production, methane generation, and space solar power.

2. **NO₂ACID - Tropospheric balloon to reduce NO₂**

Theme: In Orbit Servicing towards a Circular Economy in Space

Team: **Kinga Kaim (Cracow University of Technology, Faculty of Architecture, PL), Gabriela Kowalik (Academy of Fine Arts in Kraków, Department of Industrial Forms, PL), Prakruthi Kacchigere Prakash (Alva's Institute of Engineering and Technology, IN)**

Description: A concept aiming to reduce nitrogen dioxide levels (NO₂), which cause acid rain and lead to ecosystem damage, soil degradation, and the corrosion of structures.

CATEGORY: PROTOTYPE**1st Prize: ASTRO – Advanced Space Tethers for Remote Sensing Operations**

Theme: Innovative Electro-Optical Technologies Solutions for Remote Sensing

Team: **Stefano Aliberti, Riccardo Apa, Catello Leonardo Matonti (Politecnico di Torino, IT)**

Description: ASTRO proposes a tethered satellite system optimized for Multi-Input Multi-Output Synthetic Aperture Radar applications. It employs patented stabilization technology to address challenges in satellite constellations, such as collision risks and relative positioning errors.

Award: €10,000 and participation in one of the 2025 batches of the Seraphim Space Camp Accelerator, managed by Seraphim Space.

2nd Prize: P³ANDA (Panchromatic Plug-n-Play AI-eNabled Data Assembly)

Theme: Innovative Electro-Optical Technologies Solutions for Remote Sensing

Team: **Roberto Del Prete, Domenico Barretta, Alessandro Crispiels (Università di Napoli Federico II, Università della Campania Luigi Vanvitelli, Politecnico di Milano, IT)**

Description: This project develops a compact assembly integrating a panchromatic imager with AI-based algorithms and data preprocessing tools, tailored to meet the needs of small-satellite integrators and Earth Observation providers.

Award: €6,000 and a pre-incubation program with cesah GmbH, opening doors for ESA Business Incubation Centre participation.

3rd Prize: ARDITO – A Modular and Sustainable Rover

Theme: Space Exploration and Extra-terrestrial Exploitation

Team: **Enrico Sabbatini, Federico Fantastico, Ludovica Giacconi, Stefano Giulianelli, Damiano Carra (Politecnico di Torino, IT)**

Description: ARDITO is an advanced modular rover platform designed for lunar exploration, featuring flexible architecture, autonomous operation, and swarm coordination. Its modularity allows for in-situ upgrades and mission reconfiguration.

Award: €4,000

TEST-IT AWARD**RAYSILIENCE - Backup Solution For GNSS Denied Navigation**

Theme: Positioning, Navigation, and Timing (PNT) Solutions

Team: **Alessio Mastrogiramo, Samuele Ebano, Enrico Cestra, Nicolò Giandinoto, Emanuele Di Matteo (Sapienza Università di Roma, IT), Jacopo Alati (LUISS Guido Carli, IT)**

Description: RAYSILIENCE offers an alternative navigation system for GNSS-denied scenarios, using satellite imaging and data interpolation. Designed for autonomous air vehicles, it addresses a critical challenge in autonomous navigation.

Award: Funding for a Proof of Concept by Leonardo.

SPECIAL MENTION**eXplainable Artificial Intelligence (XAI) for Space Application Solutions**

Theme: Space Domain Awareness for the Protection of Space and Ground Infrastructures

Team: **Cheyenne Powell (University of Strathclyde, UK)**

Description: This proposal presents an AI framework designed to enhance explainability and transparency in decision-making for critical space applications.