IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
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SPOCS PROGRAM UPDATE: ENABLING CITIZEN SCIENCE INVOLVEMENT IN SPACE STATION RESEARCH BY ENGAGING UNITED STATES UNIVERSITY STUDENTS

Abstract

Student Payload Opportunity with Citizen Science (SPOCS) is a competition that provides the opportunity for student teams at United States institutions of higher learning to conduct research on the International Space Station, focusing on themes of bacteria resistance and sustainability. This program is co-created by NASA's STEM on Station in the Office of STEM Engagement, Nanoracks, which facilitates payload integration and training, and its sister company, DreamUp, which provides educational support. The primary mission of SPOCS is to enable students to participate in Space Station science directly and to engage their communities through outreach efforts.

After delaying the proposal period due to COVID-19, the SPOCS organizers re-released a call for proposals, held an additional informational webinar, and collected letters of intent from prospective teams by September 14, 2020. The student teams then submitted full written proposals by October 16, 2020. Along with detailed plans for the experiment's science, design, build, and safety considerations, the proposals required plans for community outreach and citizen science involving K-12 students, or a subset, as co-experimenters. An expert panel reviewed these proposals and selected ten finalist teams.

Next, SPOCS organizers held a finalist workshop virtually on December 10, 2020 to choose the five winning teams that will launch their experiments to the Space Station. The finalists gave an oral presentation and answered questions from DreamUp staff, Nanoracks mission managers, and members of NASA's Office of STEM Engagement.

The five experiments selected for SPOCS on December 14, 2020 were:

- Arkansas State University – "Microgravity Environment Impact on Plastic Biodegradation by Galleria mellonella"
- Columbia University – "Characterizing Antibiotic Resistance in Microgravity Environments"
- Stanford University – "Biopolymer Research for In-Situ Capabilities"
- The University of Idaho – "Bacteria Resistant Polymers in Microgravity"
- The University of New Hampshire at Manchester – "Novel Methods of Antibiotic Discovery in Space"

The SPOCS program leverages expertise from DreamUp's previous competitive programs in partnership with national space agencies, such as the Überflieger competition launched in 2017 with DLR in Germany and the Tests in Orbit competition launched in 2019 with the UAE Space Agency. As the SPOCS finalist teams work with Nanoracks mission managers to prepare their experiments for launch, the

program organizers expect that the program's impact will reach far beyond the selected teams. Through citizen science and outreach, learners around the United States will be inspired to pursue science, technology, engineering, and mathematics courses and careers.