NAU NORTHERN ARIZONA UNIVERSITY

Department of Astronomy and Planetary Science

ASTRONOMY COLLOQUIUM

DR. ALI M. BRAMSON
PURDUE UNIVERSITY

Dr. Bramson studies problems related to understanding the quantitative geomorphology of other planets, especially the physical processes related to ice and volatiles that affect the surfaces of solid bodies in our solar system. She tackles these problems using a combination of spacecraft remote sensing observations and theoretical modeling, supplemented by occasional field work at terrestrial analog sites and experimental studies. Her research on Martian mid-latitude ice is helping to shape the future of in situ resource utilization and human exploration of Mars.

WHEN:

Monday, April 13th,
3:45 PM

WHERE:

Physical Sciences,
Bldg. 19,
Room 103

DECODING THE PAST, PRESENT, AND FUTURE OF WORLDS IN OUR SOLAR SYSTEM VIA THEIR SUBSURFACE RECORDS

A well-constrained stratigraphy acts as a planet's time capsule. Over time, many different endo- and exogenous processes work to shape planetary bodies, and these processes get recorded in local stratigraphic sequences. Subsurface records therefore provide important constraints on the scales that these processes operate, both in space and time. I will present a few case studies on Mars and the Moon, highlighting a holistic combination of radar remote sensing, theoretical modeling, and analog studies in the field and lab to decode subsurface records. On Mars, we can leverage volatile cycles as a key artery that links the surface, subsurface, and atmospheric environments. This reveals the role of orbital forcing for climate shifts during the deposition of kilometers-thick polar ice caps, as well kyr timescales for meters-scale evolution of local surface topography. On the Moon, ancient lava flows buried in the subsurface provide a window into the Moon's early thermal history and the processes that occurred before, during, and after the onset of volcanism. I will additionally highlight areas where new spacecraft missions could help shape our understandings of these worlds.