



052018

InSight Mission to Mars

NASAJ2M2



National Aeronautics and Space Administration

J2M2902909593769

BOARDING PASS: INSIGHT LANDER MISSION TO MARS

Dr. Betsy Pugel

LAUNCH SITE

VANDENBERG AFB
CALIFORNIA, USA
EARTH



ARRIVAL SITE

ELYSIUM PLANITIA,
"PLAIN OF IDEAL HAPPINESS"
MARS



SCHEDULED DEPARTURE

MAY 2018

ROCKET

ATLAS V 401



AWARD POINTS EARNED

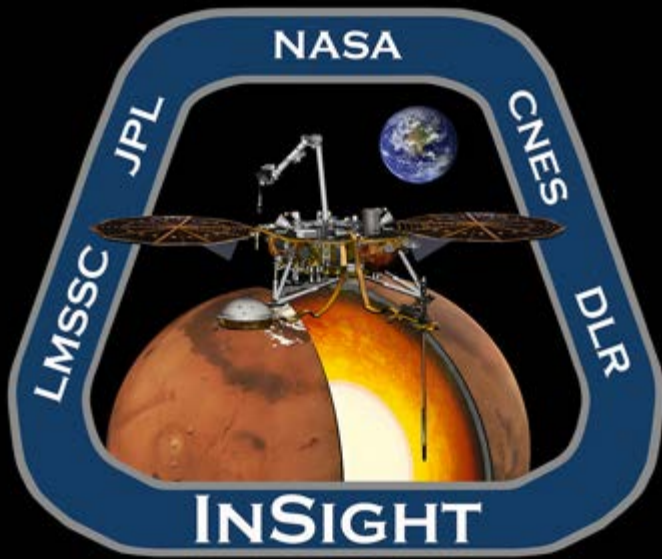
301,223,981 mi /
484,773,006 km

Outline

InSight Mission Background

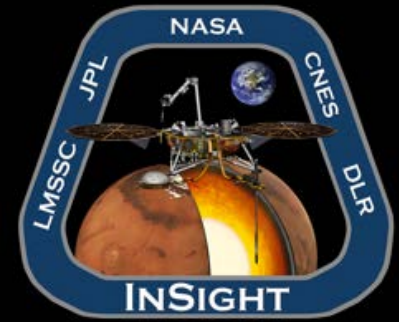
Behind the Scenes: *From Pre-Launch to Operations*

Why Call this Mission InSight?

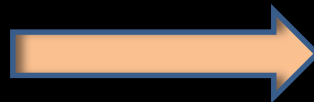


Interior Exploration using
Seismic
Investigations,
Geodesy and
Heat
Transport

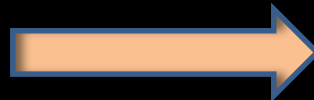
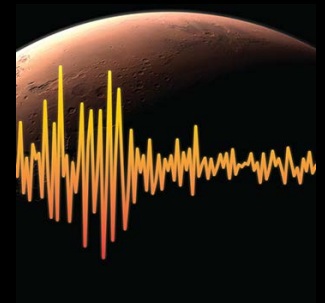
What is InSight measuring?



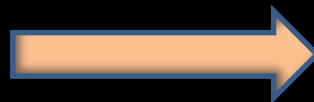
Interior Exploration using
Seismic
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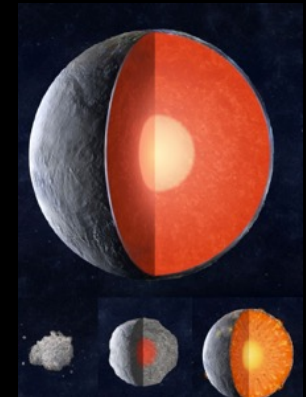
Marsquakes



Wobble



Interior
Temperature



Taking Mars' Vital Signs

*(It's been 4.3BY
since your last
appointment...)*



Checking Mars' Pulse

Seismic Activity

Taking Mars' Temperature

Thermal Conductivity

Checking Mars' Reflexes

Wobble/Precession

RISE

Rotation and Interior
Structure Experiment

- What is the precession of Mars?
- What is the size/composition of Mars' core?

SEIS

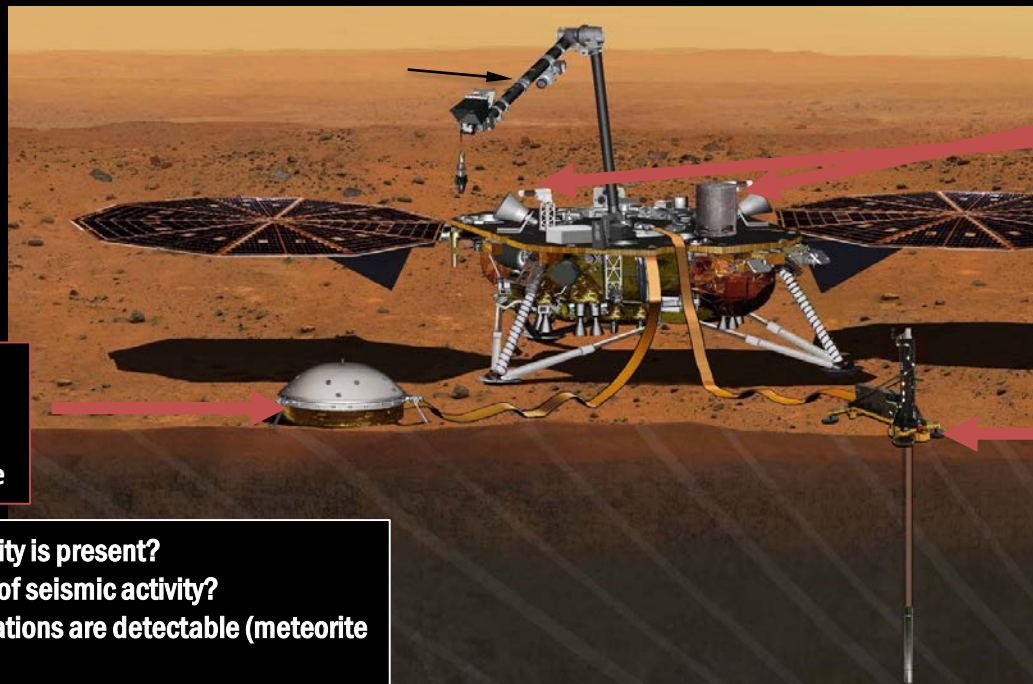
Seismic Experiment
for Interior Structure

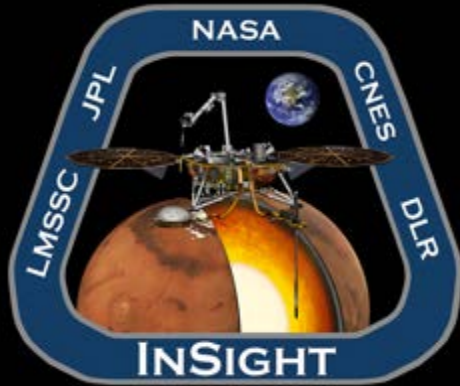
- How much seismic activity is present?
- What is the distribution of seismic activity?
- What other surface vibrations are detectable (meteorite impacts, dust storms)?

HP³

Heat-Flow and Physical
Properties Probe

- At what rate does heat escape the interior?
- What is the thermal conductivity vs. depth?
- Are Earth and Mars siblings?





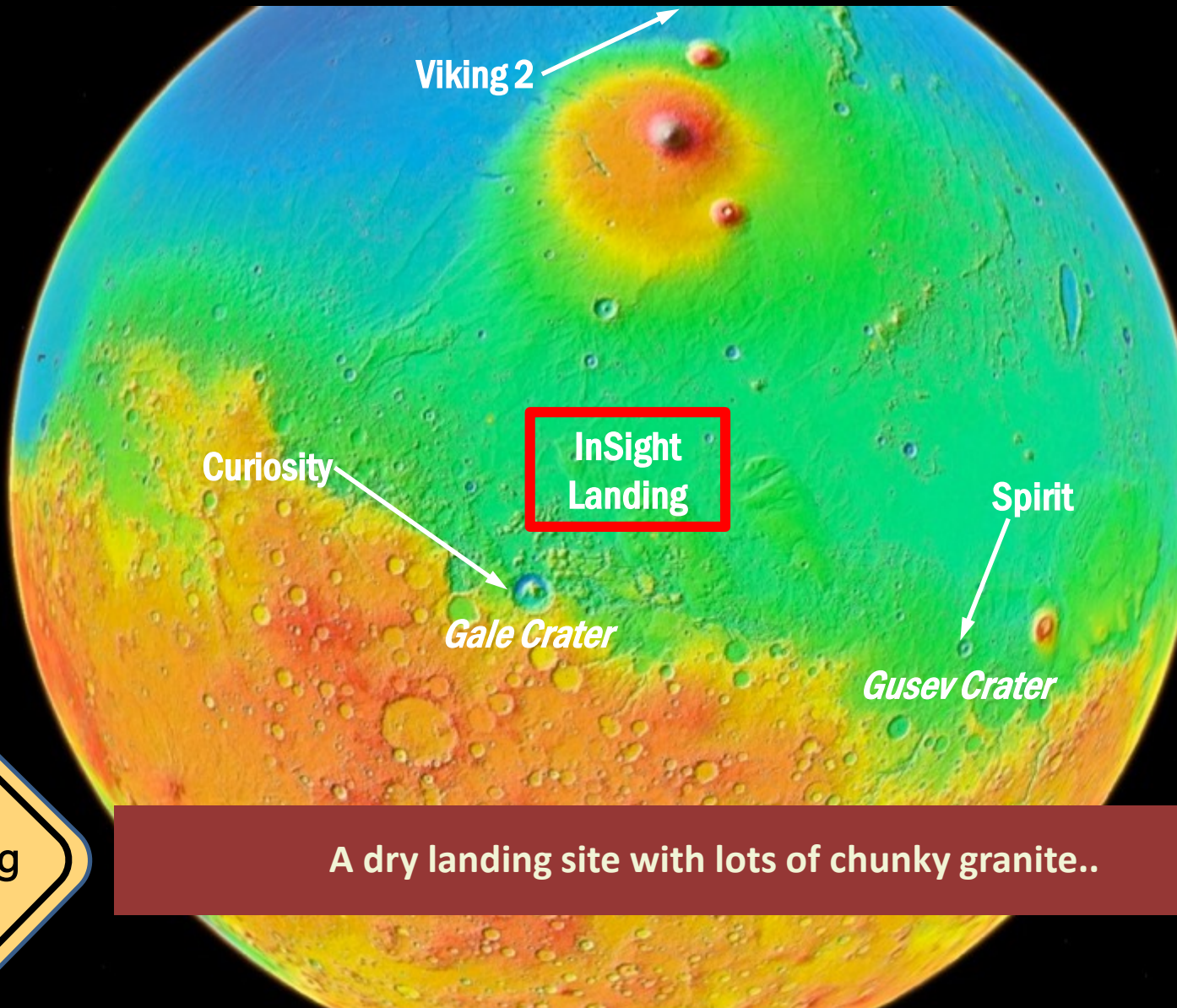
Basics

- **The first Mars launch out of the West Coast/ Vandenberg AFB**
- **Launch Date: May 5, 2018 on an Atlas V 401**
- **Landing Date: November 26, 2018**
- **Currently in operation on Mars**
- **Mission Duration: 728 Earth Days (~ 2 years)**

Landing Site

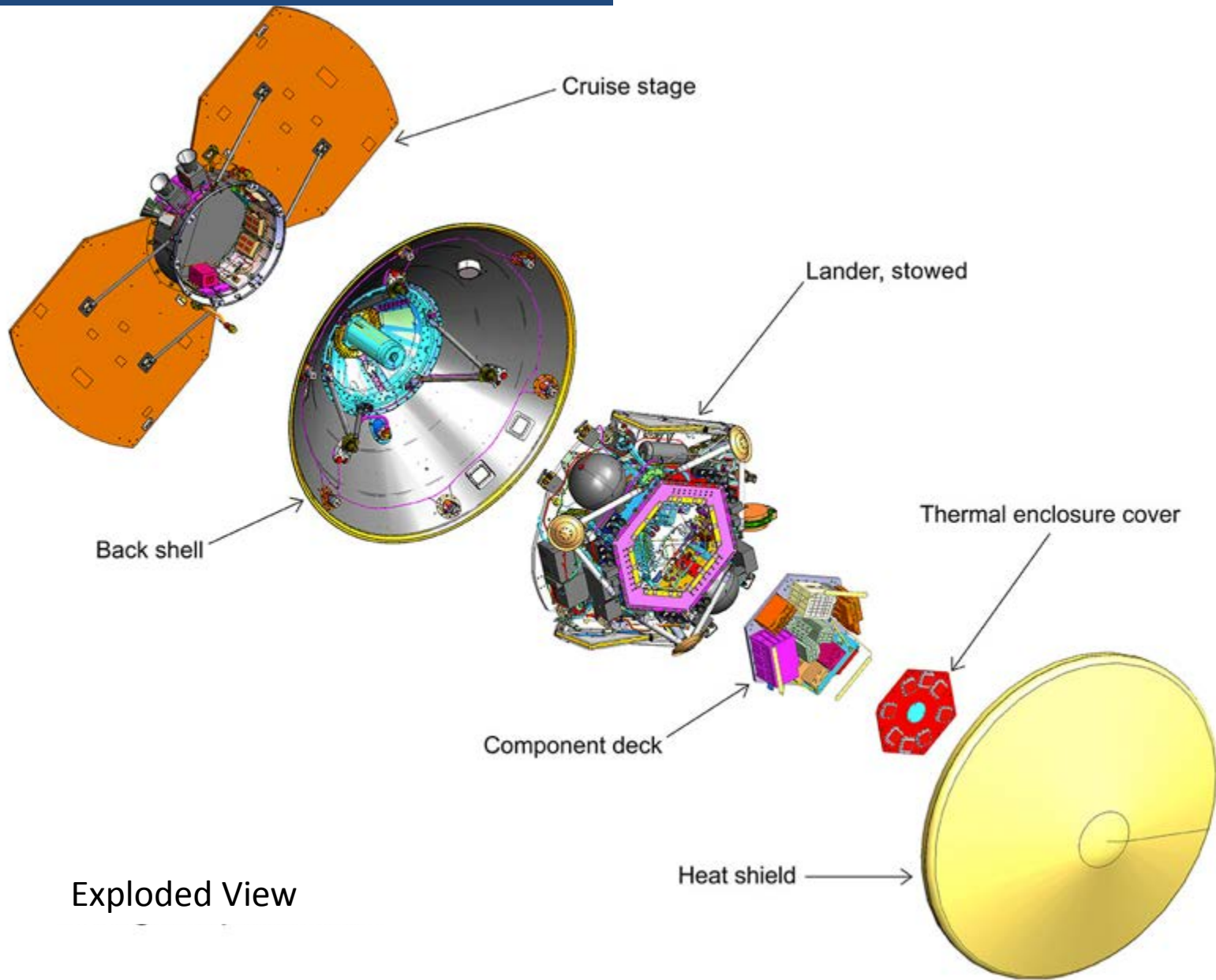
Elysium Planitia

"an afterlife paradise that is flat!"



A dry landing site with lots of chunky granite..

Spacecraft in Cruise Stage



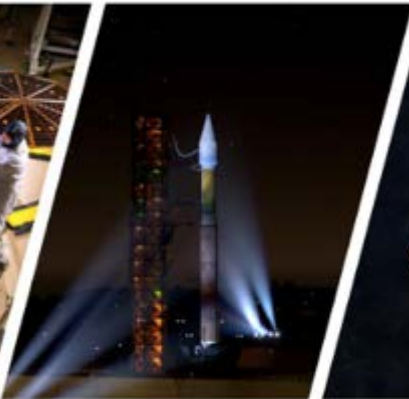
Outline

InSight Mission Background

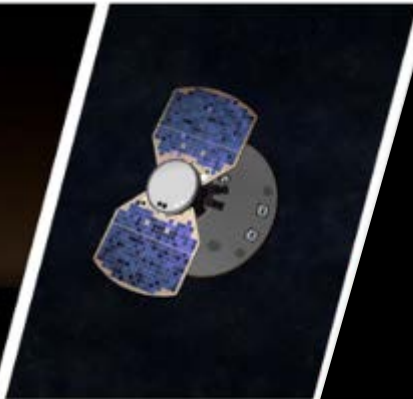
Behind the Scenes: *From Pre-Launch to Operations*



PRE-LAUNCH



LAUNCH



CRUISE



APPROACH



LANDING

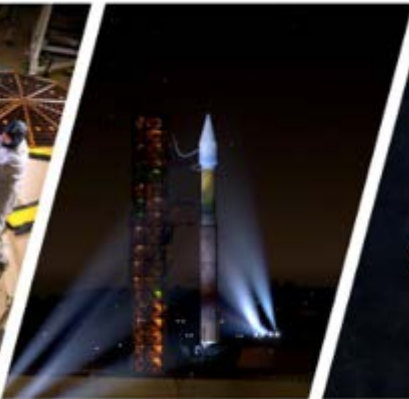


SURFACE OPS

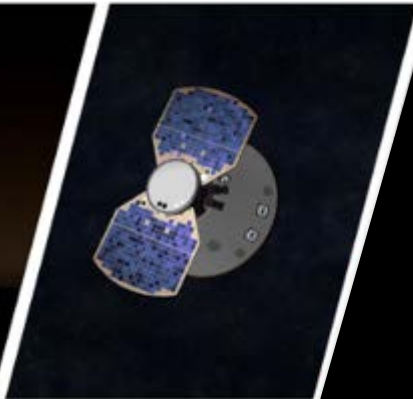
From Earth to Mars...



PRE-LAUNCH



LAUNCH



CRUISE



APPROACH



LANDING



SURFACE OPS



PRE-LAUNCH

LAUNCH

CRUISE



APPROACH

LANDING

SURFACE OPS

From Preparations to Integration and Test



PRE-LAUNCH

2014 through
February 2018



Lockheed Martin
Littleton

Through blizzards,
government shutdowns
and modified
launch opportunities...



Shipping and Unloading



PRE-LAUNCH

February
2018



Buckley
AFB



Vandenberg
AFB





Transport to Cleanroom



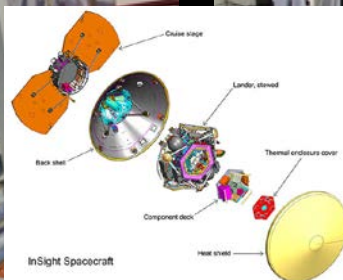


Unpack and Test

March - April 2018



Vandenberg
AFB



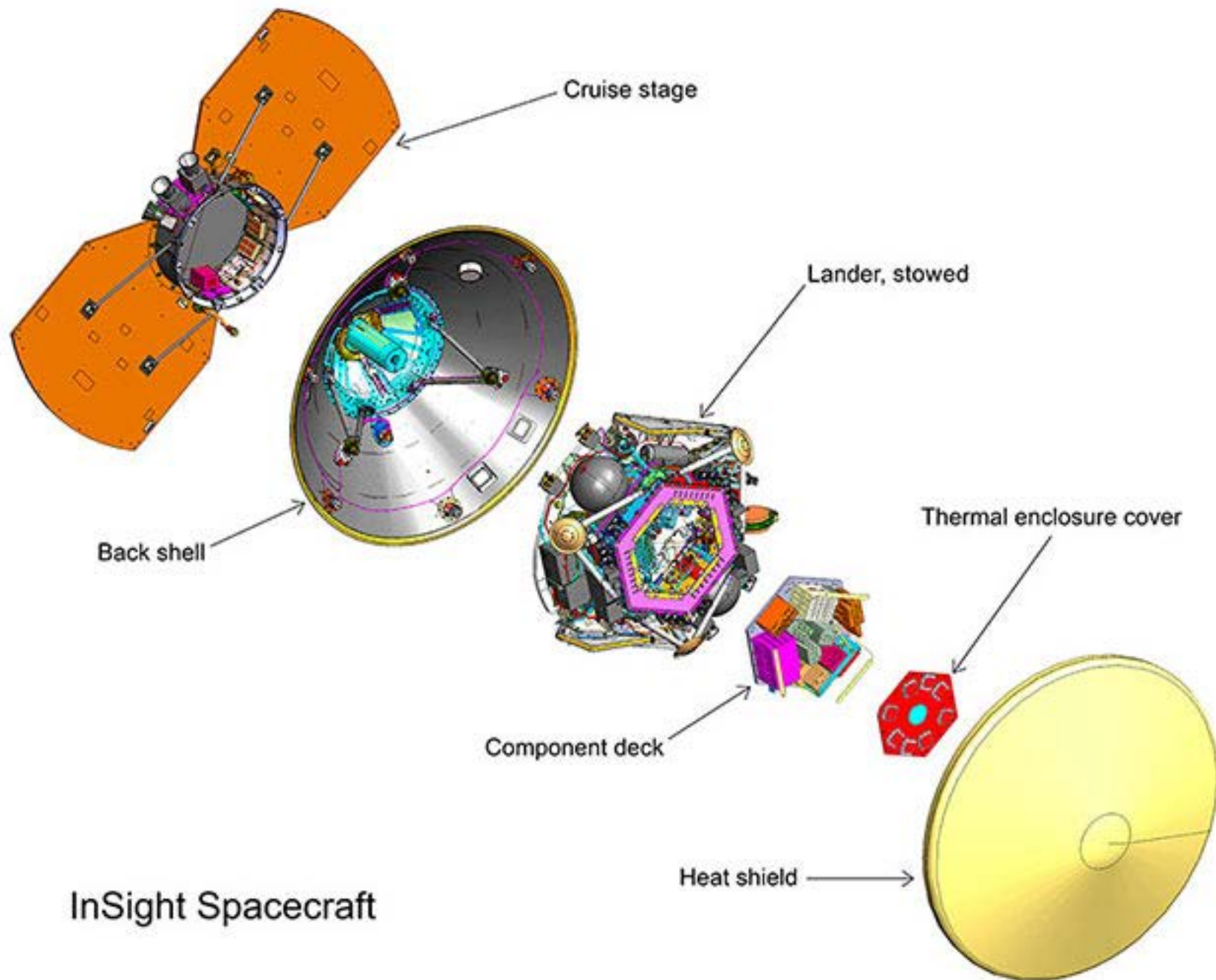


2018.04.06 14:37

Encapsulation





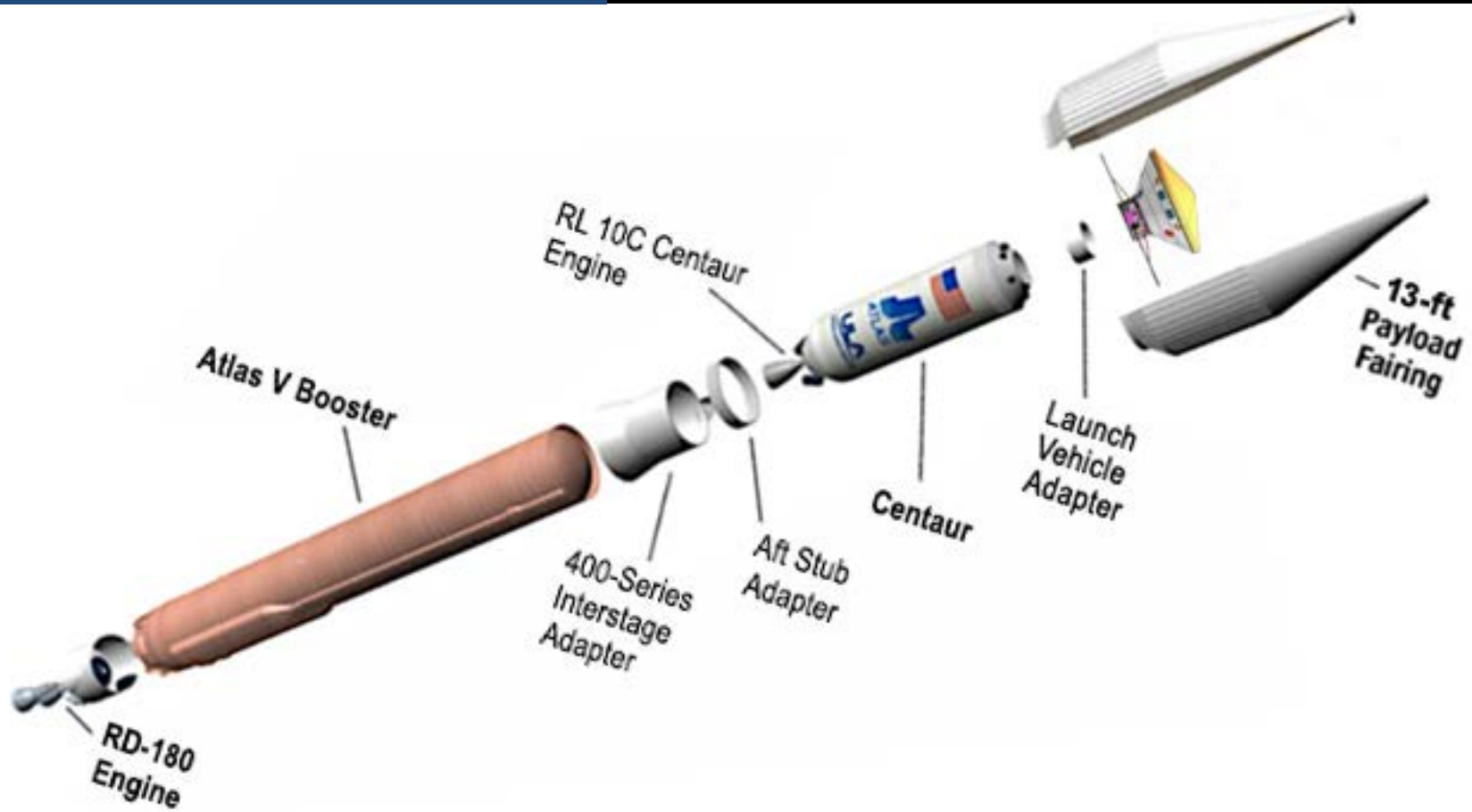


InSight Spacecraft





LV Assembly and Stack























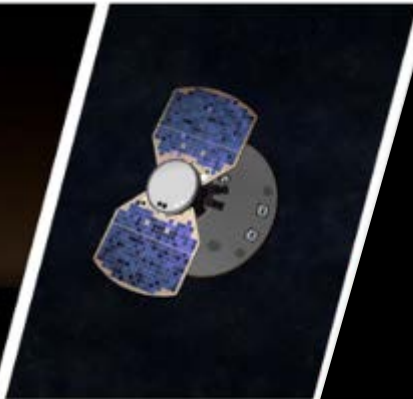




PRE-LAUNCH



LAUNCH



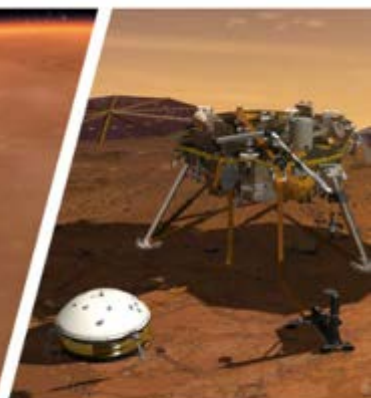
CRUISE



APPROACH




LANDING



SURFACE OPS

Launch !

VANDENBERG LAUNCH **4** You
InSight | MAY 5 #NBC4You

FORECAST LOW CLOUDS & FOG  53° WINDS NW 5-15MPH	LAUNCH WINDOW OPENS 4:05 AM LAUNCH VEHICLE ATLAS V LAUNCH SITE SLC-3E
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FIRST VANDENBERG INTERPLANETARY LAUNCH
2 HOUR LAUNCH WINDOW

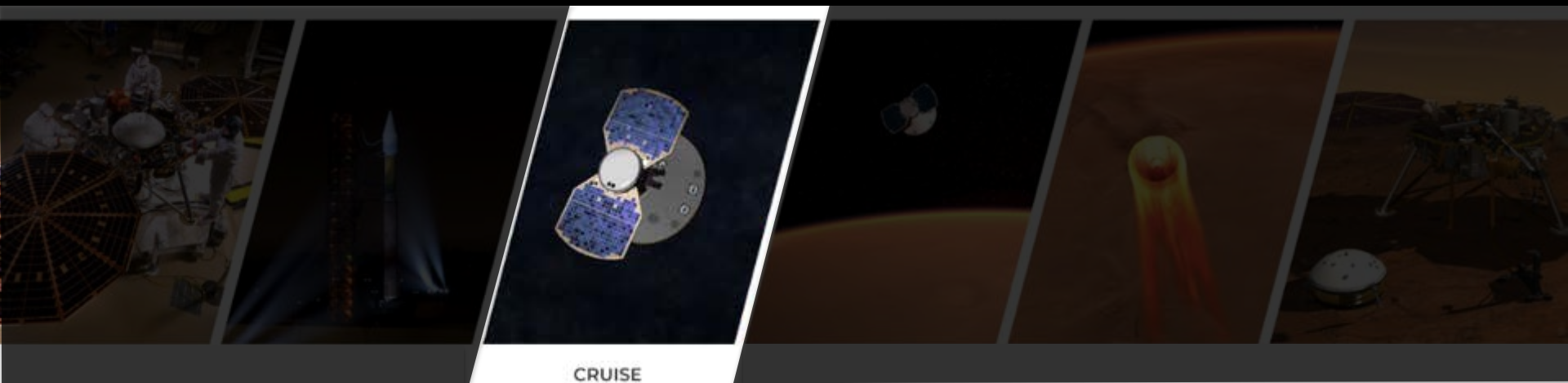






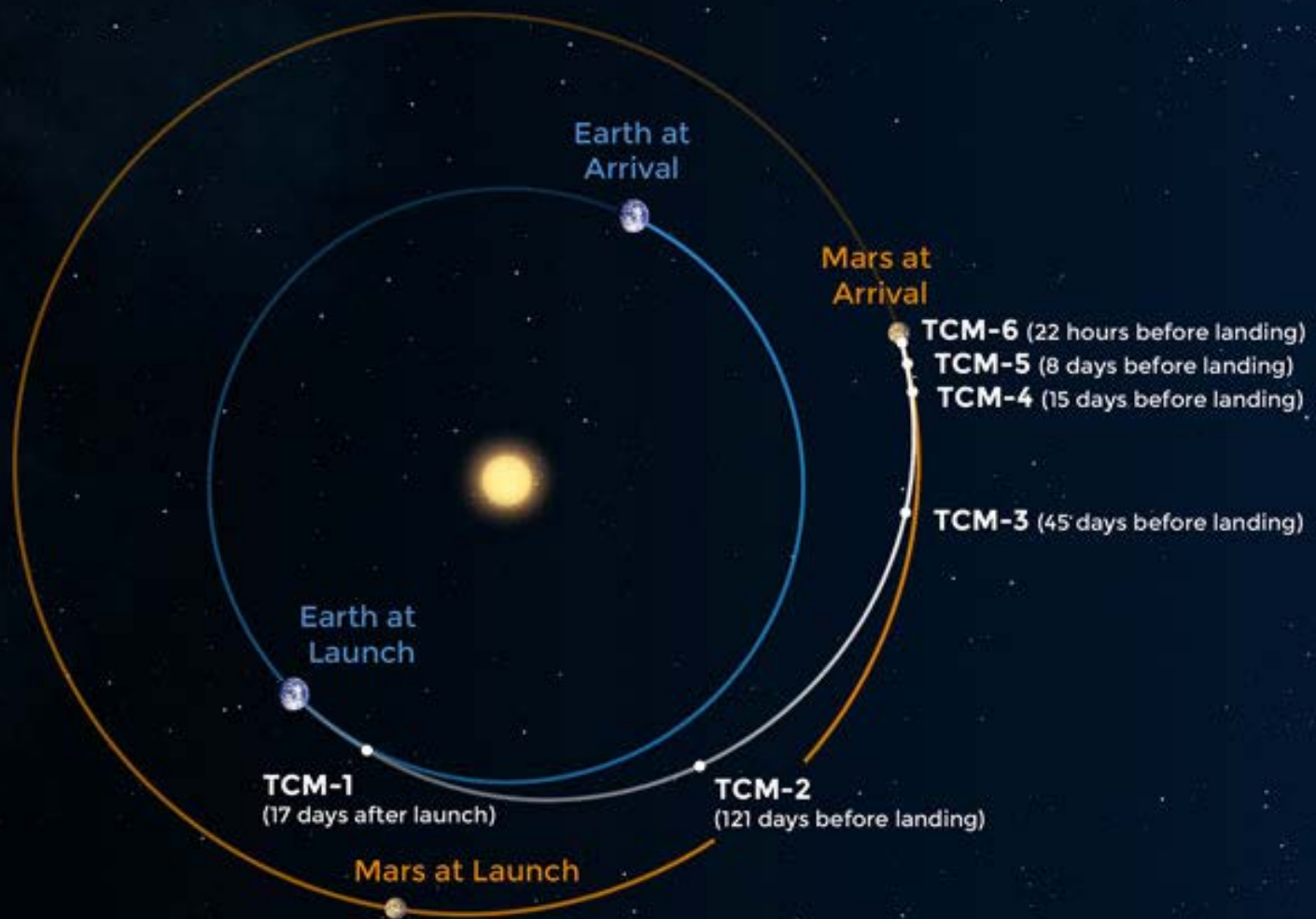






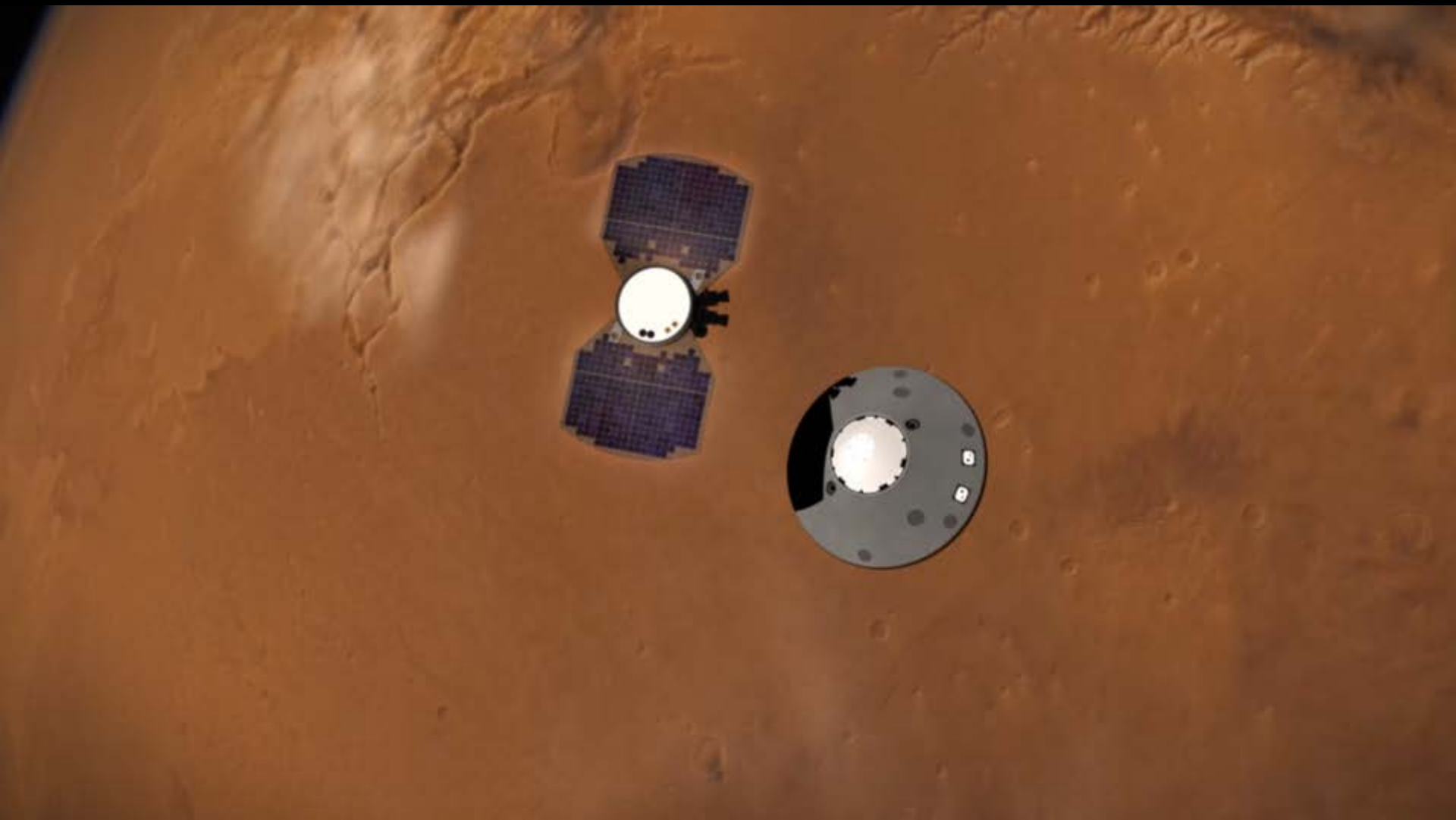
CRUISE

May - November 2018

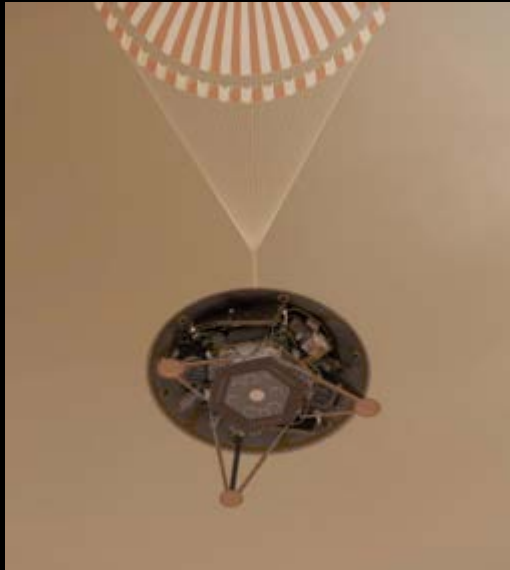




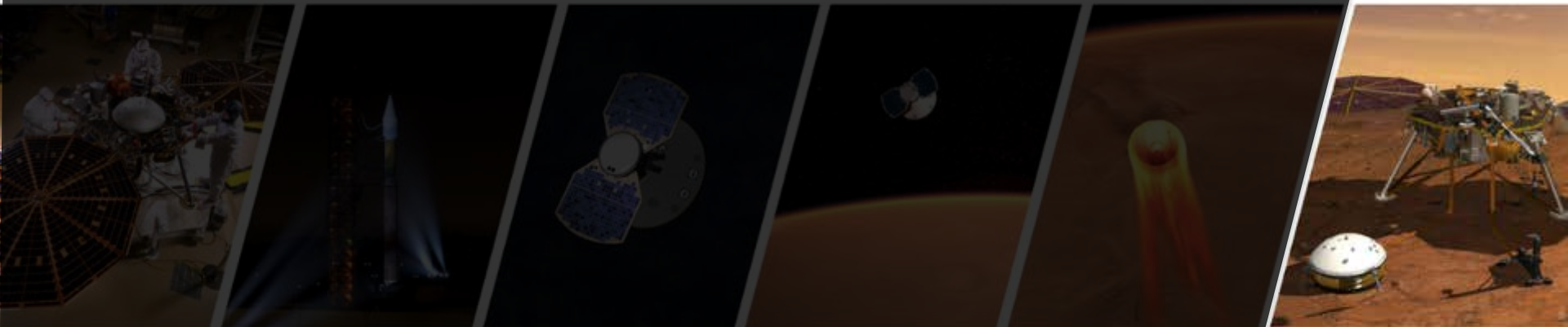
November 2018



November 26, 2018
Landing!







SURFACE OPS

Deploy!

Step 1: Solar Arrays



Artist's rendering, not actual photo

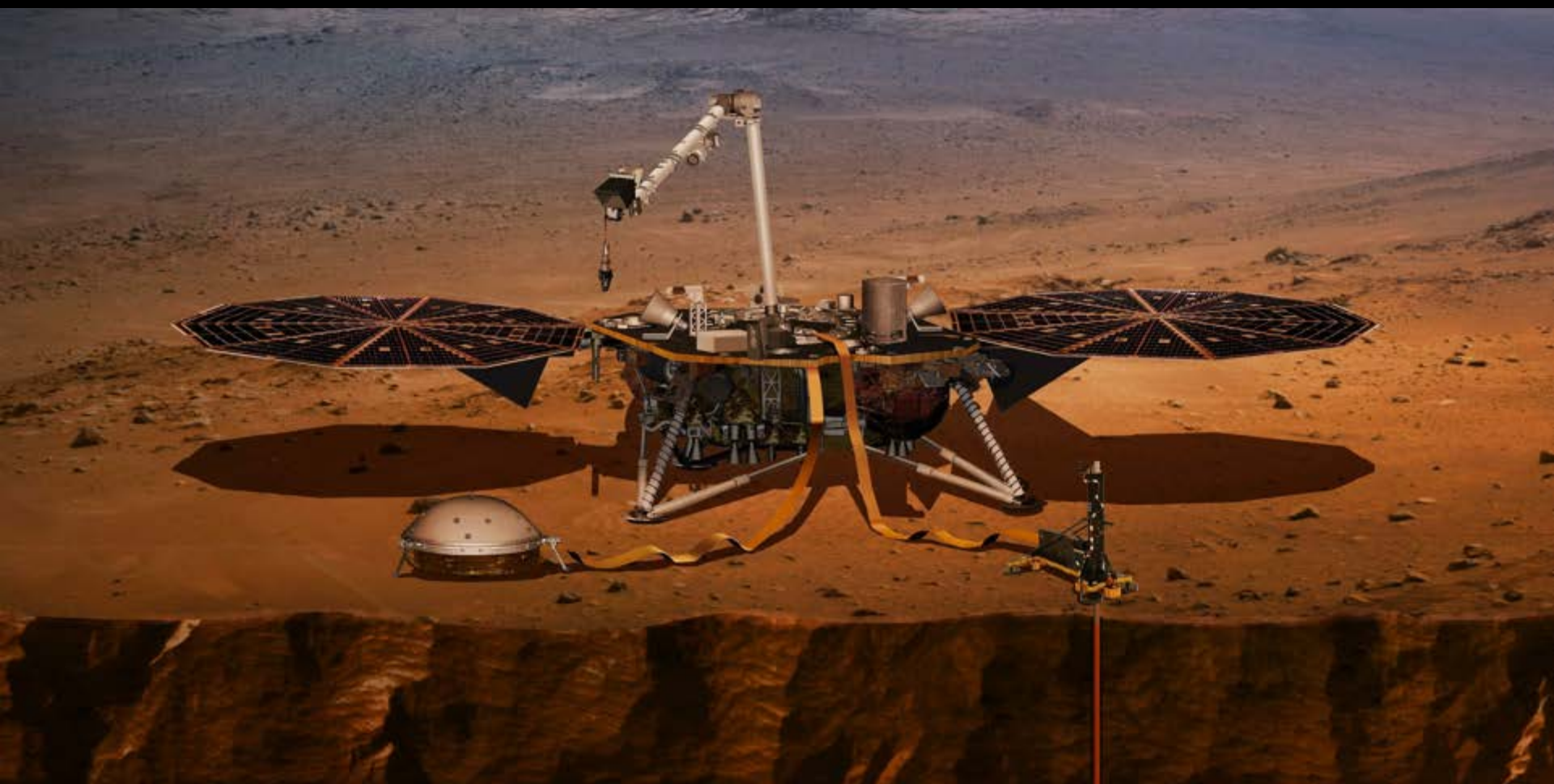
Step 2: Seismometer Deploy



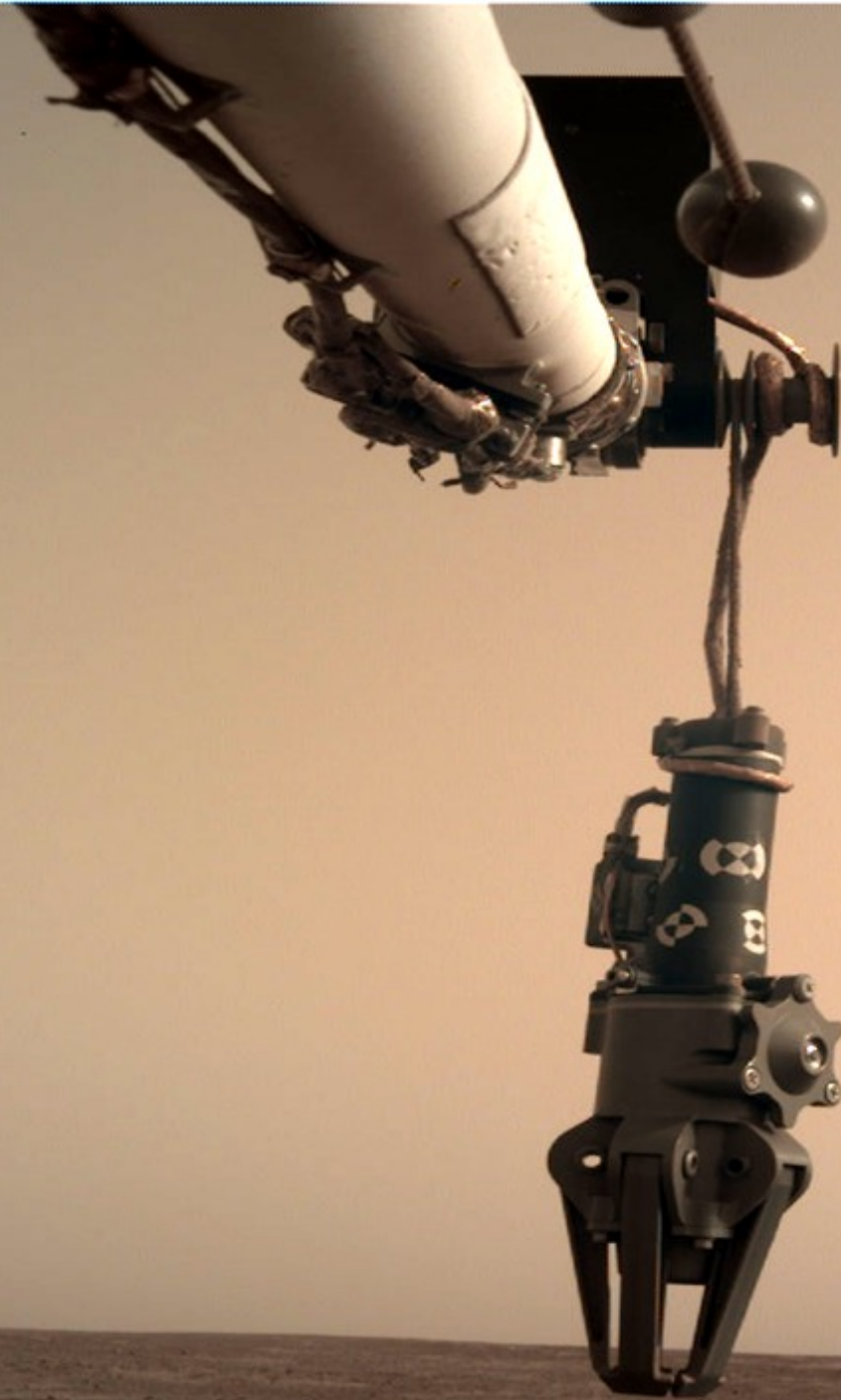
Artist's rendering, not actual photo

Step 3: HP3 Deploy

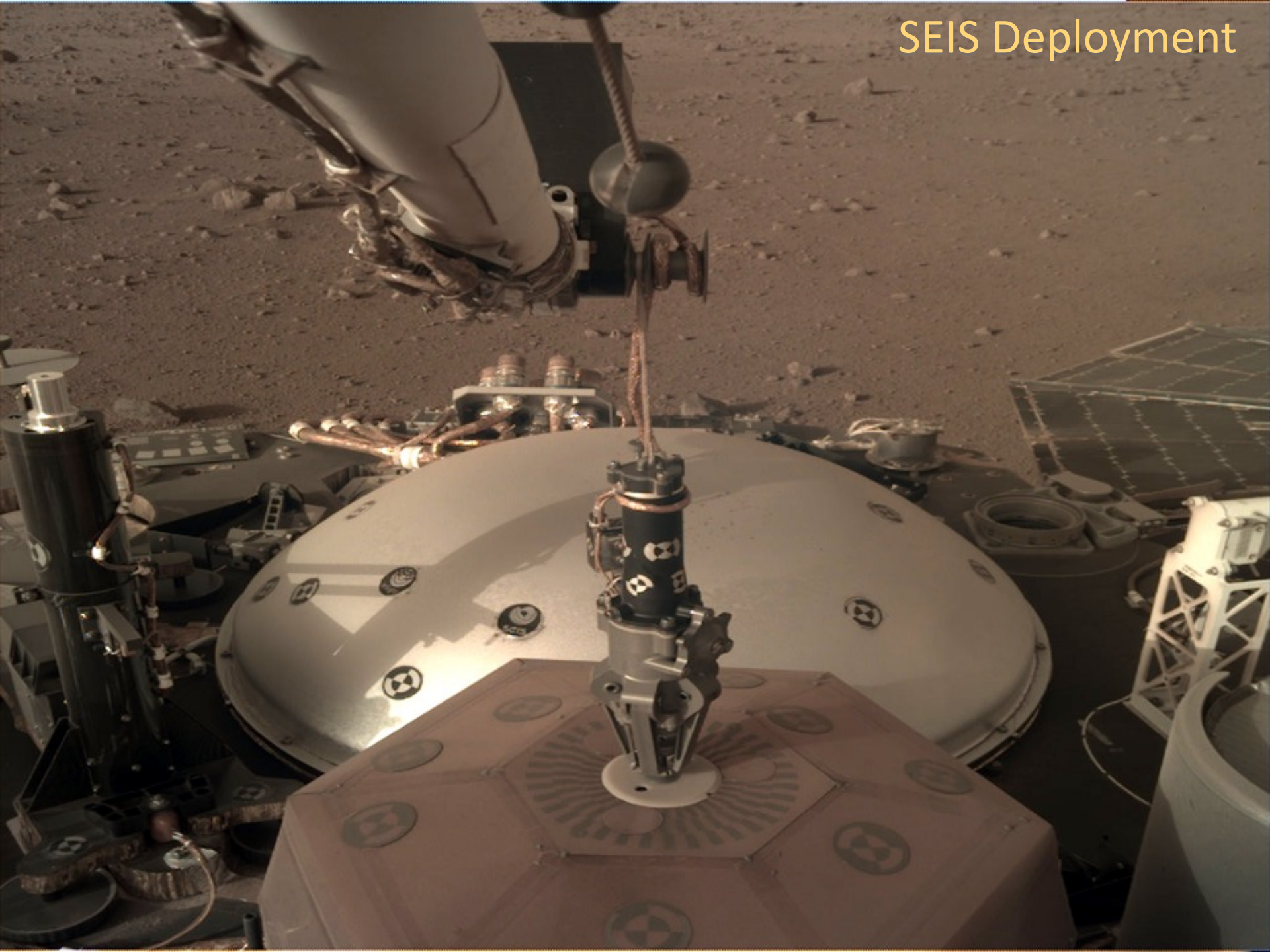


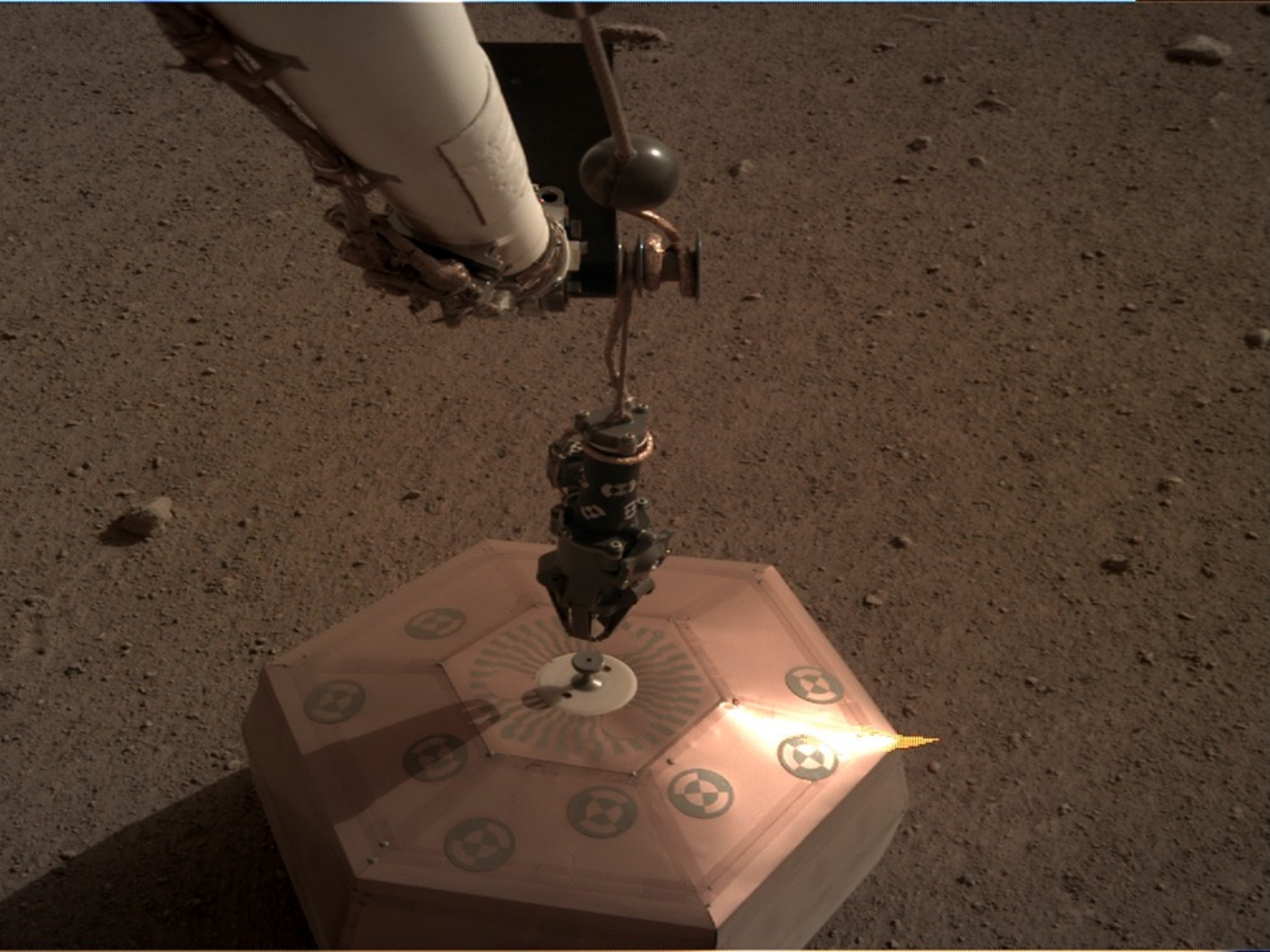


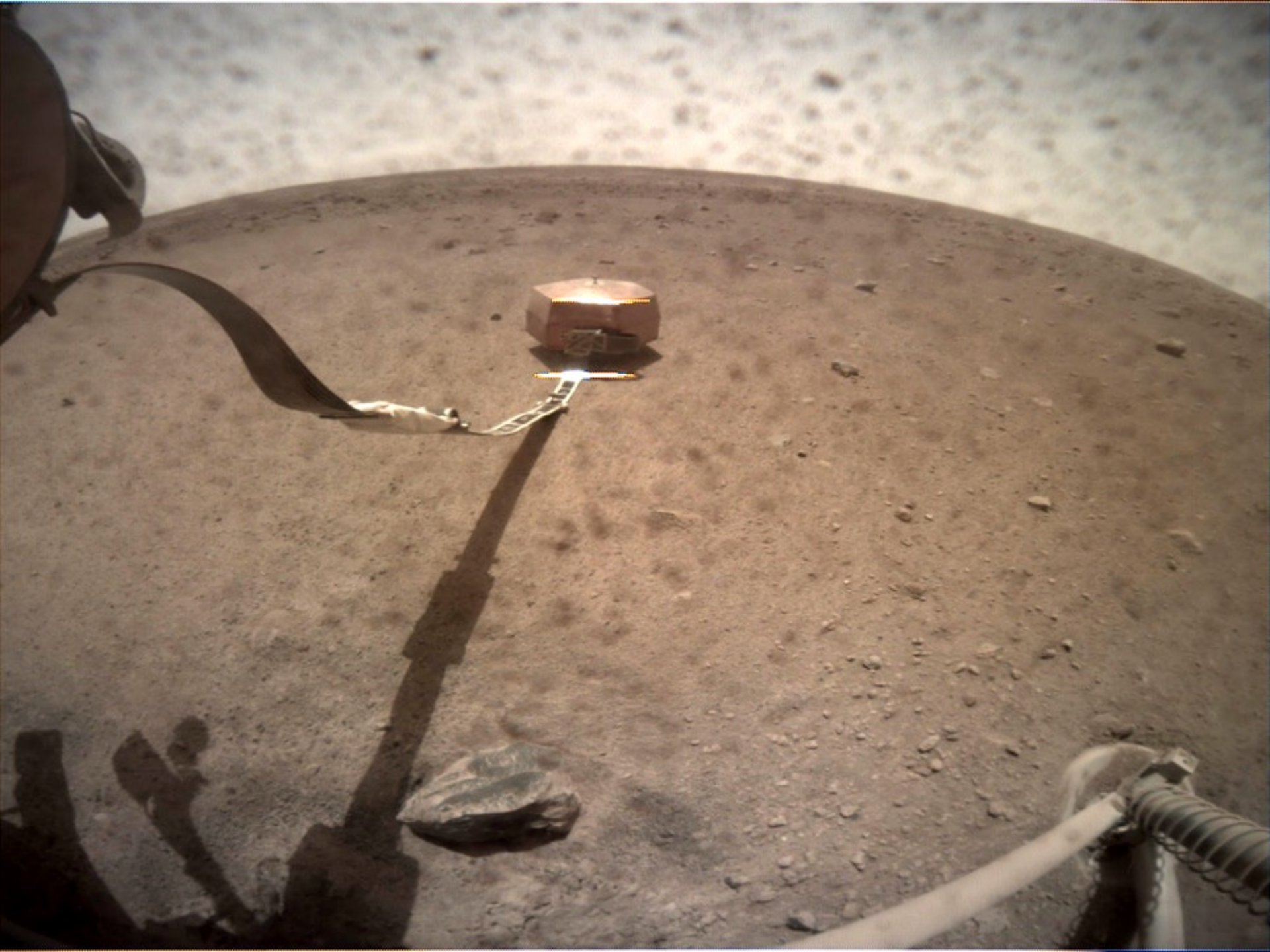
Ooooh...
the claw!



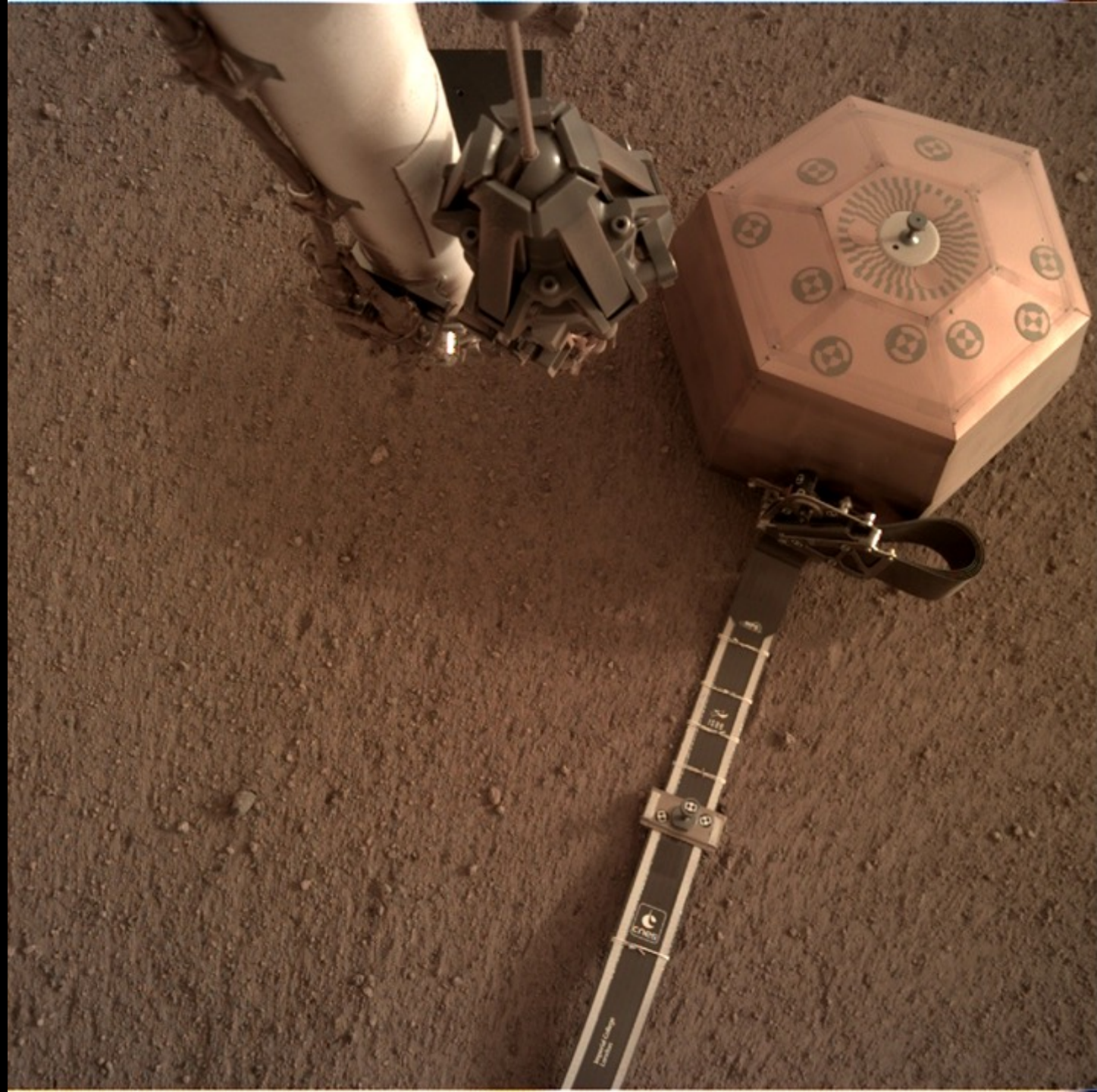
SEIS Deployment

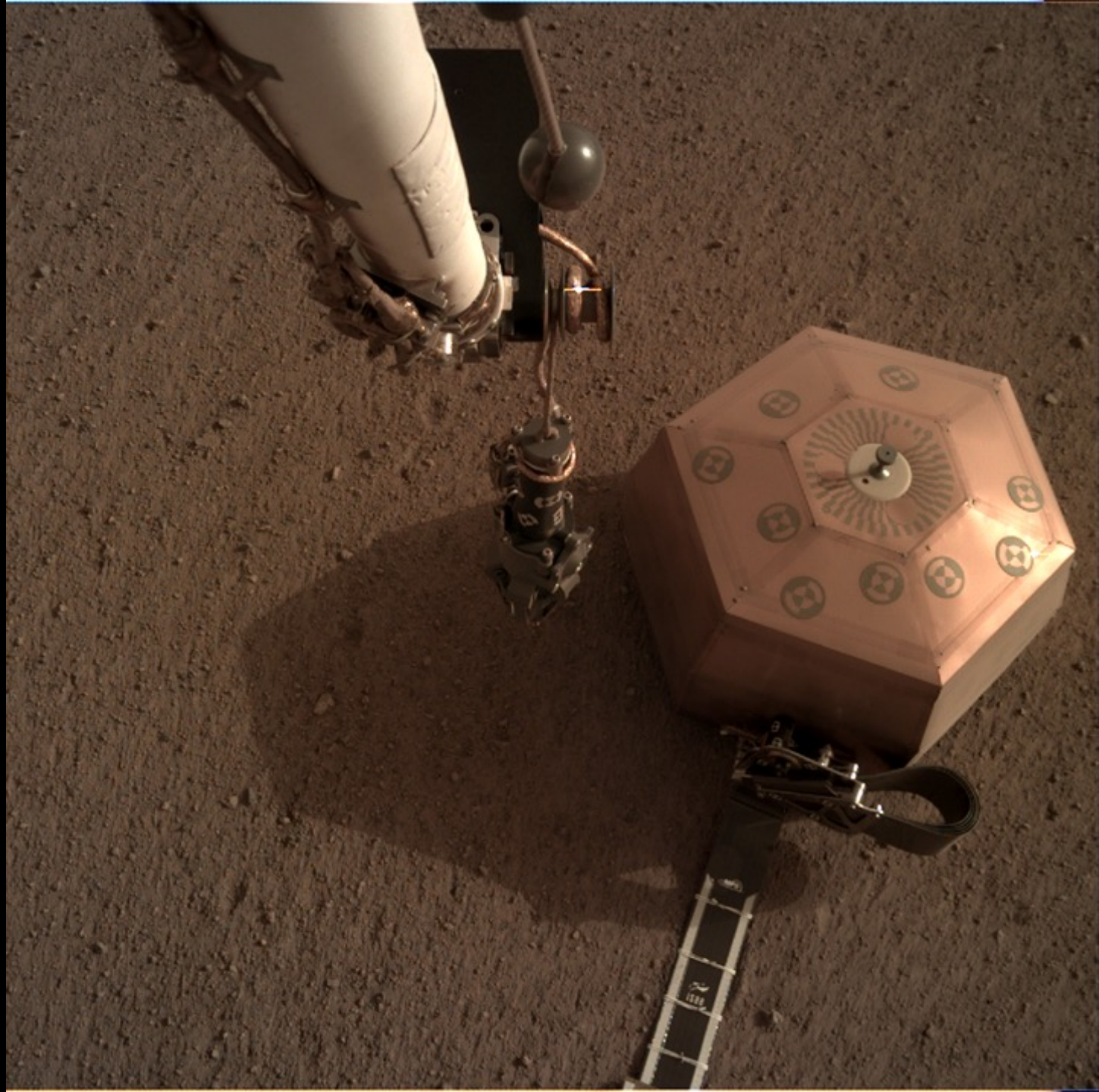








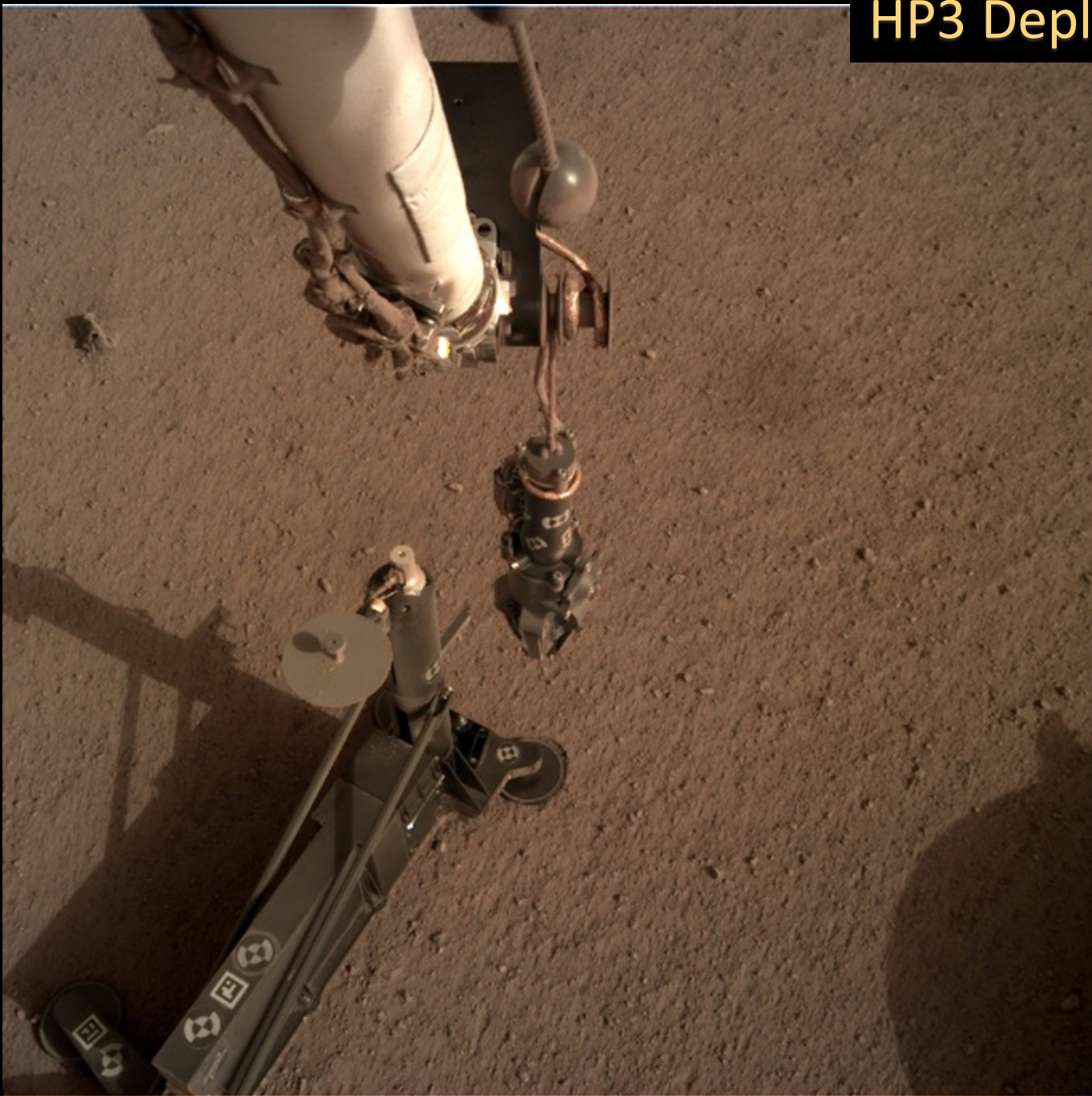


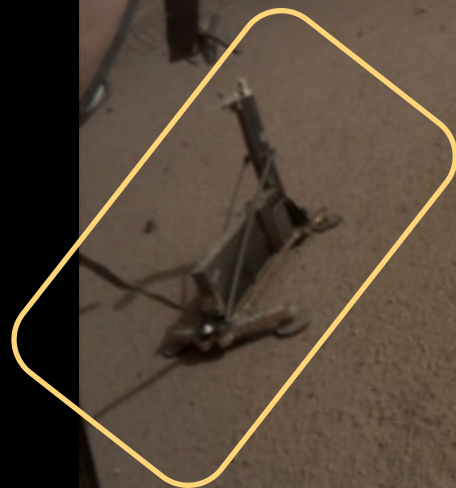


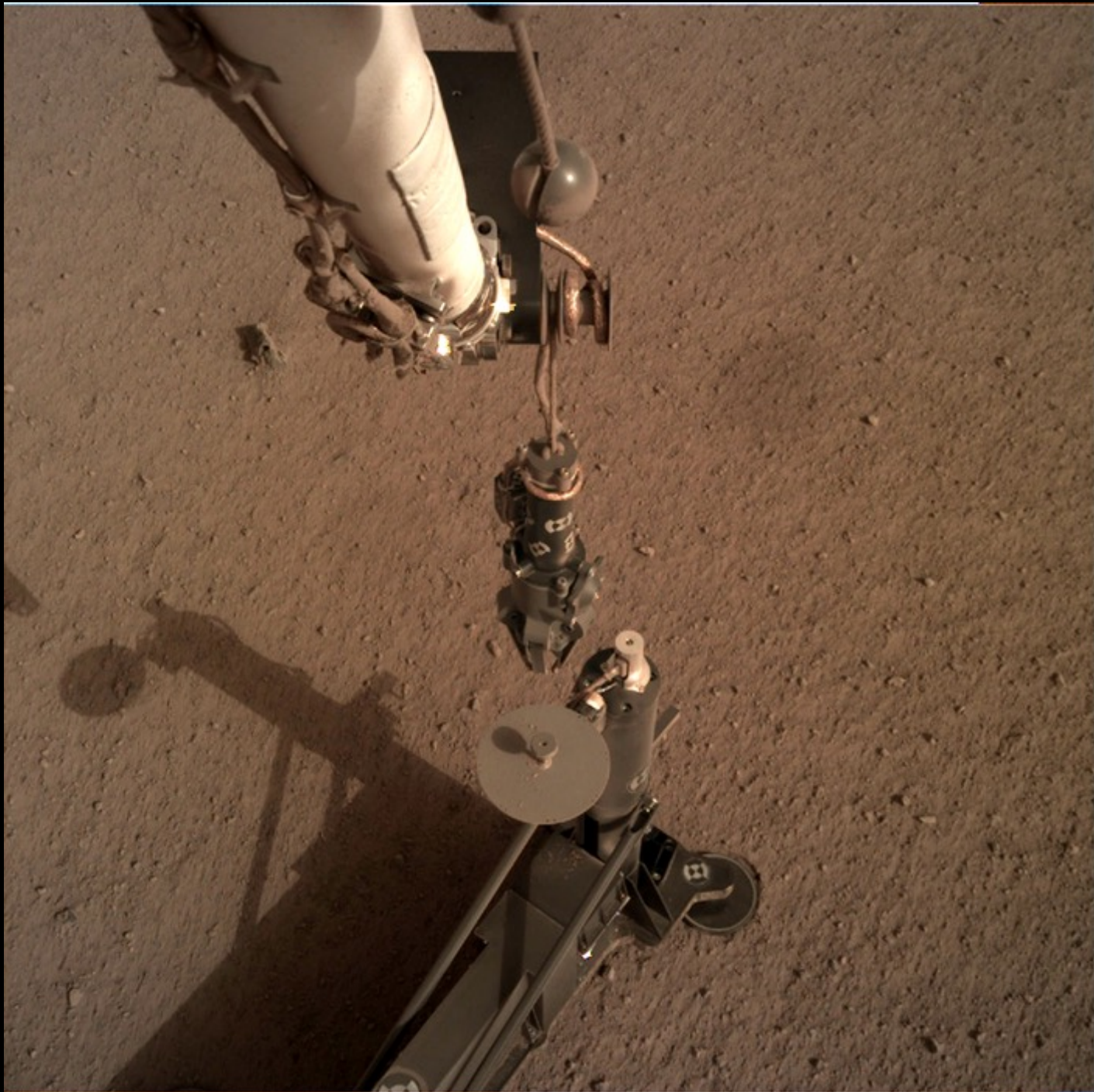
SEIS Thermal & Wind Cover Deployment



HP3 Deployment









Thank You!



Questions?

