

MoonRIDERS: NASA and Hawaii's Innovative Lunar Surface Flight Experiment for Landing in Late 2017

R. M. Kelso¹, R.Romo¹, P.J. Mackey², J.R. Phillips III², R.E. Cox², M.D. Hogue,² C.I. Calle²

¹Pacific International Space Center for Exploration Systems (PISCES), 99 Aupuni St. Suite 212-213, Hilo, Hawaii 96720 email: rkelso54@gmail.com, rfvromo@gmail.com

²Electrostatics and Surface Physics Laboratory, Swamp Works, NASA Kennedy Space Center, FL 32899 email: paul.j.mackey@nasa.gov, james.r.phillips.iii@nasa.gov, rachel.cox@nasa.gov, michael.d.hogue@nasa.gov, carlos.i.calle@nasa.gov

Abstract

Recently, NASA Kennedy Space Center, Hawaii's state aerospace agency PISCES, and two Hawaii high schools Iolani and Kealahou have come together in a unique collaboration called MoonRIDERS. This strategic partnership will allow Hawaii students to participate directly in sending a science experiment to the surface of the moon. The MoonRIDERS project started in the spring of 2014, with each institution responsible for its own project costs and activities. PISCES, given its legislative direction in advancing planetary surface systems, saw this collaboration as an important opportunity to inspire a young generation and encourage STEM (Science, Technology, Engineering, and Mathematics) learning.

Under the guidance of PISCES and NASA, the students will be involved hands-on from start to finish in the engineering, testing, and validation of a space technology called the Electrodynamic Dust Shield (EDS). Dust is a critical issue for space exploration, as evidenced by the Apollo lunar missions and Mars rovers and landers. Dust creates a number of problems for humans and hardware, including inhalation, mechanical interference, wear and tear on spacesuits, inhibition of heat transfer on radiators, and reduced efficiency of solar panels. To address this, the EDS is designed to work on a variety of materials, and functions by generating electrodynamic fields to clear away the dust.

The Google Lunar XPRIZE (GLXP), a space competition "designed to inspire pioneers to do robotic space transport on a budget," serves as a likely method for the MoonRIDERS to get their project to the moon. The EDS would potentially be flown as a hosted payload on a competitor's lander (still to be chosen).

This briefing will provide an overview of the technology, the unique partnership, progress update and testing leading to this flight opportunity.