



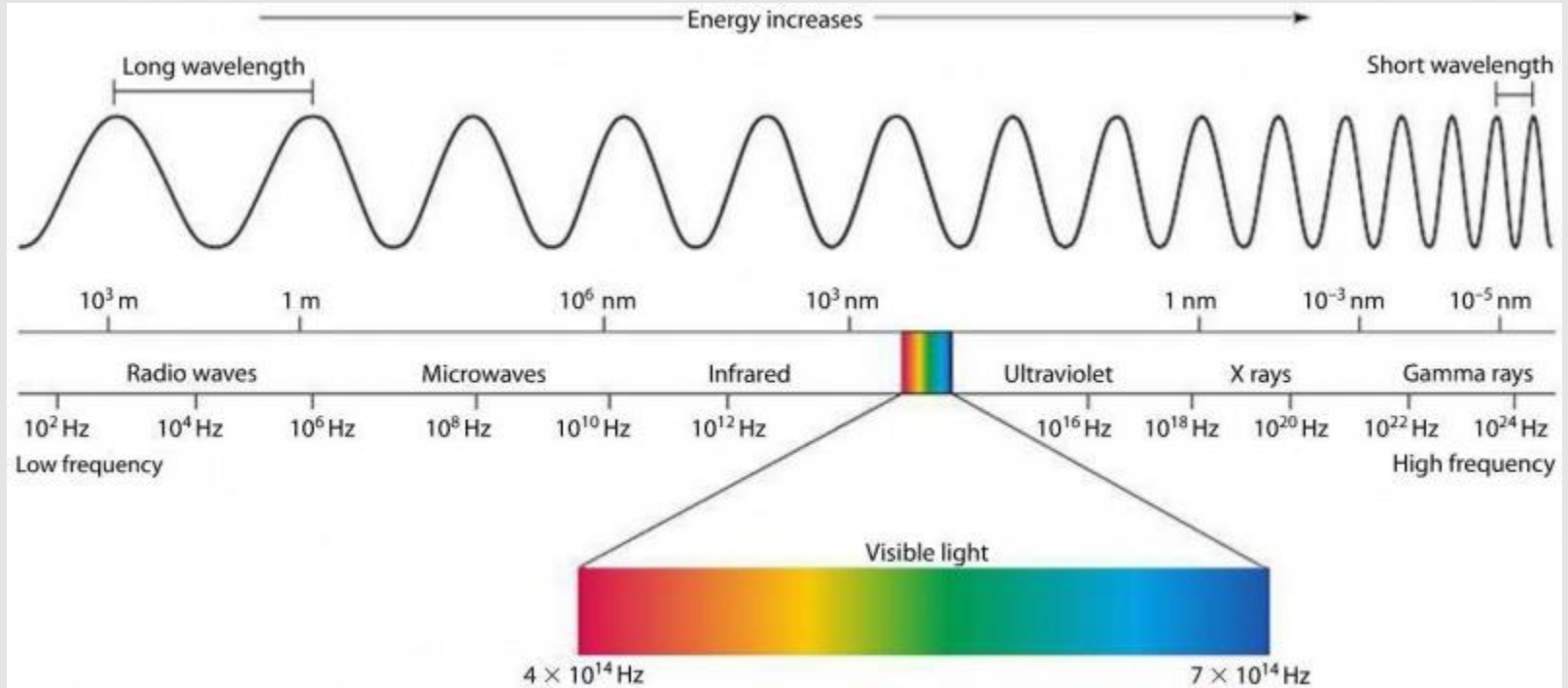
# Learning About Space

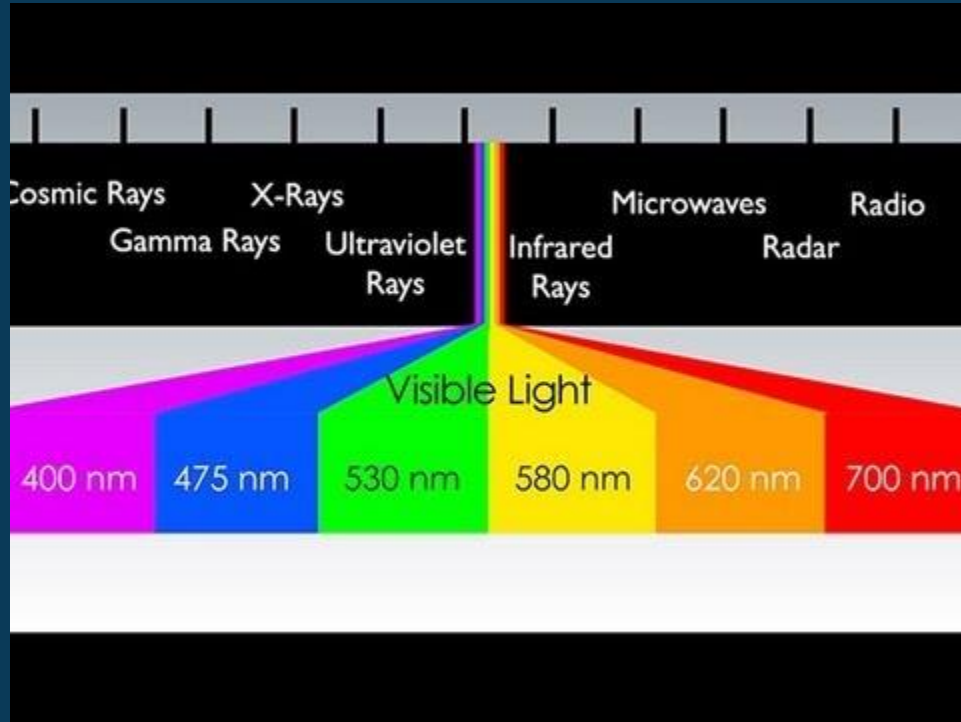


How do scientists  
learn about space?

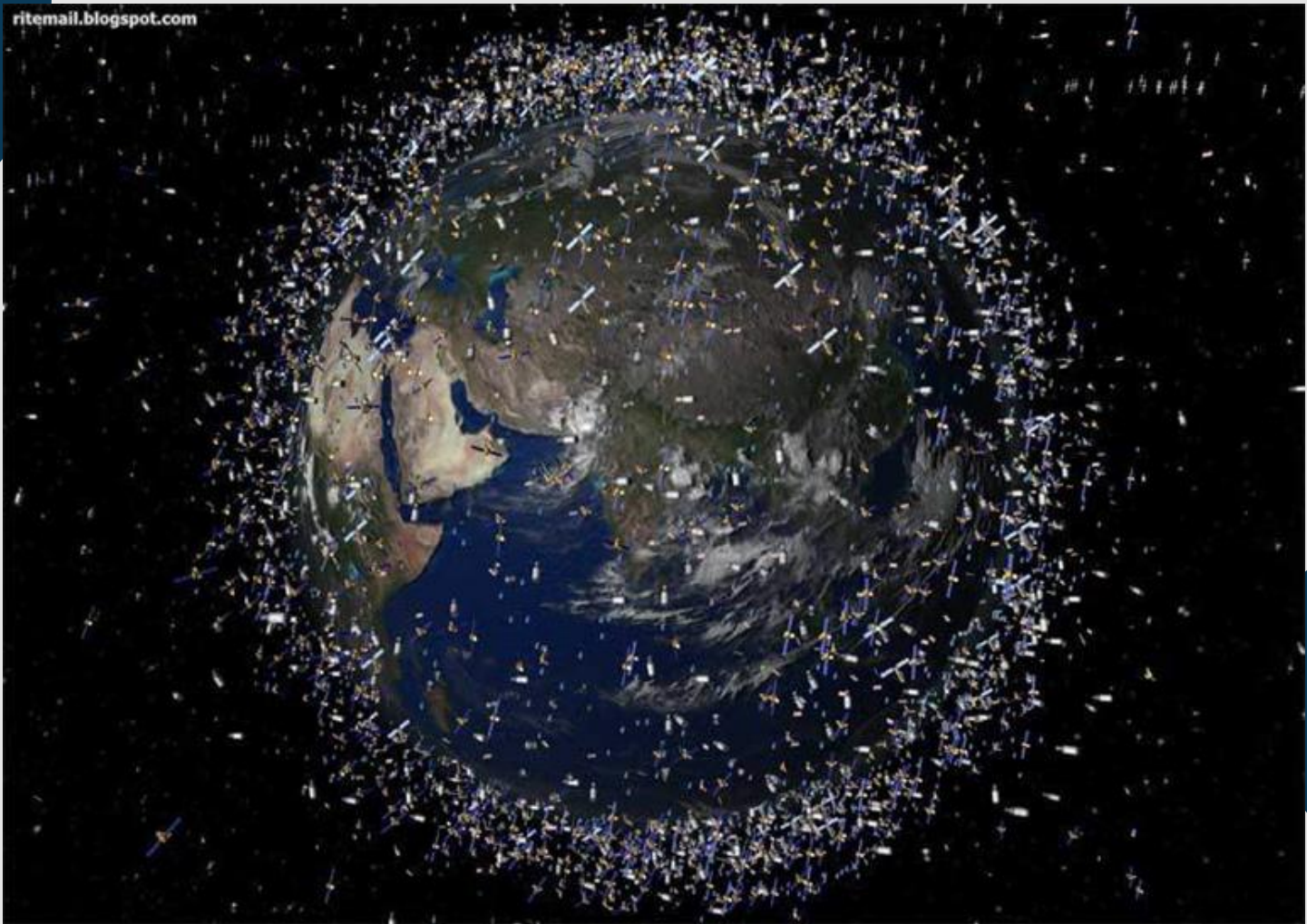
# The EM Spectrum

Good link [here](#)

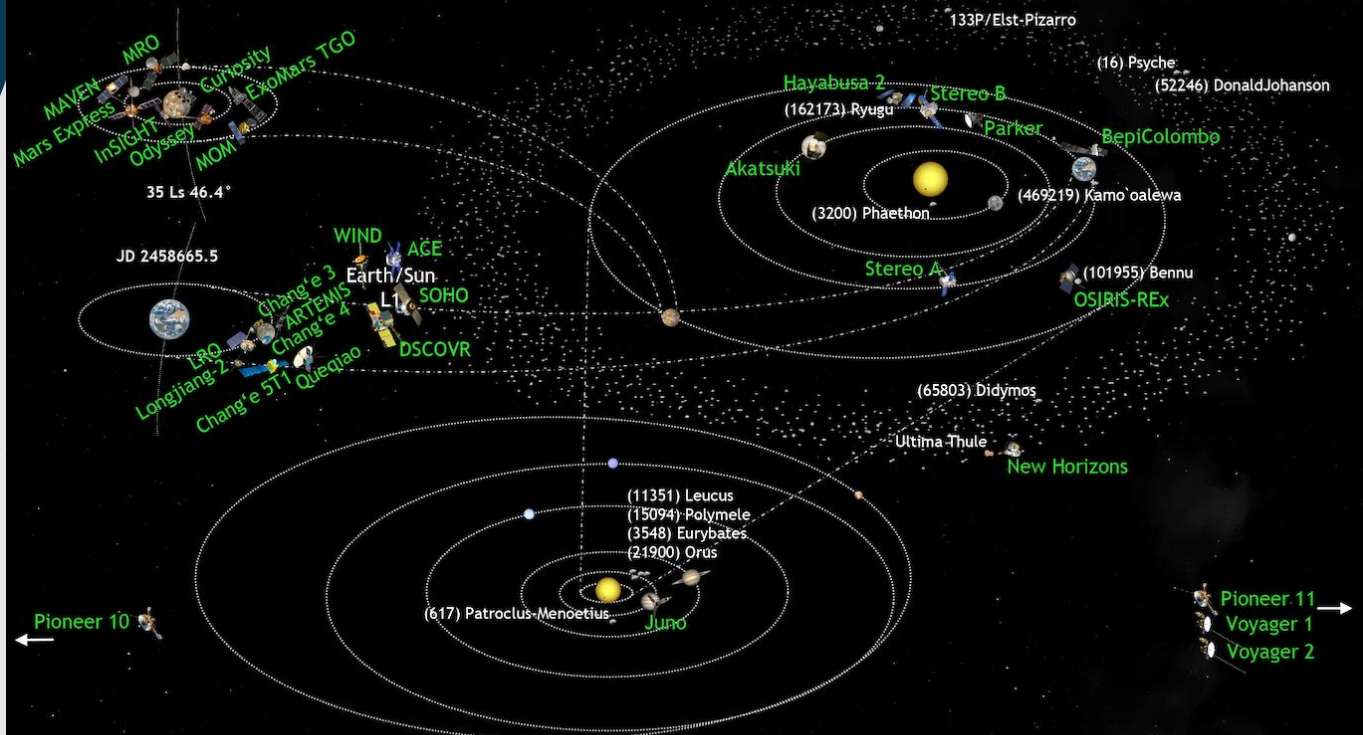




[Link to video](#)



★  
[Article](#)  
about  
who  
owns all  
these  
satellites



Reference

Upcoming Events

2019  
 Jul: Chandrayaan 2 Launch/TD Moon  
 Jul: Hayabusa 2 SR Ryugu  
 Jul: Longjiang 2 EOM  
 Sep: Hayabusa 2/MINERVA2 TD Ryugu  
 Oct: OSIRIS-REX SR Bennu  
 Nov/Dec: Hayabusa 2 Dep Ryugu  
 Dec: Parker Solar-Probe Flyby Venus  
 Dec: Chang'e 5 Launch/SR Moon  
 Deep Space Solar Obs Launch E/S-L1  
 Orion EM-1 Launch/Flyby Moon

2020  
 Apr: BepiColombo Flyby Earth  
 Jul: Parker Solar Probe Flyby Venus  
 Jul: 2020 Mars Rover Launch  
 Jul: ExoMars 2020 Launch  
 Jul: Mars Hope Launch  
 Aug: MGRSO Launch to Mars  
 Oct: BepiColombo Flyby Venus  
 Nov: Hayabusa 2 EDL Earth  
 Dec: KPLO Launch/OI Moon

SR: Sample Retrieval; OI: Orbit Insertion; App: Approach; Dep: Departure  
 EDL: Entry, Descent and Landing; TD: Touchdown; EOM: End of Mission

+13 EM-1 Cubesats Launch/OI/Flyby  
 Moon/Heliocentric Orbit  
 Solar Orbiter Launch

2021  
 Feb: Parker Solar Probe Flyby Venus  
 Mar: OSIRIS-REX Dep Bennu  
 Aug: BepiColombo Flyby Venus  
 Oct: Parker Solar Probe Flyby Venus  
 Oct: BepiColombo Flyby Mercury  
 DART Launch to Didymos  
 ExoMars Rover EDL Mars  
 Juno EOM  
 Lucy Launch to Jupiter-Trojans

Luna 25 Lander Launch  
 SLIM Launch/TD Moon

2022  
 DART App/Impact (65803) Didymos  
 DESTINY+ Launch to (3200) Phaethon  
 Europa Clipper Launch to Jupiter  
 JUICE Launch to Jupiter  
 LOP-G PPE Launch to Cislunar Space  
 MOM-2 Launch to Mars  
 Psyche Launch to (16) Psyche  
 Zheng He Launch/SR Kamo'oa'ewa  
 Juno EOM  
 Chang'e 6 Launch/SR Moon

Chang'e 7 Launch/TD Moon  
 EM-2 Launch to Cislunar Space  
 Luna 26 Orbiter Launch  
 OSIRIS-REX EDL Earth  
 Luna 27 Lander Launch (2024)  
 MMX Launch to Mars (2024)  
 Federatsiya Launch to Moon (2024)  
 EM-3/Artemis TD Moon (2024)  
 Bepi-Colombo OI Mercury (2025)  
 Dragonfly Launch to Titan (2026)  
 Chang'e 8 Launch/SL Moon (2027)  
 Comet Interceptor Launch (2028)  
 JUICE EDL Jupiter (2032)

# Types of spacecraft



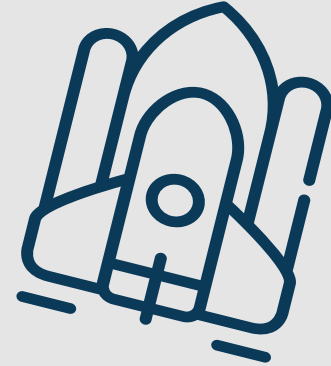
## Probes

An instrument that gathers information and sends it back to Earth

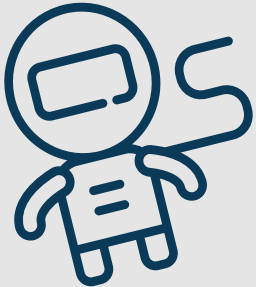


## Satellites

Any object that revolves around another object



Reference [link](#)



## Landers

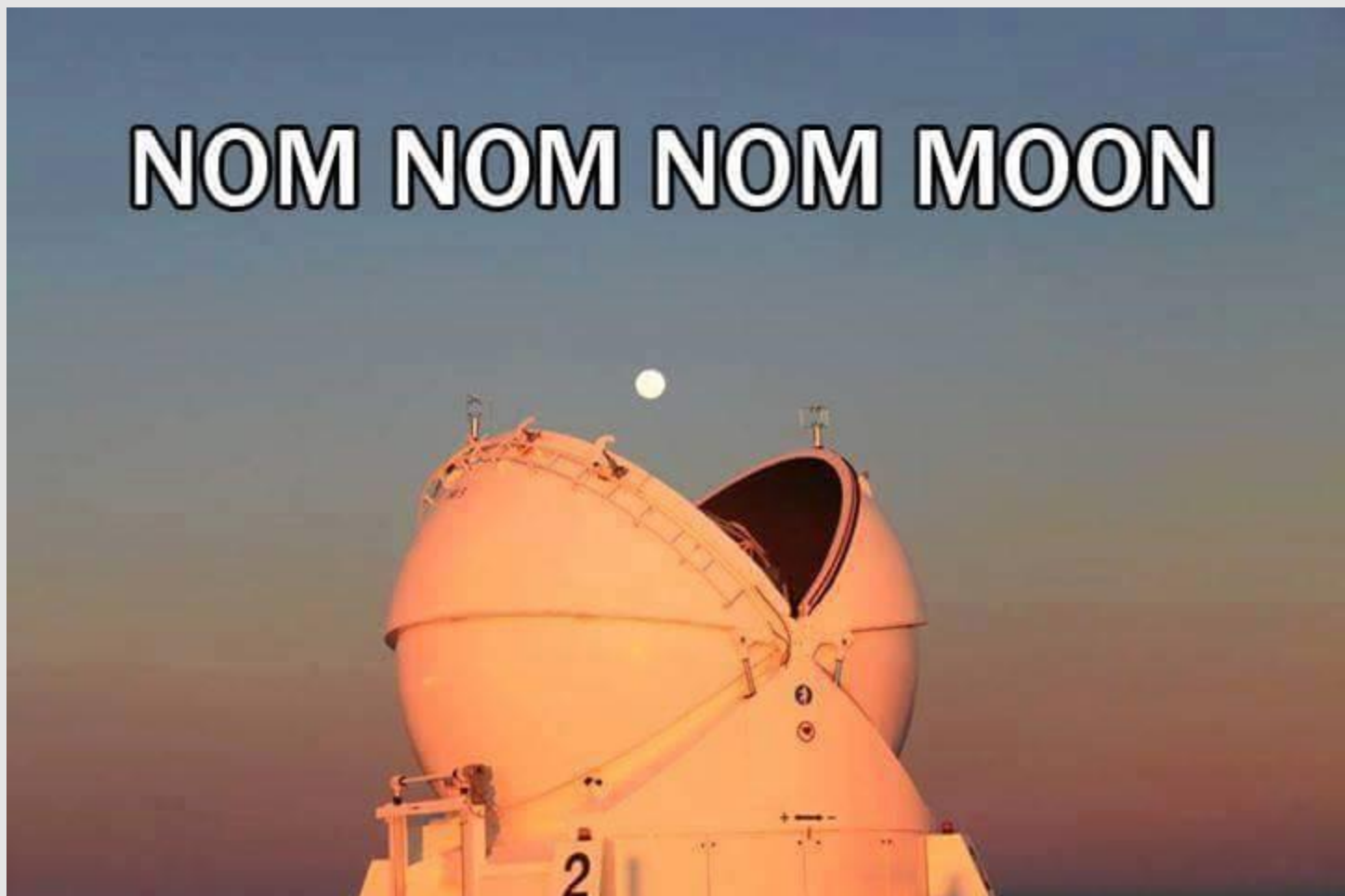
Spacecraft that descends and comes to rest on the surface of another object



## Rovers

Motor vehicle that travels across the surface of an object

**NOM NOM NOM MOON**



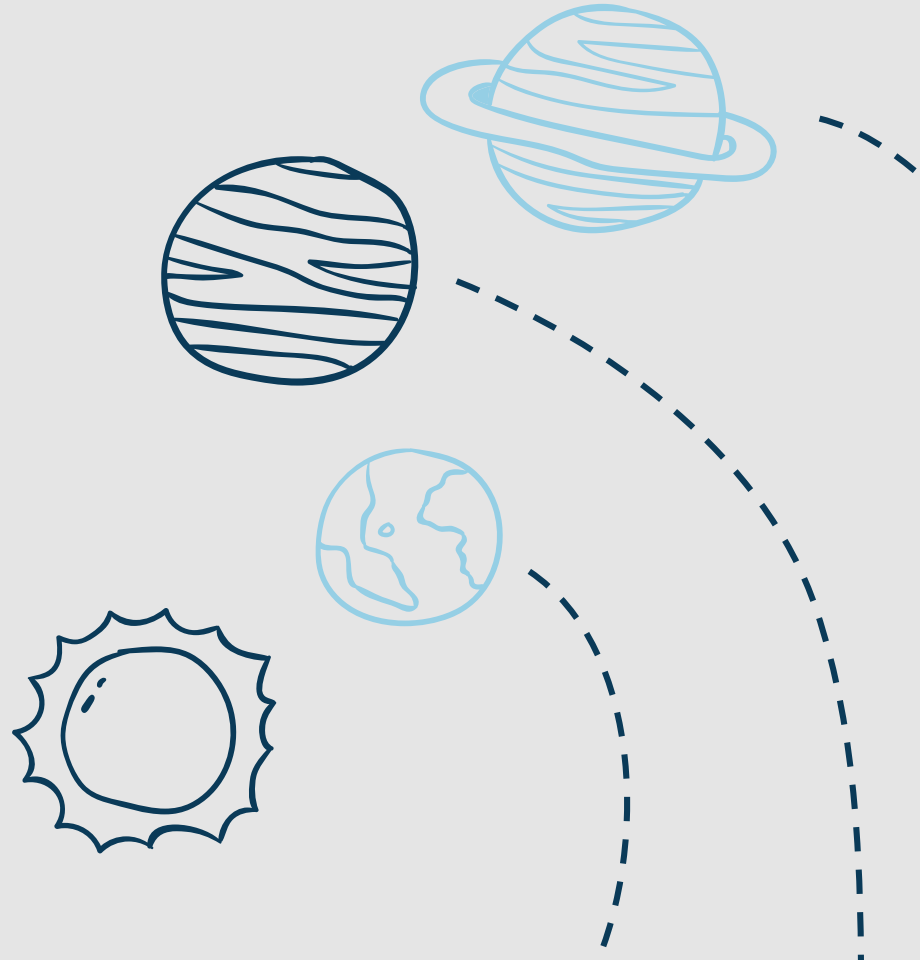


# Research Assignment

Out of the available probes, satellites, landers, and rovers pick one to research.

Become an expert in that spacecraft and create a Slide to show the important information.

Make sure to add high quality links that everyone can get to.



## Pioneer 10 and 11- Bob      1958-1992

### Pioneer 10:

Pioneer 10 was the first spacecraft to collect images from Jupiter up close. Pioneer 10 also discovered that Jupiter is mostly a liquid planet. Pioneer 10 was also the first spacecraft to go beyond Mars' orbit and through the asteroid belt.

### Pioneer 11:

Just like Pioneer 10, Pioneer 11 was sent to gather information, but on Saturn. Pioneer 11 mostly focused on Saturn, like carrying tools to study it's magnetic field and moons, but also carried back information about Jupiter.

More  
info  
[here](#)

### What makes them special:

#### Pioneer 10:

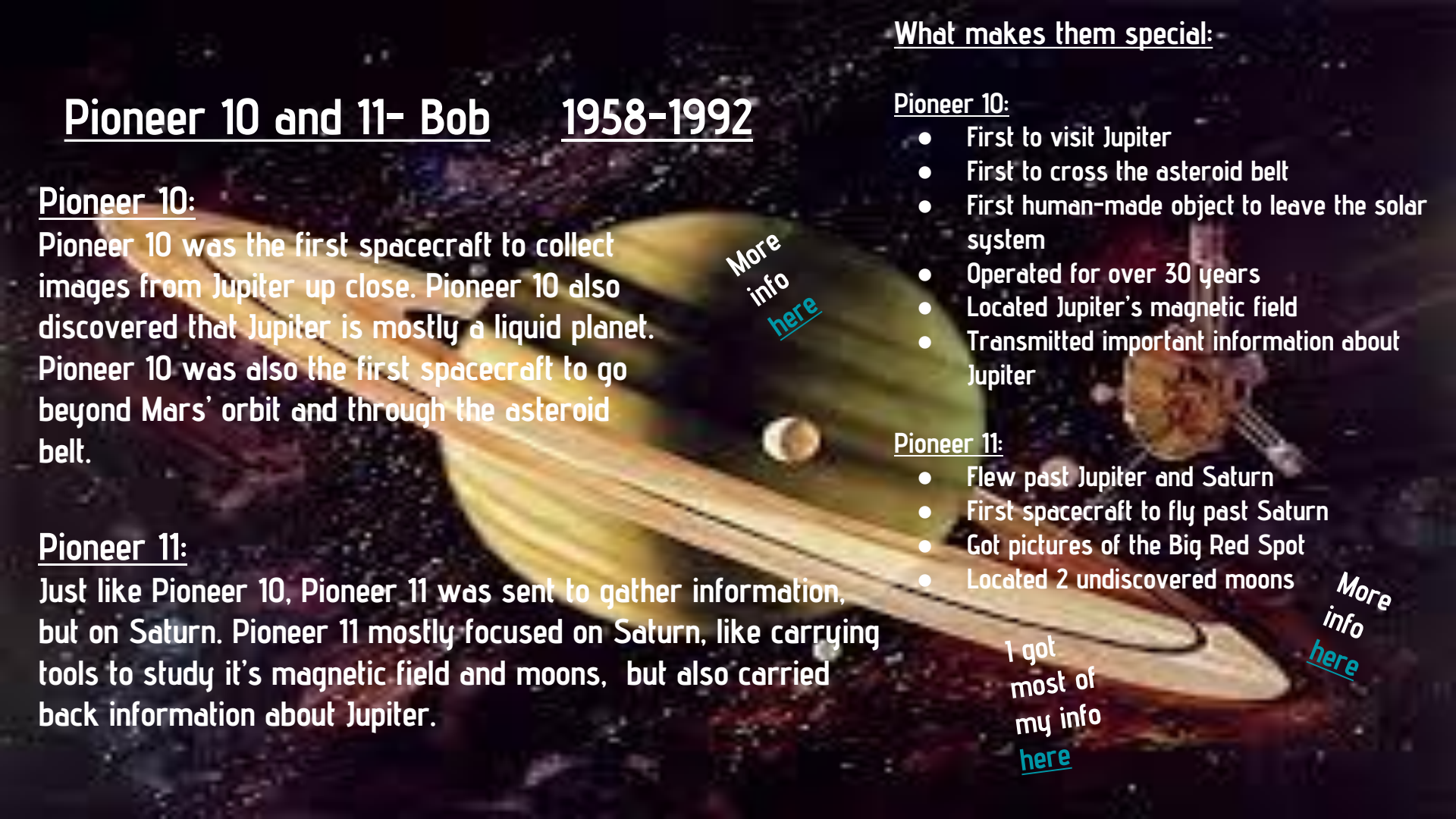
- First to visit Jupiter
- First to cross the asteroid belt
- First human-made object to leave the solar system
- Operated for over 30 years
- Located Jupiter's magnetic field
- Transmitted important information about Jupiter

#### Pioneer 11:

- Flew past Jupiter and Saturn
- First spacecraft to fly past Saturn
- Got pictures of the Big Red Spot
- Located 2 undiscovered moons

I got  
most of  
my info  
[here](#)

More  
info  
[here](#)



The background is a dark blue space theme. On the left, there is a white line-art illustration of a satellite with solar panels and a dish antenna. Below it is a spiral galaxy and a small star. On the right, there is a white line-art illustration of a comet with a long tail and a star. There are also several small white circles with double lines inside, resembling planets or moons. A large, light-colored, irregular shape in the center contains the text.

# Slide Expectations

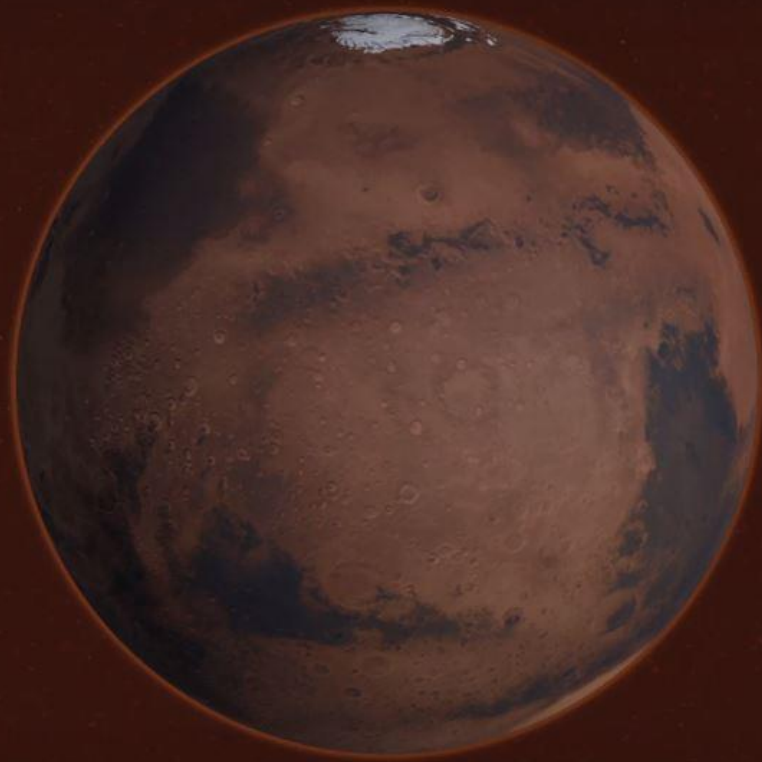
1. Explain the mission of your spacecraft well.
2. Have pictures of the spacecraft.
3. Find and share good quality links about your spacecraft that everyone can go to.
4. Able to read clearly.
5. Be interesting and informative.

FEATURED DESTINATION

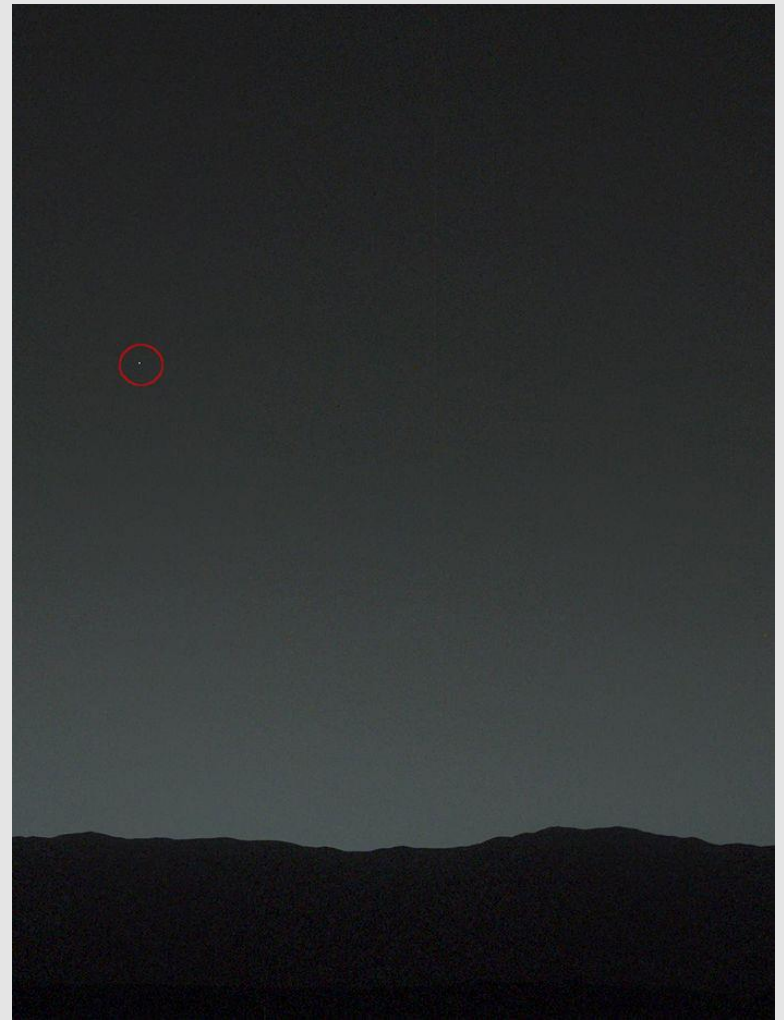
# Mars

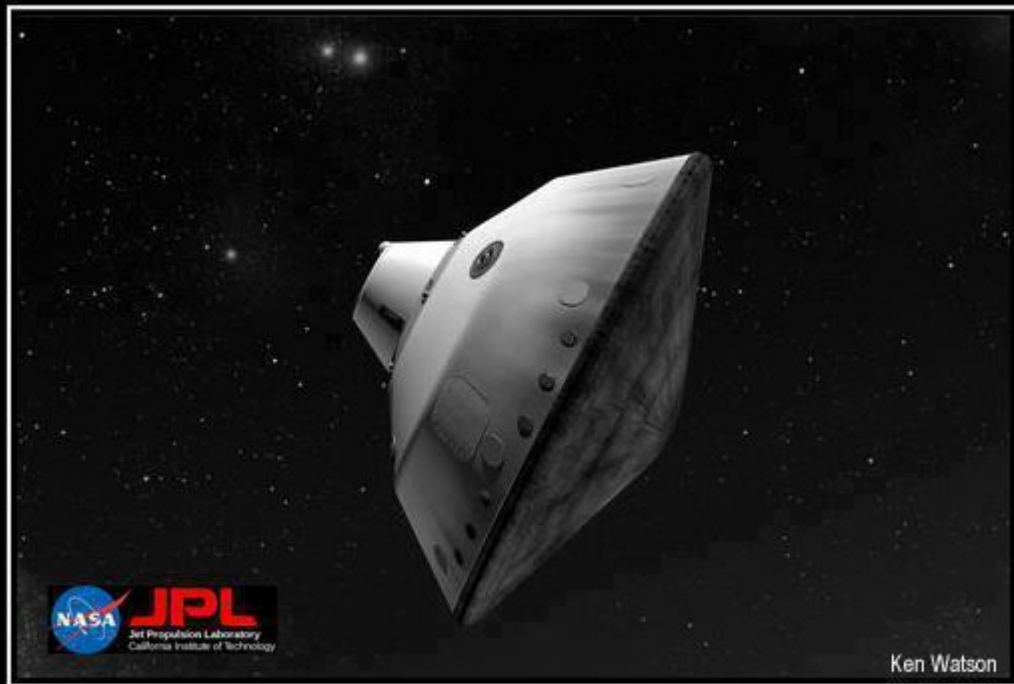
The only planet we  
know of inhabited  
entirely by robots.

[EXPLORE MARS](#)



# Earth From Mars

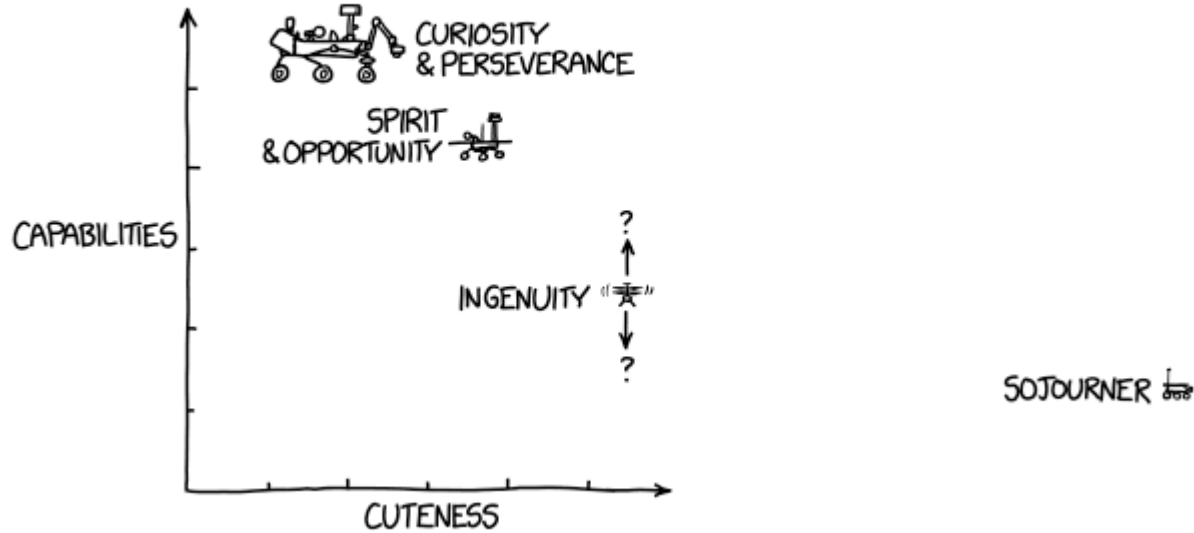




# IRONY

The first real flying saucer is from Earth  
And it landed on Mars.

# MARS ROVERS



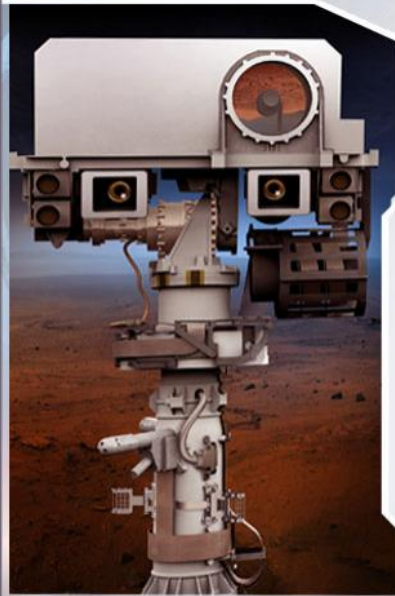
Comic link [here](#)



072020

BOARDING PASS: MARS 2020

NASAM2M



MARS 2020



National Aeronautics and Space Administration

M2M455219108802

BOARDING PASS: MARS 2020

# JOHNSON MISS

### LAUNCH SITE

CAPE CANAVERAL  
AIR FORCE STATION, FLORIDA  
EARTH

### ARRIVAL SITE

JEZERO CRATER,  
MARS

### ROCKET

ATLAS V-541



### SCHEDULED DEPARTURE

JULY 2020

AWARD POINTS EARNED [ 313,586,649 mi /  
504,668,791 km



Should there be a replacement of your spacecraft when it dies out? Why?

