ED13B-0820 Moon 101: Introducing Students to Lunar Science and Exploration

A. J. Shaner¹,2, S. Shipp¹,2, J. Allen¹,3, D. A. Kring¹,2

¹Center for Lunar Science and Exploration, ²Lunar and Planetary Institute, ³NASA Johnson Space Center

Contact: Andrew Shaner, 3600 Bay Area Boulevard, Houston, TX 77058, shaner@lpi.usra.edu

Moon 101 is designed with the purpose of familiarizing students with current and evolving scientific understanding of lunar history, geology and exploration and to prepare them to undertake open-ended lunar research projects. Armed with guiding questions, students read articles covering various lunar science topics and browse images from past and current lunar missions to familiarize themselves with available lunar data sets. Students build knowledge of lunar geology and exploration and apply this new knowledge at the end of Moon 101. At this time, students present their interpretation of the geology and chronology of features found within selected images of the lunar surface. Their newly-acquired knowledge and interpretation skills can then be used to conduct student-driven research. Originally designed for high school students, Moon 101 is highly appropriate for the undergraduate classroom, especially at the introductory level where resources for teaching lunar science are scarce.

The following lunar science topics are covered in Moon 101:

- Formation of the Moon: The Giant Impact Hypothesis and the Magma Ocean Hypothesis
- Geologic Evolution of the Moon: Impact Cratering (including the LHB), Volcanism, and Tectonics

Moon 101 is a framework for introducing students to lunar science, and can be followed up with student-driven research. Moon 101 can be easily modified to suit the needs of the students and the instructor. Because lunar science is an evolving field of study, the use of resources such as the PSRD allows Moon 101 to be flexible and to change as the lunar community re-discovers our celestial neighbor.

Students obtain their new knowledge of lunar science from articles in Scientific American, the University of Hawaii’s Planetary Science Research Discoveries (PSRD) website, the USGS professional paper The Geologic History of the Moon, by Dr. Don Wilhelms, USGS (Ret.), and documents written by CLSE staff. Students examine visible imagery from the Ranger, Lunar Orbiter, Apollo, Clementine, Lunar Prospector, and Lunar Reconnaissance Orbiter missions.

Students choose one of the three images above to characterize at the conclusion of Moon 101. Moon 101 arms students with the knowledge necessary to perform this task. Image A: Apollo 11 landing site from Lunar Orbiter 4, Image B: Apollo 17 landing site from Lunar Orbiter 4, Image C: Northern half of Mare Orientale from the Lunar Reconnaissance Orbiter.

Student and instructor guides to Moon 101, and other activity resources, can be found at: http://www.lpi.usra.edu/nlsi/education/hsResearch/resources/index.shtml