

Homework #1

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>>What NASA planetary science missions are still collecting (or have yet to start) data?

1. InSight
2. Curiosity
3. SOHO
4. Hubble Space Telescope
5. Voyager 1

>>What are their scientific objectives?

1. The mission of insight (Interior Exploration using Seismic Investigations, Geodesy, and Heat Transport) is to collect data of the Martian tectonic activities and meteorite impacts. Investigations of the earth processes involving the creation and deformation of magma and rocks as well as the impact craters formed by meteorites are conducted. This anticipatedly will reveal the answer of how planets have formed in our solar system. More than 1 year and 3 months has passed since the mission has been initiated.
2. Curiosity is a car-sized rover that is a part of the Nasa's Mars Science laboratory (MSL). The main objective for this ongoing mission is to discover the traces of microbial life and evidence of any past life on the terrestrial planet. The rover is currently collecting data of the geology and environment of Mars.
3. SOHO is the longest maintained Sun monitoring satellite that has ever existed. It is a joint project between NASA and ESA which successfully returned a plethora of information of the Sun; for example, data of the core and atmospheric activities of the Sun, conditions of the solar wind, and solar storms.
4. Hubble Space Telescope or widely known as Hubble is a Cassegrain reflector telescope which can capture astronomically distant stars and galaxies having the domain of imagery wavelength from ultraviolet to infrared lights. It was deployed in 1990 and was the very first astronomical observatory placed in an orbit around the Earth.
5. Launched in 1977, voyager 1 is a spacecraft travelling as deep as the interstellar space to observe planetary activities within the solar system reaching up to Jupiter and Saturn. Voyager 1 has the mission to provide scientists data to understand the nature of energy conserved as well as the radiation in space. The collected data is essential for the safety of future astronauts and missions. Voyager 1 has a sister spacecraft named Voyager 2 which is orbiting in a different path within the solar system.

Of these missions which seems most interesting to you and why?

1. This mission is the very first mission to investigate the inner space of Mars and with state-of-the-art instruments including a SEIS seismometer, HP3 (Heat Flow and Physical Properties Probe) self-hammering mole, and RISE (a rotation and interior structure probe), the InSight is able to collect precise data of Mars. Granted, these data will be the first data to unravel the evolutions of a rocky exoplanet.
2. The intriguing fact about this mission is the advanced technology loaded on the rover. Thanks to this technology, Curiosity or the rover has been successful of running on the Martian grounds for almost seven years. The rover is able to power itself with plutonium's radioactive decay. Another interesting fact was that Curiosity took up the challenge to implement an unique entry, descent, and landing (EDL) profile. The unprecedented landing involved several stages involving aeroshells, parachutes, and guided entry. Moreover, Curiosity found evidence of an ancient streambed indicating the possibilities of water or life on Mars.
3. The name SOHO personally reminds me of the beautiful, divine, and high-resolution pictures of the sun that you can find online. It is worth to say that owing to SOHO we have been able to collect data and analyze the effects that the solar storms and sunspots have on the Earth's weather and environment (which is caused mainly by the changes in the Earth's magnetic field).
4. The Hubble is praised for its unprecedented level of high-quality images of space in a distance many light years away. Hubble spread the opportunity for researchers to observe distant stars and galaxies and the planets in our solar system. It is said that Hubble has established the cornerstone for over 15000 technical research papers so far and lead to the discovery of many new celestial bodies.
5. The Voyager has set the record for travelling the farthest distance away from the Earth into deep solar system. It has made many notable discoveries relevant to Jupiter and Saturn. For Jupiter, Voyager imaged the moons (Amalthea, Io, Europa, Ganymede, and Callisto) which showed their actual terrain for the very first time in history. This revealed the environment of Io with many active volcanoes. In terms of Saturn, Voyager 1 has left a large impression inside me for its observations of the moon Titan.

There are other notable active missions

- BepiColombo
- Parker Solar Probe
- OSIRIS-Rex
- DSCOVR
- Gaia
- Mars Atmospheric and Volatile Evolution (MAVEN)
- Juno

- WISE/NEOWISE
- Lunar Reconnaissance Orbiter
- Interstellar Boundary Explorer (IBEX)
- ARTEMIS
- New Horizon
- Mars Reconnaissance Orbiter Spitzer Space Telescope
- Mars Odyssey
- Advanced Composition Explorer (ACE)
- Wind Geotail