KA MĀLAMALAMA O KA MAHINA: BUILDING PATHWAYS FOR INDIGENOUS LUNAR SCIENCE IN HAWAIʻI. C. M. Ferrari-Wong[1,2], E. Costello[1], K. Yoshida[2,3], M. Abella[2,4] [1]Hawai'i Institute of Geophysics and Planetology/Department of Earth Science, University of Hawai'i at Mānoa (cfw@hawaii.edu), [2]HONUA Scholars, [3]Stanford University, [4]John A. Burns School of Medicine, University of Hawai'i

Introduction: The name "Ka mālamalama o ka mahina" means "Moonlight" with the word "mālamalama" also representing the light of knowledge. At the University of Hawai'i at Mānoa, in collaboration with HONUA Scholars, we are currently developing a new program called "Ka mālamalama o ka mahina: Building pathways for indigenous lunar science in Hawai'i", motivated by a mission to improve participation and representation of Indigenous Hawaiians and Pacific Islanders in planetary science, and by a scientific goal to understand the development of the lunar surface regolith.

This project represents the foundation of a new collaboration between scientists at University of Hawai'i at Mānoa in the Department of Earth and Planetary Science, and HONUA Scholars, an organization founded: (1) To combat the sharp decline in college and graduate school enrollment, particularly among Native Hawaiians as a result of educational complications due to COVID-19; (2) To empower Native Hawaiians to become leaders in science, technology, engineering, and math (STEM) while foreign and non-local interests continue to dominate Hawaii's technology sector. HONUA Scholars aims to promote cultural, value-based STEM practices and to increase STEM participation from indigenous communities.

Through this collaboration, undergraduate and high school students will be connected with and supported by scientists at University of Hawai'i at Mānoa to pursue a cutting-edge project and contribute to lunar science.

Objectives: The program will aim to: (1) establish an ecosystem for local high school and undergraduate students to develop STEM skills and access to more opportunities in STEM higher education; (2) establish a partnership between faculty at UH Mānoa and HONUA scholars to develop and maintain a mentorship support system that uplifts indigenous students; (3) develop mentorship plans to aid in personal goal development and help students find success on their terms; (4) empower Native Hawaiians to become leaders in science, technology, engineering, and math (STEM) while foreign and non-local interests continue to dominate Hawaii's technology sector; and (5) provide opportunities for local high school and undergraduate students to present cutting edge research to the local community and wider scientific community.

Science Objective. The science objective will focus on understanding the present state of the regolith in regions around lunar skylights. Skylights are locations where a lava tube is thought to have collapsed and reveals the layering of lava flows below the regolith. We will use crater counts, rock abundance data, and block counts to assess the state of regolith around four skylights and place our analysis in the context of the body of lunar scientific studies, including the Apollo mission which sensed regolith depth. Because this work focuses on the evolution of basalts on the Moon and is oriented around skylight, a geologic feature also present on the Hawaiian islands, the science objective represents a link between Hawaii and planetary science. The project includes analysis of data from a number of NASA missions including the Lunar Reconnaissance Orbiter Camper and Diviner Lunar Thermal Radiometer, and will foster the development of a number of widely applicable STEM skills including the use of GIS software and data analysis techniques.

Mentorship Program: We are designing a 2-year mentorship and outreach program that pairs indigenous high school and undergraduate student mentees interested in lunar science with a graduate student and early career faculty mentor in the field, forming a career step-ladder designed to give students a leg up in the climb towards their goals. This partnership will aim to establish an ecosystem for students to develop STEM skills and access more opportunities in STEM higher education through a combination of activities that include: one-on-one meetings with a mentor; acquisition of STEM skills through an established research project; creation of an Individual Development Plan; outreach and presentation opportunities locally and off-island; and networking.

HONUA Scholars will assist with the identification and selection of students for the mentorship and outreach program, utilizing their growing network of individuals to spread the word and identify enthusiastic student candidates. Mentors and mentees will also have the opportunity to participate and attend workshops organized by HONUA scholars to continue their personal and professional development.

We wish to give the opportunity to undergraduate mentees supported by the project to attend and present their scientific findings at the Lunar and Planetary Science Conference, a yearly conference that brings

together international specialists in petrology, geochemistry, geophysics, geology, and astronomy. This will allow the mentees to meet and talk face-to-face with industry professionals, and allow them to expand their career network. The undergraduate and high school mentees supported by this project will also present and share their knowledge with peers at the School of Ocean and Earth Science and Technology Open House alongside NASA scientists and researchers at the Hawaii Institute of Geophysics and Planetology and with the local STEM community at the HONUA Scholars Laulima symposium.

Summary: As we encounter an increasing number of contemporary science and engineering-related indigenous issues, ranging from topics surrounding land use, sovereignty, and education, our program, alongside HONUA Scholars, hopes to create an inclusive environment in which students can become informed of indigenous value-based thinking and to lead new movements as we promote increased diversity and participation in STEM fields. We are currently working together to create a new 2-year mentorship program to expose indigenous undergraduate and high school students to lunar science and STEM skills. Together, we hope that this program will create of a network of future leaders who aim to empower others and to promote personal and professional development in STEM.