CONTINUING MENTORSHIP OF UNDERREPRESENTED STUDENTS IN PLANETARY SCIENCE THROUGH THE EDUCATIONAL INTERNSHIP IN PHYSICAL SCIENCES (EIPS). S. Pon[1], F. Enriquez[1] S. Terrazas[1], J.G. Olgin[1,2], [1]University of Texas at El Paso – Geological Sciences (500 University, El Paso, TX 79968), [2]El Paso Community College – Physics Department (9570 Gateway N. Blvd, El Paso, TX 79924)

Introduction: The Educational Internship in Physical Sciences (EIPS) at the University of Texas at El Paso (UTEP), in collaboration with El Paso Community College (EPCC), is an undergraduate research internship program for students pursuing STEM careers to enhance their skills through interdisciplinary research projects in geological sciences, teach self-created laboratories in the classroom and gain academic credit for their accomplishments through UTEP's Career Center. In previous years, interns participated in planetary themed projects which exposed them to the basics of planetary geology, and worked on projects dealing with introductory digital image processing and synthesized data on planetary bodies. In 2017, a terrestrial remote-sensing component was introduced; highlighting techniques of identifying geological features and composition through band composition analysis of Landsat 8 data and relating it to similar techniques used for studying Mars [1]. The continuing goal was to have interns, current and alumni, gain additional experience in planetary geology investigations and networking with professionals in the field; further promoting their interests and honing their abilities for future endeavors in planetary science.

Background: The number of underrepresented minorities pursuing STEM fields, specifically in the sciences, has declined in recent times [2]. In response, EIPS provides a mentoring environment so that students can actively engage in science projects with professionals in their field so as to gain the maximum benefits in an academic setting. Assigned research projects and creating laboratories related to their research for introductory physics and astronomy classes allowed for building new skill sets. Interns harness and build on what they have learned through the program, and directly apply it in an academic environment in EPCC classes on solar system astronomy. Since the majority of interns are transfer students or alums from EPCC, they give a unique perspective and dimension of interaction; giving them an opportunity to personally guide and encourage current students there on available STEM opportunities. Therefore not only will interns gain valuable lessons in teaching, research, and public speaking, but those engaged at the community college will glimpse the multiple possibilities and careers in the STEM fields.

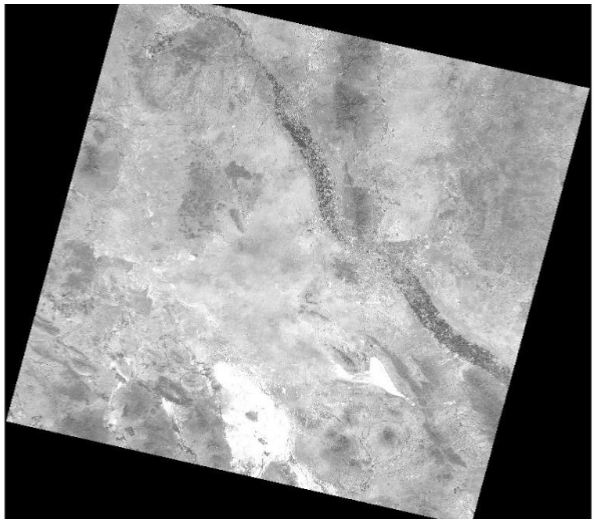

Fig 1: Short wave infrared (SWIR) Landsat 8 image from USGS of the Franklin Mountains in El Paso, TX used in band combination analysis.

Semester Curriculum: During the Fall 2017 semester, intern(s) had to complete three modules to earn credit:

Module 1: Research Topic

Interns focused on a specific research topic in planetary science, conducted background research, and pursued further investigations through basic computer modeling and image processing techniques.

Module 2: Oral presentations

Interns introduced their research topics and taught them to EPCC students that highlighted and enhanced class curriculum in solar system astronomy.

Module 3: *Laboratory Preparation, Geophysical Tour and Delivery*

Interns introduced a laboratory assignment they created from scratch and, based on their research, taught it to students in an astronomy class at EPCC. Also their research was incorporated into a geophysical tour they gave of the Sacramento Mountains (fig 3) in New Mexico, and related the terrain and tectonic history to that found similarly on other planetary bodies (e.g. Mars).

This years example was to analyze a section of the Red Bluff Granite along the Franklin Mountains using band combination analysis of Landsat 8 data (fig 1), and apply those techniques to a selected region (e.g. Gale Crater) on Mars using THEMIS data (fig 2). A lab was produced to instruct introductory solar system astronomy students at EPCC on how these techniques can be used to ascertain structure and basic composition and further understand geophysical processes on both Earth and Mars. Collaboration of intern alumni

in this year's project helps reinforce these concepts by sharing their expertise in conveying their knowledge in planetary science in the classroom [3]. Furthermore, work displayed here will be applied in developing laboratory exercises for an online educational resources (OER) based at EPCC for the Fall 2018 semester.

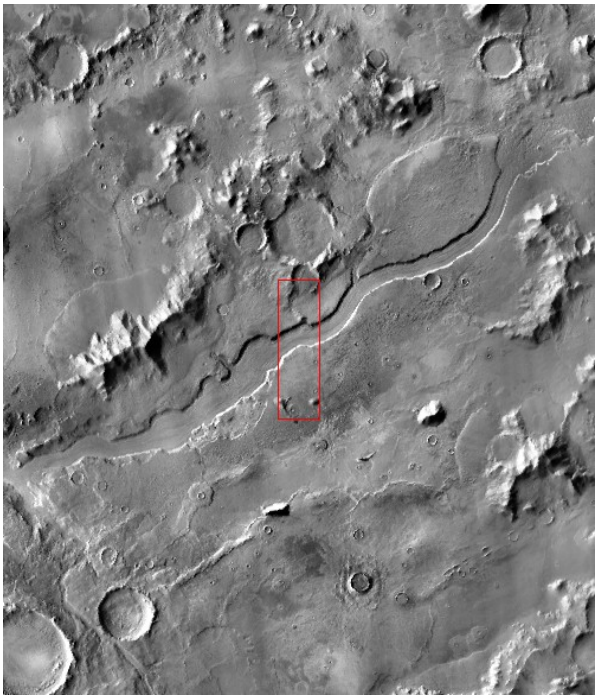

Fig 2: Sample THEMIS infrared data of Revil Vallis on Mars. Photo credit: ASU

Overview and Future Goals: Previous success of EIPS interns is reflected in their applications of those skill sets toward their graduate studies, other internships, and in their careers. Current interns followed along that same path; gaining additional experience in the planetary research, as well as communicate their knowledge in a classroom setting. Furthermore, the Spring and Fall 2018 will include networking activities with planetary science professionals, specifically researchers from the Applied Research Labs in Maryland (APL) and at Arizona State University (ASU) on Pluto and Mars respectively to further enhance interns' experience. Future work will increase collaborations with student organizations at UTEP, such as the unmanned aerial systems club (UAS Club) and the Student Applications of Technology in Science club (SATS) who engage students in interdisciplinary projects related to their field of study. EIPS will also actively promote interns to work at national laboratories and agencies to further their experience, such as with NASA, the Lunar Planetary Institute (LPI), and the United States Geological Survey (USGS), and assist them to further their goals through various academic pathways. Results of intern feedback and progress will be presented here.

Fig 3: Photos from past and current EIPS interns giving talks and directing tours during the geophysical/planetary field excursion.

References: [1] M.D. Lane and P. R. Christensen. (2013) Geophys Res Lett, 40(14)1944-8007. [2] NSF (2013) Report: NSF 13-304 http://www.nsf.gov/statistics/wmpd/ [3] F. Enriquez, S. K. Terrazas, and J. Olgin, *LPSC* 1160, 2017.