NASA Spacecraft Record New and Larger Meteor Strikes on Mars

美国宇航局航天器记录新的和更大的流星撞击火星

Two NASA spacecraft have recorded the biggest meteor strikes and impact craters on Mars than ever before.

美国宇航局的两艘宇宙飞船记录了火星上最大的流星撞击和撞击 坑，这是前所未有的。

One of the spacecraft is on Mars' surface. The other is orbiting the planet.

其中一艘宇宙飞船在火星表面。另一个是绕行星运行。

The impacts last year produced seismic waves that travelled thousands of kilometers across Mars. These are the first seismic waves scientists have ever found near the surface of another planet. The hits produced craters nearly 150 meters wide, scientists reported Thursday in the journal Science.

去年的撞击产生了穿越火星数千公里的地震波。这是科学家们在另一个行星表面附近发现的第一批地震波。科学家们周四在《科学》杂志上报道说，这些撞击产生了近 150 米宽的陨石坑。

The larger of the two strikes threw out large pieces of ice. That information may help researchers find ways future astronauts can use Mars' natural resources.

两次打击中较大的一次抛出了大块冰块。这些信息可能有助于研究人员找到未来宇航员使用火星自然资源的方法。

The Insight lander measured the seismic waves, while the Mars Reconnaissance Orbiter provided pictures of the craters.

洞察号着陆器测量了地震波，而火星勘测轨道器提供了陨石坑的图片。

Liliya Posiolova of Malin Space Science Systems in San Diego is one of the study investigators. She said scientists were lucky to be able match the seismic waves with pictures of the impact craters.

圣地亚哥马林空间科学系统公司的 Liliya Posiolova 是该研究的调查员之一。她说，科学家们很幸运能够将地震波与撞击坑的图片相匹配。

Mars' atmosphere is thin. On Earth, the thick atmosphere stops most space rocks from reaching the ground. Instead, the rocks break apart and burn in the atmosphere.

火星的大气层很稀薄。在地球上，厚厚的大气层阻止了大多数太空岩石到达地面。相反，岩石在大气中分解并燃烧。

InSight is close to the end of its operation. Its power equipment is covered in dust from storms on Mars and failing. InSight landed on Mars in 2018 and has since recorded more than 1,300 marsquakes. A marsquake is similar to an earthquake.

InSight 的运营已接近尾声。它的动力设备被火星上的风暴和故障所覆盖的灰尘所覆盖。洞察号于 2018 年登陆火星，此后记录了 1,300 多次火星地震。大地震类似于地震。

Bruce Banerdt of NASA's Jet Propulsion Laboratory, the lander's chief scientist who took part in the studies, estimated the lander had between four to eight more weeks before power runs out.

美国宇航局喷气推进实验室的布鲁斯·班纳特 (Bruce Banerdt) 是参与研究的着陆器首席科学家，他估计着陆器在电力耗尽之前还有四到八周的时间。

The space rocks were between 5 meters and 12 meters wide, said Posiolova. The larger of the two struck last December about 3,500 kilometers from InSight, creating a crater about 21 meters deep. The Orbiter's cameras showed material thrown as far as 40 kilometers from the impact. They also showed white spots of ice around the crater, the most frozen water observed at such low latitudes, Posiolova said.

Posiolova 说，太空岩石的宽度在 5 米到 12 米之间。去年 12 月，两者中较大的一个在距离洞察号约 3,500 公里处撞击，形成了一个深约 21 米的陨石坑。轨道飞行器的摄像机显示了距离撞击点 40 公里远的物质。波西奥洛娃说，他们还在火山口周围显示了白色的冰点，这是在如此低纬度地区观察到的最冰冻的水。

Posiolova found the crater earlier this year after taking extra pictures of the region from orbit. The crater was missing from earlier photos. After looking at older photos, the scientist dated the impact to late December. She also remembered a large seismic event recorded by InSight around that time. With help from the Insight team, Posiolova connected the new hole to the strike.

今年早些时候，波西奥洛娃在从轨道上拍摄了该地区的额外照片后发现了这个陨石坑。早先的照片中没有这个陨石坑。在查看了较旧的照片后，这位科学家将这次撞击确定为 12 月下旬。她还记得当时 InSight 记录的一次大型地震事件。在洞察团队的帮助下，波西奥洛娃将新洞与击球联系起来。

Scientists also learned that the lander and orbiter both recorded an earlier meteoroid strike. It was more than double the distance of the December one and a little smaller.

科学家们还了解到，着陆器和轨道飞行器都记录了较早的流星撞击。这是十二月的距离的两倍多，而且更小。

"Everybody was just shocked and amazed," Posiolova remembered.

“每个人都感到震惊和惊讶，”波西奥洛娃回忆道。

The seismic readings from the two impacts point to a denser Martian layer of ground beyond InSight's location.

两次撞击的地震读数表明，在 InSight 所在位置之外的火星地层更密集。

Doyeon Kim of ETH Zurich's Institute of Geophysics in Switzerland, was part of the research. He said scientists still have much to learn about the deeper structure of Mars.

瑞士苏黎世联邦理工学院地球物理研究所的 Doyeon Kim 参与了这项研究。 他说，关于火星的更深结构，科学家们还有很多需要了解。

Outside scientists said future landers from Europe and China will carry even more advanced equipment to detect seismic waves.

外部科学家表示，未来来自欧洲和中国的着陆器将携带更先进的设备来探测地震波。