

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Interactive Presentations - IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (IP)

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THE INNOVATION CHALLENGE: A NEW APPROACH TO PAYLOAD DEVELOPMENT

**Abstract**

The MILO Space Science Institute ("MILO") is a non-profit research collaborative founded to enable more scientists and engineers, including those new to their fields, to develop and conduct deep space robotic missions with high science return. MILO's primary goal is building a global consortium of members to self-fund science-focused deep space missions and develop member's local space science and engineering workforce. To stimulate a culture of innovation, MILO has established an Innovation Challenge model providing members with a structure to develop functioning science payload prototypes.

MILO works with members to execute an Innovation Challenge centered around a space science objective, such as building a lunar rover to perform in-situ resource utilization on the lunar surface culminating in a flight opportunity for mature payloads. This format energizes the academic and startup communities to create scientific mission concepts that meet the requirements of the challenge. Teams learn key skills throughout the challenge such as design thinking, creating the perfect pitch, systems engineering, and mission design. Once teams pitch their design concepts they are partnered with mentors to build functioning prototypes. These prototype payloads are then demonstrated in a realistic environment (simulated lunar surface) at Demo Day, performing a series of tasks to test the capabilities of the payloads.

A challenge consists of four phases:

1. Stakeholder Engagement: identify relevant space science challenge topics. Stakeholders work to guide teams toward relevant solutions.
2. Design: faculty-led teams receive training, go through ideation, and develop concepts for a Pitch event.
3. Prototype: teams go through two design reviews and build functioning prototype payloads to demonstrate capability at Demo Day.
4. Accelerate: teams learn systems integration and entrepreneurial principles. The goal is to mature prototypes into flight ready payloads to ride on a MILO mission or create viable startups.

The MILO Institute enables space exploration through global partnerships by:

- Facilitating knowledge transfer and producing skilled professionals;
- Encouraging global collaboration between university teams, industry, and government;
- Creating new opportunities for all people to engage in a thriving, innovation ecosystem.

The MILO Institute takes a new approach to advancing compelling space science. Through a challenge model, members of the institute participate in space missions, enhance their workforce, and grow their innovation ecosystems. MILO makes space science more affordable and provides a myriad of teaming opportunities.