

NASA's Mars InSight Probe

Why in news?

\n\n

NASA's Mars InSight probe has reached its destination and touched down near the red planet's equator.

\n\n

What is the objective?

\n\n

\n

- InSight marks the 21st US-launched Mars mission.
- InSight (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) is on a 24-month mission.
- It will not be looking for life on Mars.
- It will study its insides as to what it is made of, how that material is layered and how much heat seeps out of it.

\n

\n\n

Why Mars?

\n\n

\n

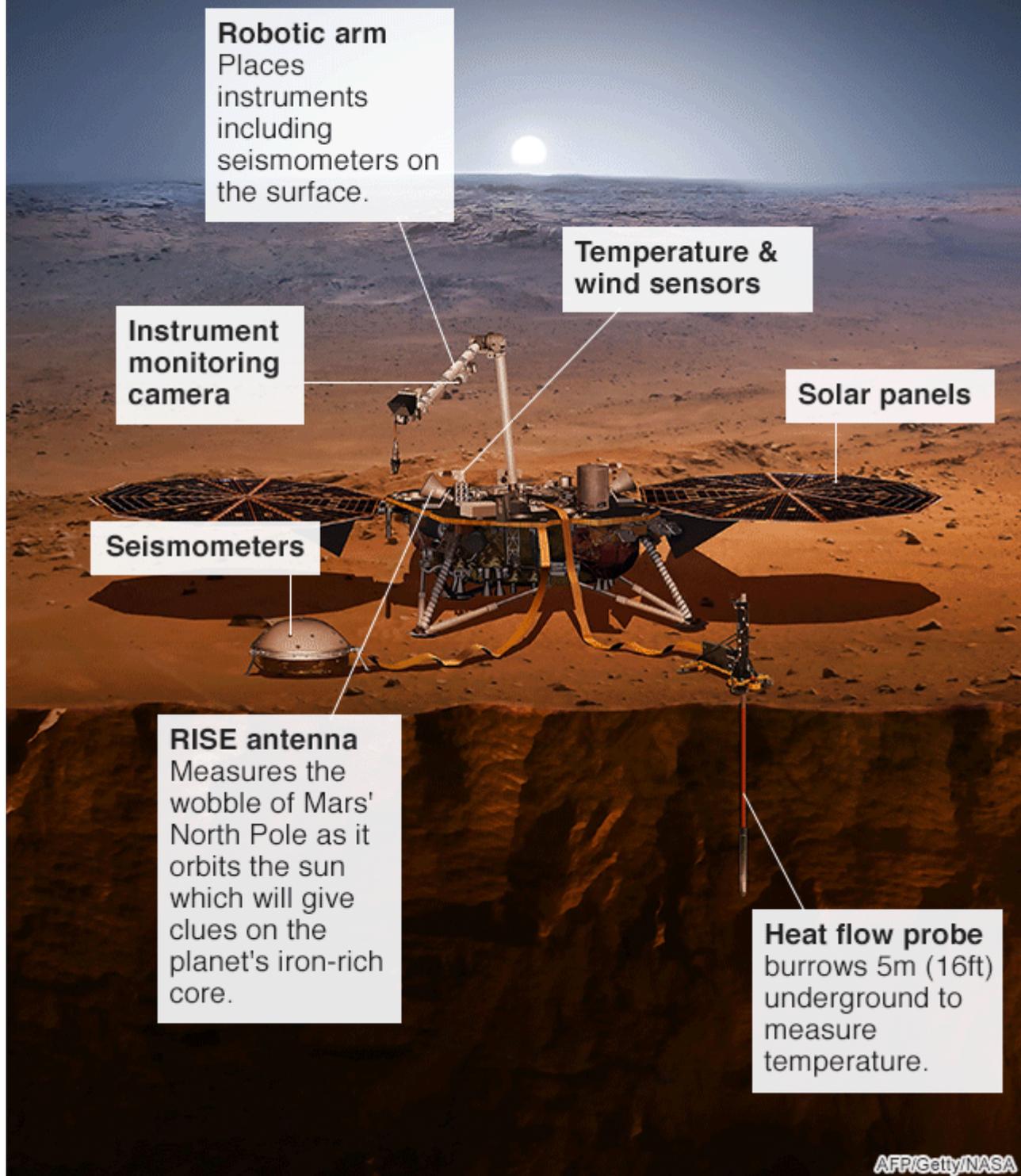
- Earth and Mars used to be similar - warm, wet and shrouded in thick atmospheres.
- But this was before they took different paths 3.4 billion years ago.
- After the event, Mars stopped changing, while Earth continued to evolve.
- They turned out so different - Mars cold and dry, Venus and Mercury burning hot, and Earth hospitable to life.

\n

- With InSight, Earth would thus be compared to Mars, to better understand how a planet's starting materials make it more or less likely to support life.
\n
- It is thus expected to study how Mars and other rocky worlds formed at the dawn of the solar system 4.6bn years ago.
\n
- But notably, sending a probe to Mars, whether to land, orbit or fly past, is risky; only 40% of missions have succeeded so far.
\n

\n\n

The InSight lander



\n\n

How does it work?

\n\n

\n

- **Landing site** - The landing site is Elysium Planitia, where InSight can stay still and quiet all through.

\n

- It is a vast, smooth lava plain that NASA calls “the biggest parking lot on Mars”.

\n

- This featureless, and hopefully quiet, landscape is well-suited for the mission, to map the interior of the planet.

\n

- **Lander** - The lander (6m × 1.56m, deck height 83-108 cm) carries a robotic arm 1.8 m long.

\n

- The lander will use a set of instruments to study the makeup and dimensions of the planet’s core, mantle and crust.

\n

- It is powered by two solar panels, and carries a seismometer, heat probe and a radio science experiment.

\n

- Two complementary engineering cameras help with navigation and hazard avoidance.

\n

- **Satellites** - Along with the spacecraft, a pair of mini satellites known as Mars Cube One, or MarCO also reached Mars.

\n

- The satellites provided real-time updates of the spacecraft’s supersonic descent.

\n

- **Observation** - From Earth, NASA team will be monitoring radio signals using a variety of spacecraft and even radio telescopes on Earth.

\n

- Signals will come from various sources -

\n

\n\n

\n

i. the lander during descent

\n

ii. two experimental briefcase-sized spacecraft called MarCOs that is flying behind InSight

\n

iii. InSight itself after landing

\n

iv. the Mars Reconnaissance Orbiter (MRO) spacecraft during descent

\n

v. the 2001 Mars Odyssey (Mars orbiter) after InSight's touchdown
\n

\n\n

\n\n

Source: Indian Express, The Guardian

\n

