

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – missions current and future (3A)

Author: Dr. Ramon P. De Paula

National Aeronautics and Space Administration (NASA), United States, ramon.p.depaula@nasa.gov

Dr. William Bruce Banerdt

National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory, United States,
bruce.banerdt@jpl.nasa.govDISCOVERIES AND STATUS OF NASA'S INSIGHT MARS MISSION INSIGHT: [INTERIOR
EXPLORATION USING SEISMIC INVESTIGATIONS, GEODESY AND HEAT TRANSPORT]**Abstract**

This paper will provide the status of NASA's InSight Mission (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport), and a summary of the scientific discoveries the mission has made since landing on the surface of Mars on November 26, 2018 (almost 2 years). The presentation will discuss the latest status of its operations, technical issues, and the key discoveries so far.

The InSight lander mission developed by NASA and its international partners, deployed on Mars a set of complex instruments for geophysical investigation. The team has made many measurements and also overcome a series of technical challenges since the successful landing on Mars on November 26, 2018. Since February 25, 2019, with instrument deployment completed, InSight has been acquiring seismic, imaging, magnetic, and meteorological data with the spacecraft and instruments operating well. However, HP3, the penetrating mole, has encountered difficulties with penetrating Mars' regolith due to unexpected soil properties.

InSight's science is very unique, it is an investigation of the terrestrial planets that will address fundamental issues of planet formation and evolution with a study of the deep interior of Mars. The InSight mission seeks to provide us with scientific data to understand the evolutionary formation of rocky planets, including Earth, by investigating the crust and core of Mars. InSight will also investigate the dynamics of any Martian tectonic activity and meteorite impacts and compare this with like phenomena on Earth. On Mars, the InSight Seismometer has observed, so far, over 450 events believed to be marsquakes, including more than 40 thought to be moderately sized distant quakes, and the results of the analysis will be presented, and what it tell us about the planet formation.

InSight is also accumulating what will be the most complete data set of simultaneous, high-rate atmospheric pressure, temperature and wind measurements ever acquired on Mars.

The paper will present an overview of all these measurements, technical issues, and the plans for continuing future investigations.