

The Lunar Exploration Summer Intern Program: Plugging Students into the Lunar Science and Exploration Pipeline. D. A. Kring^{1,3}, W. W. Mendell^{2,3}, A. J. Shaner^{1,3}, S. S. Shipp^{1,3}, and J. D. Tygielski^{1,3}, ¹Lunar and Planetary Institute, 3600 Bay Area Boulevard, Houston, TX 77058, kring@lpi.usra.edu, ²Johnson Space Center, Houston, TX, ³Center for Lunar Science and Exploration.

Introduction: After a long hiatus, NASA is returning humans to the Moon. The agency and its partners in academia, industry, and the international community are engaged in an exciting new exploration initiative designed to study the lunar surface robotically beginning in 2008 and with crewed landers before 2020. At the request of NASA, the National Research Council (NRC) has developed a set of science priorities for this lunar exploration initiative. In 2007, the NRC released a report that summarizes *The Scientific Context for Exploration of the Moon* (Figure 1).

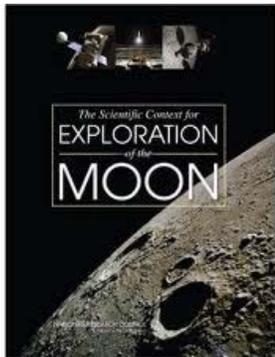


Figure 1. The National Research Council's 2007 document outlines the science priorities for lunar exploration.

To help integrate those science priorities with NASA's exploration program, the Lunar and Planetary Institute (LPI), in collaboration with the NASA Johnson Space Center (JSC), hosts a special summer intern program to evaluate possible landing sites for robotic and human exploration missions. Two teams of students work with LPI science staff and other collaborators to evaluate the best landing sites to address each of the NRC's science priorities. The Lunar Exploration Summer Intern Program is open to graduate students in geology, planetary science, and related programs. It is also open to undergraduates with at least 50 semester hours of credit in geology, astronomy, chemistry and/or physics.

Program Background: NASA's plan for lunar science and exploration requires talented young students to pursue lunar science related careers. Together, LPI and JSC have 32-year history of training young researchers through the LPI-JSC Undergraduate Intern Program. This 10-week research experience goes beyond a traditional internship, incorporating seminars

on selecting a graduate school and identifying a research advisor, and provides funding to enable presentation of results in an international forum. LPI and JSC scientists have trained more than 400 of these interns, 80% of whom remain in STEM-related fields, with 25% choosing planetary science careers.

In anticipation of an opportunity to be part of the NASA Lunar Science Institute (NLSI), the LPI-JSC team conducted a pilot Lunar Exploration Intern Program for students over the summer of 2008. The success of the pilot resulted in further funding for the program from the NLSI.

Student Activities: Each summer, two teams of five students work with LPI science staff and other collaborators to evaluate the best landing sites to address one of the science concepts in NRC reports. Armed with the goals one concept and engineering constraints, students identify potential landing sites for future human exploration. In the pilot program (2008) interns were tasked with identifying landing sites best suited for testing the lunar cataclysm hypothesis. In 2009, one team was tasked with identifying landing sites in the South Pole-Aitken Basin that would address as many of the NRC goals as possible while the other team identified landing sites best suited to answer questions related to lunar volcanism. To date, all eight of the concepts in the NRC document have been addressed by the Lunar Exploration Summer Intern program.

In addition to their research, students also interact with lunar scientists and engineers in weekly briefings – presentations about past, present, and lunar science and exploration.



Figure 2. 2011 interns attend a weekly briefing: *Microscopic Study of Apollo Thin Sections*.

Evaluation: Students were asked to complete a survey at the end of the 2010 and 2011 programs. The

purpose of this survey was to obtain feedback from the students on their experience. Results from these surveys will be discussed, but in general, students indicated the internship had a positive impact on their academic career.

Experience afforded by the intern programs shows that in recruiting future lunar scientists, we need to create ways to introduce students to the field of lunar and planetary science early in their education and influence career-path decisions. The LPI-JSC team's training efforts focus on expanding the number and diversity of students introduced to lunar science.

Additional Information: If you have any questions or need additional information regarding the Lunar Exploration Summer Intern program, please send an email to lunarintern@lpi.usra.edu.