

**NASA PLANETARY SCIENCE SUMMER SCHOOL: 25 YEARS OF PREPARING THE NEXT GENERATION OF PLANETARY MISSION LEADERS.** C. J. Budney<sup>1</sup>, L. L. Lowes<sup>1</sup>, K. L. Mitchell, A. M. Sohus<sup>1</sup>, T. D. Stelzner, and A. S. Wessen<sup>1</sup>, <sup>1</sup>NASA Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, California 91109.

**Introduction:** Sponsored by NASA's Planetary Science Division, and managed by the Jet Propulsion Laboratory (JPL), the Planetary Science Summer School prepares the next generation of engineers and scientists to participate in future solar system exploration missions.

**Project Evolution:** This program was first organized by JPL in 1989 as a week-long series of lectures at the California Institute of Technology with a one-day tour of JPL. This experience was conducted for 10 years, annually attended by 60-80 Post-Docs and PhD-candidates in planetary science who heard from cutting-edge researchers and networked with peers. In 1999, JPL evolved the experience to utilize JPL's emerging concurrent mission design "Team X" as mentors. With this model, participants learn the mission life cycle, roles of scientists and engineers in a mission environment, mission design interconnectedness and trade-offs, and the importance of teamwork.

**Participants:** Applicants are sought who have a strong interest and experience in careers in planetary exploration, and who are science and engineering post-docs, recent PhDs, and doctoral students, and faculty teaching such students. Disciplines include planetary science, geoscience, geophysics, environmental science, aerospace engineering, mechanical engineering, and materials science. Participants are selected through a competitive review process, with selections based on the strength of the application and advisor's recommendation letter.

The majority of students come from top US universities with planetary science or aerospace-related engineering programs, such as MIT, Brown University, University of Colorado, Georgia Tech, University of Arizona, Caltech, Stanford, UCLA, University of Michigan, and UC Berkeley. Almost one quarter of Planetary Science Summer School alumni from the last decade of the program are currently employed by NASA or JPL.

**The Planetary Science Summer School Experience:** Under the mentorship of a lead engineer (most recently, Dr. Charles Budney), students select, design, and develop a mission concept in response to the NASA New Frontiers Announcement of Opportunity. They develop their mission in the JPL Advanced Projects Design Team (Team X) environment, which is a cross-functional multidisciplinary team of professional engineers that utilizes concurrent engineering method-

ologies to complete rapid design, analysis and evaluation of mission concept designs.

30-36 students typically participate each year, divided into two summer sessions. In advance of an intensive week-long session in the Project Design Center at JPL, students select the mission and science goals during a series of eight weekly WebEx/telecons, and develop a preliminary suite of instrumentation and a science traceability matrix. Students assume both a science team and a mission development role with JPL Team X mentors. Once at JPL, students participate in a series of Team X project design sessions, during which their mentors aid them in finalizing their mission design and instrument suite, and in making the necessary trade-offs to stay within the cost cap. Tours of JPL facilities highlight the end-to-end life cycle of a mission. At week's end, students present their Concept Study to a "proposal review board" of JPL scientists and engineers and NASA Headquarters executives, who feed back the strengths and weaknesses of their proposal and mission design.

**Alumni Survey:** A survey of Planetary Science Summer School alumni administered in winter 2012/2013 provides information on the program's impact on students' career choices and leadership roles as they pursue their employment in planetary science and related fields. Results will be presented during the session, along with highlights of topics and missions covered since the program's inception.

**Implementation:** The Planetary Science Summer School is implemented by the JPL Education Office in partnership with JPL's Team X Project Design Center. URL: <http://pscischool.jpl.nasa.gov>