

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
On Track - Undergraduate Space Education (3)

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REFLECTIONS ON SPOCS: STUDENT PAYLOAD OPPORTUNITY WITH CITIZEN SCIENCE

**Abstract**

On November 26, 2022, SpaceX's CRS-26 mission launched from Kennedy Space Center, Florida, carrying 7,700 pounds of science, research, crew supplies, and hardware destined for the International Space Station. Among this cargo was the fifth and final payload from the Student Payload Opportunity with Citizen Science (SPOCS) activity. This payload, Novel Methods of Antibiotic Discovery in Space (NoMADS), was a Nanolab experiment built by students from the University of New Hampshire at Manchester (UNHM). SPOCS, a competitive opportunity funded by NASA's Office of STEM Engagement and made possible through partnerships with commercial companies DreamUp and Nanoracks, provided space station research opportunities focused on bacteria resistance and sustainability to five student teams from United States institutions of higher learning.

To execute their microgravity experiments, UNHM, in addition to the four other student teams from Arkansas State University, Columbia University, Stanford University, and the University of Idaho, all received 20,000 USD in funding, a payload opportunity via Nanoracks, and support from NASA experts, DreamUp, and Nanoracks. In addition to implementing their experiment, the teams were also tasked with engaging K12 researchers in their communities as citizen scientists as well as conducting outreach campaigns to create awareness of their research projects.

As part of the program, NASA conducted a detailed evaluation which chronicled the experiences of each student team as well as the program's impact on the participating students' knowledge, STEM identity, attitude, skills, and interests. In general, students experienced significant gains in their understanding of the International Space Station as an experimental environment of their research topic and of citizen science, and outreach. Students also reported moderate gains in their understanding of experimental design, data analysis, and communications of results of a scientific study as well as interest in NASA missions, NASA internships, other NASA opportunities and careers. This data shows the extensive impact that participating in a hands-on microgravity research opportunity has on students.

Lessons learned from this program, as well as the program's impact gleaned from this evaluation, serve as an informative case study for other space agencies and organizations implementing similar programs to engage their student population in space research and invest in building the capacity of their future workforce.