



2022 Amelia Earhart Fellow

Emileigh Shoemaker



Citizenship: United States

Proposed Program: Planetary sciences at the University of Arizona, USA

Ms. Shoemaker's research focuses on investigating the subsurface of volcanic environments on Mars and Earth using orbital and ground penetrating radar (GPR) systems. Eruptive products like lava flows from effusive volcanic activity or ash and pumice from explosive activity provide a glimpse into the evolution of the interior of a planet.

On Mars, volcanic activity is primarily effusive—resulting in shield-like volcanic edifices and extensive lava flows similar to those seen in Hawaii. Explosive activity is less common; however, there is evidence on the surface that these types of eruptions have taken place in the past. Ms. Shoemaker uses the Shallow Radar (SHARAD) instrument currently orbiting Mars to investigate the subsurface and the stratigraphy of the largest volcanic province on the planet known as Tharsis. This region has been volcanically active for most of Mars' history which makes it an excellent site to study the evolution of the planet over time. SHARAD has assisted Ms. Shoemaker in making measurements of the thickness of lava flows and ash deposits there.

Ms. Shoemaker has represented the University of Arizona as a participant of several NASA field expeditions to the Icelandic Highlands, where she mapped ice buried by ash and pumice from two eruptions of the Askja Volcano using GPR. This area was used to test operational methods to map subsurface ice using these handheld radar systems for future astronauts who will need to access this precious resource during missions on other terrestrial bodies like Mars and the Moon. During these expeditions, Ms. Shoemaker can speak to the general public and hopes these interactions will encourage other students to participate in planetary field geology and geophysics in the future.