

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

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TESTS IN ORBIT- ONCE IN LIFETIME STUDENT EXPERIMENT COMPETITION IN UNITED
ARAB EMIRATES TO LAUNCH NANO LABS INTO INTERNATIONAL SPACE STATION

Abstract

The UAE Space Agency and Higher Colleges of Technology have been engaged in organizing “Tests in Orbit” in the United Arab Emirates (UAE). This competitive project is managed in conjunction with DreamUp, and the associated launch opportunity coordinated by Nanoracks via its Space Act Agreement with NASA. The program invited university student groups in the UAE to develop experiments focused in two areas – Life in Space and Energy in Space. A number of applications were received from teams of students representing various higher educational institutes in the UAE, and after a down-selection process, two university teams were ultimately chosen to launch their experiments to the International Space Station. This final selection was conducted by an expert panel at a workshop during the Global Space Congress in Abu Dhabi in March 2019. Subsequently, the student teams have been building their experiments, under the guidance of Nanoracks and the UAE Space Agency.

The winning Life in Space student experiment from New York University Abu Dhabi, is “Cytokine-Hematopoietic Stem Cell Interaction in Microgravity Environment (CHIME).” CHIME will study the effects of the microgravity environment on astronaut health including the impact on bone cells, muscle cells, and blood cells, and how to circumvent these potentially negative effects to ensure the optimal health and safety of astronauts during prolonged exposure to microgravity. The winning Energy in Space experiment, developed by students from Khalifa University, “The Effect of Micro-gravity on Coronary Nitinol Stents,” responds to the proposal’s call for students to test new power sources that could work well in a microgravity environment. With this investigation, these Khalifa University students will study the performance of Nickel-Titanium Stents when exposed to the conditions of the Space Station. Both of these experiments will be enclosed in a 1.5U Nanoracks Nanolab enclosure and are expected to launch to the Space Station by Spring 2021.

The approach of “Tests in Orbit” is one-of-a-kind, providing real time learning experiences not only to university students who will launch their experiments to the Space Station, but also to countless learners throughout the Middle East and the world, who will be inspired to also reach orbit. “Tests in Orbit” has already inspired a similar contest in the United States, NASA’s “Student Payloads Opportunity with Citizen Science (SPOCS),” which is currently open to proposals. This paper describes the methods and current status of the Test in Orbit program and the lessons learned during its course.