

'INSIGHT LANDER' DOWN SAFELY ON MARS

There's a new robot on Mars' surface, the InSight spacecraft, designed to study the planet's interior. It set down safely Monday after nearly 7 months of flight from Earth and a 7-minute nail-biting plummet through Mars' thin atmosphere.

It was a gigantic cheer from space scientists and engineers at NASA's Jet Propulsion Laboratory as they witnessed the nail-biting minutes prior to the InSight spacecraft's successful touchdown on Mars' surface Monday, November 26, 2018. The lander touched down near Mars' equator on the western side of a flat, smooth expanse of lava called Elysium Planitia. This was NASA's eighth successful soft-landing on Mars. InSight took almost seven months to travel 458 million km from Earth. This craft is not a rover; it's designed to stay in one place and to drill into and study Mars' deep interior. The name InSight stands for **I**nterior **E**xploration using **S**eismic **I**nvestigations, **G**eodesy and **H**eat **T**ransport. Its two-year mission will be to study the deep interior of Mars to learn how all celestial bodies with rocky surfaces, including Earth and the Moon, formed. It hit the Martian atmosphere at 19,800 km per hour, and the whole sequence to touching down on the surface took only 6 1/2 minutes. During that short span of time, InSight had to autonomously perform dozens of operations and do them flawlessly – and by all indications that is exactly what the spacecraft did.

Another big winner on Monday was the MarCO mission, embodied in two briefcase-sized CubeSats that launched on the same rocket as InSight and made the trip to Mars with it. When they reached Mars, the twin MarCOs were set in position to receive transmissions from InSight during its entry, descent and landing. They are the first CubeSats sent into deep space. That's one giant leap for the briefcase-sized robotic explorers. CubeSats have a big future beyond Earth's orbit.

InSight will begin to collect science data within the first week after landing, though the teams will focus mainly on preparing to set InSight's instruments on the Martian ground. At least two days after touchdown, the engineering team will begin to deploy InSight's 1.8-meter-long robotic arm so that it can take images of the landscape. InSight is expected to operate on the surface for one Martian year, plus 40 Martian days, or sols, until at least November 24, 2020.

Thanks to NASA's successful InSight mission, the space agency is one step closer to finding out how the rocky planets in our solar system first formed. It also may provide insight as to why Earth and Mars evolved so differently from the others. Though there have been other missions to Mars, this one stands out.

Short for "Interior Exploration using Seismic Investigations, Geodesy and Heat Transport," InSight aims to study the inner space of our red planet neighbour. Studying its surface since 1965, scientists have been able to study the orbit and surface of Mars, learning about its weather, atmosphere, geology and surface chemistry, this mission is part of a series focussed on asking critical questions in solar system science, and any insights should give scientists a deeper understanding of Mars. Kind of like a check-up at the doctor's office, the Mars lander will give a check-up of our terrestrial neighbour since it formed 4.5 billion years ago, according to NASA. By studying the interior structure of the red planet, scientists may finally get answers to key questions such as:

- How rocky body forms and evolves to become a planet
- How to determine the rate of Martian tectonic activity and meteorite impacts

The lander is able to go 5 metre deep beneath the surface to measure the planet's seismology, heat flow and detecting quakes. AK, with EarthSky and Wikipedia Notes



Tom Hoffman, InSight Project Manager, left, and Sue Smrekar, InSight deputy principal investigator, react after receiving confirmation that the InSight Mars lander successfully touched down on the surface of Mars on Monday.

