

The InSight Mission is a collaboration among the following space agencies:

National Aeronautics and Space Administration

Centre National des Études Spatiales

Deutsches Zentrum für Luft- und Raumfahrt

With key work being performed by the following institutions:

Jet Propulsion Laboratory

Lockheed-Martin Aerospace

Insitut de Physique du Globe de Paris

Swiss Institute of Technology, Zürich

Max Planck Institute for Solar System Research

Imperial College, London

Institut Supérieur de l'Aéronautique et de l'Éspace

Oxford University

Centro de Astrobiologia

Centrum Badan Kosmicznych

InSight Status Report

W. Bruce Banerdt, InSight PI

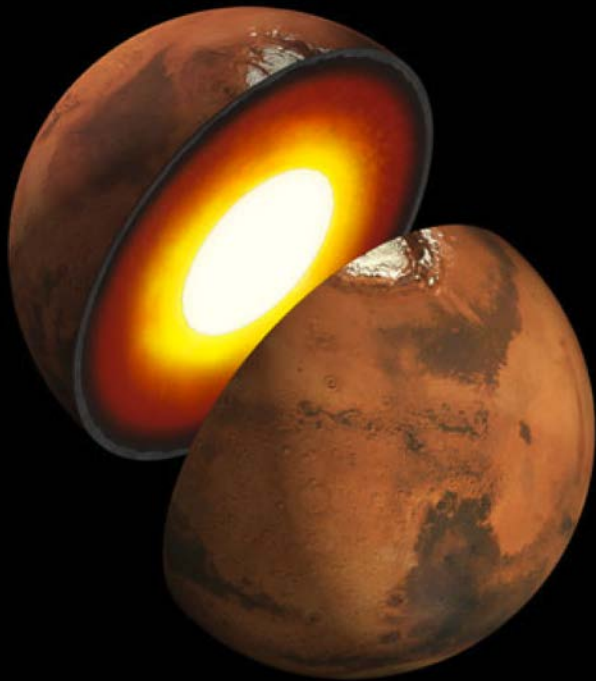
Jet Propulsion Laboratory, California Institute of Technology

6 October, 2016

© 2016. All rights reserved

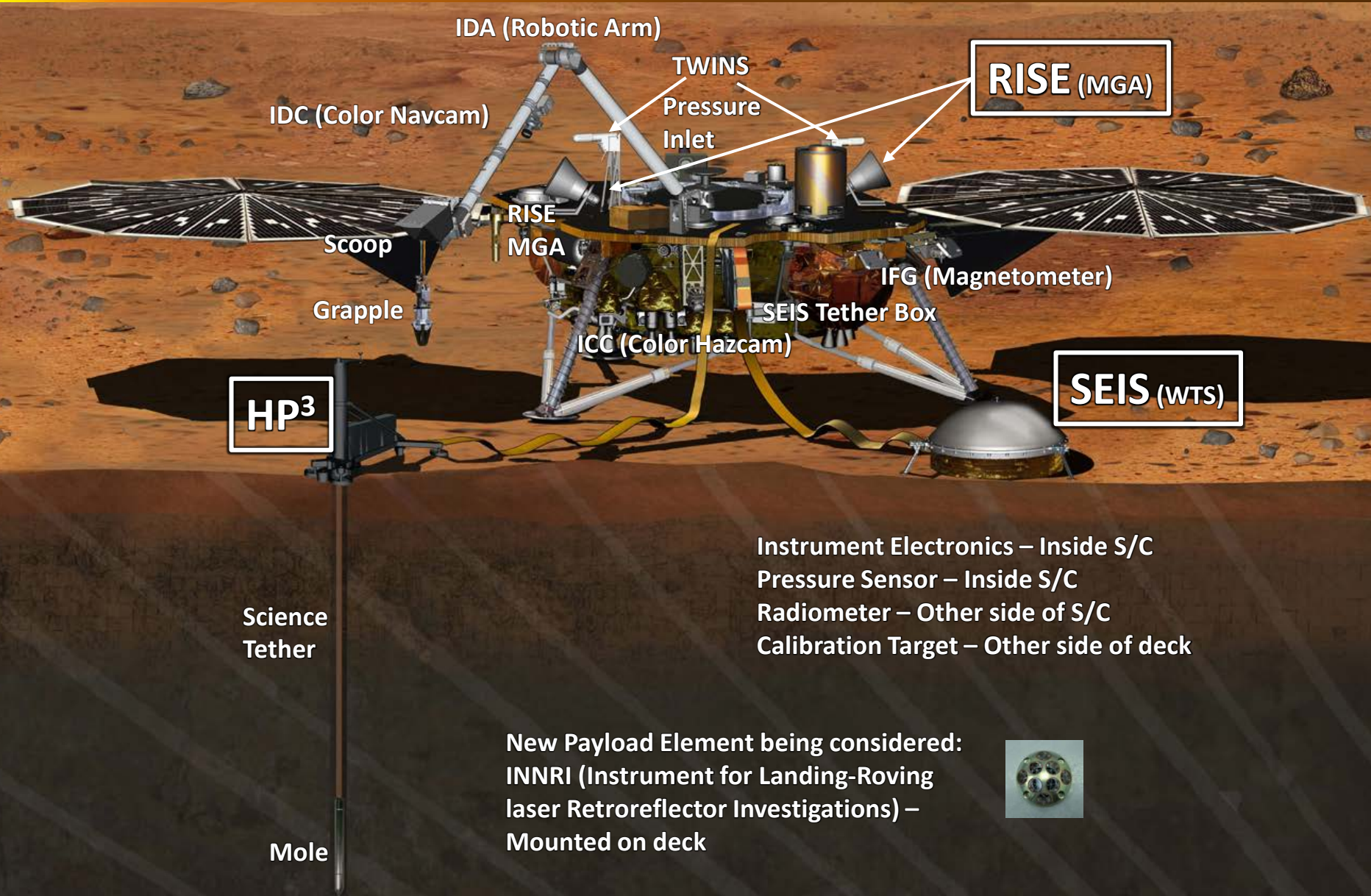


Understand the formation and evolution of terrestrial planets through investigation of the interior structure and processes of Mars.



Specific measurements:

- **Crust thickness and layering**
- **Mantle composition and layering**
- **Core size, density and state**
- **Heat flow from the interior**
- **Frequency and location of marsquakes**
- **Frequency of meteorite impacts**

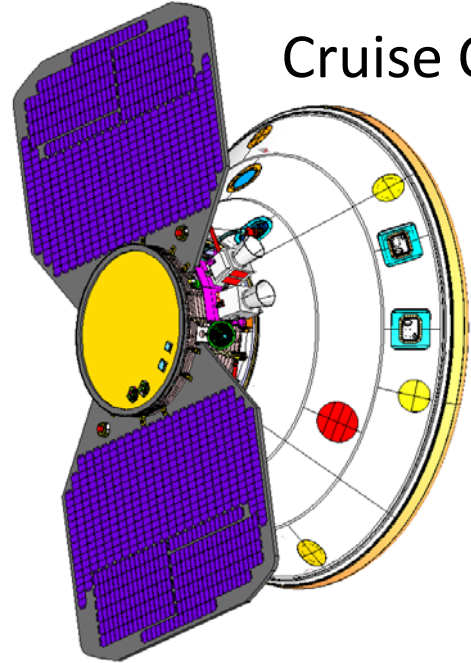


- Instrument Electronics – Inside S/C
- Pressure Sensor – Inside S/C
- Radiometer – Other side of S/C
- Calibration Target – Other side of deck

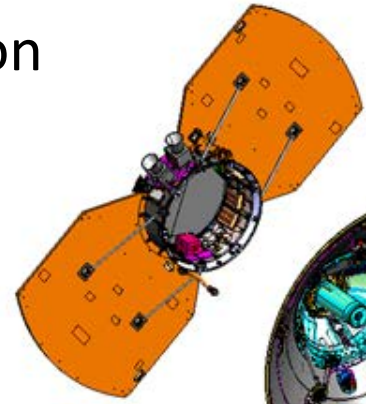
New Payload Element being considered:
 INNRI (Instrument for Landing-Roving
 laser Retroreflector Investigations) –
 Mounted on deck



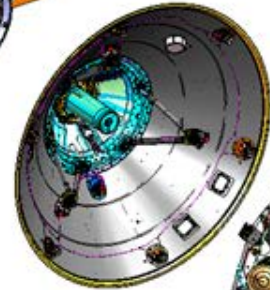
Cruise Configuration



Cruise Stage



Backshell



Lander

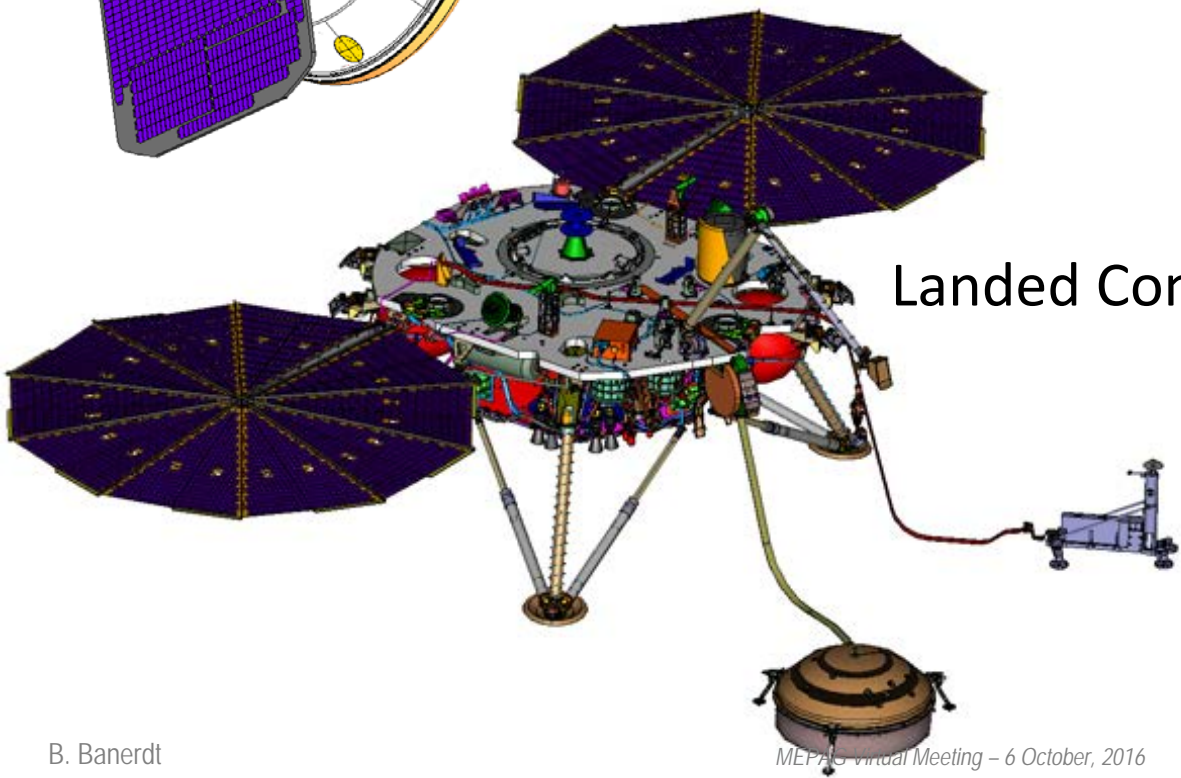


Component Deck/Cover



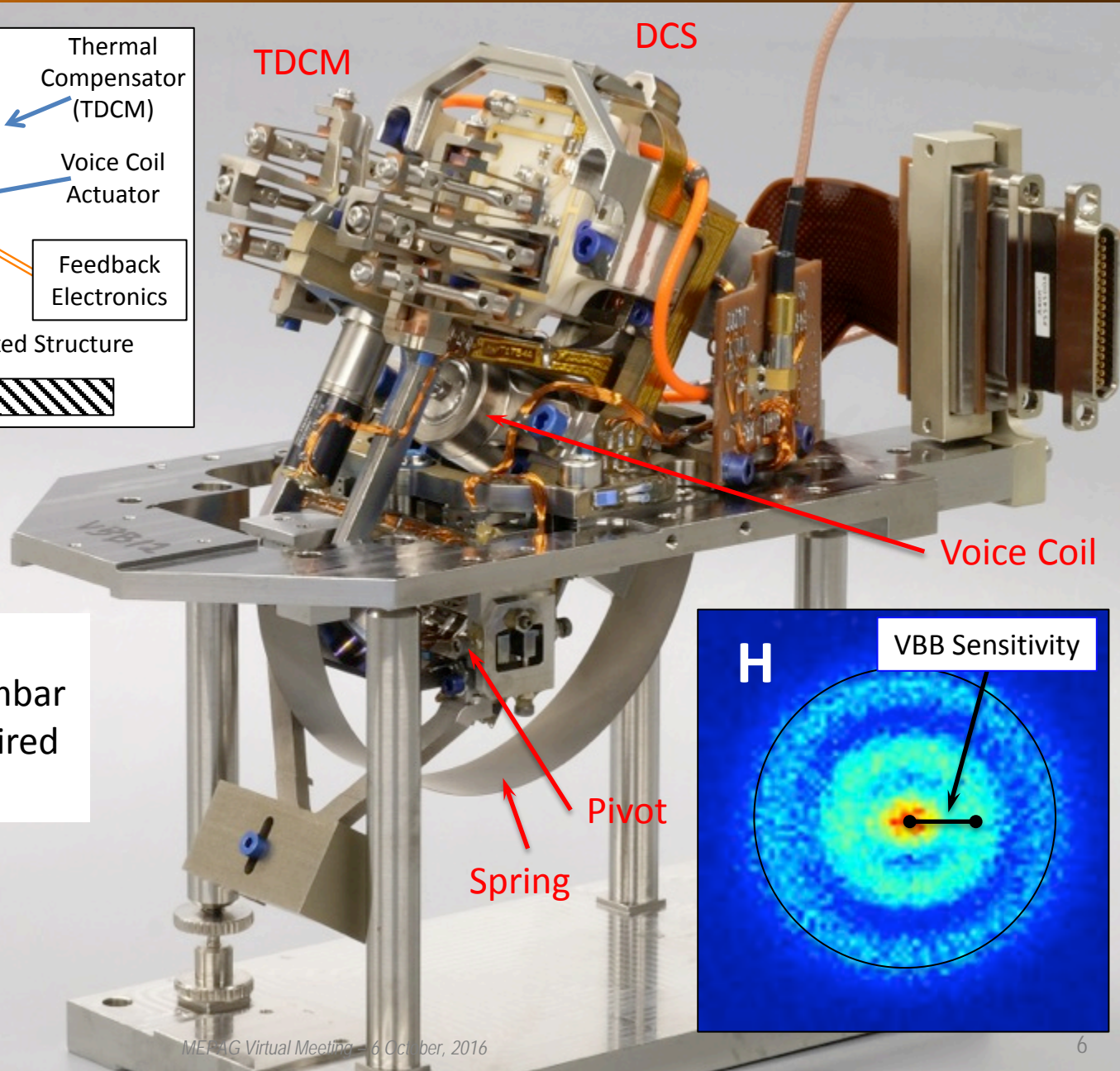
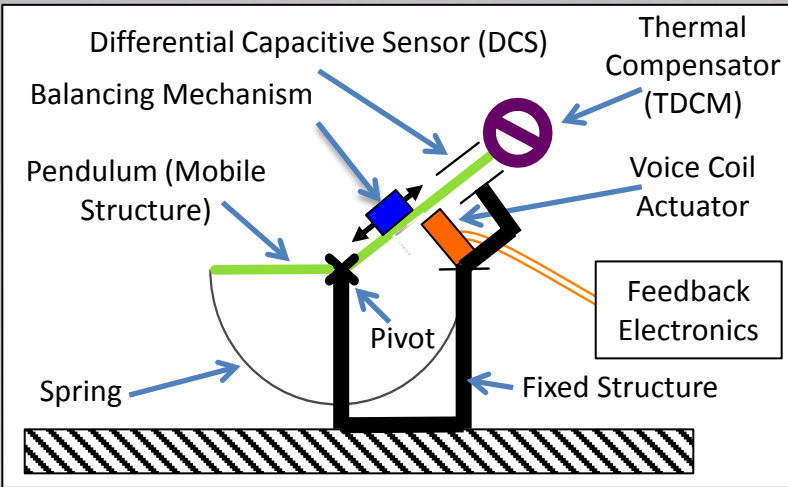
Heat Shield

Landed Configuration

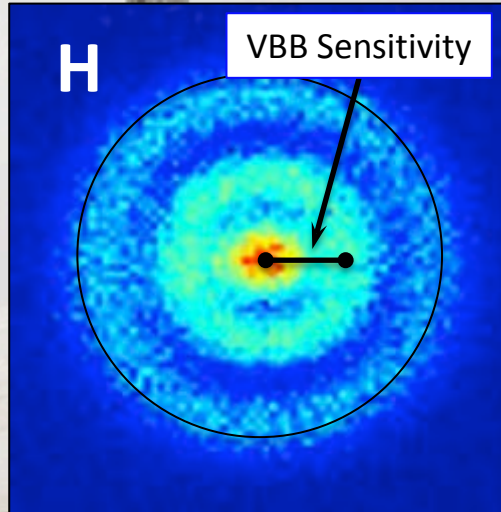


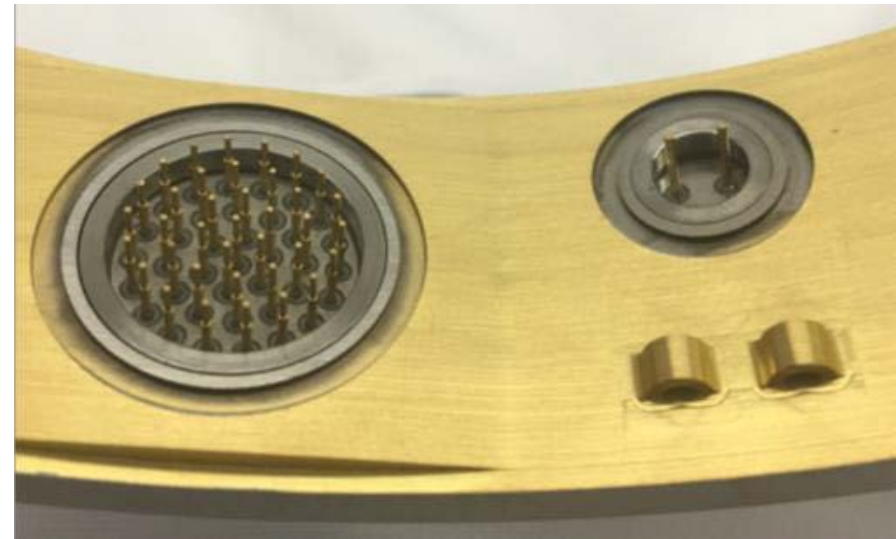
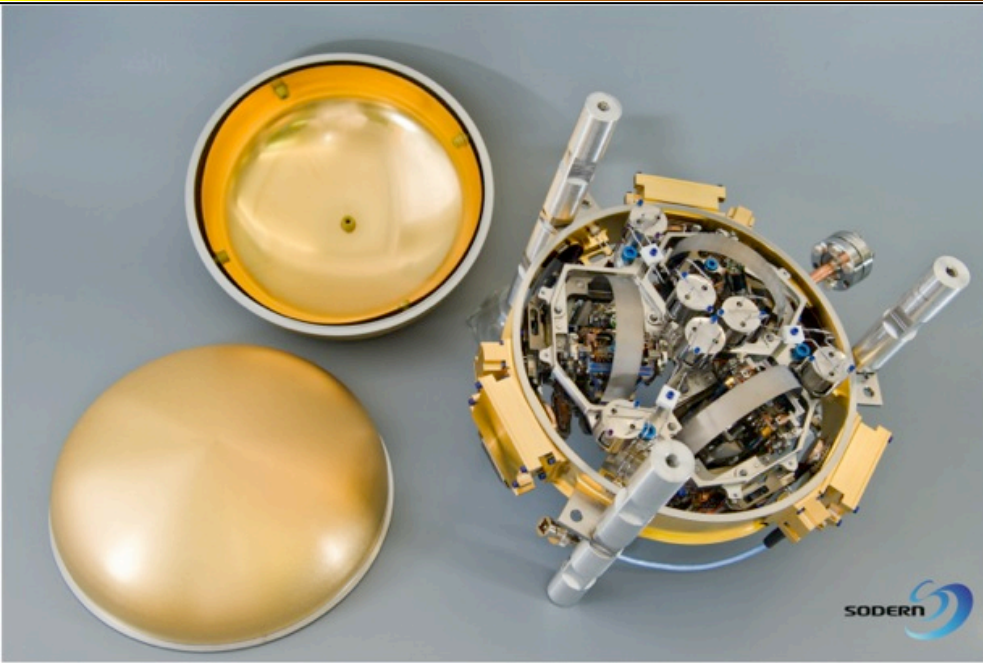






Must be operated at a pressure less than 10^{-2} mbar in order to achieve required sensitivity



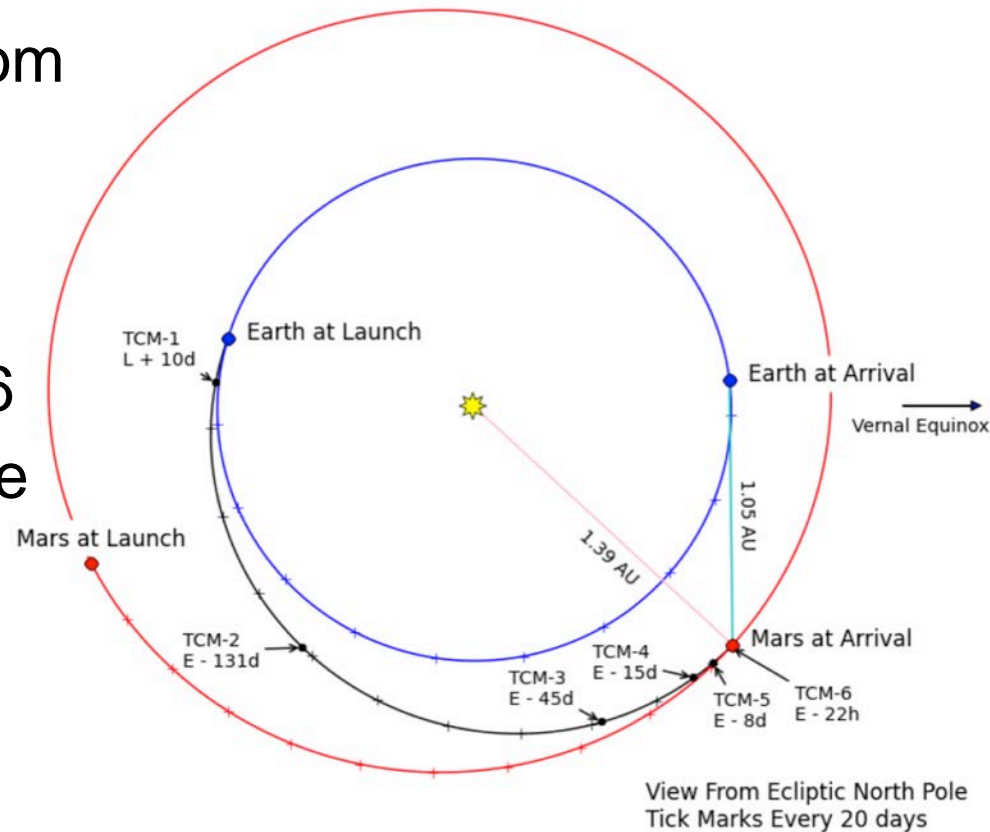


← 22 cm →

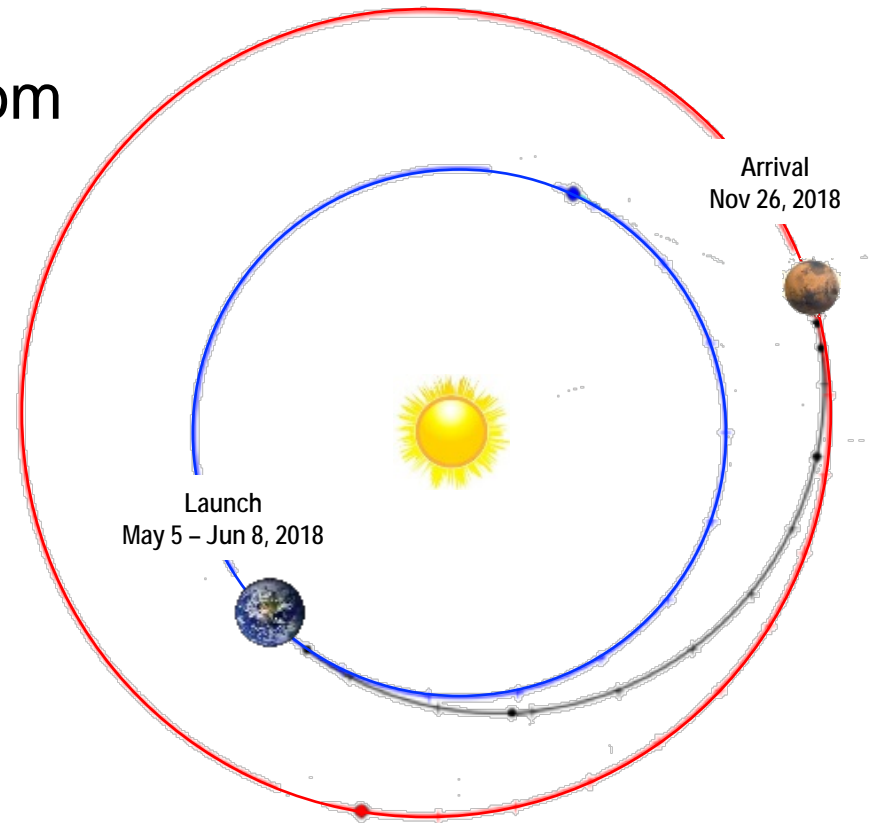


- InSight uses a near-copy of the successful Phoenix lander
- Launch: March 4-30, 2016 from Vandenberg AFB, California
- Very fast, type-1 trajectory: 6.5-month cruise to Mars
- Landing: September 28, 2016
- Two-month deployment phase
- Two years (one Mars year) science operations on the surface; repetitive operations
- Nominal end-of-mission: September 26, 2018

Launch = 03/04/2016
 Arrival = 09/28/2016



- InSight uses a near-copy of the successful Phoenix lander
- Launch: **May 5-June 8, 2018** from Vandenberg AFB, California
- Very fast, type-1 trajectory: 6.5-month cruise to Mars
- Landing: **November 26, 2018**
- Two-month deployment phase
- Two years (one Mars year) science operations on the surface; repetitive operations
- Nominal end-of-mission: **November 24, 2020**



Type 1 Trajectory
Max $C_3 = 14.3 \text{ km}^2/\text{s}^2$, max DLA = -40.8 deg

Landing Site – Still Western Elysium Planitia

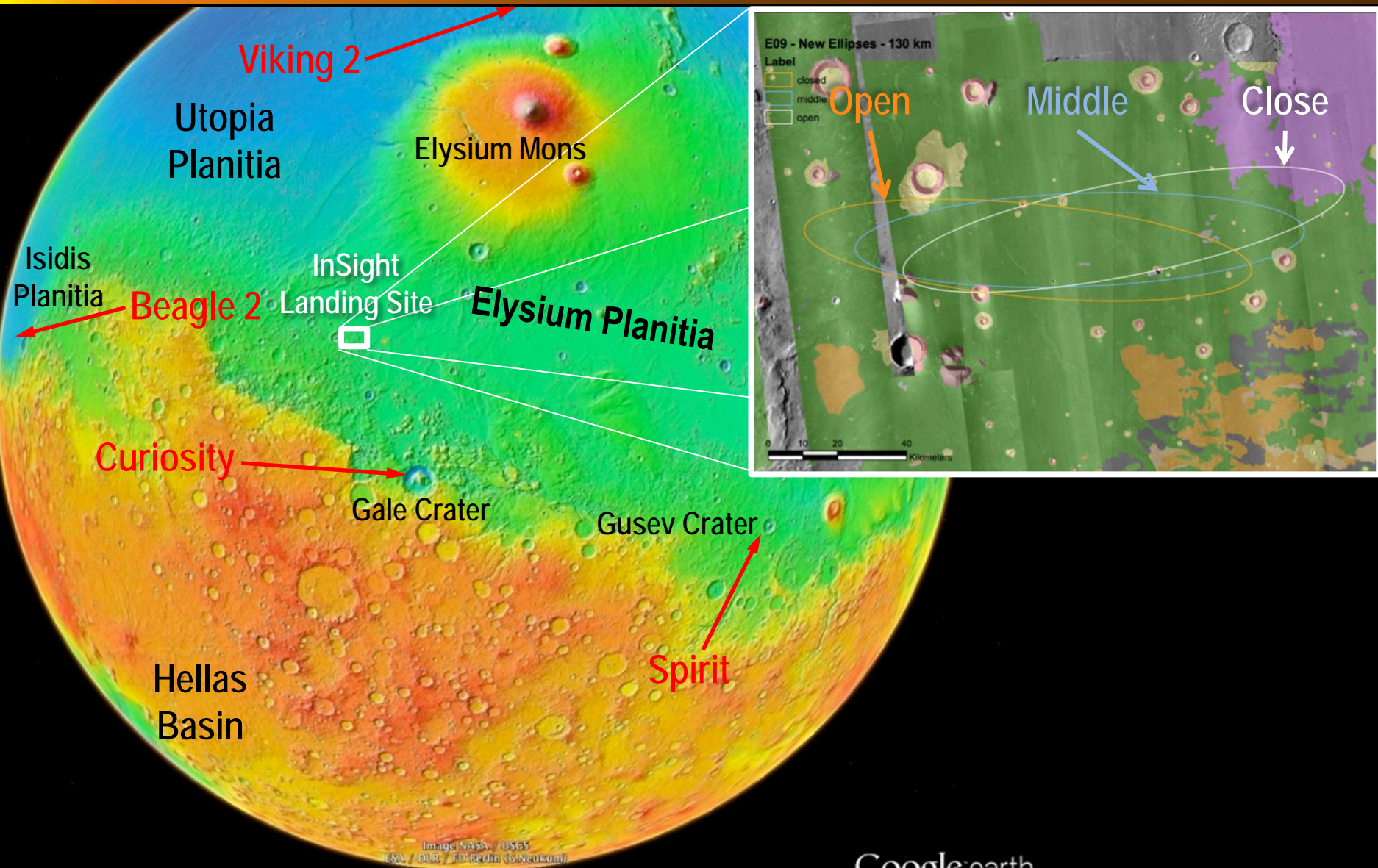


Image NASA / USGS
ESA / DLR / FU Berlin (G. Neukum)

Google earth

1°20'13.11" N 142°02'18.20" E elev -2482 m

Eye alt 4297.40 km

- Aug. 31, 2016: NASA approval of InSight Mission Replan
- Dec. 2016: Complete design modification, fabrication and test of SEIS Evacuated Container; complete rework/fabrication and test of 4-5 VBBs, select best 3 for flight
- May 2017: Complete SEIS environmental/performance testing
- June 2017: Deliver SEIS instrument to Denver; begin spacecraft integration and test
- Feb. 26, 2018: Ship lander to launch site for final assembly
- **May 5, 2018**: Launch from Vandenberg Air Force Base, CA
- **Nov. 26, 2018**: Land on Elysium Planitia ($L_s = 296$)
 - 48-sol deployment phase
 - 1 Mars year of science operations
- Nov. 24, 2020: End of nominal mission