InSight Science

Peering into the interior of a terrestrial planet, other than our own, from an in-situ, surface-based platform.

InSight Will:

• Determine the size, composition, and physical state of the core
• Determine the thickness and structure of the crust
• Determine the composition and structure of the mantle
• Determine the thermal state of the interior
• Measure the rate and distribution of internal seismic activity
• Measure the rate of meteorite impacts on the surface

InSight is more than just a Mars mission—It’s the study of the formation and evolution of all terrestrial planets.

Lockheed Martin is the InSight prime contractor and is responsible for the complete Spacecraft System—Cruise Stage, Aeroshell and Lander

• Proven spacecraft design—Significant heritage from the successful 2007 Phoenix mission including a cruise, entry, descent and landing system that has demonstrated capability for safe landing on Mars
• Low-risk development—Heavily leverages current-generation avionics presently in use on numerous Lockheed Martin interplanetary spacecraft
• Surface operations—Long mission lifetime with low operational costs and reliable data return
• Payload accommodation—Integrating and testing science instruments from a variety of partner institutions

Instruments to Explore the Martian Interior:

• SEIS: Seismic Experiment for Interior Structure—An extremely sensitive, surface-based single-station seismometer to monitor seismic activity, tidal displacements, and surface impacts
• HP3: Heat Flow and Physical Properties Package—A penetrating probe to determine the geothermal heat flux; capable of up to 5 meters of depth
• IDS: Instrument Deployment System—A robotic arm to deploy the SEIS and HP3 to the surface, and two cameras to support a variety of operations
• APSS: Auxiliary Payload Sensor Suite—A complement of sensitive environmental sensors to measure wind velocity, atmospheric temperature and pressure, and the magnetic field
• RISE: Rotation and Interior Structure Experiment—An X-band Doppler tracking experiment to measure rotational variations of the planet