

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Enabling the Future - Developing the Space Workforce (5)

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AN ACADEMIC APPROACH TO DEVELOPING TOMORROW'S SPACE PROFESSIONAL

**Abstract**

The role of education in preparing future space science and engineering leaders is changing as commercial space is evolving as a global enterprise. Today's science and engineering students enter into the professional workforce with the expectation of technical knowledge, teaming skills, and immediate contribution. The Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado Boulder has evolved an approach to space education in academia beginning with NASA's Solar Mesosphere Explorer (SME) Mission, and further refined for the Student Nitric Oxide Explorer (SNOE) Satellite, the New Horizons Student Dust Counter (SDC), and most recently the Colorado Student Space Weather Experiment (CSSWE) Cubesat. The LASP "curriculum" centers on Science, Engineering, and Mission Operations – core elements in space research. This is done through: 1) immersing students in space engineering and mission operations project roles with mentorship by academic scientists and professional engineers; 2) professionally training in space disciplines supporting a systems perspective for the students; and 3) teaching within academic departments. This paper reviews the evolution of the approaches used to successfully incorporate teaching and training of space engineering and space science into the educational environment, identifying academic practices that have both failed and succeeded, on scales ranging from Cubesats to full NASA Missions. These lessons learned will benefit academic institutions considering the adoption of a program in space science, and at the other end of the spectrum describe techniques that will serve to enhance the practices of organizations currently engaged in space education.