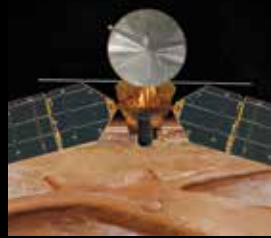


RESEARCH ON THE RED PLANET

Mars research at the Jackson School of Geosciences spans across the Red Planet. The findings are helping us learn more about our planetary neighbor, including the best spots to potentially look for signs of ancient extraterrestrial life, and where future Mars colonists could go to find water. This basic research on Mars could become vital information for future space missions.

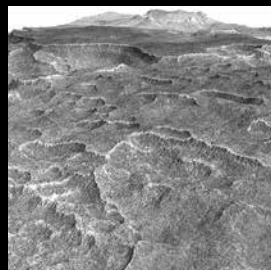
Holt at the Helm of SHARAD

Research Professor Jack Holt is the co-principal investigator for SHARAD—a radar instrument on NASA's Mars Reconnaissance Orbiter. Holt's radar expertise, honed on ice sheets and exotic terrain on Earth, prepared him for managing an instrument than can see about half a mile below Mars' surface. Much of the Mars research at UT—and around the world—depends on SHARAD data.



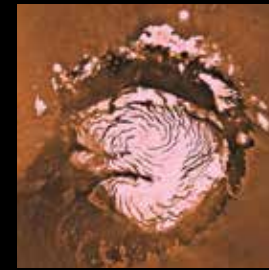
The "Great Lake" of Utopia Planitia

Cassie Stuurman (M.S. '17) discovered a buried ice deposit in Mars' Utopia Planitia region that holds as much water as Lake Superior and creates distinctive "ice-cream scoop" surface terrain.



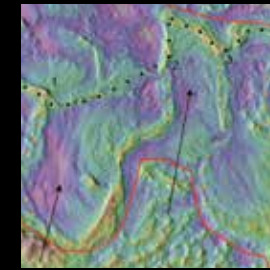
The Ice Cauldron of Hellas Basin

A volcano beneath an ice sheet—a structure called an "ice cauldron"—is likely responsible for creating a funnel-shaped depression in Mars' Hellas Basin. UTIG Research Affiliate Joe Levy found the structure after noticing a bull's-eye pattern in the ice that resembled marks made by ice cauldrons on Earth.



Paleoclimate on Ice

Ice deposits on Mars record the planet's climate history. Ph.D. students Stefano Nerozzi and Dan Lalich are researching the climate history of Mars by analyzing ice deposits layer by layer, a feat made possible with ice-penetrating radar on NASA's Mars Reconnaissance Orbiter.



River Research

Ancient eroded river deposits on Mars called "sinuous ridges" are leftovers from a time when Mars was a wet world billions of years ago. By comparing a locale on Mars with similar ridges on Earth, Ph.D. student Ben Cardenas has found they likely formed along an ancient coastline and retain the curvature of the Martian rivers that formed them.



Dunes on Mars and Beyond

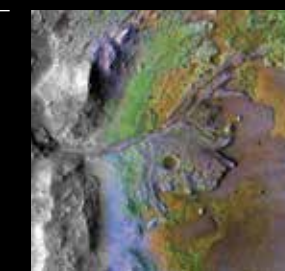
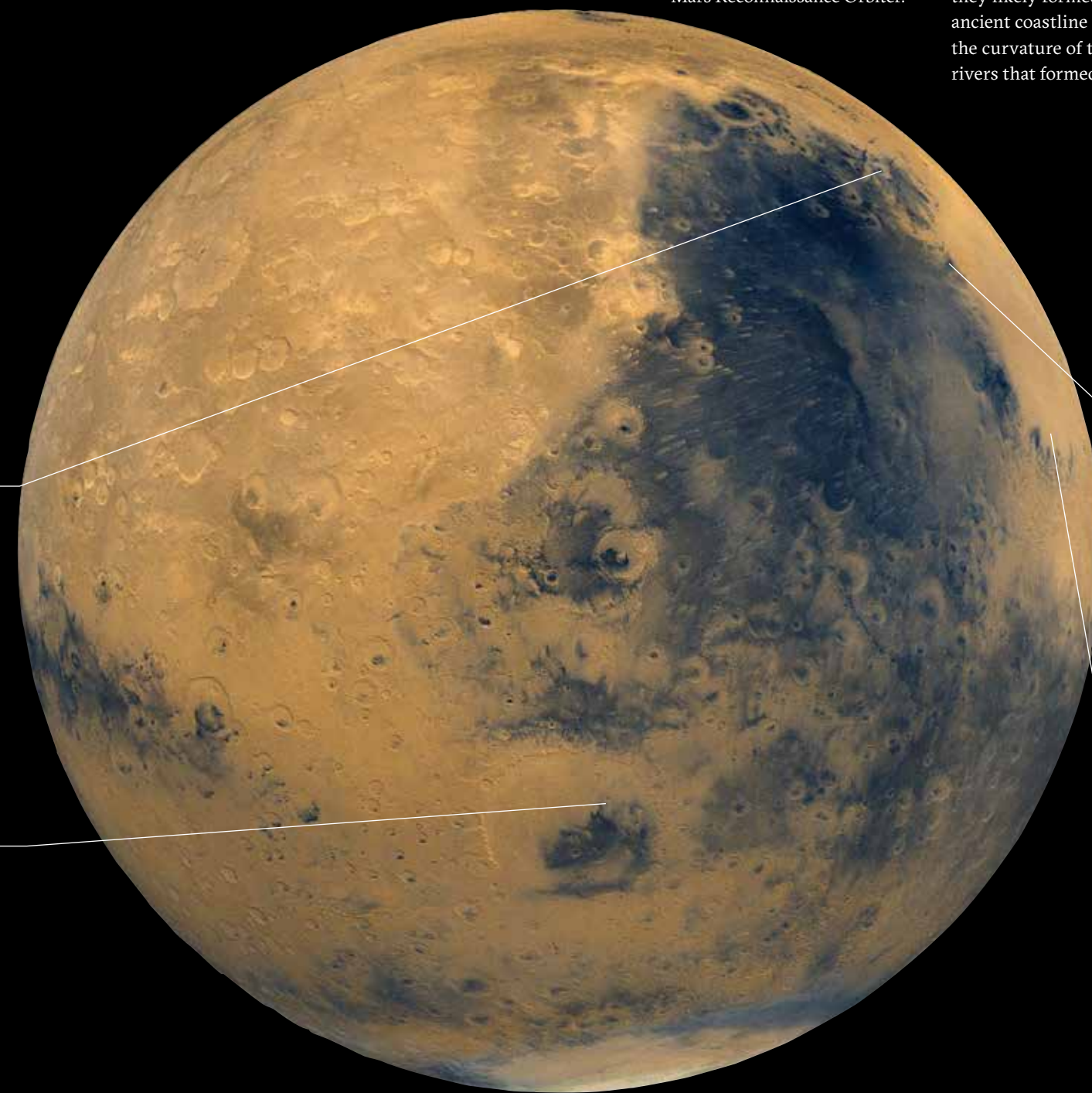
In 2016, Mackenzie Day (Ph.D. '17) found that wind likely shaped Mount Sharp, a mile-high mountain inside Gale Crater and the destination site for the NASA rover Curiosity. For her thesis, she compared dune patterns on Earth, Mars and Saturn's moon Titan and found that dune fields form similar patterns across planetary bodies.



Chasma Boreale

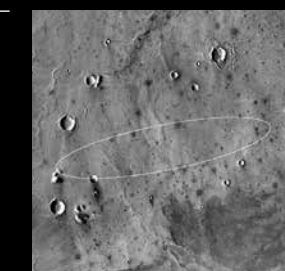
Dunes of ice and sand are at the bottom of Mars' Chasma Boreale, a deep indentation at the planet's north pole. Sarah Brothers (Ph.D. '16) studied the processes that shape these modern dunes to understand how ancient dunes, now covered by ice, were formed millions of years ago. Brothers is now a postdoctoral research associate at Texas A&M University.

NOTE: RESEARCH SITES LISTED ABOVE ARE NOT VISIBLE FROM VANTAGE OF MARS ON LEFT. PHOTOS: NASA.



Scientists Prefer Jezero

At a meeting in February 2017, scientists selected Jezero Crater as their top pick to send a new NASA Mars rover set to launch in 2020. Postdoctoral Fellow Timothy Gouge proposed the site because his research on the crater indicates it was once a wet, mineral-rich lake. Jezero is now among the top-three landing sites under NASA's consideration.



NASA Scout

UTIG Research Associate Cyril Grima helped NASA select the Elysium Planitia region of Mars as the landing spot for its InSight lander, a probe scheduled to land in 2018. Grima used a statistical technique he developed to analyze the surface roughness of the site.