Mars Research in the Chilean High Andes

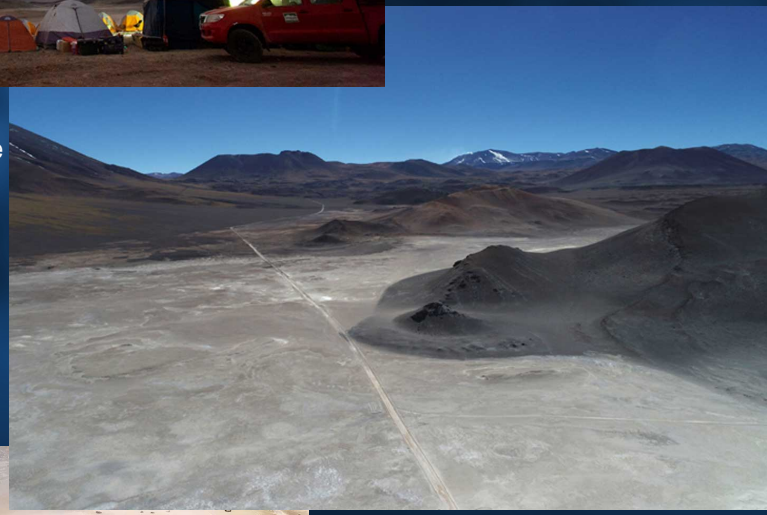
From October 17-November 20, 2018, a team of researchers from the NASA Astrobiology Institute's SETI Institute, travelled to the Chilean High Andes to work on the development of new planetary exploration strategies, instruments, and systems. Their aim was to dramatically change the way scientists search for life beyond Earth. Research locations included the liquid environments of El Tatio geyser field, Laguna Lejia, and Salar de Pajonales.

In Salar de Pajonales, the team performed experiments and deployed instruments equivalent to those planned to be onboard NASA's Mars 2020 and ESA's ExoMars missions. The experiments for these missions will help shift the focus from the characterization of planetary habitability–the type of exploration performed in the past 15 years–to searching for ancient or recent biosignatures on Mars.

The field work is documented at: https://www.seti.org/update-seti-institute-nai-team-2018-expedition-andes

Habitability is primarily defined by astronomy and environment (physicochemical conditions), whereas ancient habitats are defined by biology—in this case, microbial life. Their scales (habitability vs. habitats) and the resolution needed to explore them are vastly different, which means that exploration strategies and methods must adapt. Two of the main questions are 1) how much does the data at global to regional scales inform us about the patterns to search for when exploring for microbial habitats, and 2) how can we integrate this information from orbit to the ground?

The team's camp at night. Right in the center of the star trail, the two Magellanic Clouds give visions of alien worlds. Photo Credit: Victor Robles, Campoalto and the SETI Institute NAI Team.



Right: Salar de Pajonales (3,600 m/ 11,800 ft), an otherworldly landscape at the boundary between the Atacama desert and the Altiplano. In the horizon, the Lastaria volcano continues to spew large plumes of water vapor and sulfur. Credit: Michael Phillips, University of Tennessee Knoxville and the SETI Institute NAI Team.

Left: A small sinter spewing hot water. Credit: David Wettergreen, CMU/ The SETI Institute NAI team.