VISEGRAD SPACE ANALOGUE CHALLENGE

HYDRONAUT H03 DEEPLAB, Prague, **01–03.11.2024**

DETAILS ON THE MISSION OBJECTIVES

The Visegrad Spaceflight Analog Challenge aims to engage high school students from Czechia, Hungary, Poland, and Slovakia in a realistic spaceflight mission simulation. This unique opportunity is designed to ignite a passion for human spaceflight and exploration, mirroring the efforts of Visegrad countries preparing astronauts for missions on the International Space Station. The mission provides participants with hands-on experience in international collaboration on space-related scientific and technological projects. Students will develop teamwork and cooperation skills across different countries, reflecting the collaborative nature of real-world space missions. This valuable experience will enhance their proficiency in Science, Technology, Engineering, and Mathematics (STEM) through practical, hands-on projects and problem-solving activities, benefiting their future professional development and career aspirations in the space industry and related fields.

The opportunity consists of two challenges for which students can apply: 1) Analogue Astronaut and Mission Control Teams Selection; 2) Scientific and Technological Experiments Selection.

1. ANALOGUE ASTRONAUT AND MISSION CONTROL TEAMS SELECTION

The competition is open to **teams of 8 individuals** from Czechia, Hungary, Poland, and Slovakia, consisting of:

- **Analogue Astronaut Candidate:** An individual selected to serve the role of an astronaut during a simulated crewed mission. Four candidates (one from each Visegrad country) will spend 24 hours in the Hydronaut facility, collaborating and working on scientific and technological projects. This role has an age limit of >18 at the time of the mission.
- **Flight Director**: The leader of the mission control team supporting their analogue astronaut. Responsible for leading and managing the mission control team and coordinating with teams from other countries to ensure mission success.
- **Payload Communicator**: Acts as the primary liaison between the mission control team and the analogue astronaut regarding payload operations. Communicates detailed instructions, updates, and troubleshooting information about scientific experiments and equipment. Relays data and status updates from the crew back to the mission control team.
- **IT Ground Control**: Manages and maintains the technological infrastructure that supports mission operations. Ensures the functionality and security of computer systems, networks, and communication links between mission control and the Hydronaut facility central control. Collects mission progress information, addresses issues, and summarizes them in a post-mission report.
- **Payload Specialist for Scientific Experiment**: Coordinates and oversees selected scientific experiments during the space analogue mission. Works closely

with experiment principal investigators and the mission control team to ensure proper experiment planning and adherence to protocols. Monitors real-time data acquisition, analyzes results, and provides updates to the mission control team and principal investigators.

- **Payload Specialist for Technological Experiment**: Oversees and manages the implementation of selected technology experiments during the space analogue mission. The role is similar to that of the scientific experiment payload specialist.
- **Communication and Public Affairs Officer**: The primary spokesperson for the team. Manages social media and creates content to share real-time updates, photos, videos, and stories from the mission. Engages with the public through Q&A sessions, live streams, and interactive posts to foster interest and enthusiasm about the mission and facilitate its impact.
- **MCC Back-up:** A person serving as a potential back-up for Flight Director, Payload Communicator, Payload Specialist, Communication and Public Affairs Officer, or IT Ground Control, in case someone from the team will be indisposed (sickness, etc.).

Please note that it is not required for all team members to be from the same school, but the mission control center team needs to work together in person during the mission. The only age requirement applies to analogue astronauts, who must be adults at the time of the mission.

The **selection process** will have several steps:

A. **Reception of CVs, Motivation Letters, and Recommendation Letters**:
All seven team members must send their own CV and motivation letter. Additionally, they must provide two recommendation letters, one from their parents (or legal guardian) and one from their teacher, expressing support for the individual's involvement in the mission. Analogue astronaut candidates are required to submit also a medical evaluation equivalent to PADI license requirement.

   - Analogue astronaut candidates are highly encouraged to visit the Hydronaut | Project facility at their own expense during September and early October. The dates for this opportunity will be announced in early September. If this is not an option, we require applicants to truthfully assess their ability to spend time in isolation and explain it in their own motivation letters and in recommendation letters from teachers and parents. The habitable area, which will be shared among four individuals for 24 hours, has a diameter of 2.6 meters and a length of 4.8 meters, making it approximately 20 square meters. This environment could be considered stressful and unsuitable for some individuals, especially those who are claustrophobic.

B. **Online Individual Test**:
Analogue astronaut candidates will take an online test examining cognitive skills, technical knowledge, scientific knowledge, language skills, and mental arithmetic. The top 20 candidates (five from each country) will be invited to the third round.

C. **Online Group Test**:
Groups of four analogue astronaut candidates (one from each country) will be invited for a 20-minute task to solve problems together. The analogue astronauts must cooperate remotely with their own mission control center teams. Performance will be evaluated by a panel of experts:

- Romain Charles - ESA Spaceship ECSAT Coordinator, member of the Mars500 analogue mission with experience in astronaut operations at the European Astronaut Center.
- Assoc. Prof. Iva Poláčková Šolcová, PhD - Social psychologist and scientist focusing on space analog psychology (Mars500, SIRIUS, AQUAKOSMOW).
- Matej Poliaček - Flight operations engineer at DLR in ISS Columbus Flight Control team with experience as a crew commander in the LunAres analogue mission.
- Robert J. Cenker - Former astronaut, American aerospace and electrical engineer, and aerospace systems consultant. He was part of two NASA's Space Shuttle missions as a Payload Specialist.
- And possibly more...

D. Final Selection:
Four candidates (one from each country) with their respective teams will be selected to participate in a 24-hour mission held at the Hydronaut facility in Prague.

- Additionally, a back-up teams will be selected, in case the main crew members are indisposed.

2. SCIENTIFIC AND TECHNOLOGICAL PROJECTS

High school students from Czechia, Hungary, Poland, and Slovakia will have the opportunity to apply with space-related projects and experiments in science and technology. Suitable fields include (but are not limited to) environmental sciences and sustainability, agriculture, engineering, life sciences, psychology, and medicine in a space-exploration context. Selection criteria include feasibility, scientific value, economic and ethical considerations, and the complexity of operations and logistics.

Potential aspirants are highly encouraged to connect with schools, universities, companies, and start-ups to utilize innovative technology, measurement devices, and other resources. Some of the potential resources that could be used within the mission are:

- **VERONIKA nano-satellite**
(New Mission: Veronika - SPACEMANIC; information about access in Slovak/English language: Tretia slovenská družica mieri do vesmíru. Všetky informácie na jednom mieste. - kozmonautika.sk)
- **VR simulation of a spacewalk** on the Moon
- **Biomedical data monitoring**
(Opportunity for real-time monitoring and data collection - specifics will be discussed on an individual basis.)
    - Please note that all research projects requiring collection of data from analogue astronauts will require ethics approval. You will be given appropriate forms to fill out and accompany with your project proposal at the beginning of competition (early September).

Individuals or teams are expected to apply with the following:

- **CVs, Motivation Letters, and Recommendation Letters:** Individuals or experiment team members must send their own CV and motivation letter. Additionally, they must provide two recommendation letters, one from their parents (or legal guardian) and one from their teacher, expressing support for the individual's involvement in the mission.
- **Experiment Proposal:** A template will be released early in September.

For more information, please contact us at info@v4kosmos.org, and/or to the e-mail of country representatives:

CZ:	Lucie Ráčková:	rackova.lucie@gmail.com
HU:	Dorotthya Milankovich	dorottya.milankovich@gmail.com
PL:	Kinga Gruszecka	kinga.gruszecka@pspa.pl
SK:	Matúš Toderiska	matus.toderiska@sosa.sk