About Space

Fifth Edition

By Jana Carson

TREASURE BAY
Family Engagement in Reading

WE BOTH READ®

Parent's Introduction

Whether your child is a beginning reader, a reluctant reader, or an eager reader, this book offers a fun and easy way to encourage and help your child in reading.

Developed with reading education specialists, **We Both Read** books invite you and your child to take turns reading aloud. You read the left-hand pages of the book, and your child reads the right-hand pages—which have easier text written for a specific reading level. The result is a wonderful new reading experience and faster reading development!

You may find it helpful to read the entire book aloud yourself the first time, then invite your child to participate the second time. As you read, try to make the story come alive by reading with expression. This will help to model good fluency.

In some books, a few challenging words are introduced in the parent's text with **bold** lettering. Pointing out and discussing these words can help to build your child's reading vocabulary. If your child is a beginning reader, it may be helpful to run a finger under the text as each of you reads. To help show whose turn it is, a blue dot ● comes before text for you to read, and a red star ★ comes before text for your child to read.

If your child struggles with a word, you can encourage "sounding it out," but keep in mind that this will not help with all words because some words don't follow phonetic patterns.

You can help with breaking down the sounds of the letters or syllables, but if your child becomes too frustrated, it is usually best to simply say the word.

While reading together, try to help your child understand what is being read. It can help to stop every few pages to ask questions about the text and check if there are any words your child doesn't understand. After you finish the book, ask a few more questions or discuss what you've read together. Rereading this book multiple times may also help your child to read with more ease and understanding.

Most importantly, remember to praise your child's efforts and keep the reading fun. Keep the tips above in mind, but don't worry about doing everything right. Simply sharing the enjoyment of reading together will increase your child's reading skills and help to start your child on a lifetime of reading enjoyment!

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A We Both Read Book
Level 1–2
Guided Reading: Level H

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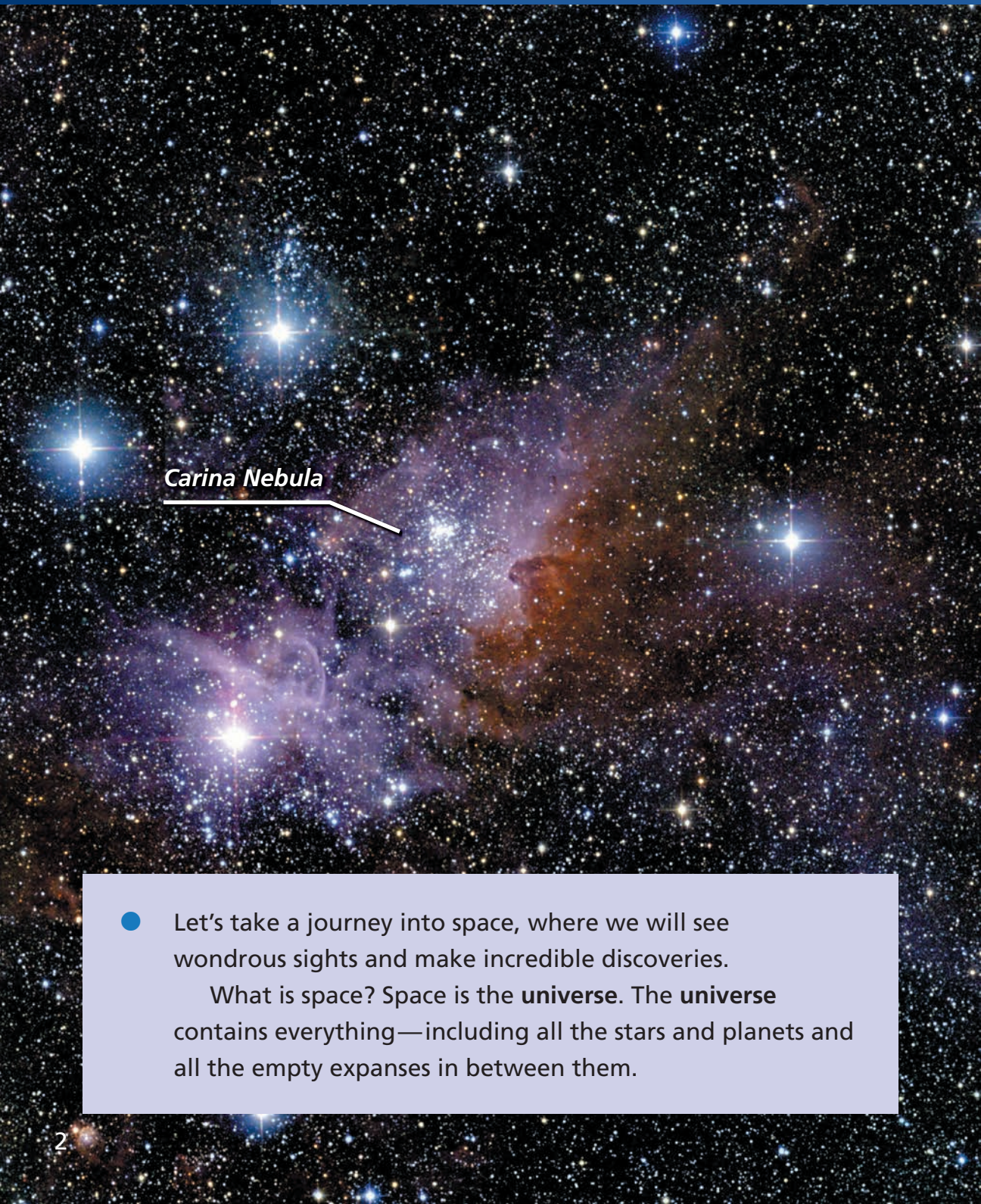
CHAPTER 1 THE VASTNESS OF SPACE



Let's take a journey into space, where we will see wondrous sights and make incredible discoveries.

What is space? Space is the **universe**. The **universe** contains everything—including all the stars and planets and all the empty expanses in between them.

★ Have you ever looked up at the sky? It seems so big and there are so many stars! Yet what we see in our sky is only a very tiny part of the **universe**.

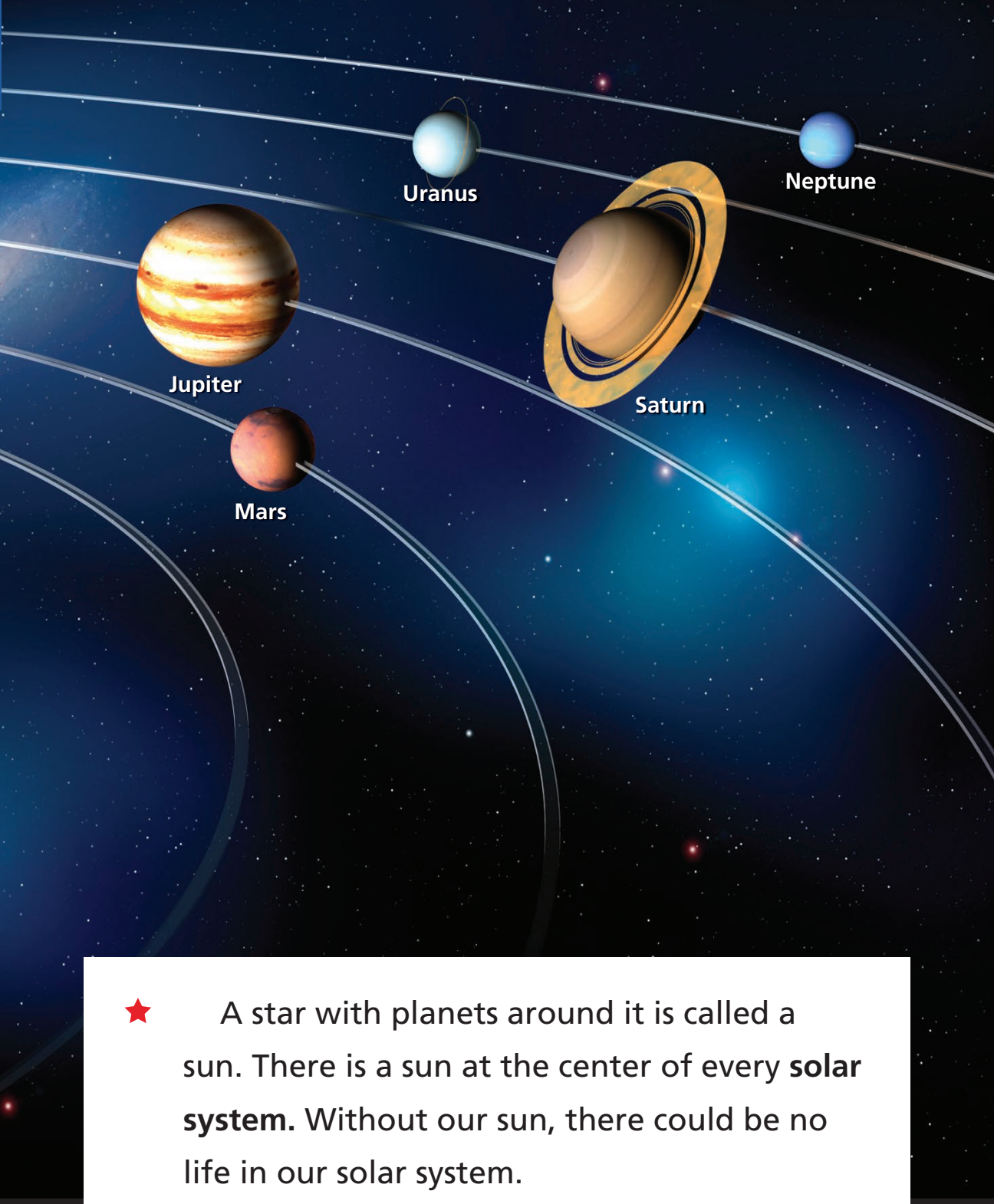
Orion Nebula, a huge expanse of dust and gas in our galaxy where many new stars are being created

- A galaxy is a large system of stars held together in a group by gravity. We are in a galaxy called the **Milky Way**, and the stars that we are able to see in our night sky are part of our galaxy. We can see many more of the stars in our galaxy through the use of a telescope.

Milky Way galaxy

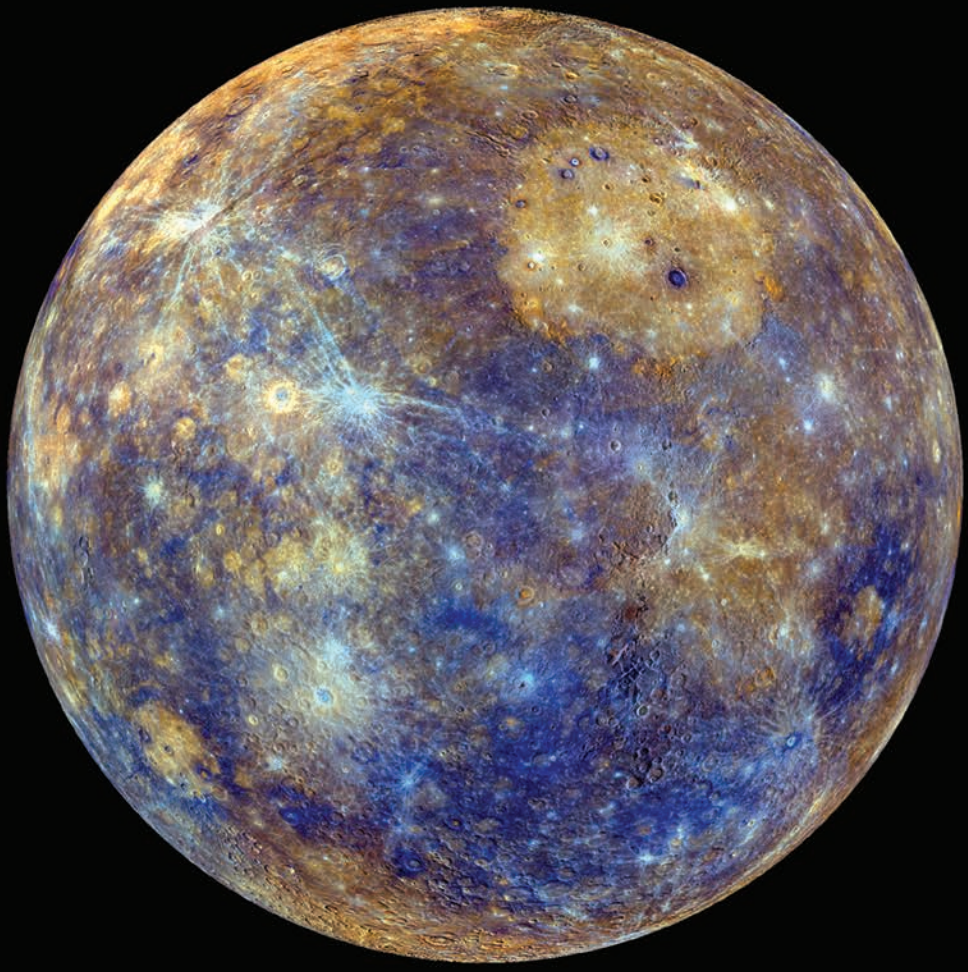
★ Long ago, people could only look at the stars with their eyes. Most of the stars of the **Milky Way** just looked like a white streak in the sky.

- Within a galaxy there may be many **solar systems**. A **solar system** is made up of a sun and everything that moves around it. Our **solar system** exists within the Milky Way galaxy. It includes all the planets and their moons as well as the comets, asteroids, and space objects that orbit, or move in circles, around our sun.



★ A star with planets around it is called a sun. There is a sun at the center of every **solar system.** Without our sun, there could be no life in our solar system.

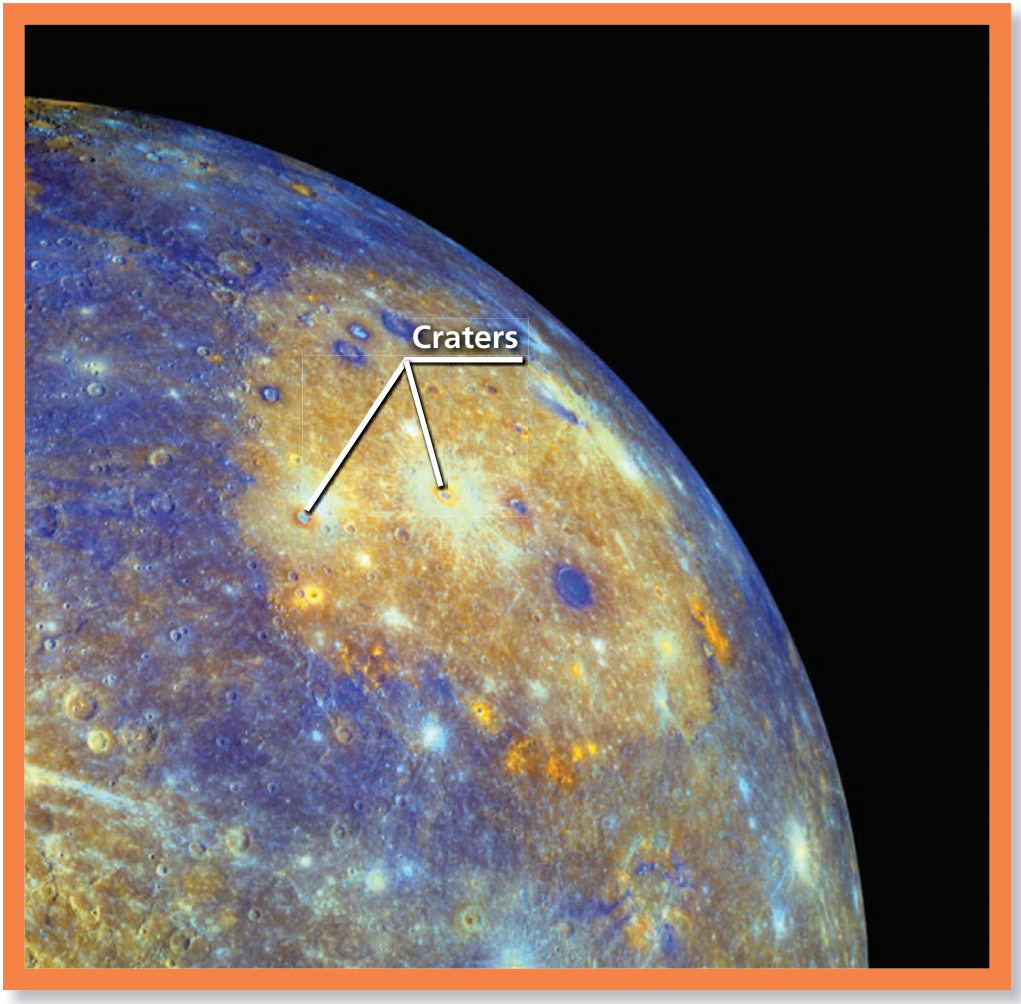
Planet Mercury (Colors are not accurate but show the different types of rocks on the surface.)



The planet we live on is called Earth. As far as we know, it is the only planet in our solar system that has life on it. Other planets in our solar system are **Mercury**, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune.

Mercury is the closest planet to our sun. No humans have visited the **surface** of **Mercury**, but robotic spacecraft have taken pictures of it.

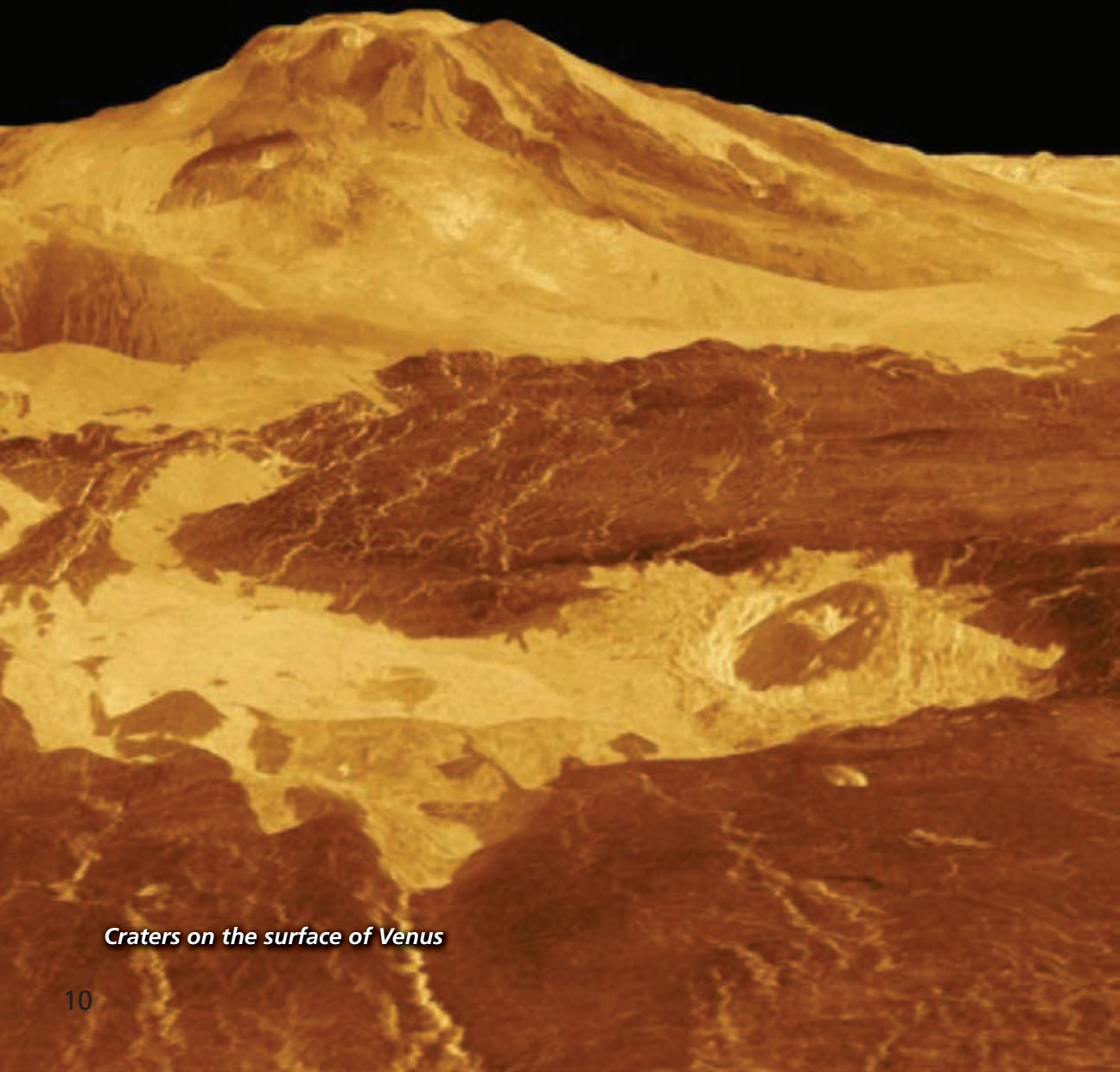
View of Mercury showing craters and the great Caloris basin (large tan area)



★ **Mercury** is much smaller than our planet. There is no water or air on the **surface** of Mercury, and it is very hot.

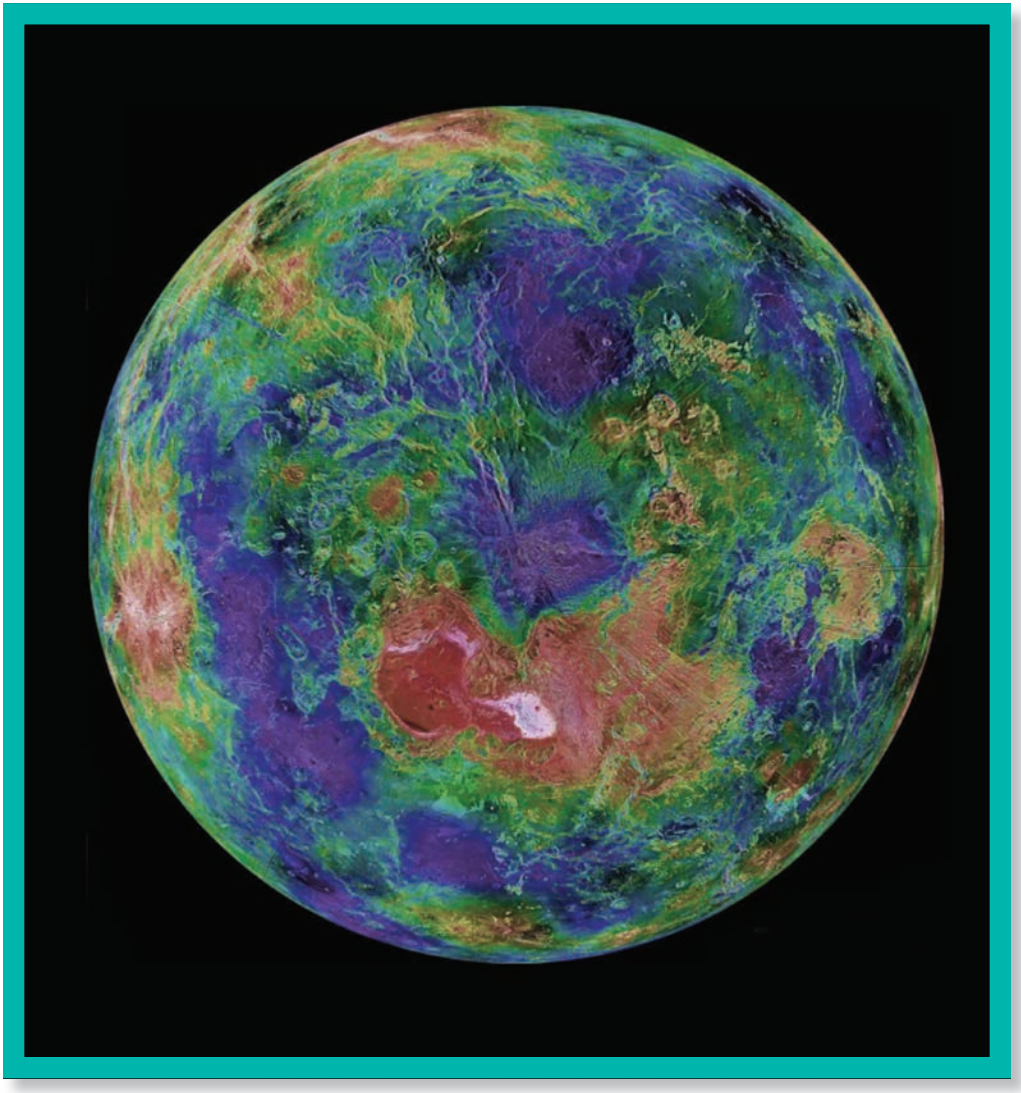
The surface of Mercury looks a lot like our moon. There are many craters.

- **Venus** and Earth are similar in size, and they both have mountains and valleys and plains. However, there is no water on **Venus**. Scientists believe there may have been water there billions of years ago, but it has all now boiled off into steam or **clouds**. Venus is also known as the "**evening star**."



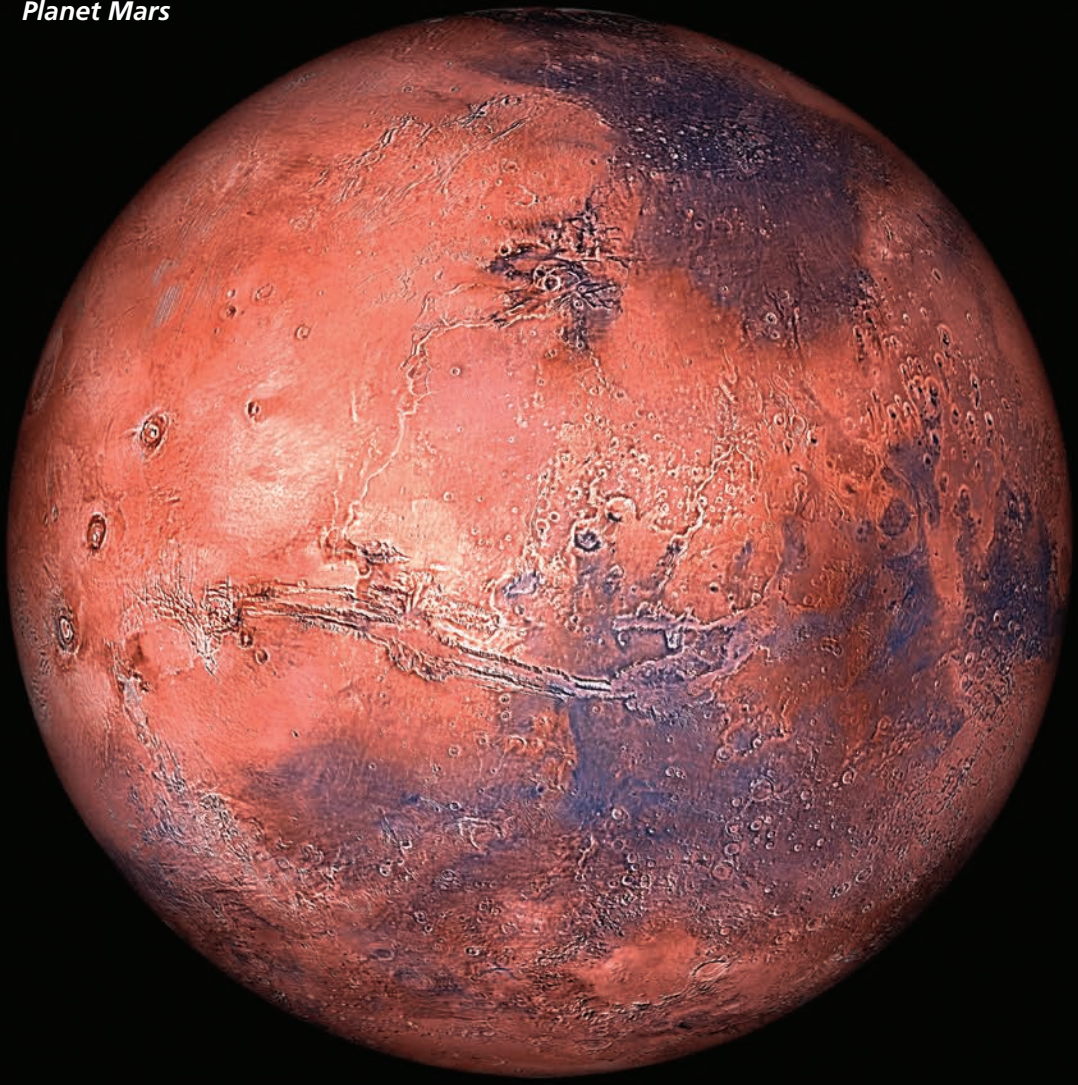
Craters on the surface of Venus

Planet Venus



★ **Venus** has been called the **evening star** because it shines very brightly just about sunset. Venus is covered with thick **clouds**. There are always very big storms in these clouds.

Planet Mars



Mars is one of the planets that is closest to Earth. It can be seen in the sky without a telescope.

Scientists know a lot about **Mars**. They know the soil contains a lot of a certain metal called **iron**.

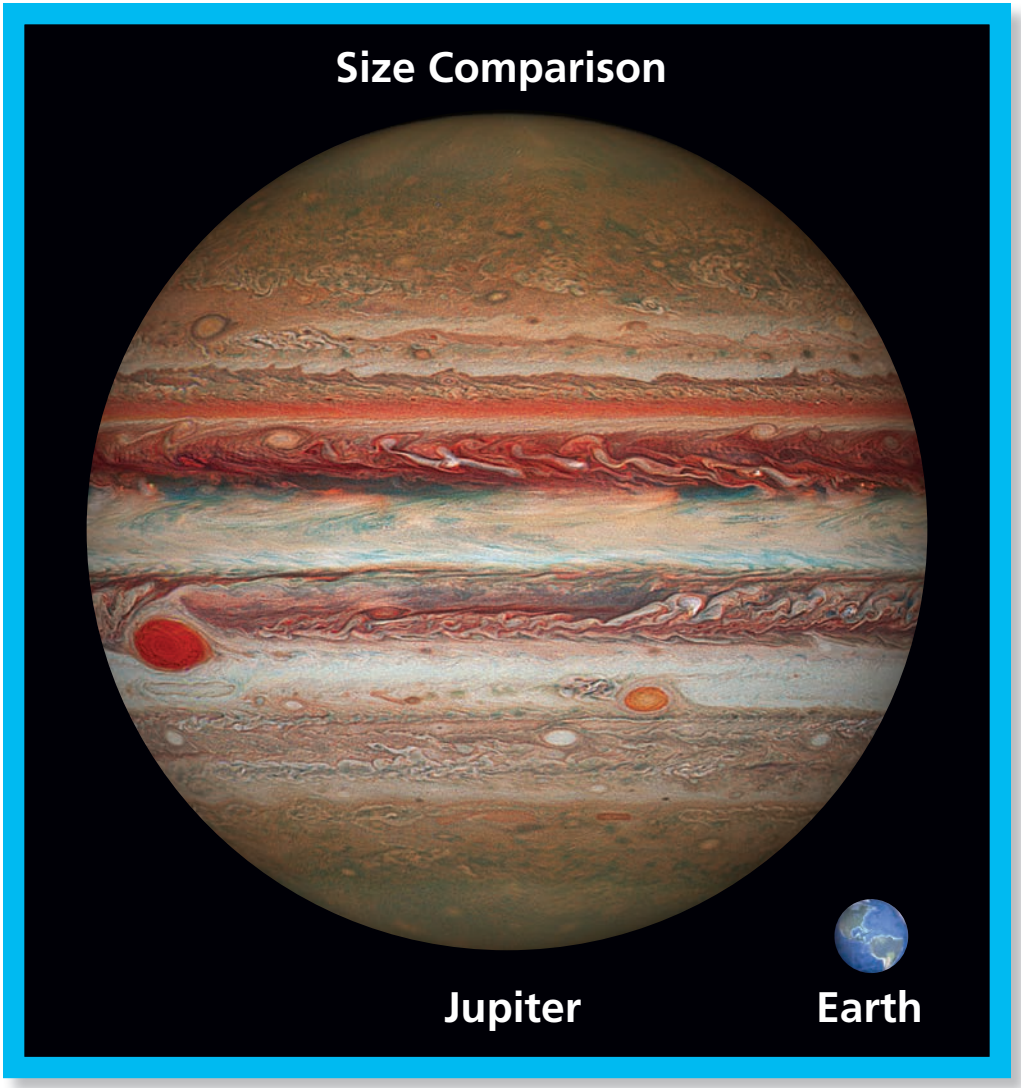
NASA's space rover, Perseverance, on the surface of Mars

★ The **iron** in the **soil** makes the planet look red. That is why **Mars** is often called the Red Planet.

Planet Jupiter

- **Jupiter** is the largest planet in our solar system. There are terrific lightning bolts and huge gas storms in **Jupiter's** atmosphere.

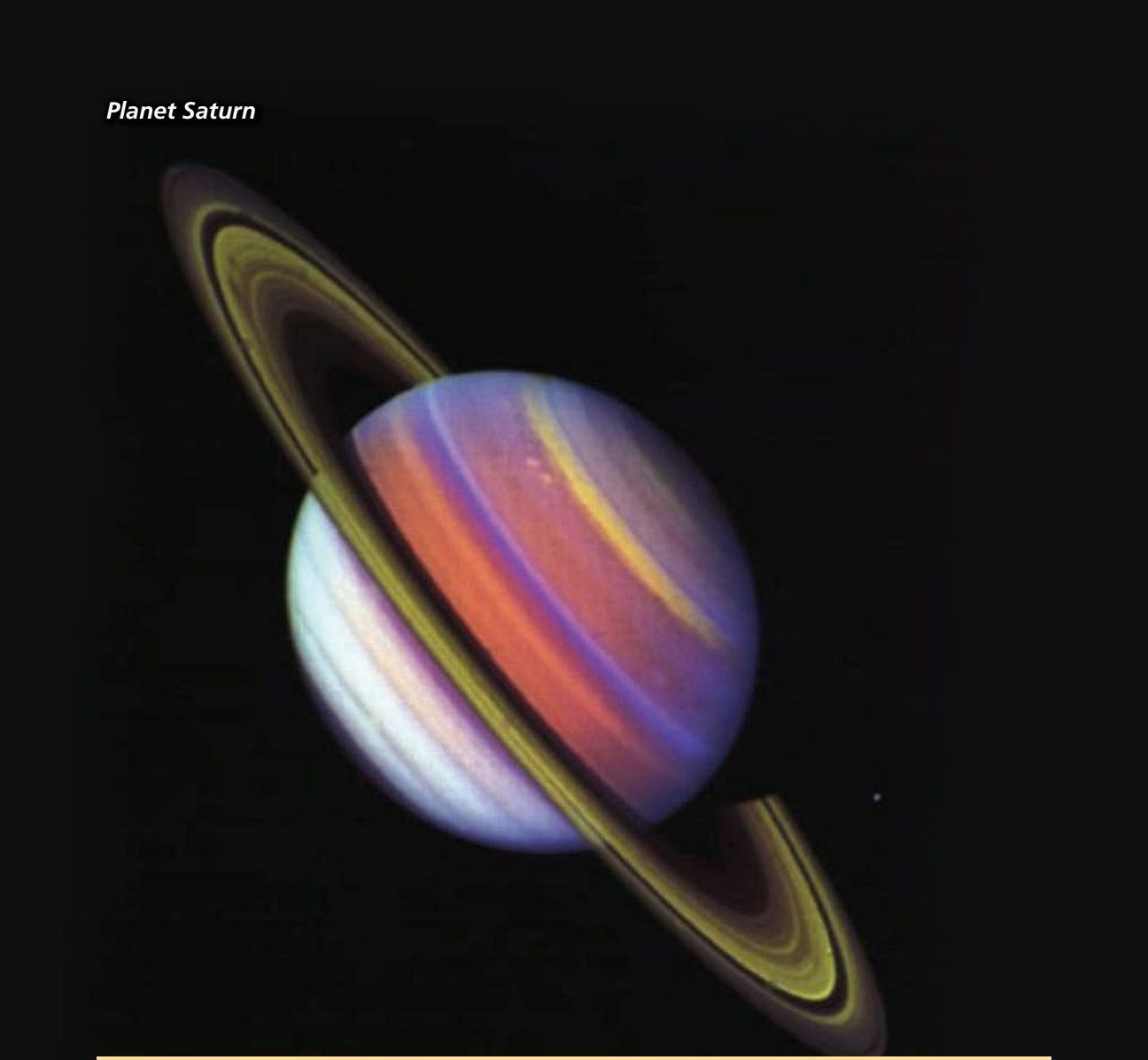
  A large area of swirling gas called the Great Red Spot is believed to be a hurricane-like storm.



★ **Jupiter** is a huge planet. It is so big that all the other planets in our solar system could fit inside it.

Jupiter has more than ninety moons. One is almost as big as the planet Mars!

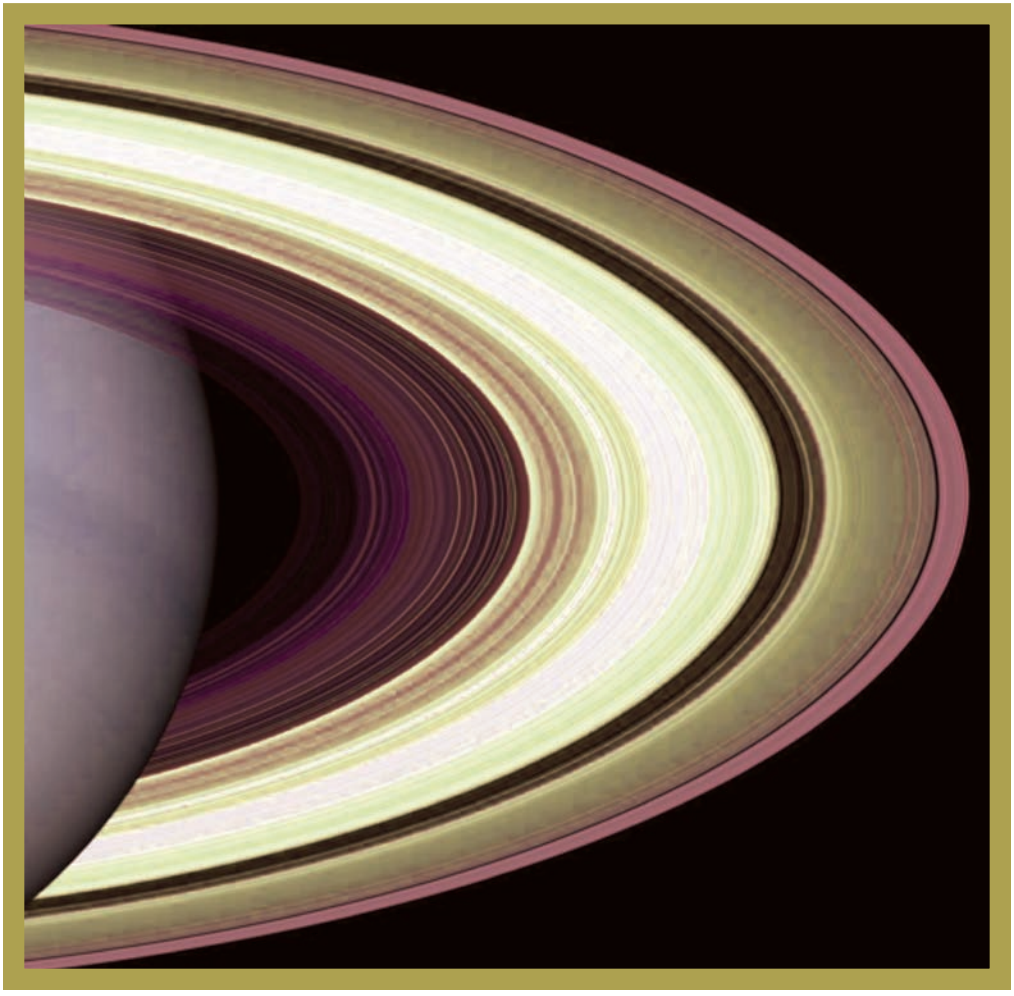
Planet Saturn



Saturn is the second-largest planet in our solar system. This planet spins rapidly on its axis, causing the top and bottom of the planet to flatten out.

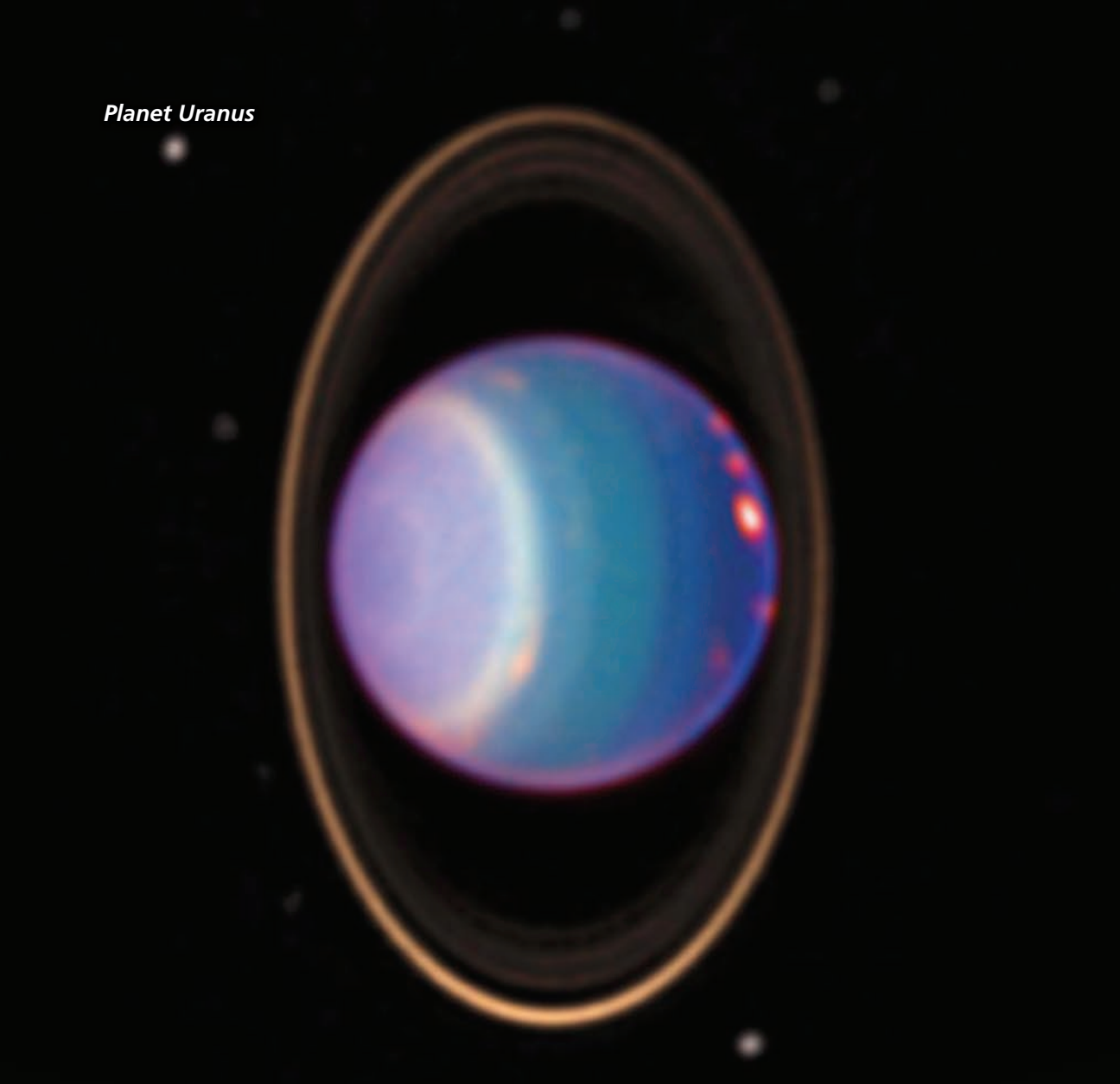
Saturn has even more moons than Jupiter—at least one hundred and forty-six. The largest is called Titan *(TY-tun)*. Some scientists think there may be a salty ocean beneath the surface of Titan.

Saturn's rings



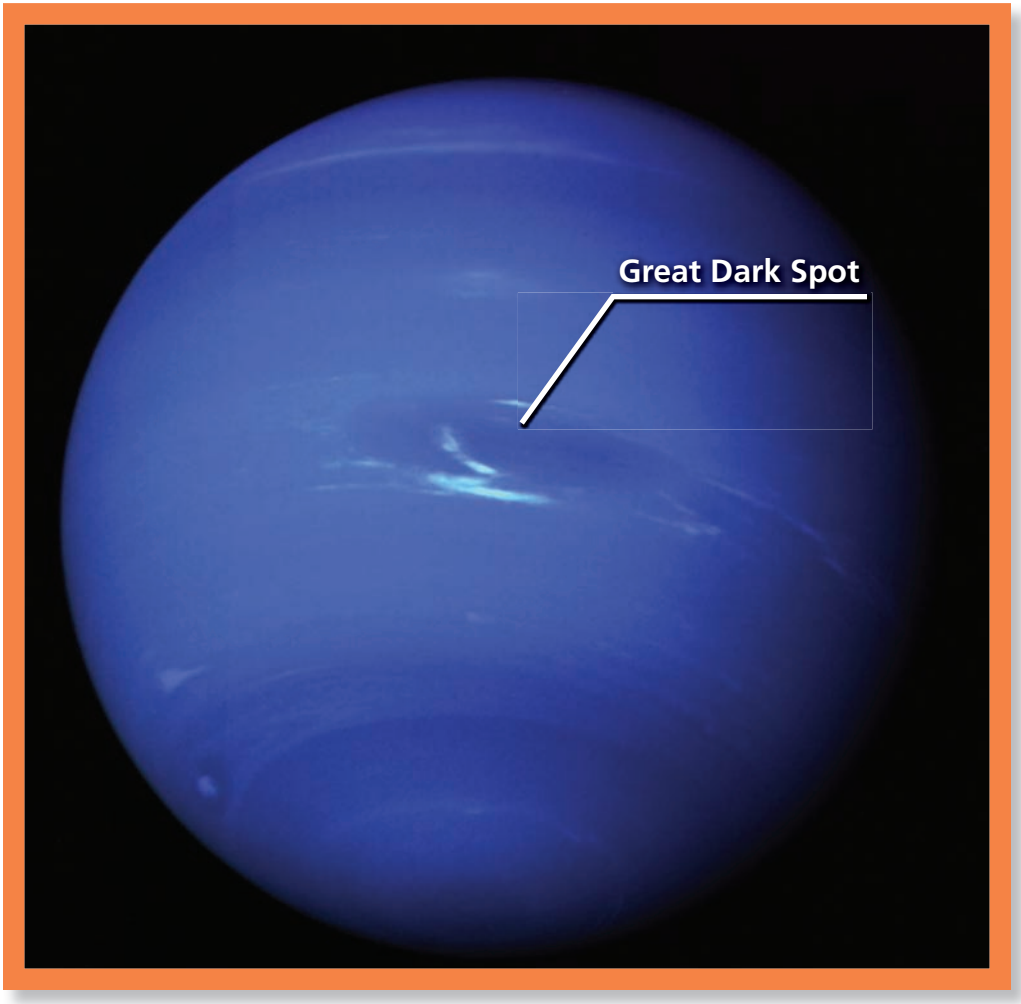
★ There are also rings that orbit **Saturn**. These rings are made up of ice and small rocks. Some chunks of ice are as big as a house. Some are as small as a speck of dust.

Planet Uranus



- Uranus and **Neptune** have similar atmospheres composed primarily of hydrogen and helium gases. However, Uranus is unique because of how it is tilted on its axis. It lies almost on its side in relation to the sun. When the sun rises at its north pole, it stays up for forty-two Earth years before it sets!

Planet Neptune



★ Both of these planets have rings around them. The rings around **Neptune** are very hard to see.

Neptune has huge storms on the surface. These storms can be seen on the planet as dark spots. They are called Great Dark Spots, and they can be as wide across as our entire planet.

Size Comparison

Earth Moon

- **Earth** is our home planet. It's the third planet from the sun and is the only planet in our solar system that has flowing water on its surface.

  About seventy percent of **Earth**'s surface is covered with water. Continents with mountains, plains, forests, and **deserts** cover the remaining thirty percent.

Earth's moon

★ **Earth** has one moon. Our moon is like a very dry **desert**. From here on Earth we can only see one side of our moon. The side that we see is called the near side. The side we never see is called the far side.

Buzz Aldrin on the moon

Our moon has had visitors! NASA *(NAS-uh)*, the official U.S. space agency, launched the Apollo 11 spaceship in 1969. The Apollo 11 spaceship carried astronauts Neil Armstrong and Edwin "Buzz" Aldrin to the moon to explore its surface.

Neil Armstrong was the first person to walk on the moon.

Footprints on the moon

★ He left his footprints. There is no air on the moon to blow them away. His footprints are still on the moon.

NASA astronaut Sunita Williams participates in a spacesuit fit check.

- **Astronauts** go through years of specialized training. They must have strong skills in science, math, and technology.

  The **astronauts** that go into space must learn how to function in weightless environments and even learn how to do a spacewalk.

Astronauts training underwater

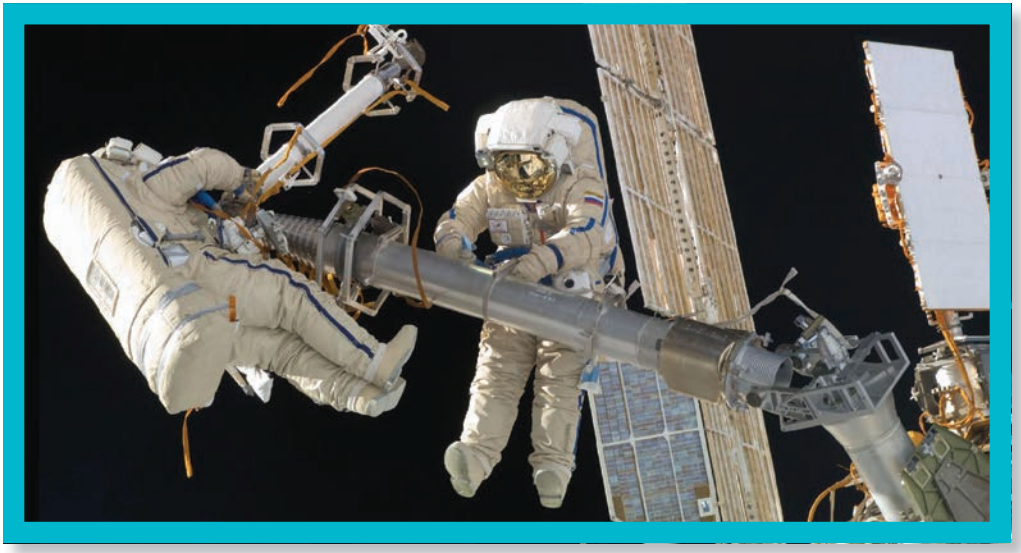
★ Sometimes **astronauts** train underwater. The water helps them know what it feels like to float in space.

International Space Station with Earth's horizon in the background

How would you like to live in space? Some astronauts do. There are teams of astronauts that take turns living and working on a space station. A space station is an enormous satellite that orbits Earth.

The biggest space station so far has been the **International Space Station**.

Astronauts doing construction and maintenance on the International Space Station



★ The **International Space Station** was built from many different parts. Astronauts put these parts together in space.

Astronauts, fruit, vegetables, and a plant floating in the International Space Station

- Many types of science **experiments** done on the space station cannot be done on Earth. There is no **gravity** on the space station. Everything that is not attached to the inside of the space station floats freely in the air.

★ Some **experiments** explore the effects of no **gravity**. For example, how do plants grow when there is no gravity? Or what is the effect on humans and animals when they live without gravity for weeks or months?

Astronaut taking photos during a spacewalk

- The International Space Station has been in orbit since 1998, and it will soon be ending its mission. However, work has started on a new space station that will have even more advanced **technology** and capabilities.

Astronauts in space

★ A new space station may be able to help with flights to the moon and even to Mars.

New and advanced **technologies** *(tek-NAH-luh-jeez)* will also help look into deep space. Deep space is the far end of our solar system and past it.

Hubble telescope above Earth

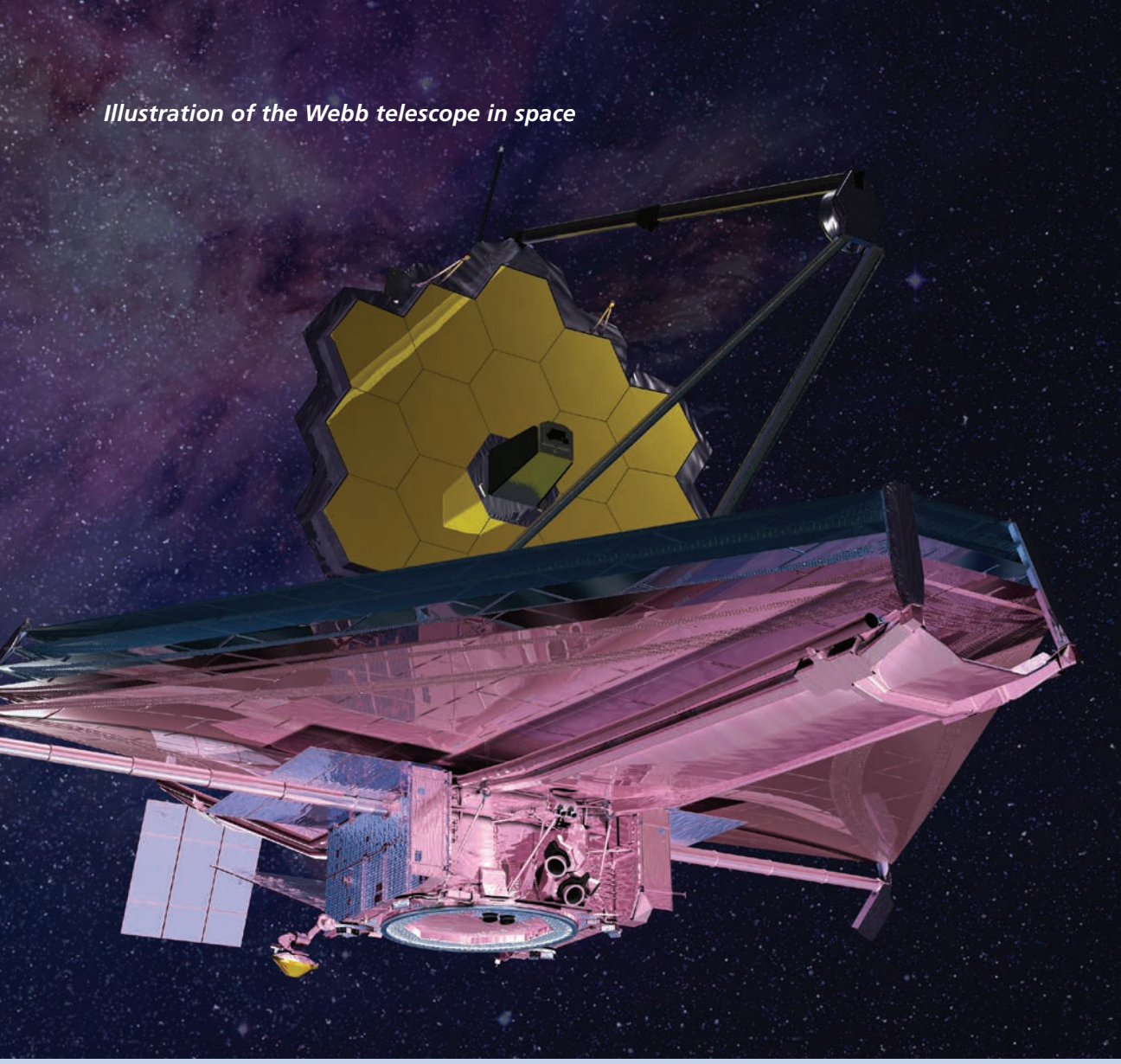
NASA's Voyager 1

- The invention of the **telescope** allowed people to see the stars in our galaxy much more clearly. As bigger **telescopes** were built, our understanding of the universe grew. We now send super-high-powered **telescopes** out into space. **Unmanned** space probes, such as the Voyager and Pioneer, are also sent out to explore.

The Webb telescope being tested before its launch into space

★ **Telescopes** and **unmanned** probes take pictures in space. They send the pictures back to Earth. This lets us see more of the vast universe than ever before. The Webb telescope may be the most advanced telescope ever built.

Illustration of the Webb telescope in space



- The Webb telescope has sent back amazing pictures of different **nebulas** *(NEB-yoo-luz)* from deep space. A **nebula** *(NEB-yoo-luh)* is a giant cloud of gas and dust in space. A **nebula** can be created from the explosion of a dying star. New stars can also be formed inside some **nebulas**.

The Helix Nebula

★ The closest known **nebula** to Earth is called the Helix *(HEE-liks)* Nebula. It is the remains of a dying star—possibly one like our sun. It is about 700 light-years away from Earth. That means even if you could travel at the speed of light, it would still take you 700 years to get there!

Scientists test the Mars Curiosity Rover

- Space rovers are also used to explore the mysteries of space. These unmanned vehicles have been sent to Mars by the United States and other countries. The space rovers collect information that is examined by **scientists**. They have found evidence that billions of years ago, the surface of Mars contained rivers and lots of water. There is still water on Mars, but most of it is now locked in ice.

A Mars rover has discovered ancient river beds on the surface of Mars.

Curiosity Rover takes a photo of a dry river bed on Mars.

★ Water is one of the most important things needed for life. Many **scientists** now think that there could have been some form of life on Mars a very long time ago.

A SpaceX rocket launch

SpaceX Crew Dragon docking to the ISS

Humans have always been curious about what is out there in space. Technology that allows for space exploration is now available to more people than ever before. While NASA continues developing new ways to explore space, private companies here in the U.S. and space agencies in other countries are also designing and building new types of spacecraft.

An artist's idea of what space travel in future might look like

★ The day may soon come when anyone can take a short trip to space to see the sights. Or maybe even visit another planet!

Artist's concept of a space station on Mars

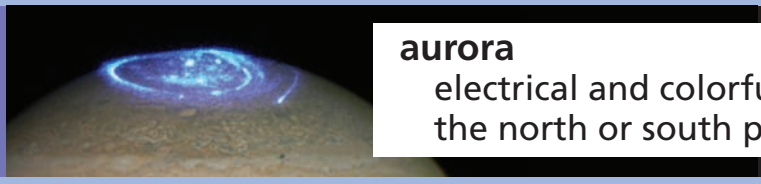
There is so much more **exciting** information to learn about space. Maybe someday you will be a scientist or an astronomer. Perhaps you will make new discoveries and explore distant galaxies.

Artist's idea of the view from inside a space station

★ What if you were an astronaut? Think of all the **exciting** things you could do. Maybe you could fly to Mars and help build a space station there!

Glossary

atmosphere
the mass of air that surrounds Earth



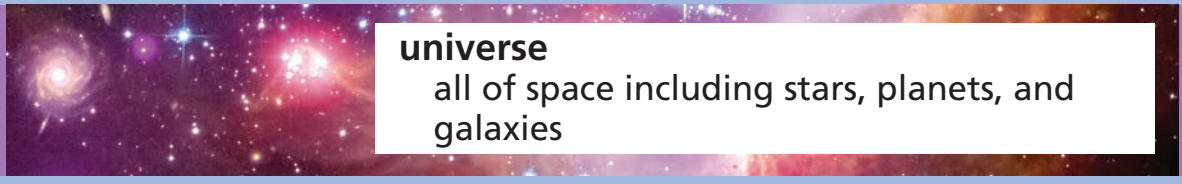
aurora
electrical and colorful light in the sky near the north or south poles

galaxy
any one of the large groups of stars that make up the universe

satellite
a large object sent into space that moves around Earth

solar system
a sun and the planets that move around it

telescope
a device that makes distant objects appear larger



universe
all of space including stars, planets, and galaxies

Questions to Think About

Add to the benefits of reading this book by discussing answers to these questions. Also consider discussing a few of your own questions.

1. Why is the sun so important to us?

2. Why is Venus called the "evening star"?
Can you find the page that supports your answer?

3. What kind of training do you think you would need to be an astronaut?

4. Would you like to live in space?
Why or why not?

5. How would living in space be different from living on Earth?

6. Can you tell me something that you would like to know about space or astronauts?
How might you find information about this?

Websites about Space

For more information about space,
you might want to check out these websites:

www.spaceplace.nasa.gov
www.nasa.gov/learning-resources
www.esa.int/kids

Please note that these website addresses may no longer be available. We recommend that children are always supervised by a teacher or parent while on the internet.

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