

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift Off - Secondary Space Education (2)

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THE INNOVATIVE SYSTEM PROJECT FOR THE INCREASED RECRUITMENT OF EMERGING
STEM STUDENTS (INSPIRESS)

Abstract

The Innovative System Project for the Increased Recruitment of Emerging STEM Students (InSPIRESS) project, connected to the University of Alabama in Huntsville (UAH) undergraduate Integrated Product Team (IPT) class, provides the opportunity for high school students to design and develop a scientific payload for a conceptual NASA Science Mission Directorate mission of interest, via a science and engineering design challenge. Over the course of a semester, teams of high school students determine the science objective(s) of their payload in order to develop engineering requirements, develop alternative solutions and down-select using decision analysis techniques, apply science and mathematical theories to their payload's concept of operations in order to determine key design parameters, and understand the importance of effective engineering communication via reports and briefings delivered to external professional review boards. This process is similar to the one suggested in A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.

A unique feature of the InSPIRESS project is the interaction between undergraduate IPT project students and the InSPIRESS high school students. The undergraduates serve as team mentors, offering guidance and advice in the development of the science payload. Furthermore, the interim design reviews in the InSPIRESS project are staffed by the undergraduate students, which offers benefits for both the high school and the college students: while the high school students are questioned by individuals with an intimate knowledge of the proposed mission, the college students learn the roles, responsibilities, and expectations of a being a customer. Feedback from this experience has been positive on both sides.

An exciting new component of the InSPIRESS project is the Community Engagement Activity (CEA). The purpose of the CEA is to have the high school teams engage with the local community, usually the nearby middle and elementary schools, in activities that help explain the high school team's proposed payload design for the science mission. Through near-peer relationships with the high school students, the middle and elementary school students witness specific science and engineering concepts related to the project, and they learn how exciting and rewarding continued interest in science and engineering can be. In most of the participating high schools, the CEA has become their primary avenue for community outreach. Teachers, school administrators, and parents have all commented on the effectiveness of this component.