

21st IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT (D3)

Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and Development (1)

Author: Mr. David Thomas

Arizona State University, United States

Ms. Sheri Klug Boonstra

Arizona State University, United States

Prof. James Bell

Arizona State University, United States

Mr. Scott Smas

Arizona State University, United States

Mr. Dann Garcia

Arizona State University, United States

SPACE WORKS CHALLENGE: A MILO SPACE SCIENCE INSTITUTE CAPACITY BUILDING PROGRAM

Abstract

The MILO Space Science Institute ("MILO"; [1]) at Arizona State University is a non-profit research collaborative founded to enable more scientists and engineers, including those new to their fields, to develop payloads for and/or to conduct science-focused robotic space missions. MILO's primary goal is building a global consortium of members to self-fund science-focused space missions and to develop member's local space science and engineering workforce. To help stimulate a culture of innovation, MILO has established structured programs to build the capacity necessary to support space missions. A new program, called Space Works Challenge, is patterned on the highly successful ASU Space Works program [2].

Space Works Challenge is designed to fill the recognized gap between foundational academic discipline learning and industry workforce needs within the commercial, academic, and government space sectors. Student teams are mentored to learn and align to industry-standard practices, protocols, and procedures to help them become equipped with the unique skill sets that the space ecosystem will value. The program provides the framework and requirements for teams to ultimately produce a demonstration of critical functionality via prototypes, computer models, or through cumulative work published in the public domain. Each team's demonstration is unique, and responds to the mission challenge with instrumentation, fabrication, electronics, coding, and/or testing in space-like conditions.

Each Space Works Challenge session is offered in a 12-week session using a live, virtual platform. Teams (each of which could form the basis of a nascent company) prepare a business roadmap that shows how they are prepared for investment, market capture, and – potentially – direct participation in space missions. In the Design Review (week 4), teams present to a review panel the design, performance metrics, budgets, schedule, and test plan. Review panels consist of space professionals from academia, industry, and government who evaluate the design and progress toward completion, provide constructive feedback, and help identify and address risks.

A Test Readiness Review (week 10) demonstrates meeting requirements for safety, system demonstration, system operation, documentation, and mission assurance. Each team submits a video that documents pre-defined functions and features of the prototype system. The program culminates with

a demonstration event called Demo Day, where teams present their business roadmap and demonstrate capability through a series of live tests.

Through models like Space Works Challenge, MILO member organizations participate in space missions, enhance their workforce, and grow their innovation ecosystems.

References: [1] <http://miloinstitute.org>. [2] <https://resources.sw.siemens.com/en-US/case-study-nasa-lspace-academy>