

Snapshot of Space

As you read, think about how space exploration is an example of how scientists plan and carry out investigations to answer questions.

Scientists are exploring our **solar system**. Here's a look at what they're discovering.

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Last year, we celebrated 50 years since humans first walked on the **moon**. That was a long time ago. Yet, we're still exploring space today. What's in the rest of our solar system? We've sent lots of spacecraft to find out. These missions are all unmanned.



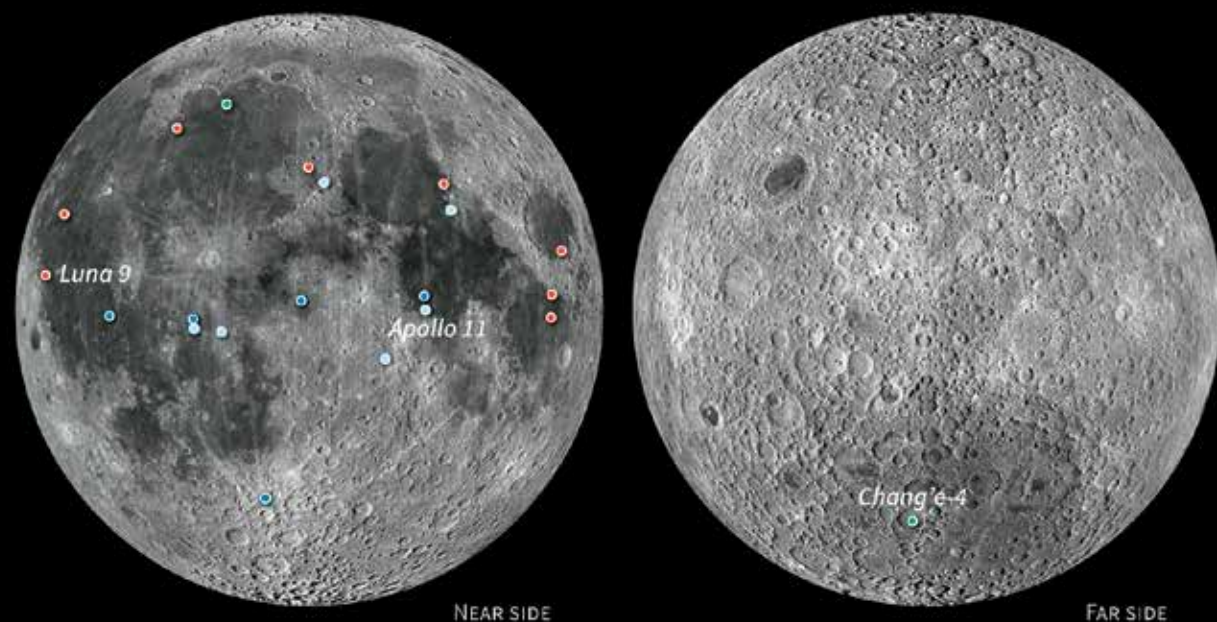
A view of Earth from the surface of the moon

One of the latest missions went back to the moon, but to a different part of it. The moon goes around Earth once a month. And the same side always faces Earth. That near side is the part we have always visited with men or unmanned spacecraft.

In 2019, China landed a spacecraft on the far side of the moon. It landed in a huge crater. Billions of years ago, a large object hit this area. It carved out the crater and kicked up rocks from the moon's mantle. The spacecraft will study these rocks.

All landings—manned or unmanned—happened on the near side of the moon. An unmanned Chinese spacecraft recently landed on the far side.

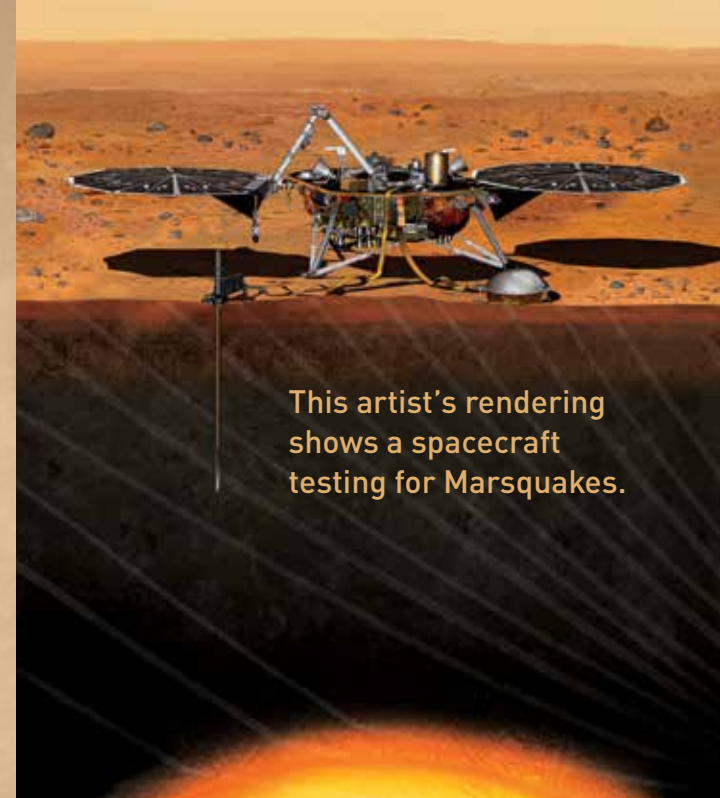
● former USSR ● United States ● manned Apollo missions ● China



Measuring 'Marsquakes'

The moon is large, but it's not a **planet**. Planets are large, round, and orbit, or go around, the sun. Our moon doesn't orbit the sun. It goes around Earth. One of the nearest planets to Earth is Mars. People may travel there someday.

In 2018, the United States' National Aeronautics and Space Administration (NASA) landed a spacecraft on Mars. It's studying things that are happening inside the planet. In 2019, the craft detected the first "earthquakes," or "marsquakes," ever observed on the planet.



This artist's rendering shows a spacecraft testing for Marsquakes.

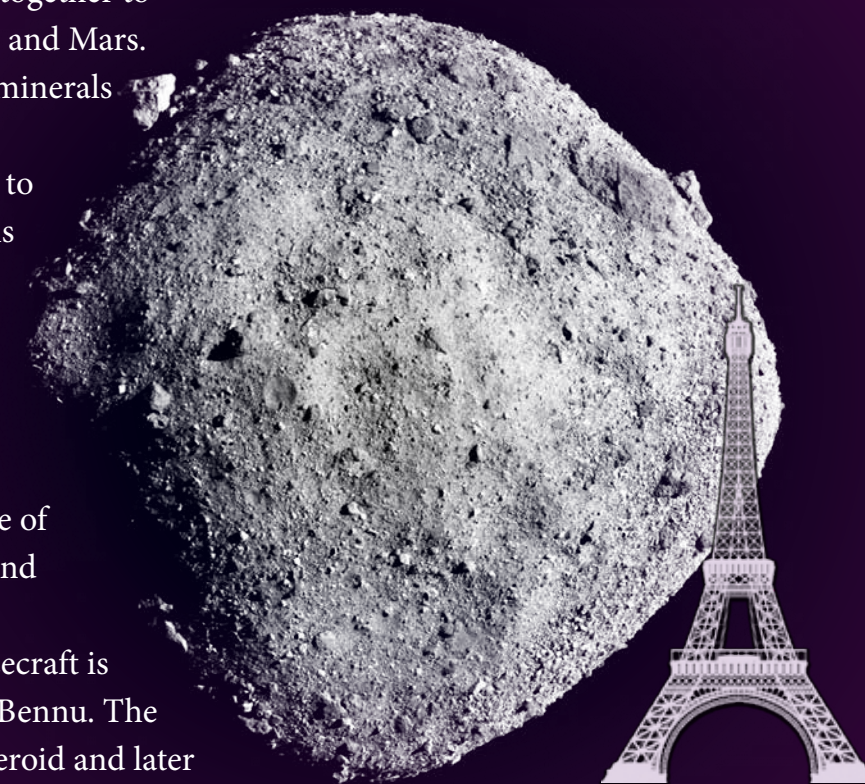
Assessing Asteroids

Beyond Mars are lots of small, rocky objects that go around the sun. These are **asteroids**. Asteroids are small and irregular. They are important to study because long ago objects similar to them came together to build rocky planets like Earth and Mars. Asteroids may have valuable minerals we could mine someday.

Some asteroids come close to Earth. A Japanese spacecraft is exploring one named Ryugu. It is shaped like a cube with lots of boulders. Last year, the spacecraft shot a large "bullet" at the asteroid. The blast kicked up material, some of which the spacecraft caught and will bring home for study.

A United States (U.S.) spacecraft is exploring an asteroid named Bennu. The spacecraft will sample the asteroid and later bring that sample back to Earth.

This image shows the Bennu asteroid next to the Eiffel Tower, for scale.



Picturing the Poles

Beyond the asteroid belt lies Jupiter. Jupiter is the largest planet in the solar system. It is 11 times the diameter of Earth. Since 2016, a NASA spacecraft named Juno has been orbiting Jupiter.

Jupiter spins faster than any other planet in the solar system. This rapid spin creates belts of gas that run from east to west. But Juno took pictures of Jupiter's north and south poles. There are no gas belts there. Instead, the poles have vast, swirling storms.

Farther and Further

In 2006, NASA launched a spacecraft named New Horizons. It used Jupiter's gravity to slingshot itself toward Pluto. Pluto is the ninth largest object that goes around the sun.

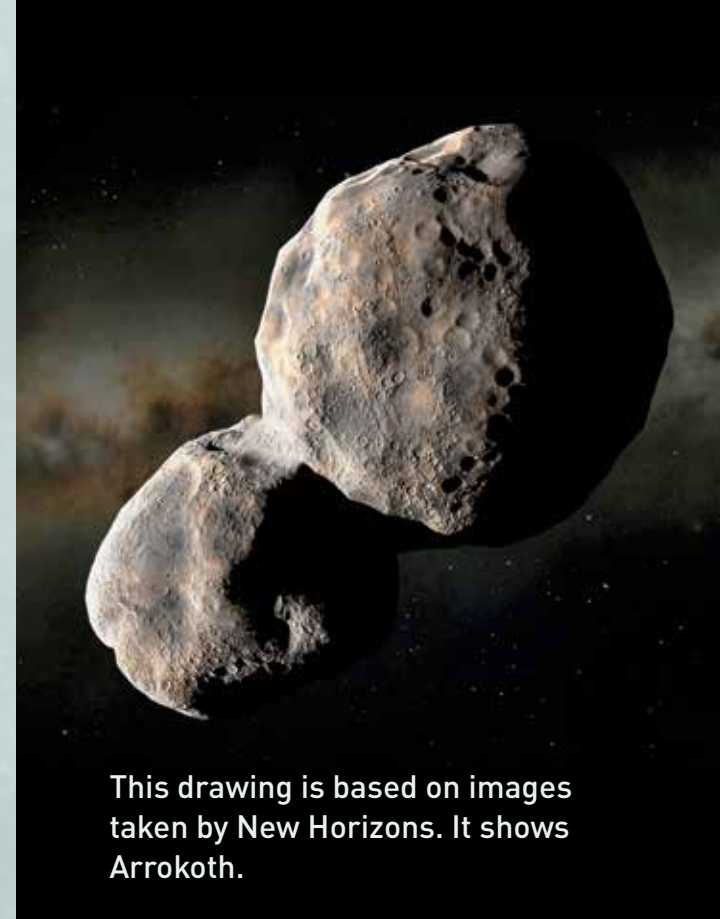
Nine years later, New Horizons flew past the dwarf planet. It showed us pictures of mountains kilometers high. The mountains were made of water-ice. Pluto is so cold that this substance is as hard as rock. It was an important discovery. Scientists want to know how the mountains formed.

New Horizons is still going. It flew past the farthest object ever visited, Arrokoth. Much smaller than Pluto, Arrokoth is made of two objects stuck together. It looks like a snowman in space! From tip to tip, it is about 35 kilometers (22 miles) long.

Arrokoth is far, far away. Believe it or not, some spacecraft have traveled even farther. Voyager 1 and Voyager 2 were launched by NASA in 1977. Voyager 1's mission was to fly by Jupiter and Saturn. Voyager 2 flew by Jupiter, Saturn, Uranus, and Neptune.

Both spacecraft kept going. They are now really far away but are still sending data back to Earth. They are now exploring interstellar space. That's the region between stars. This is the first time a spacecraft has gone into it to see what it's like.

Why do we explore the solar system? Because we are a part of it. We want to know more about the place where we live. Each mission teaches us more and shows us fascinating new places in space.



This drawing is based on images taken by New Horizons. It shows Arrokoth.

WORDWISE

asteroid: a small, rocky object that goes around the sun

moon: an object that goes around a planet

planet: a large object, like Earth or Mars, that goes around the sun or another star

solar system: the sun plus everything that goes around it: planets, asteroids, comets, and dust



This drawing shows how Juno looks as it orbits Jupiter.



Voyager now explores interstellar space, as shown in this drawing.