



# **Rakia Mission's Involvement in Ax-4: Impact Review**






Axiom Mission 4 marked the return to human spaceflight for India, Poland, and Hungary, with each country launching its first government-sponsored astronaut in over four decades. It was the first time all three nations conducted a mission aboard the International Space Station, highlighting the growing global accessibility to low-Earth orbit missions.

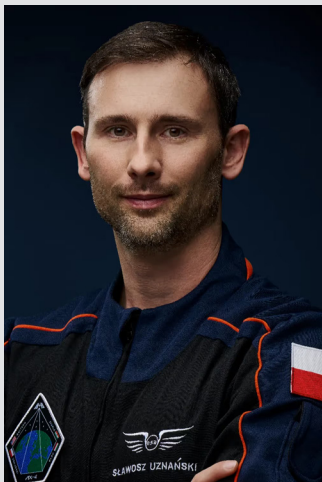
As part of this historic flight, the Rakia Mission joined Ax-4 to support science, educational outreach, and international collaboration efforts, with a focus on amplifying public engagement and societal impact. Building on the success of its involvement in Ax-1, Ax-2, and Ax-3, Rakia continued to advance its mission of connecting human spaceflight to meaningful public impact.



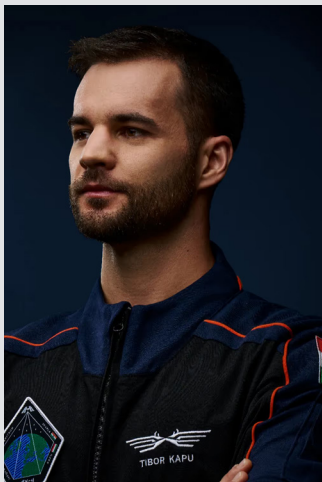
**Peggy Whitson**   
Commander




**Shubhanshu Shukla**   
Pilot



**Sławosz Uznański-Wiśniewski**   
Mission Specialist



**Tibor Kapu**   
Mission Specialist

**8.4M** Miles of Spaceflight  
**320** Orbits Around the Earth

More Than **60** Research Activities  
**23** Outreach Events  
**20** Mission Days



## From Tel Aviv to Budapest: Rakia–HUNOR Partnership



Presenting the potential of public private collaboration in space



Rakia Mission team in Hungary: meeting the astronaut candidates

Rakia was first approached by the HUNOR (Hungary Space Program) team in April 2023, with a request to share the knowledge and insights gained during the preparation for the Ax-1 mission. In September 2023, the Rakia team traveled to Budapest to meet with the four Hungarian astronaut candidates and the broader HUNOR team. During this visit, Rakia shared its experience in mission planning, public engagement, and impact modeling, and held working sessions to support Hungary's effort to send its second astronaut to space.

In October 2024, during the International Astronautical Congress (IAC) in Milan, Rakia and HUNOR signed a Memorandum of Understanding (MoU) to deepen their collaboration and formalize Rakia's ongoing support for the HUNOR program. Since then, the teams have met regularly, with Rakia providing strategic guidance on public outreach, and supporting the development of HUNOR's Payload Control Center and Visitor Center.



Rakia Mission and HUNOR Sign Memorandum of Understanding

## Observing from Space: The ILAN-ES and UHU Lightning Experiments

The ILAN-ES (Imaging Lightning and Nocturnal Emissions from Space) experiment builds on the legacy of MEIDEX (STS-107, 2003) and has flown on the Ax-1, Ax-2, and Ax-3 missions. Led by Prof. Yoav Yair of Reichman University, ILAN-ES captures transient luminous events (TLEs) such as sprites and elves from the ISS Cupola using astronaut-operated photography.

For Ax-4, ILAN-ES evolved into the UHU experiment, a joint campaign between the Rakia Mission and HUNOR (Hungarian Space Program), led by Prof. József Bór of the HUN-REN Research Centre for Astronomy and Earth Sciences.



Sprite taken from the ISS by astronaut Eytan Stibbe during Ax-1 Mission, 15 April 2022 08:32:54.48 UT.

UHU, named after the Eurasian eagle-owl, combines high-resolution ISS-based imagery with synchronized ground-based observations to study electrical phenomena above thunderstorms from multiple viewpoints.

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*"The RAKIA team helped us a lot in starting this project, which we haven't had experience with. Their support was invaluable in preparing to and carrying out the operational phase, e.g., in making target forecasts, training the astronauts, and facilitating communication with various support teams. They also provided useful hints and examples, upon which we could compile the national editions of the project-related educational materials."*

**Bór József, HUN-REN Institute of Earth Physics and Space Science – UHU leading researcher**

Ahead of the Ax-4 mission, Prof. József Bór and Prof. Yoav Yair, together with astronaut Eytan Stibbe and the Rakia team, provided dedicated pre-flight training to the entire Ax-4 crew. The sessions focused on the scientific goals of the lightning experiment, imaging protocols, and real-time visual identification of lightning, ensuring high-quality data collection during the mission.



The imagery and observational data collected during Ax-4 are now being analyzed by research teams in Hungary and Israel to advance understanding of upper-atmospheric electrical phenomena.



View from Space: Ax-4 Pilot Group Captain Shubhanshu Shukla at the Cupola Window

*"UHU was a natural continuation of the heritage of MEIDEX and ILAN-ES campaigns for TLE research. The collaboration between the Israeli and Hungarian teams in target selection and mission operations was invaluable for the successful implementation of the experiment. Thunderstorms are a global phenomenon, and as such, it merits international collaboration between many scientists, and UHU was a perfect example for this".*

**Prof. Yoav Yair, School of Sustainability, Reichman University – ILAN-ES leading researcher**

4

**Academic papers have been published on the ILAN-ES experiment**

26

**TLEs observation attempts during the mission**

7

**Presentations of ILAN-ES findings in professional conferences**

More Than 10

**ELEVES and Blue emissions observed**

Elves taken from the ISS by astronaut Eytan Stibbe during Ax-1 Mission

## Shared Mission for Space Education: From Tel Aviv to Lucknow

City Montessori School (CMS) in Lucknow, India, is recognized by the Guinness World Records as the largest school in the world, with more than 65,000 students. It is also the home institution of Group Captain Shubhanshu Shukla, pilot of the Ax-4 mission. In the months leading up to the mission, the Rakia team worked closely with CMS's dedicated and visionary staff to design an impactful educational and outreach program surrounding Shukla's historic journey to space.



Rakia Visit to Lucknow: Meeting with Chief Minister of Uttar Pradesh Hon'ble Shri Yogi Adityanath

As demonstrated during Ax-1, many of the most inspiring space-related activities for students do not require the astronaut to already be in orbit. Choosing a meaningful name for the mission, designing a symbolic mission patch, engaging students in art and science projects, and sparking curiosity about space history, astronaut training, daily life aboard the ISS, and human exploration — all of these can serve as powerful tools

to ignite imagination and learning. The Rakia team supported CMS in shaping its educational and outreach programs across its campuses, helping extend the mission's impact beyond the classroom and into the broader community. This included technical guidance in developing an operational control center, which served not only as a focal point for following the mission in real time, but also as a hub for interactive space education activities that made Ax-4 accessible and meaningful to thousands of students and families.

Ahead of the mission, astronaut Eytan Stibbe gave a keynote talk during CMS's Teachers' Thanksgiving Day event, sharing insights on how spaceflight can inspire the next generation. He also engaged directly with students, answering their questions and recounting moments from his time aboard the ISS during Ax-1.

Inspiring the Young Generation: Astronaut Eytan Stibbe with CMS Students





Just prior to launch, the Rakia team traveled to Lucknow for final preparations at the CMS control center. Melody Korman, flight operations manager for Eytan Stibbe during Ax-1, addressed the school's volunteers and explained the inner workings and complexities of space mission planning. Yuval Malul, head of Rakia's student space community "Space Campus IL", led outreach activities and laid the foundation for future student collaborations between Israel and India.

Throughout the duration of Ax-4, the Rakia team continued to support CMS, offering guidance, materials, and live updates. The collaboration culminated in a live splashdown event, where Rakia provided a real-time explanation of the re-entry and landing process—addressed especially to Group Captain Shukla's family, who were seated in the audience.



*"Rakia team's support made all the difference. They helped us set up our Mission Control Centre, guided us to the right resources, and kept us informed at every stage.*

*We also have such fond memories of their visit to Lucknow on a possible launch day. It made the mission feel personal, and our students loved knowing that they were part of something that reached far beyond our city.*

*This collaboration has not just taught our students about space — it has shown them what international friendship, teamwork, and shared human curiosity look like. For that, we are truly grateful."*

**Sushama Rajkumar**  
**Dean, Cambridge Education**  
**City Montessori School, Lucknow**



Rakia Mission team in CMS Mission Control Center



Mission Control, Lucknow: Facilitating Live Communication and Community Outreach

CMS and Rakia are committed to continuing their collaboration around space education, aiming to develop new joint initiatives that inspire students, promote cross-cultural learning, and expand access to space-related knowledge and experiences for youth in both India and Israel.

## Vyomotsav – CMS Space Fest 2025

**2** visits of Rakia team to Lucknow

More Than **400** students participated in Rakia team sessions

**3500** teachers - attended Eytan Stibbe's talk on using space for education

More Than **5000** students engaged in launch and splashdown events at Lucknow

More Than **10,000** student reached through Ax-4 activities in Lucknow via CMS–Rakia collaboration



# UN SDG's Using Space for Global Impact

The Rakia Mission is deeply committed to aligning its activities with the United Nations Sustainable Development Goals (SDGs), recognizing the unique role space can play in advancing education, innovation, international cooperation, and global equity. Throughout the Ax-4 mission, Rakia's initiatives contributed meaningfully to several key SDGs by leveraging human spaceflight for impact on Earth.

Key SDGs advanced through Rakia's Ax-4 activities:



## SDG 4 – Quality Education

Through its collaborations with CMS in India and HUNOR in Hungary, Rakia promoted inclusive, hands-on learning experiences that brought space exploration to life for thousands of students and educators.



## SDG 9 – Industry, Innovation and Infrastructure

By supporting the development of a payload control center in Budapest and educational space centers in Lucknow, Rakia helped strengthen both scientific and public engagement with space-related innovation, contributing to the foundation of future scientific infrastructure in emerging space nations.



## SDG 10 – Reduced Inequalities

Rakia's partnerships with nontraditional space stakeholders, such as CMS in India and HUNOR in Hungary, reflect its commitment to broadening access to space engagement and scientific inspiration, regardless of geography or socioeconomic background.



**SDG 13 – Climate Action**

As climate change intensifies, lightning activity is expected to increase in both frequency and severity - posing greater risks to human life, infrastructure, and ecosystems. The ILAN-ES and UHU experiments, supported by Rakia across multiple missions, deepen scientific understanding of thunderstorms and upper-atmospheric electrical activity, providing data to support global monitoring of climate-related risks.



**SDG 17 – Partnerships for the Goals**

By fostering long-term collaborations with organizations like HUNOR, CMS, and international researchers, Rakia demonstrated the power of cross-border partnerships to amplify impact and promote shared progress in science, education, and outreach.







## Sharing the Story: Rakia’s Media Engagement During Ax-4

During Ax-4, Rakia’s involvement in international collaborations and educational activities was featured in a range of media stories, helping share the broader impact of the mission with the public:

10

media articles  
covering Rakia’s  
involvement in  
Ax-4

35

social media  
posts published  
across Rakia’s  
channels during  
the mission

10.5K

social media  
impressions  
on Rakia’s Ax-4  
content



## From Ax-1 to the Future: Rakia and Axiom Partnership

Rakia, a Public Benefit Corporation, is dedicated to advancing and developing the space sector in Israel through local and international partnerships, with a focus on human spaceflight. From leading the Israel Space Forum to founding Space Campus IL, Rakia is driven by the belief that space should be accessible to all – serving as a source of inspiration, innovation, societal impact, and artistic exploration.

In 2023, Rakia joined Axiom Space’s Access Program as Israel’s official representative. This ongoing collaboration is designed to strengthen Israel’s integration into the global space ecosystem, expand opportunities for human spaceflight and space-based research, and amplify the broader impact of space exploration across education, science, culture, and the arts.

AXIOM  
SPACE

vce

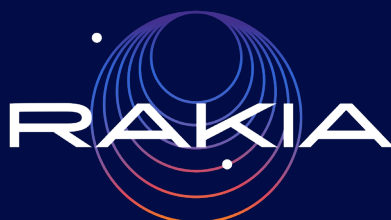
CMS  
CITY  
MONTESSORI  
SCHOOL



HUNOR



אוניברסיטת  
רייכמן



For more information, contact us at:  
[www.rakiamission.com/home-en](http://www.rakiamission.com/home-en)