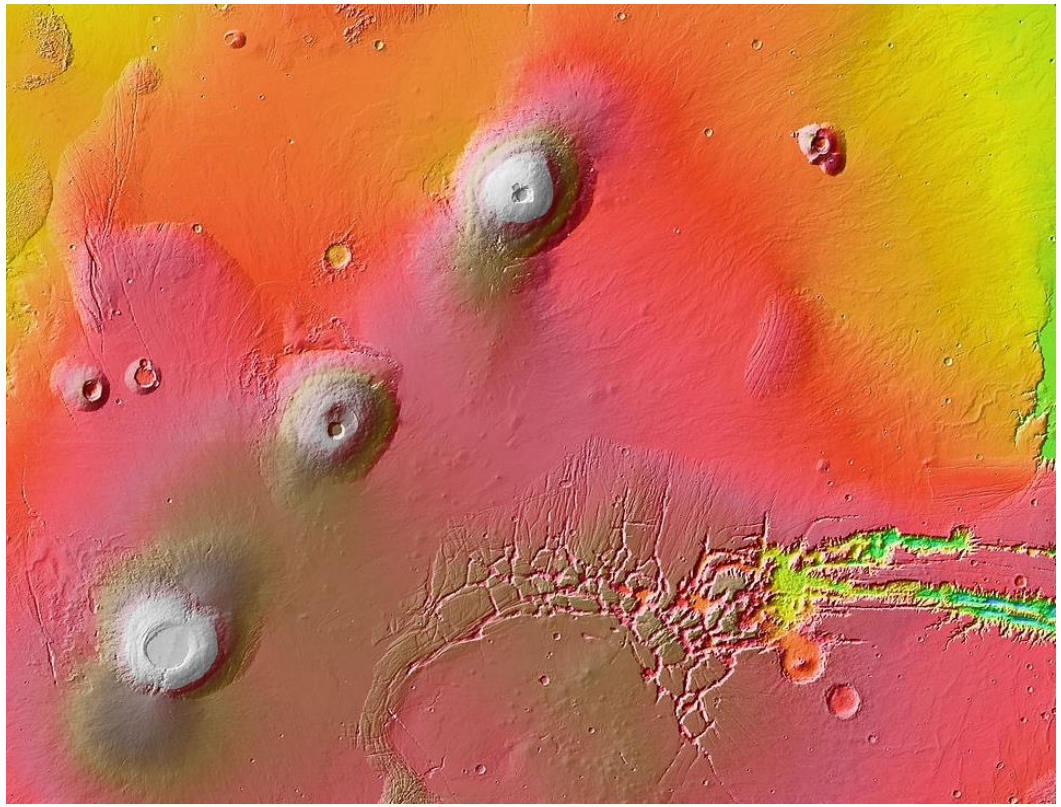


MOLA Colorized Elevation

Mapping the Subsurface Near Pavonis and Arsia Mons Volcanoes, Mars, using SHARAD Radar Sounder Data

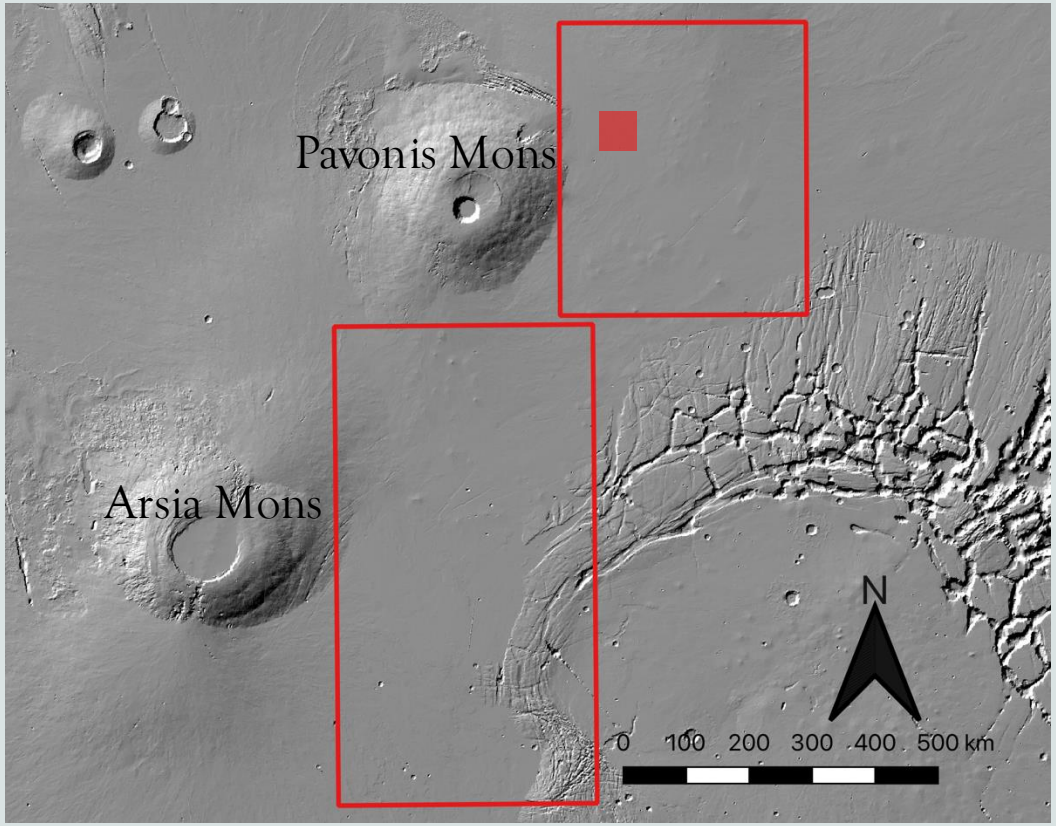
Alessandro Bressani, Emileigh Shoemaker, Lynn Carter

THE UNIVERSITY OF ARIZONA
COLLEGE OF SCIENCE
STEWARD OBSERVATORY

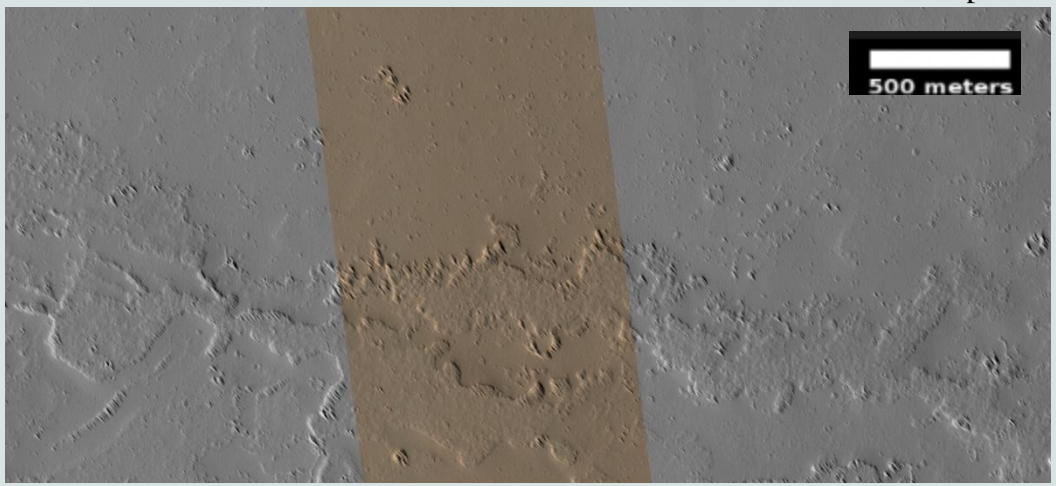
COLLEGE OF SCIENCE
LUNAR & PLANETARY LABORATORY

Tharsis Province

- Tharsis Montes
- High elevation
- Quarter of the surface of Mars
- 4 billion years old – active for most of history
- Dusty surface



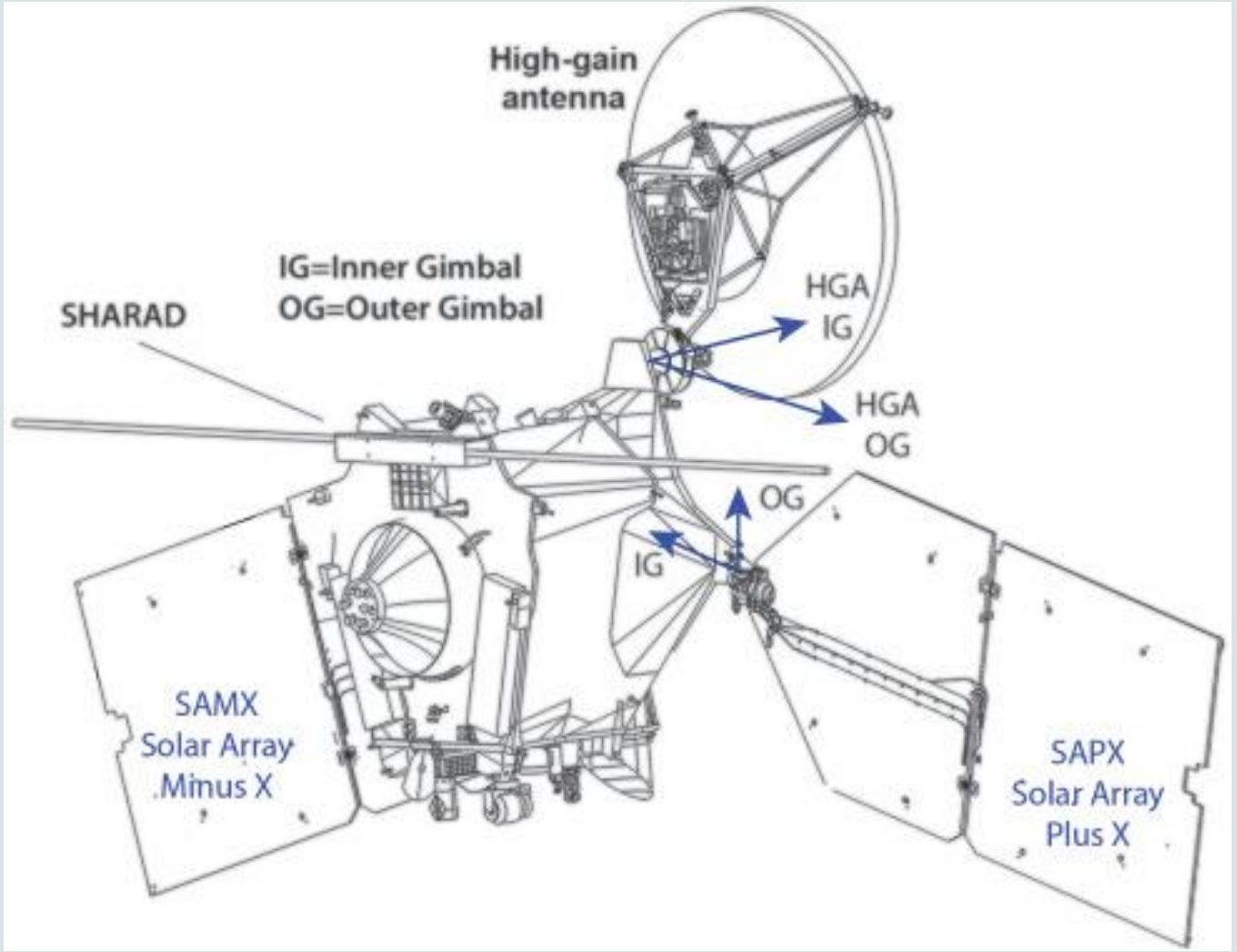
MOLA Hillshade Map



University of Arizona/HiRise

SHARAD

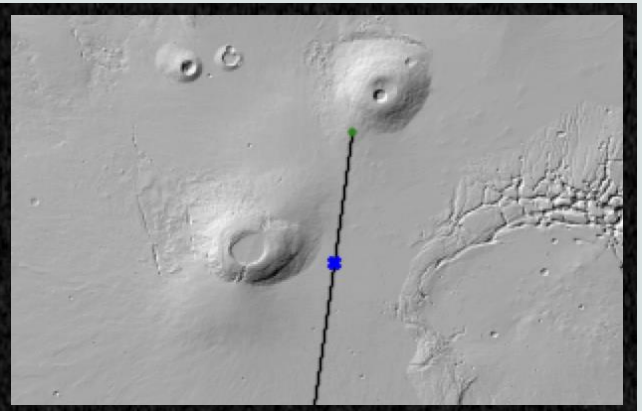
- Mars Reconnaissance Orbiter (MRO)
- Shallow Radar
- 20m dipole antenna
- 15-25 megahertz



Campbell et al., 2021

Methods and Data

s_02790301



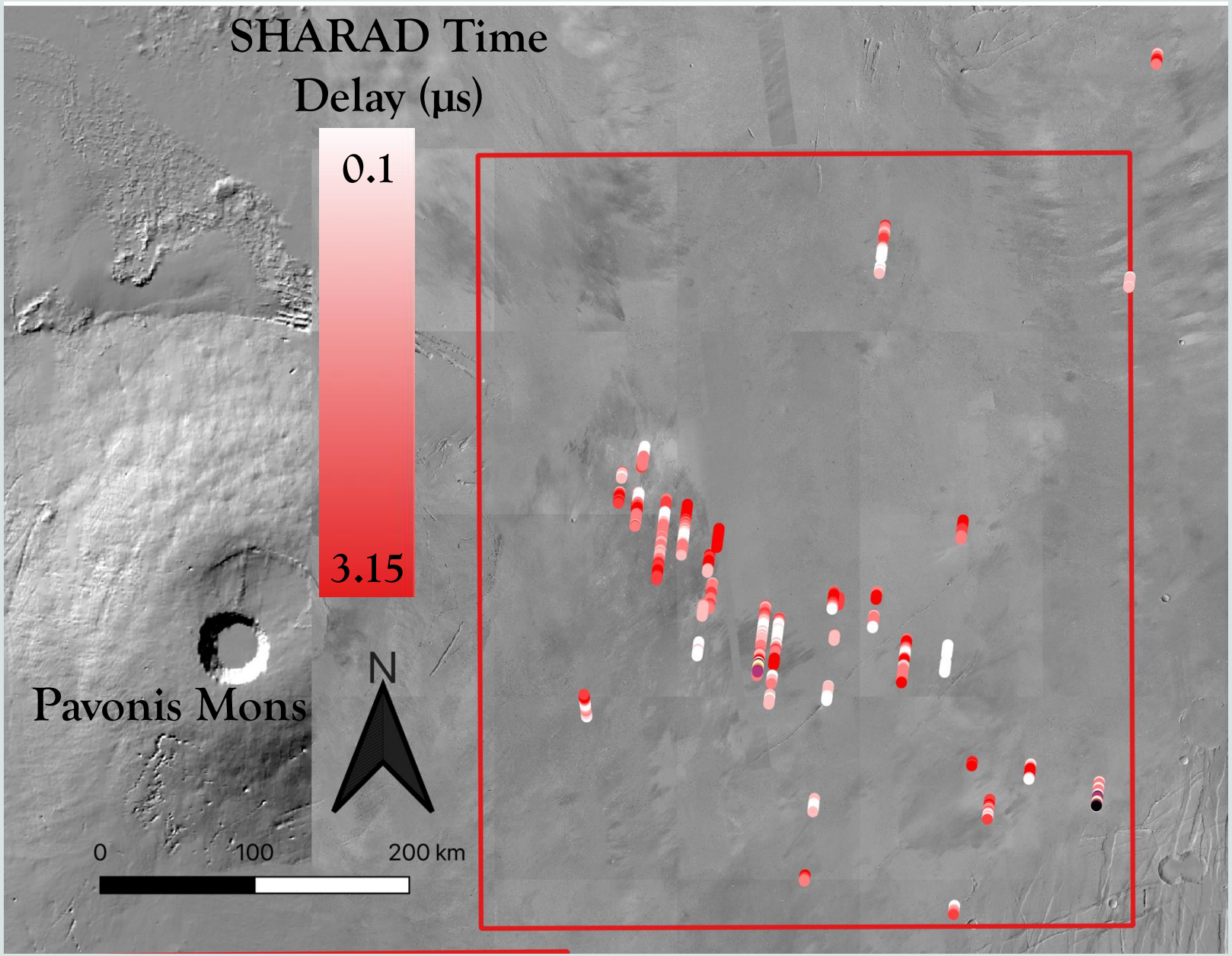
N

2 μs

Radargram

Cluttersim

Map of High Confidence Tracks



MOLA Hillshade Map/CTX Overlay, Murray Lab, 2018

Conclusion & Upcoming Research Goals

- Reflectors could be series of lava flows or tephra
- We use HiRise and other sources to help understand the depositional history—sequence of events in the region
- Preliminary work
- We have many more SHARAD tracks to study
- Team consists of Emileigh Shoemaker and Lynn Carter

Take-home Points

- We used SHARAD to probe sequences of lava flows pyroclastic material, and/or dust
- We used SHARAD to look for changes in density beneath the Tharsis Province (reflectors)
- We are building a map of subsurface reflectors to help uncover the stratigraphic history of the region