

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

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

Introduction: Recently, a unique flight technology project was formed for the design, development, testing and flight operation of a lunar surface flight experiment jointly developed between Hawaii's PISCES, NASA-KSC, and two Hawaii High Schools. While the Google Lunar X-PRIZE is "designed to inspire pioneers to do robotic space transport on a budget", the MoonRIDERS project seeks to inspire this generation of Hawaii high school students in a first-ever student-participation involving a lunar surface experiment project with emphasis on STEM. In a similar fashion, this project allows for critical flight testing/validation of spacecraft systems technology on the surface of the moon.

Over the last 4-5 years, NASA-KSC has been actively working to advance dust-removal technologies which could be critical in future spacecraft systems operating on planetary surfaces...referred to as the Electrodynamic Dust Shield (EDS). As has been seen with lunar surface operations during Apollo and more recently with the experiences with dust on lander/rover systems on Mars, dust is a major problem affecting: mechanisms, ability to negatively impact thermal characteristics of space suit materials, lowering efficiencies of radiators and solar arrays, and more. PISCES, given its legislative direction in advancing planetary surface systems, saw this collaboration as an opportunity to uniquely involve Hawaii high school students in a joint engineering project with NASA KSC...then flying as a hosted-payload/secondary on an upcoming GLXP mission.

Since the spring of 2014, NASA-KSC and PISCES have initiated a "program-start" on this project and have added two participating Hawaii high schools within the engineering project to flight test EDS on the lunar surface. Project costs are being handled individually within each organization/school...funding their own activities in the strategic partnership.

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