

NASA RECORDS FIRST LIKELY 'QUAKE' ON MARS

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This photo made available by NASA on Tuesday, April 23, 2019 shows the InSight lander's domed wind and thermal shield which covers a seismometer on the 110th Martian day, or sol, of the mission. On Tuesday, the space agency announced the instrument picked up a gentle rumble, believed to be the first marsquake ever detected. Photo: NASA/JPL-Caltech

NASA's robotic Mars InSight lander has recorded a likely "marsquake" for the first time ever, the U.S. space agency said. The faint seismic signal, detected by the lander's Seismic Experiment for Interior Structure (SEIS) instrument, was recorded on April 6, the lander's 128th Martian day.

This is the first recorded trembling that appears to have come from inside the planet, as opposed to being caused by forces above the surface, such as wind, NASA said in a statement.

Scientists still are examining the data to determine the exact cause of the signal.

"InSight's first readings carry on the science that began with NASA's Apollo missions," said InSight Principal Investigator Bruce Banerdt of NASA's Jet Propulsion Laboratory (JPL) in the U.S.

"We've been collecting background noise up until now, but this first event officially kicks off a new field: Martian seismology!" Mr. Banerdt said.

The new seismic event was too small to provide solid data on the Martian interior, which is one of InSight's main objectives.

The Martian surface is extremely quiet, allowing SEIS, InSight's specially designed seismometer, to pick up faint rumbles.

In contrast, Earth's surface is quivering constantly from seismic noise created by oceans and weather. An event of this size in Southern California would be lost among dozens of tiny crackles that occur every day.

"The Martian Sol 128 event is exciting because its size and longer duration fit the profile of moonquakes detected on the lunar surface during the Apollo missions," said Lori Glaze, Planetary Science Division director at NASA Headquarters.

NASA's Apollo astronauts installed five seismometers that measured thousands of quakes while operating on the Moon between 1969 and 1977, revealing seismic activity on the Moon. Different materials can change the speed of seismic waves or reflect them, allowing scientists to use these waves to learn about the interior of the Moon and model its formation.

NASA currently is planning to return astronauts to the Moon by 2024, laying the foundation that will eventually enable human exploration of Mars.

InSight's seismometer, which the lander placed on the planet's surface on December 19, 2018, will enable scientists to gather similar data about Mars.

By studying the deep interior of Mars, they hope to learn how other rocky worlds, including Earth and the Moon, formed.

Three other seismic signals occurred on March 14, April 10 and April 11. Detected by SEIS' more sensitive Very Broad Band sensors, these signals were even smaller than the Sol 128 event and more ambiguous in origin.

The team will continue to study these events to try to determine their cause, NASA said.

Regardless of its cause, the Sol 128 signal is an exciting milestone for the team.

"We've been waiting months for a signal like this," said Philippe Lognonne, SEIS team lead at the Institut de Physique du Globe de Paris (IPGP) in France.

"It's so exciting to finally have proof that Mars is still seismically active. We're looking forward to sharing detailed results once we've had a chance to analyze them," Mr. Lognonne said.

Most people are familiar with quakes on Earth, which occur on faults created by the motion of tectonic plates.

Mars and the Moon do not have tectonic plates, but they still experience quakes — in their cases, caused by a continual process of cooling and contraction that creates stress.

This stress builds over time, until it is strong enough to break the crust, causing a quake.

Detecting these tiny quakes required a huge feat of engineering. On Earth, high-quality seismometers often are sealed in underground vaults to isolate them from changes in temperature and weather.

InSight's instrument has several ingenious insulating barriers, including a cover built by JPL called the Wind and Thermal Shield, to protect it from the planet's extreme temperature changes and high winds.

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The data generated will help scientists understand how the jets of luminosity that enabled us to see the black holes actually work and behave.

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