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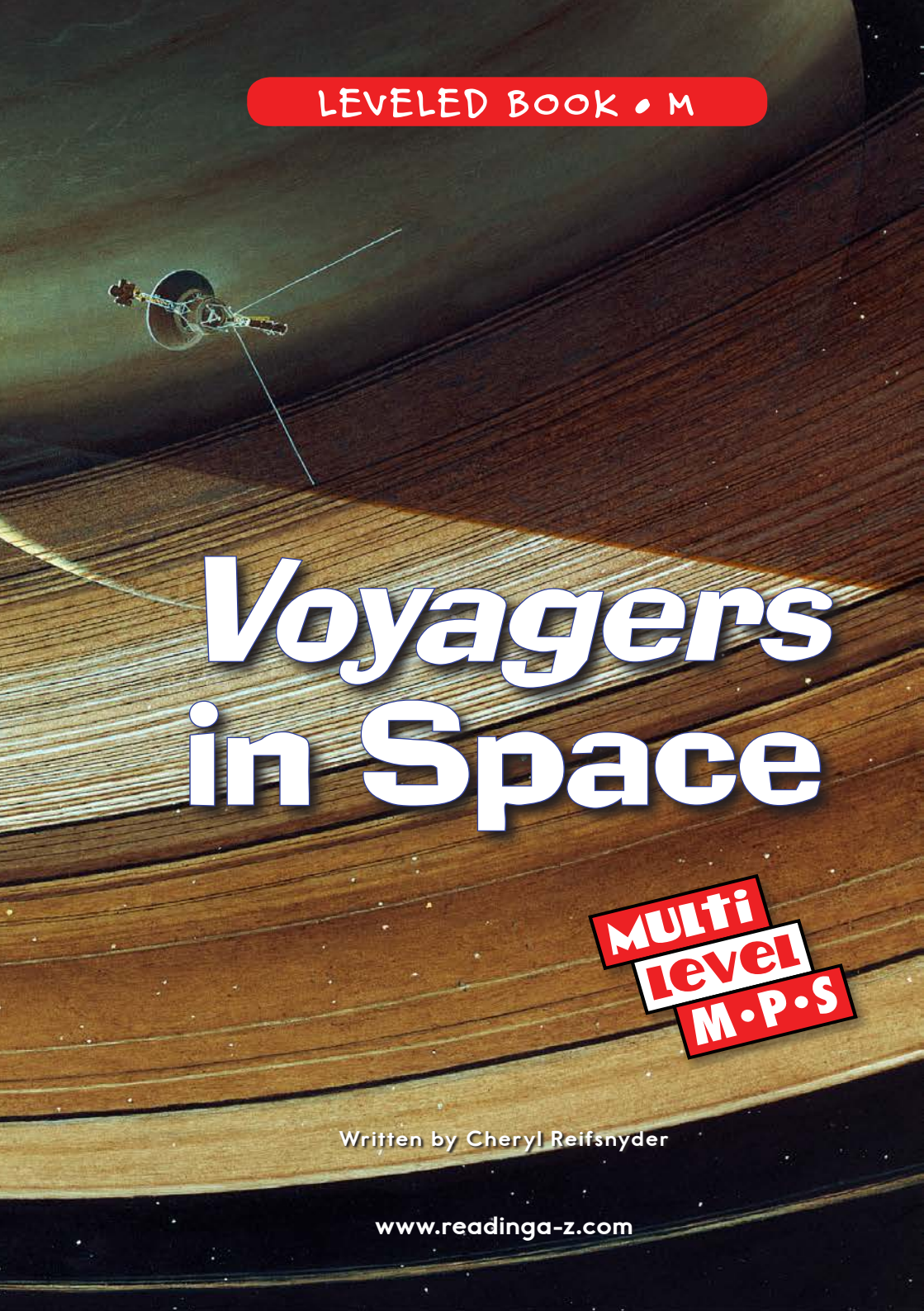


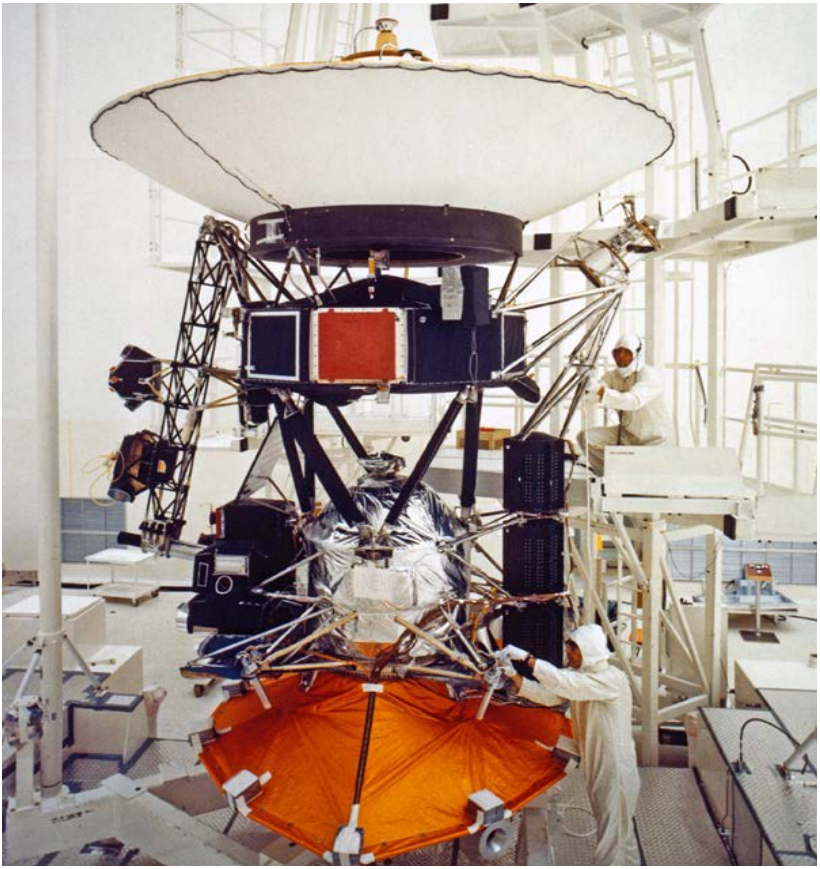
Voyagers in Space

MULTI LEVEL M•P•S

Written by Cheryl Reifsnyder

www.readinga-z.com

Voyagers in Space



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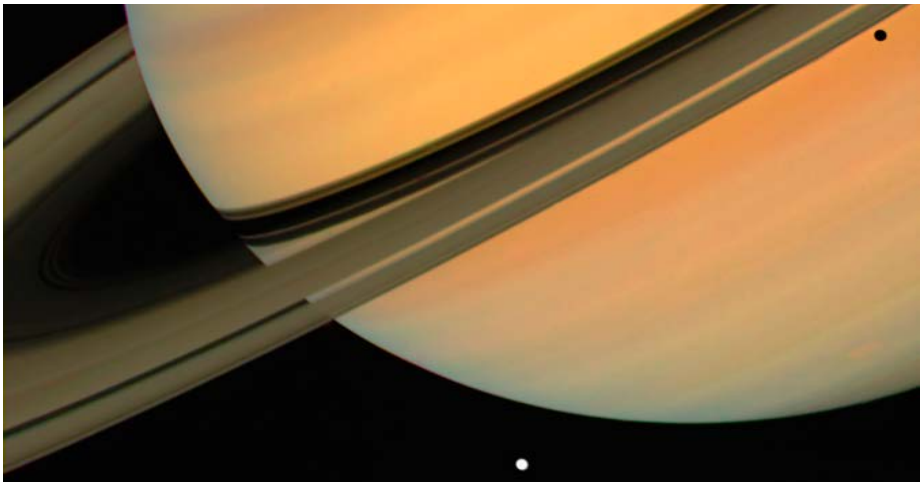


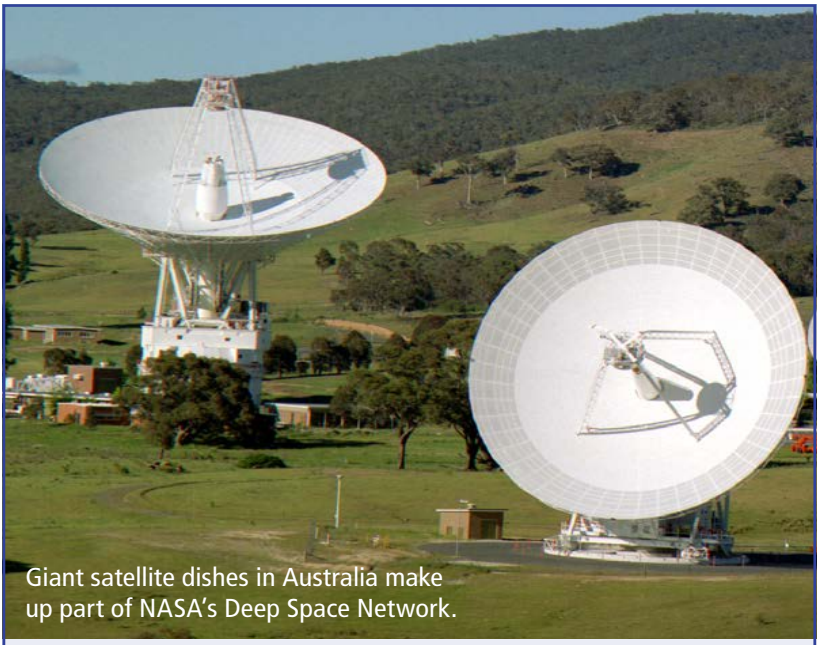
Table of Contents

Voyager 2 launches from Kennedy Space Center in Florida on August 20, 1977. A Titan/Centaur rocket carries it into space.

One Tough Job

The United States sent two *Voyager* **spacecraft** into space in 1977. Their job was to fly past Jupiter and Saturn, two giant **planets** in our **solar system**.

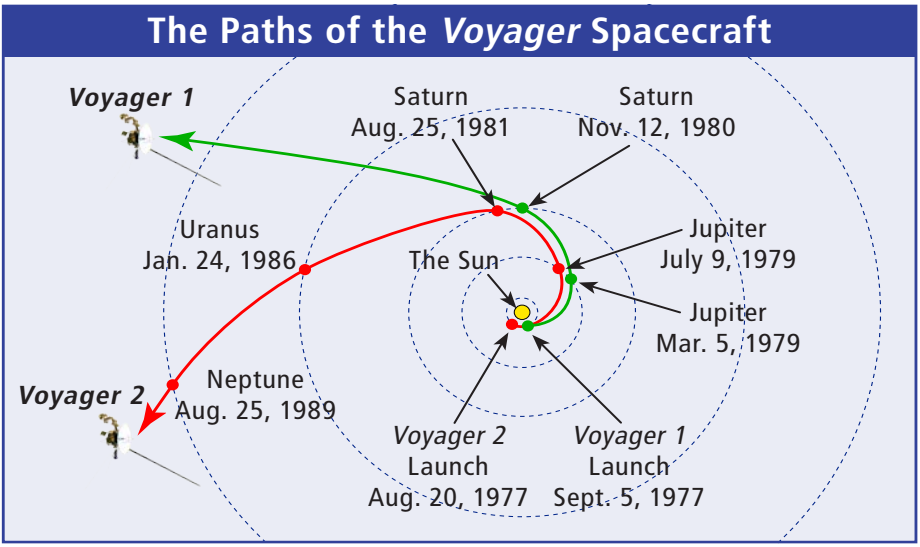
Scientists built the *Voyagers* to be tough. Still, they thought the *Voyagers* would only work for about five years. More than thirty-five years later, both spacecraft are still working.



Giant satellite dishes in Australia make up part of NASA's Deep Space Network.

Can You Hear Me Now?

As of 2014, *Voyager 1* is about twelve billion miles away from Earth. It sends messages home using a radio. That radio is only about as powerful as the lightbulb in a refrigerator, though. The messages take about seventeen hours to travel back to Earth. NASA uses giant satellite dishes around the world to catch the weak signal.



Planning

The trip was carefully planned. The planets all move around the Sun at different speeds. Sometimes they are on the same side of the Sun. Sometimes they are on opposite sides. In the late 1970s, the four biggest planets in our solar system all lined up near each other. They were close enough together that the *Voyagers* could visit them all in one trip.

Jupiter is the fifth planet from the Sun and the first of the outer planets.

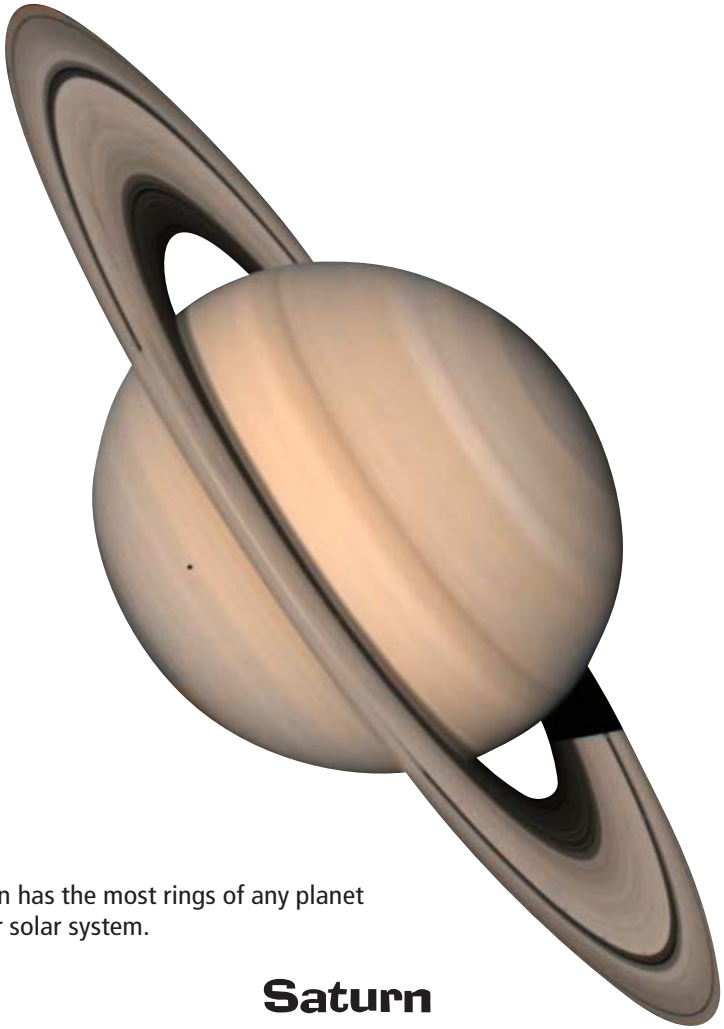
The Main Task

The *Voyagers'* first job was to study Jupiter and Saturn, their larger **moons**, and Saturn's **rings**. As the two spacecraft flew, they made **discoveries** about our solar system.

The Great Red Spot on Jupiter is the size of two or three Earths.

Jupiter

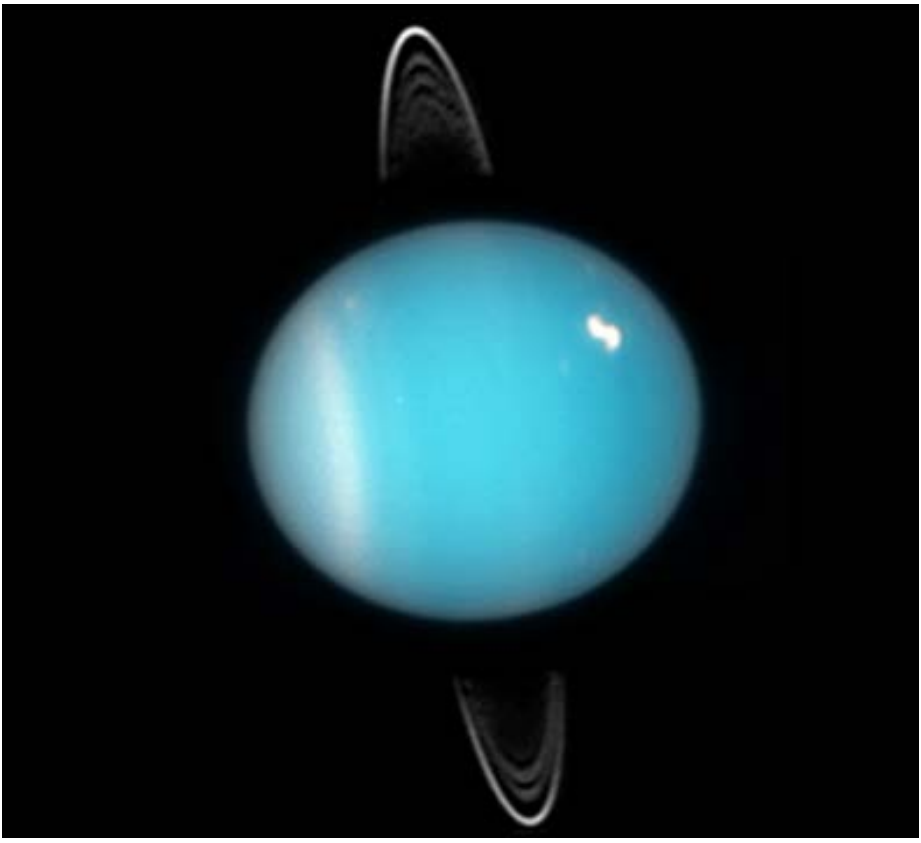
The *Voyagers'* first target was Jupiter, the solar system's largest planet. People had already seen Jupiter through **telescopes**, but the *Voyagers* gave a much better view. They showed that the Great Red Spot was a huge, spinning storm. They discovered a ring around Jupiter, like the ones around Saturn. They also helped scientists learn more about Jupiter's moons.



Saturn has the most rings of any planet in our solar system.

Saturn

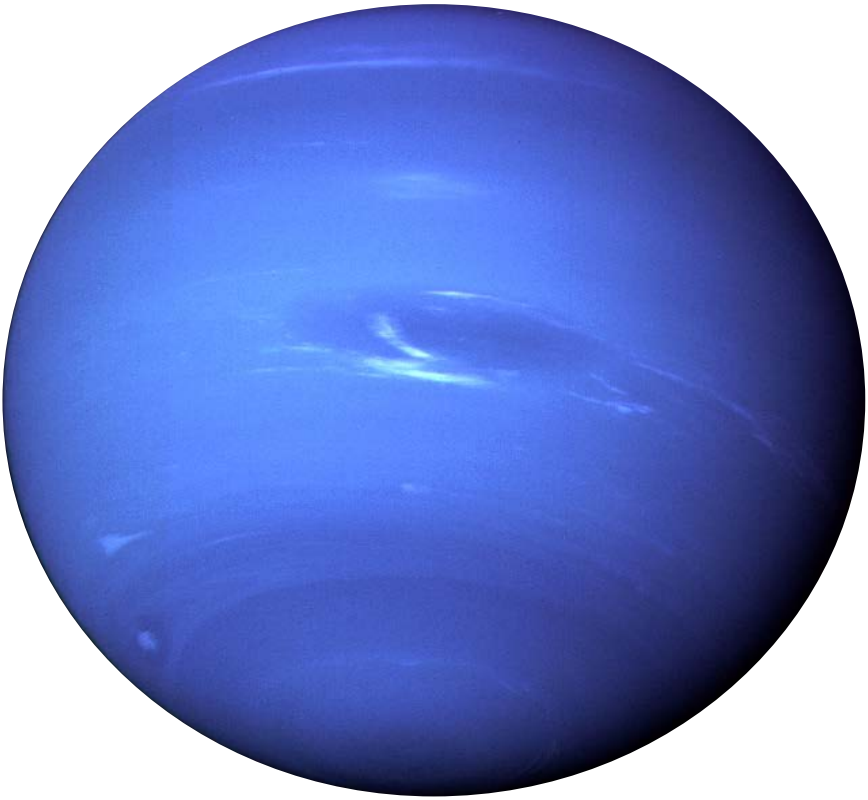
The *Voyagers* arrived at Saturn nine months apart in 1980 and 1981. They took pictures that showed new rings around the solar system's second-largest planet.



The rings around Uranus clearly show how the planet is tipped on its side.

Uranus

After passing Saturn, *Voyager 1* headed toward deep space. *Voyager 2* kept going toward Uranus. This strange light blue planet is tipped on its side. *Voyager 2* passed Uranus in early 1986.

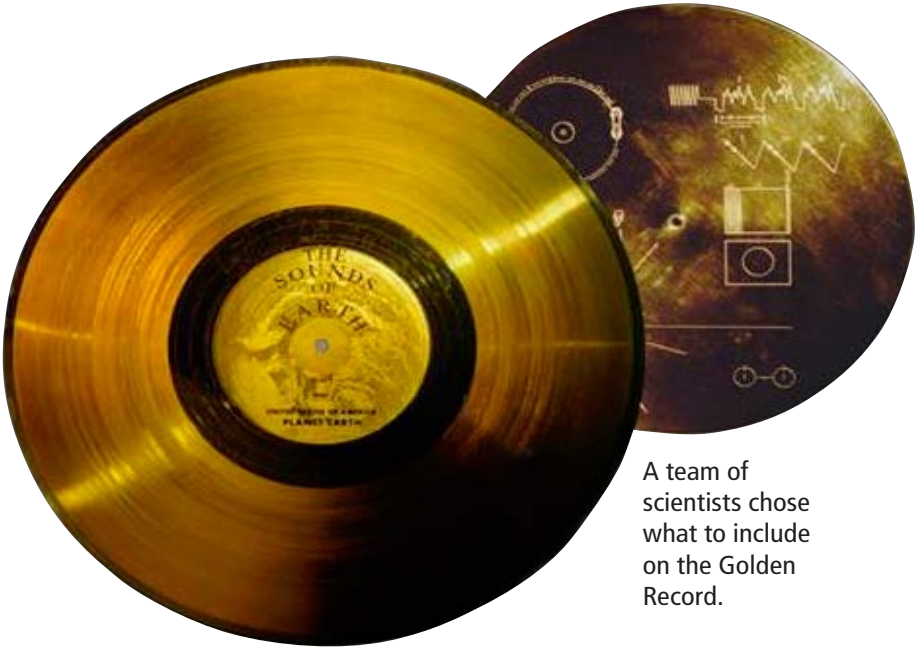


A type of gas in Neptune's atmosphere gives the planet its deep blue color.

Neptune

Next, *Voyager 2* flew toward Neptune. It passed the planet in August of 1989 and discovered five new moons.

Then, like *Voyager 1, Voyager 2* began its **journey** toward deep space.



A team of scientists chose what to include on the Golden Record.

The Golden Record

The *Voyagers* aren't just collecting information. They are also carrying a message. It's a greeting to other living things that may be in space.

The message is on a "Golden Record" on the side of each spacecraft. The record has music, art, and people from around the world saying "hello" on it.

Time Line: Important Dates for the *Voyager* Missions

1977 *Voyager 1* and *Voyager 2* launch 16 days apart

1979 Jupiter flybys, with discovery of volcanoes and ice on Jupiter's moons

1980 Saturn flybys, with discovery of atmosphere on Titan; *Voyager 1* begins trip out of solar system

1986 *Voyager 2* reaches Uranus

1989 *Voyager 2* reaches Neptune and begins trip out of solar system

1990 *Voyager* given task of exploring deep space

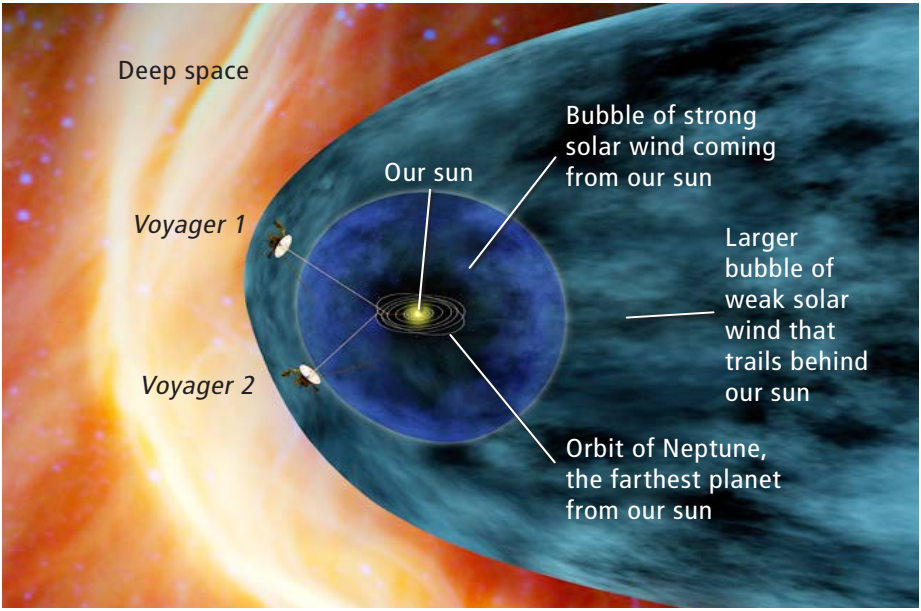
1998 *Voyager 1* passes *Pioneer 10,* becoming the most distant human-made object in space

2012 *Voyager 1* enters deep space

The outside of the record has a map that shows where Earth is. Other living things could use the map to find our planet, but that probably won't happen soon. *Voyager 1* won't come close to another star for at least forty thousand years!

The Final Task

Now that the *Voyagers* have finished **exploring** planets, they have a new task. Their job is to explore space beyond our solar system. In August 2012, *Voyager 1* left our solar system and began this new journey. The spacecraft is the first thing made by people ever to leave our solar system.



Beyond the Moon are some of the many photographs taken by the *Voyager* spacecraft during their trip.

Conclusion

Voyager "has opened up our solar system," says project scientist Dr. Edward Stone. The two spacecraft flew past all of the solar system's giant outer planets and many moons. Now the *Voyagers* are giving us a first look at deep space while carrying a message from Earth.

Glossary

discoveries *(n.)* acts of finding or uncovering something for the first time (p. 7)

exploring *(v.)* observing and learning about an area by traveling over or through it (p. 14)

journey *(n.)* a long trip (p. 11)

moons *(n.)* huge balls of rock that travel around a planet (p. 7)

planets *(n.)* large, round objects that travel around a star (p. 4)

rings *(n.)* bands of dust and ice that circle a planet (p. 7)

solar system *(n.)* a group of objects in space that orbit a star (p. 4)

spacecraft *(n.)* a vehicle used for traveling in space (p. 4)

telescopes *(n.)* instruments used to make distant objects look closer (p. 8)

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Front and back covers: Illustration of *Voyager 2* passing close by Saturn's rings in August of 1981.

Title page: A NASA scientist checks a test model of a *Voyager* spacecraft in 1977 at the Kennedy Space Center in Cape Canaveral, Florida.

Page 3: Saturn and one of its moons as photographed by *Voyager 1* on November 3, 1980. The shadow of the moon appears on the planet's cloud tops.

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Level M Leveled Book

Written by Cheryl Reifsnyder

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