**NASA/CSU Spaceward Bound: Research experiences for pre-service teachers in the Mojave National Preserve.**

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**Introduction:**

The NASA/CSU Spaceward Bound program is an expeditionary learning program for pre-service teachers from the STEM disciplines. This research-based program tasks students from the California State University (CSU) system with ongoing projects lead by faculty and scientists from Cal Poly Pomona, CSU San Bernardino, Jet Propulsion Laboratory, NASA Ames Research Center (ARC), Baylor University, University of Nevada, Las Vegas, and other institutions. Spaceward Bound was initially developed in 2006 at the NASA ARC and originally funded by the NASA Exploration Systems Mission Directorate. Through a partnership with the CSU, Spaceward Bound is now part of a broader effort designed to enhance the integration of NASA Mission Directives into the classroom at the secondary and undergraduate levels. Since 2009, this program has provided hands-on research opportunities to 85 undergraduate and Master's students from minority-serving institutions within the CSU.

**Results & Discussion:**

The research efforts of this program have directly contributed to the genetic, biochemical, and geochemical characterization of biological soil crusts from the western Mojave Desert, and the development of soil-based batteries. Using these experiences, our students have developed several astrobiology-related lesson plans, which have been presented at local K12 schools as part of an ongoing course at Cal Poly Pomona. In this presentation, therefore, we will discuss the academic framework, organizational structure, scientific objectives, and student-centered philosophy of the NASA/CSU Spaceward Bound program.

**Figure 1.** Spaceward Bound Cohort 2014

**Figure 2.** Spaceward Bound Cohort 2009

**Figure 3.** Traversing the Pisgah Caves in 2014.

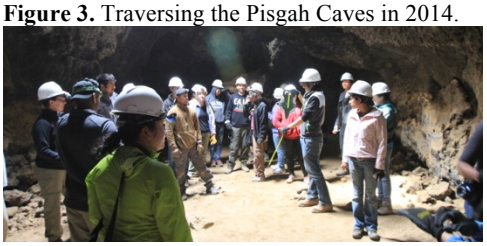

**Figure 4.** Field assays on biological soil crusts in 2014.

**Figure 5.** Training the next-generation of teachers (2014).

**Figure 6.** Learning soil science with the USDA-NRCS (2014).