The InSight Mission is a collaboration among the following space agencies:
National Aeronautics and Space Administration
Centre National des Études Spatiale
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

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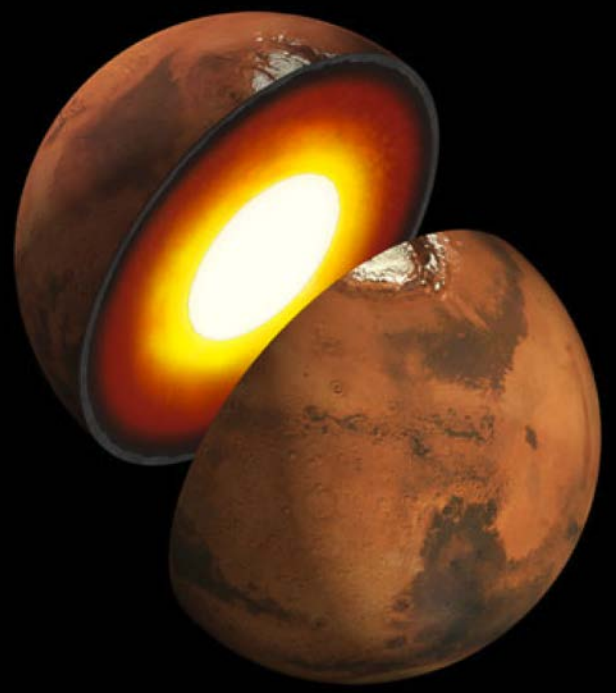
InSight Science Goal

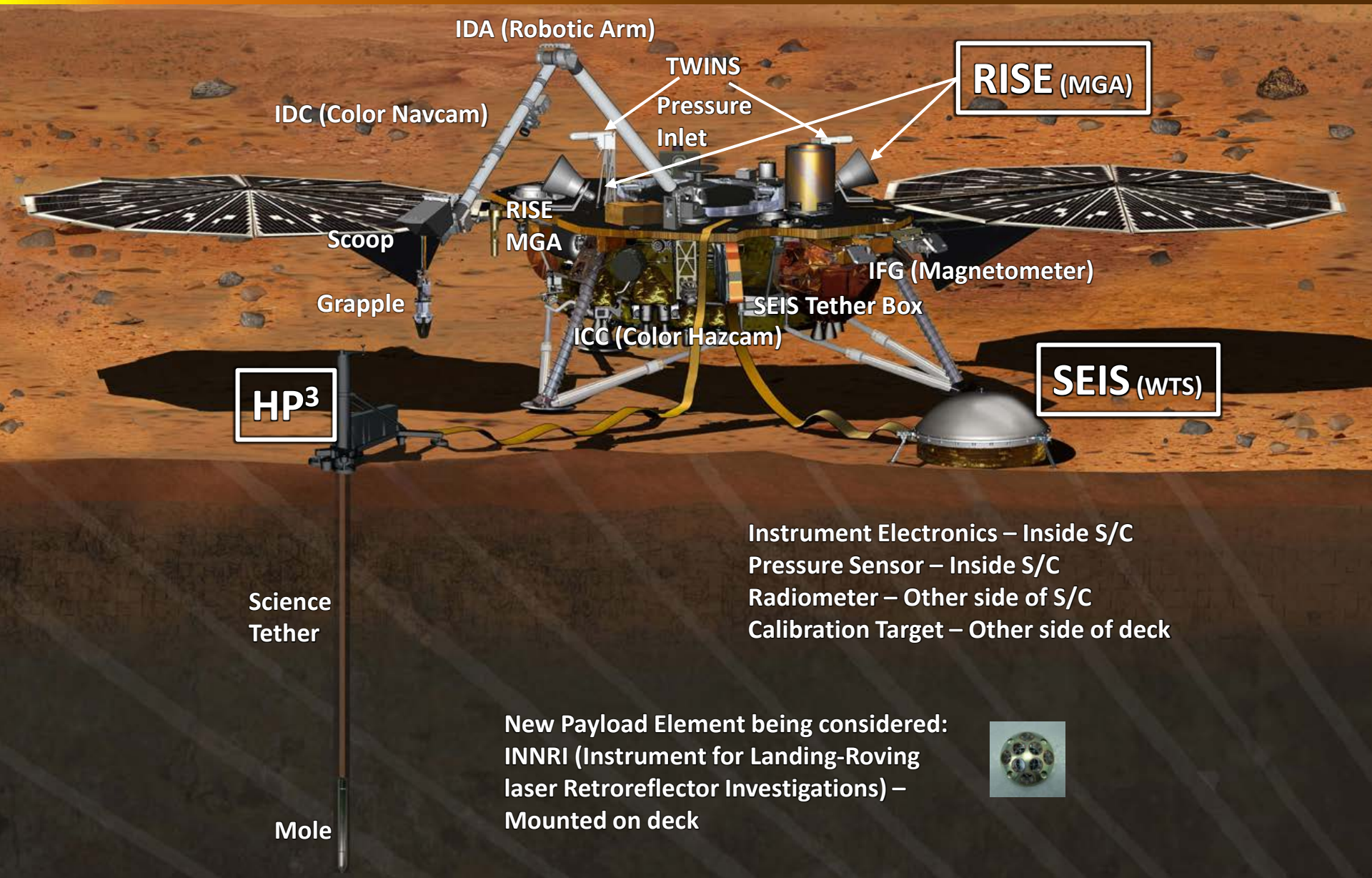
Understand the formation and evolution of terrestrial planets through investigation of the interior structure and processes of Mars.



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**

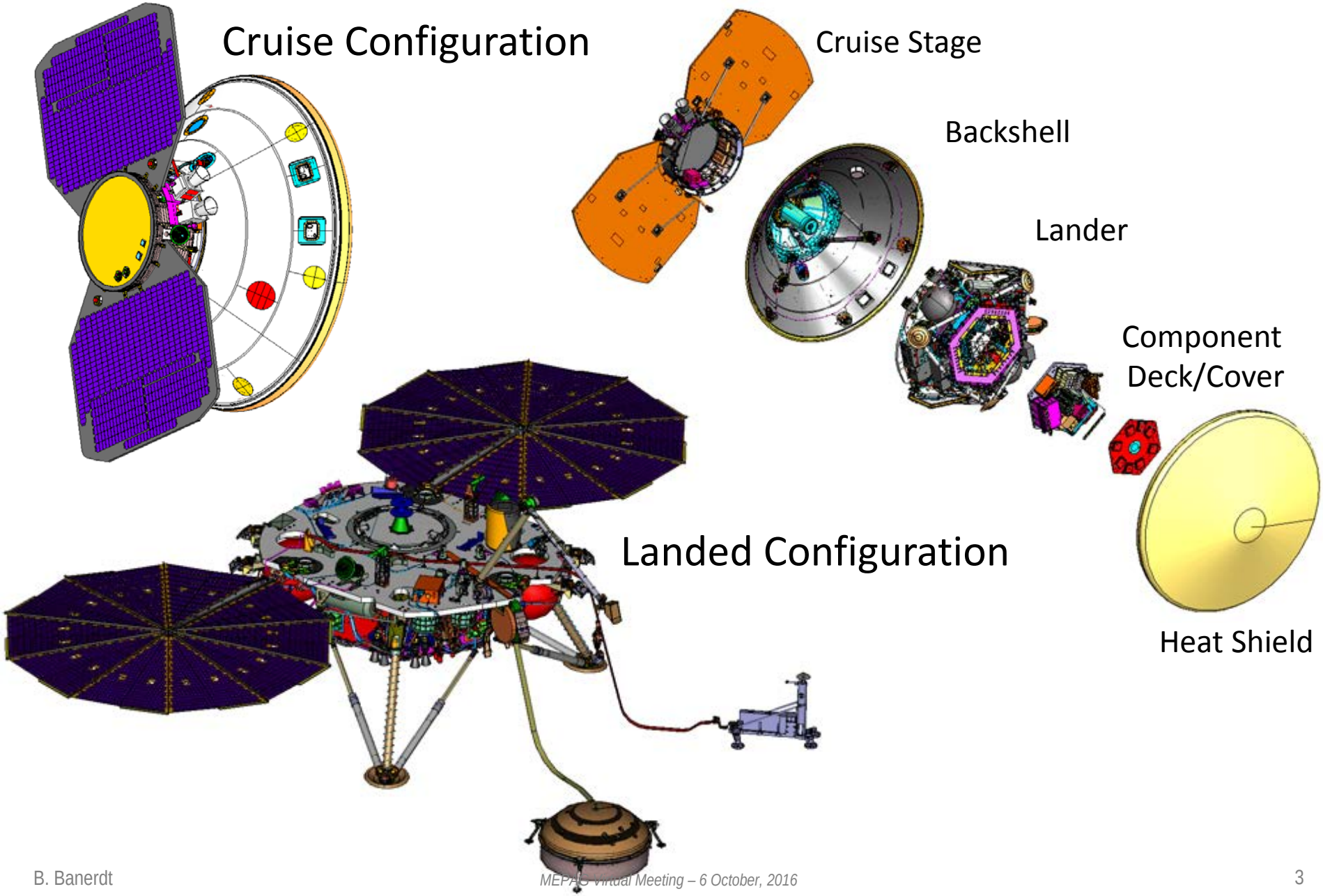
InSight Payload Configuration



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

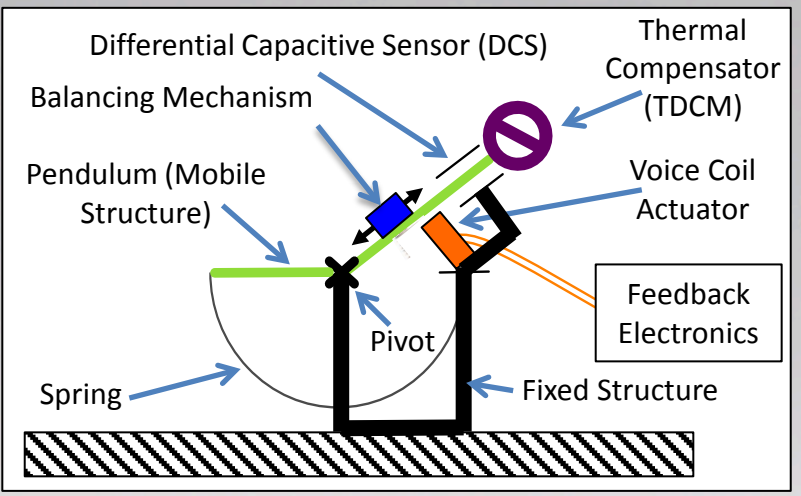
InSight Spacecraft

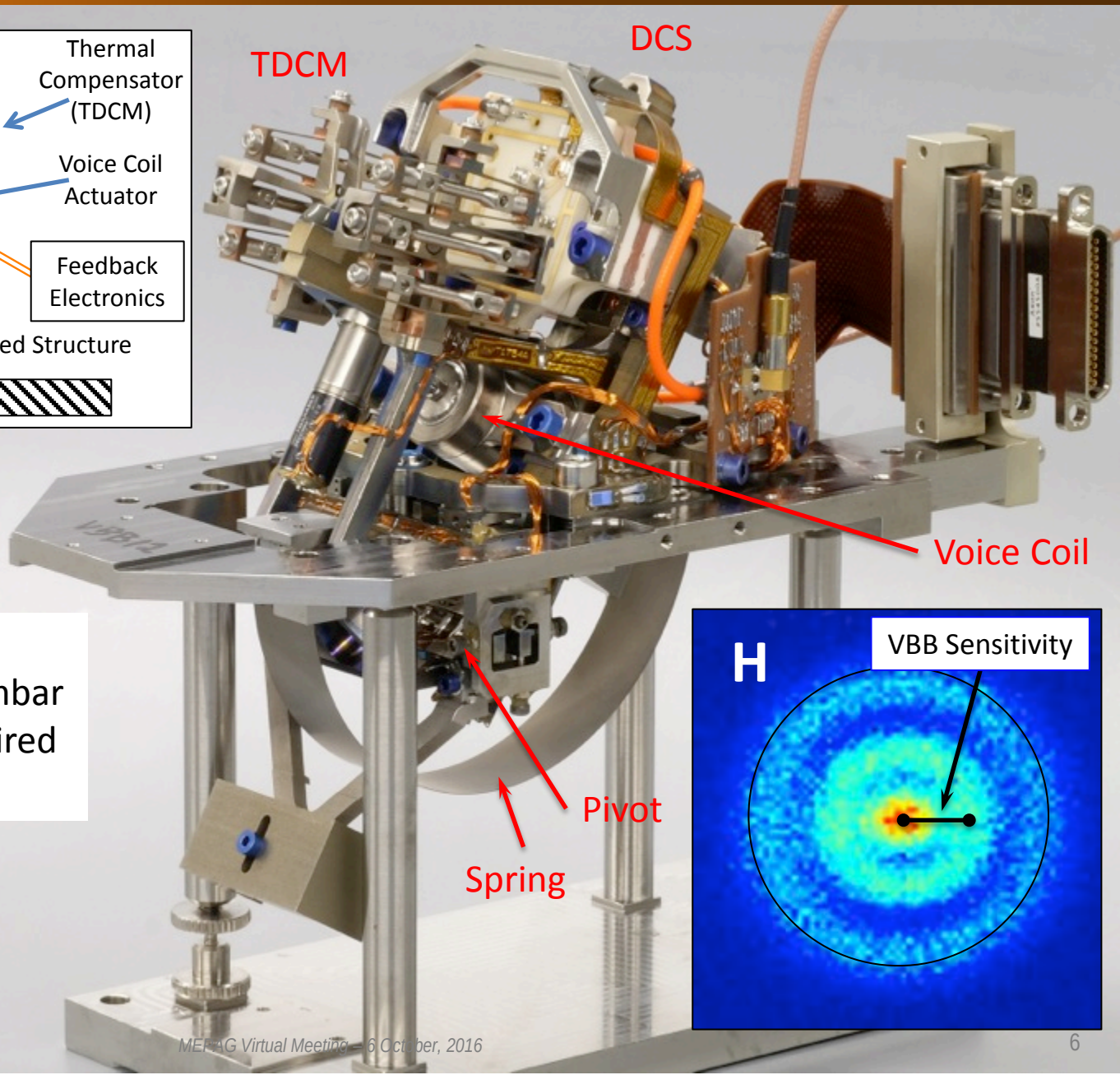


Spacecraft in Landed Configuration (LM, Denver, Apr. 2015)

Spacecraft in Cruise Configuration (VAFB, CA, Dec. 2015)

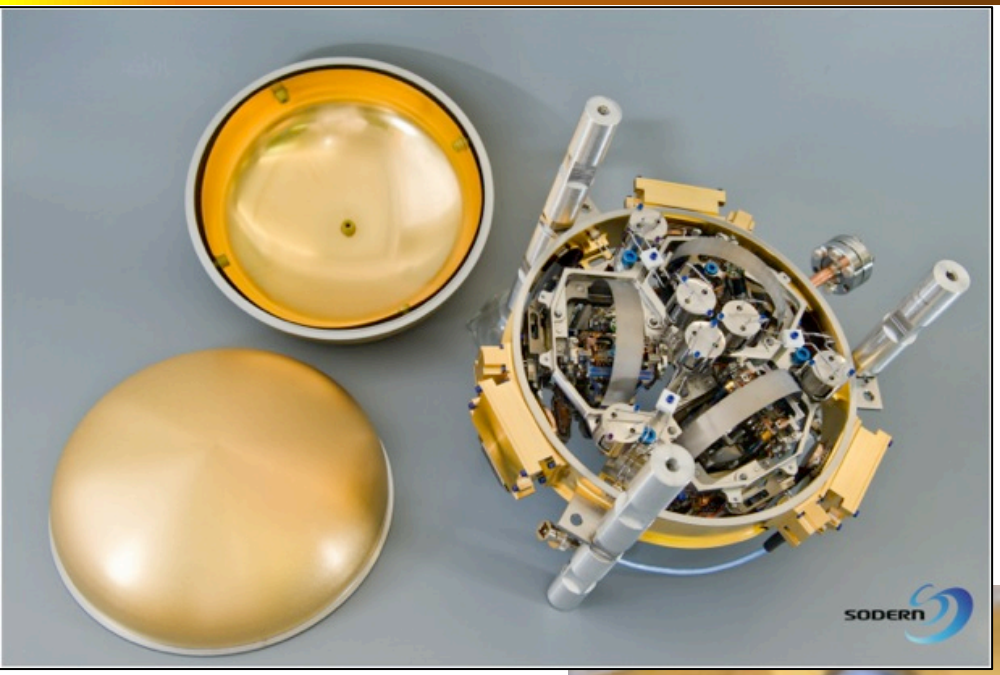
VBB (Very Broad Band) Sensor



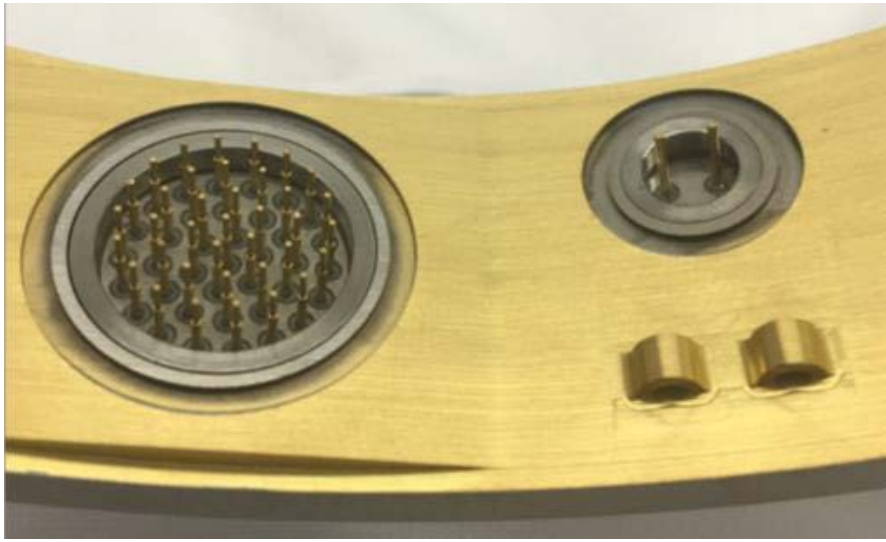


Must be operated at a pressure less than 10^{-2} mbar in order to achieve required sensitivity

SEIS Sphere/EC and Feedthroughs

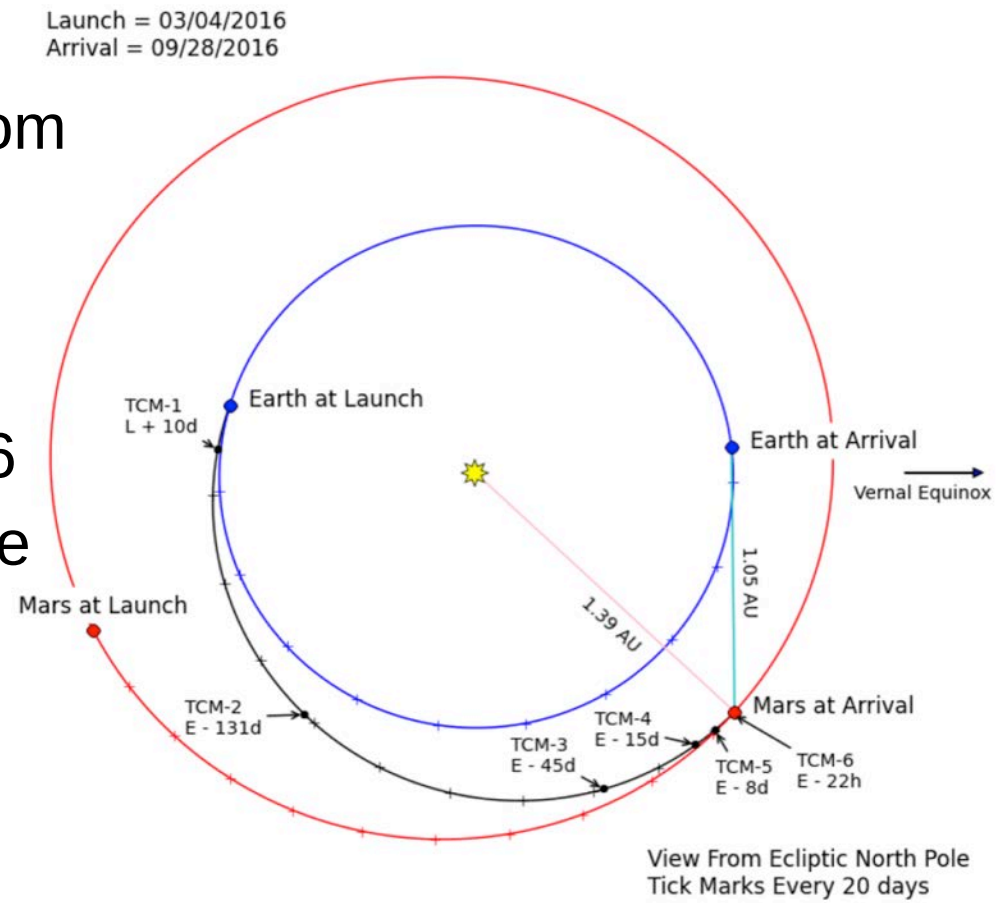


22 cm



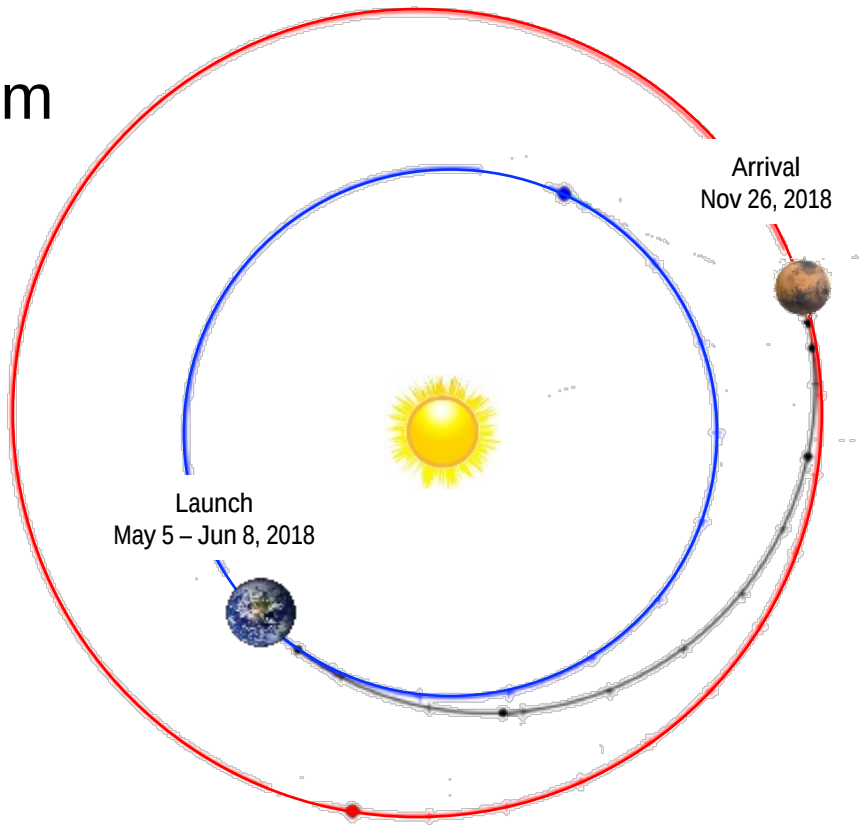
Original Mission Summary

- 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



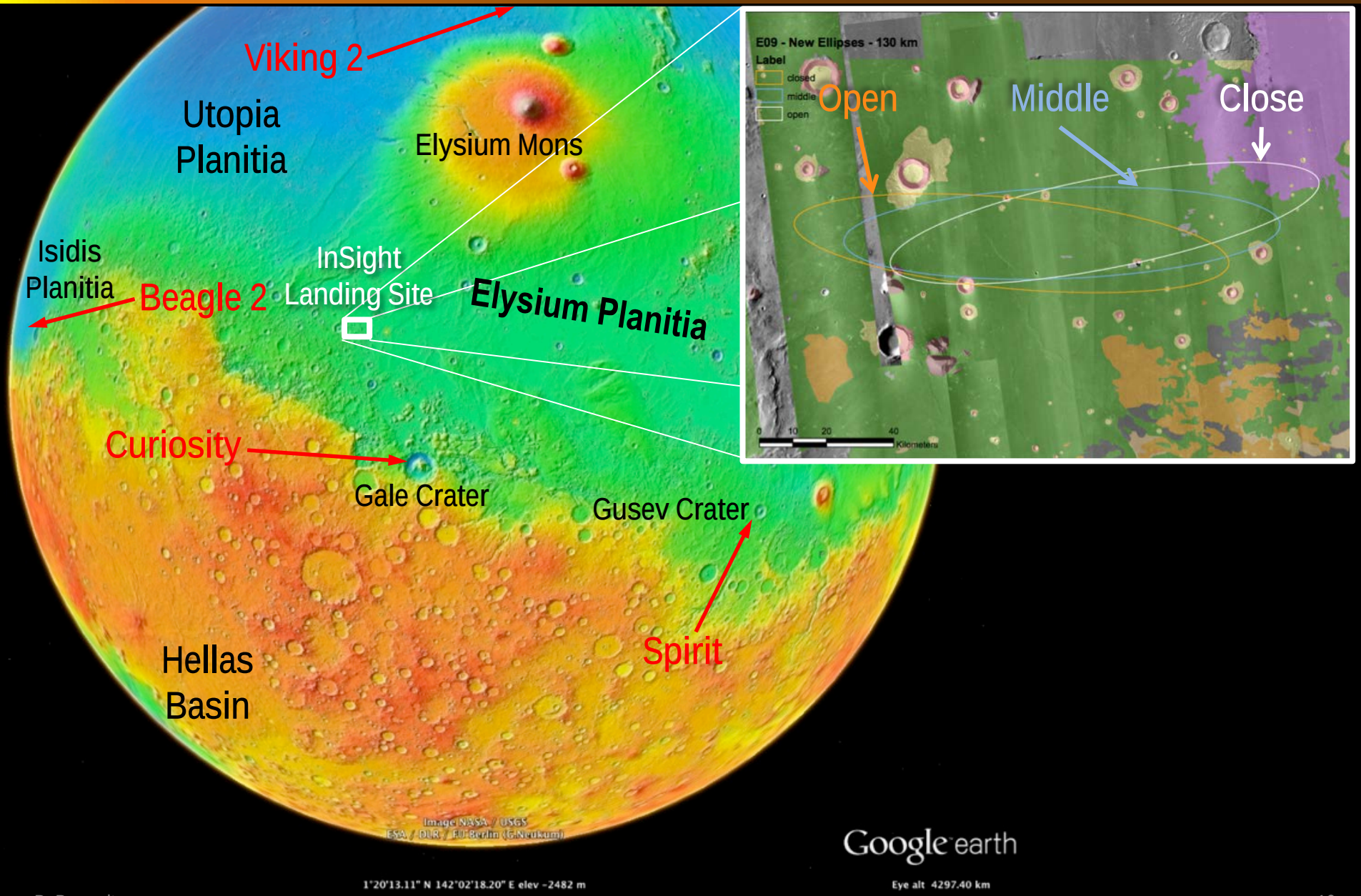
Current Mission Summary

- 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 km^2/s^2, max DLA = -40.8 deg

Landing Site – Still Western Elysium Planitia



InSight Mission Plan – Milestones

- 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