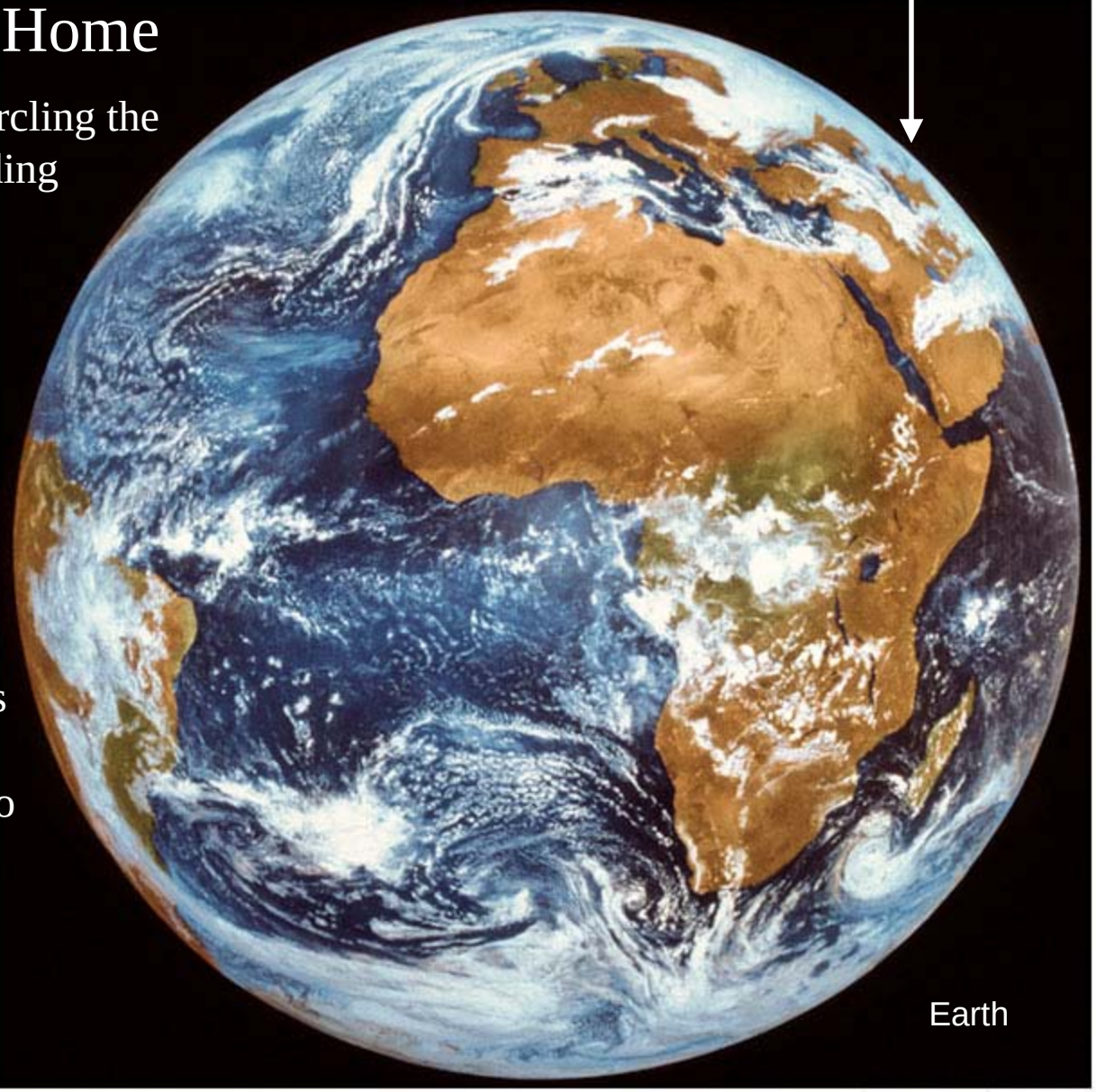
Earth—Home Sweet Home

There are eight major planets circling the Sun in our solar system—including Earth, our home sweet home. What makes Earth so special? Water has a lot to do with it. More than two thirds of Earth is covered with it. The blanket of air that surrounds Earth, called the atmosphere, is also a big deal.

Air and water provide the basics for many different living things (including plants and animals) to live and grow on the planet!

Average distance from Sun: 93 million miles

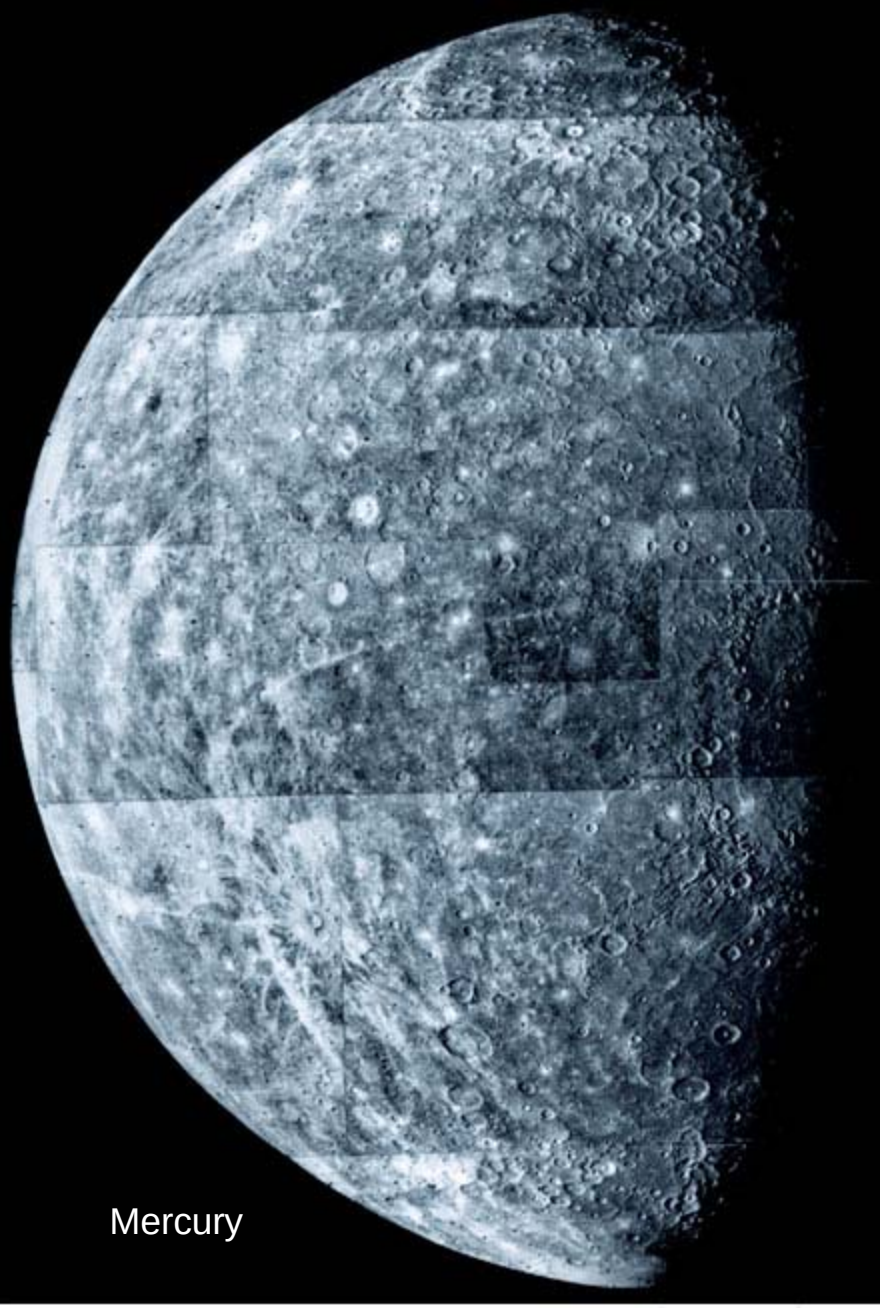


Mercury—What a Swing!

Mercury is the planet closest to the Sun. During the day, temperatures can reach 800 degrees Fahrenheit! That's hot enough to melt some metals.

But guess what? Mercury doesn't have much of an atmosphere to trap that heat. So at night the temperature drops hundreds of degrees. How low can it go? Imagine what 275 degrees below zero feels like. That's quite a temperature swing for the littlest planet!

Average distance from Sun:
38 million miles



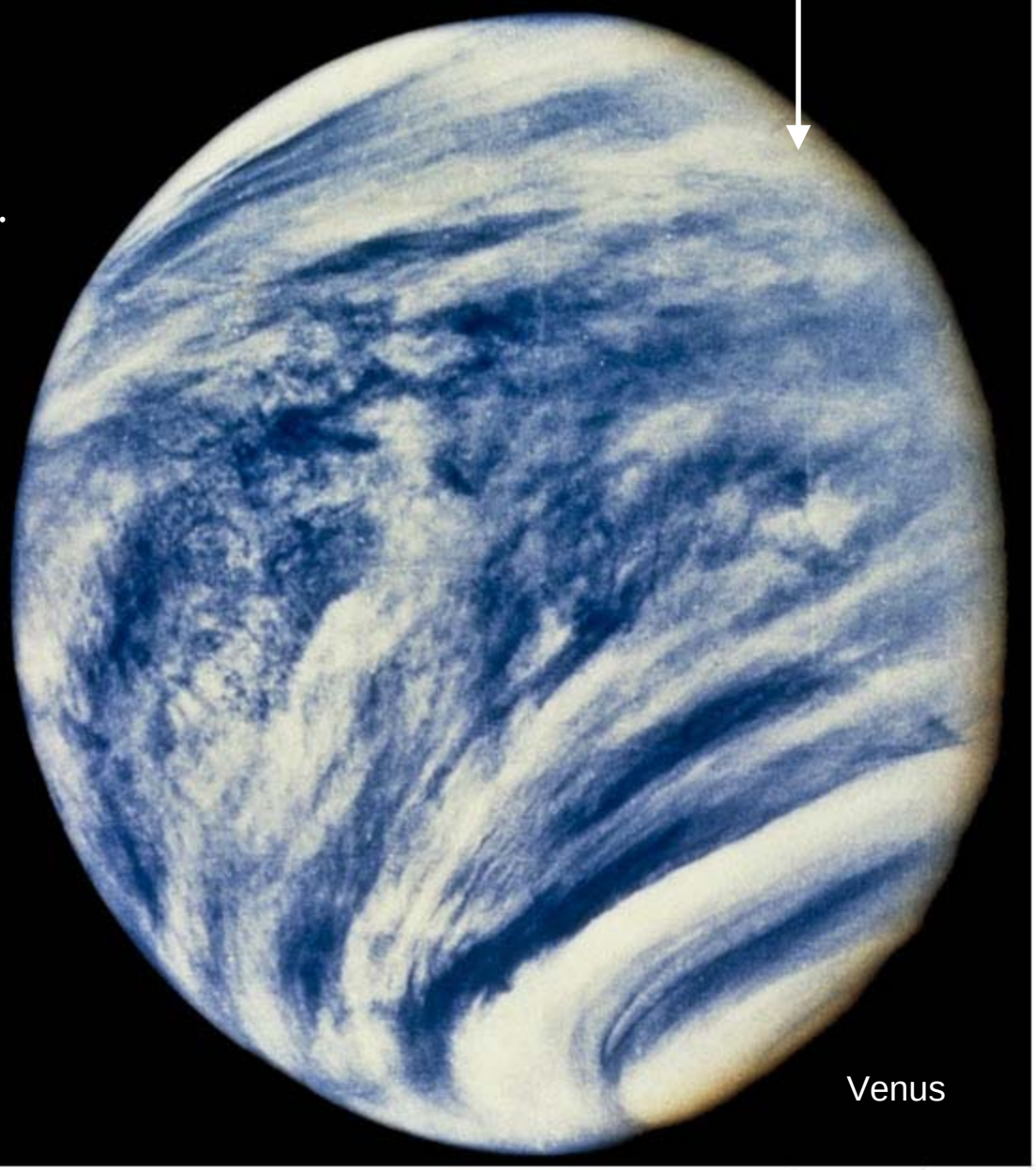
Mercury

Venus—Hot, Hot, Hot!

Venus is similar to the Earth in size but it's not a place that you could live. Venus' thick atmosphere of carbon dioxide and sulfuric acid traps the Sun's heat. This means temperatures on the planet's surface can go above 880 degrees Fahrenheit.

How do we know? Scientists have landed probes on the planet. One problem, though. These probes only work for a little while before the high temperature destroys them!

Average distance from Sun:
67 million miles



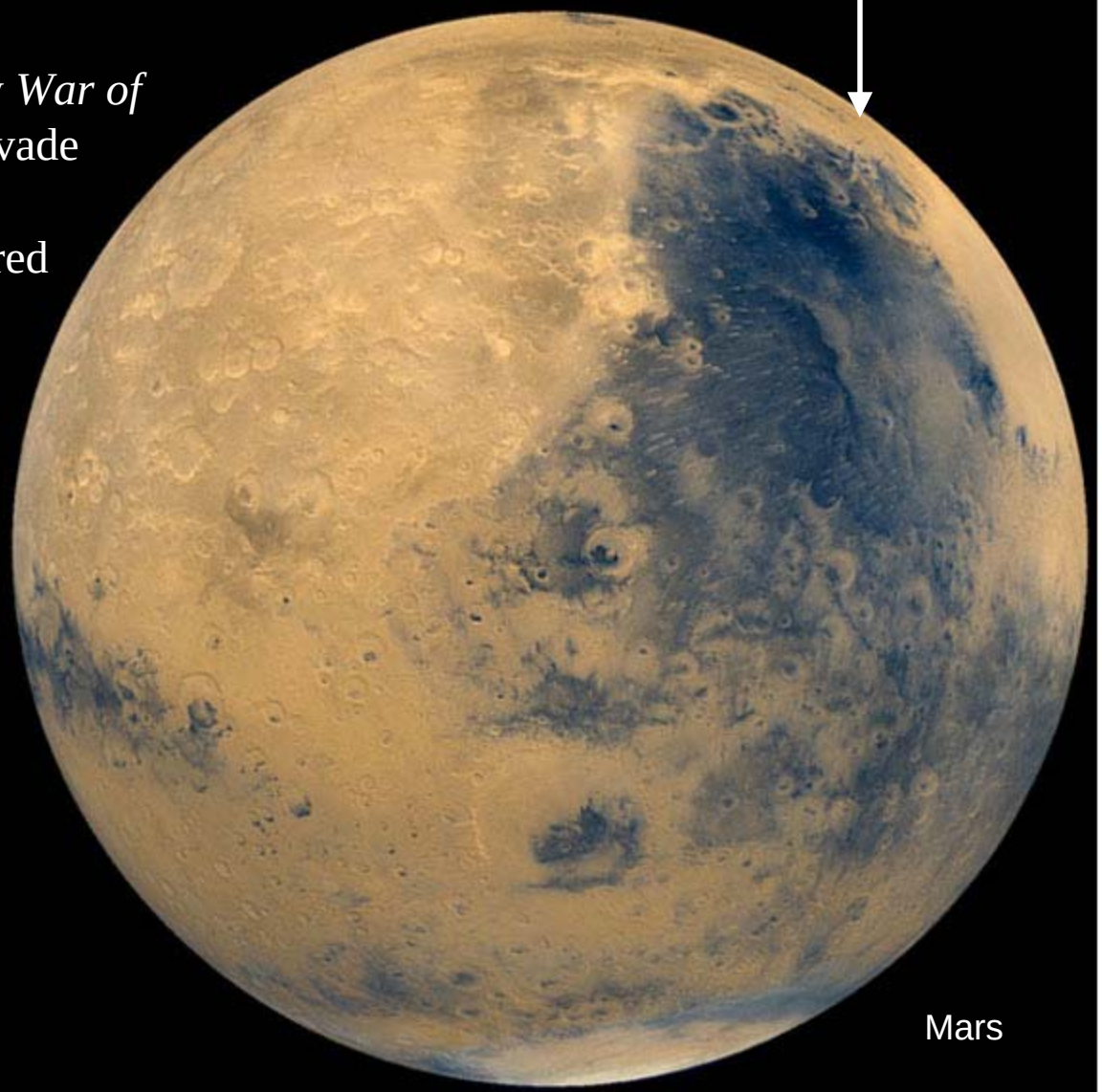
Venus

Mars—The Red Planet

In H.G. Well's science fiction story *War of the Worlds*, creatures from Mars invade Earth. It's just a fantasy but people have always been interested in the red planet. Why does the planet look orange or slightly red? The color is caused by iron compounds in the dust and rocks on the planet. You might say that Mars is a bit rusty!

Scientists think Mars once had a lot of water on its surface. In fact, there are polar ice caps there now. But the planet is too cold for water to exist as a liquid on its surface.

Average distance from Sun:
141 million miles



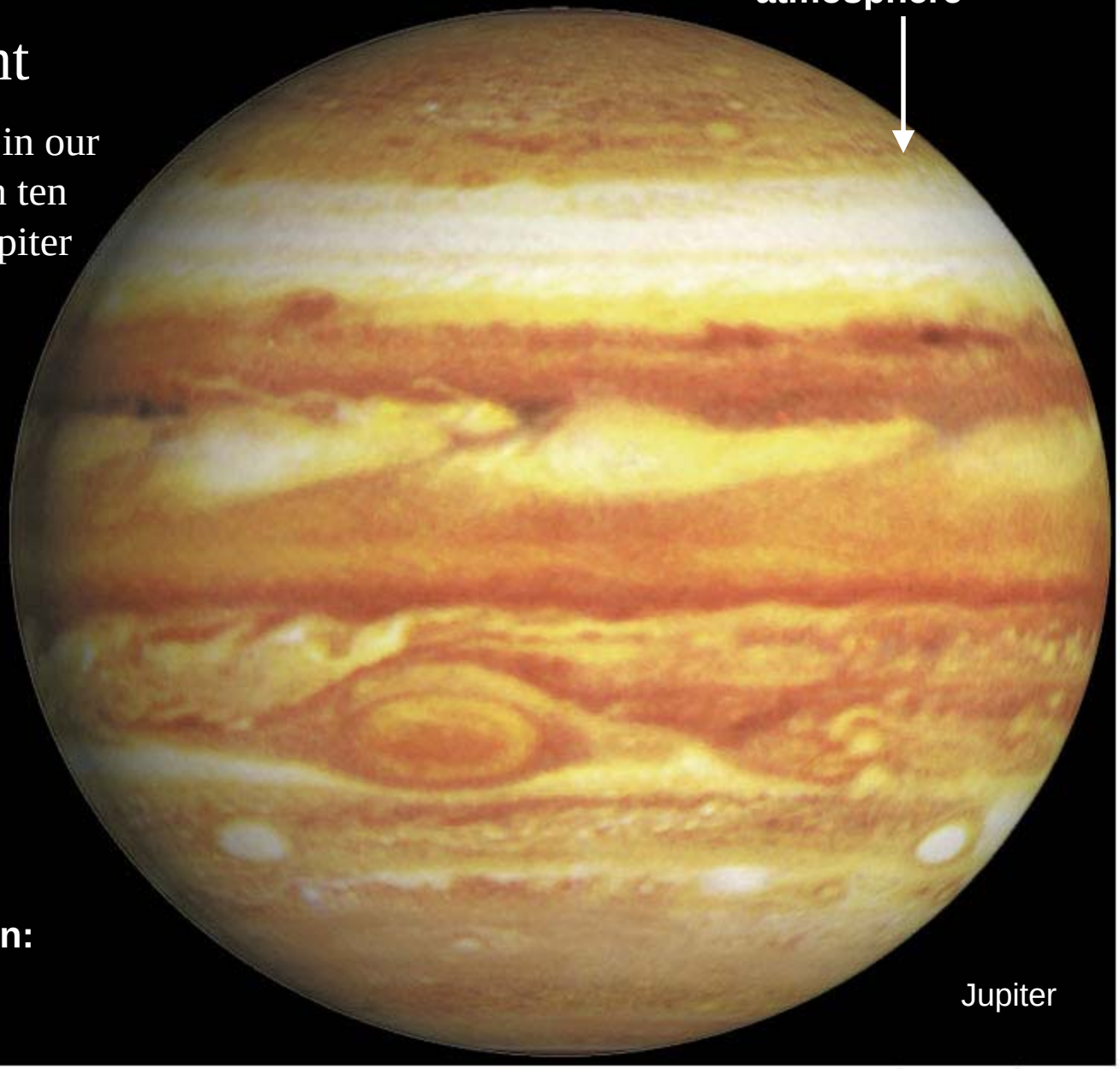
Mars

Jupiter—The Giant

Jupiter is the largest planet in our solar system. It's more than ten times bigger than Earth! Jupiter also has four planet-sized moons orbiting it.

Even though Jupiter is classified as a planet, its atmosphere of helium and hydrogen makes it close to being a star. It (along with Saturn, Uranus, and Neptune) is known as one of the giant gas planets.

Average distance from Sun: 484 million miles

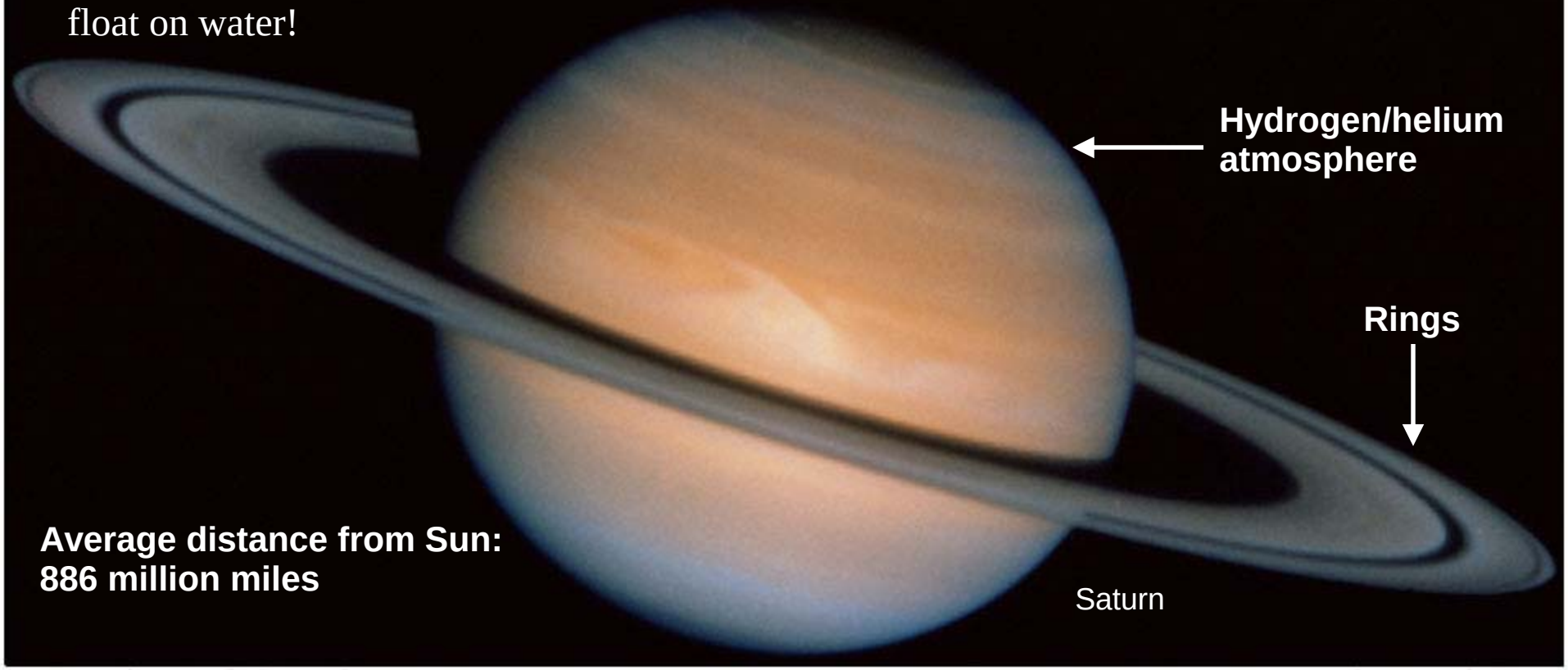


Jupiter

Saturn—The Ringmaster

Although it's not the only planet to have them, Saturn is famous for the rings that circle it. The rings look solid from Earth, but they are not. They are actually made of billions of pieces of ice, rock, and dust.

Saturn, a giant gas planet, is made mostly of hydrogen. The planet is so light that it could float on water!



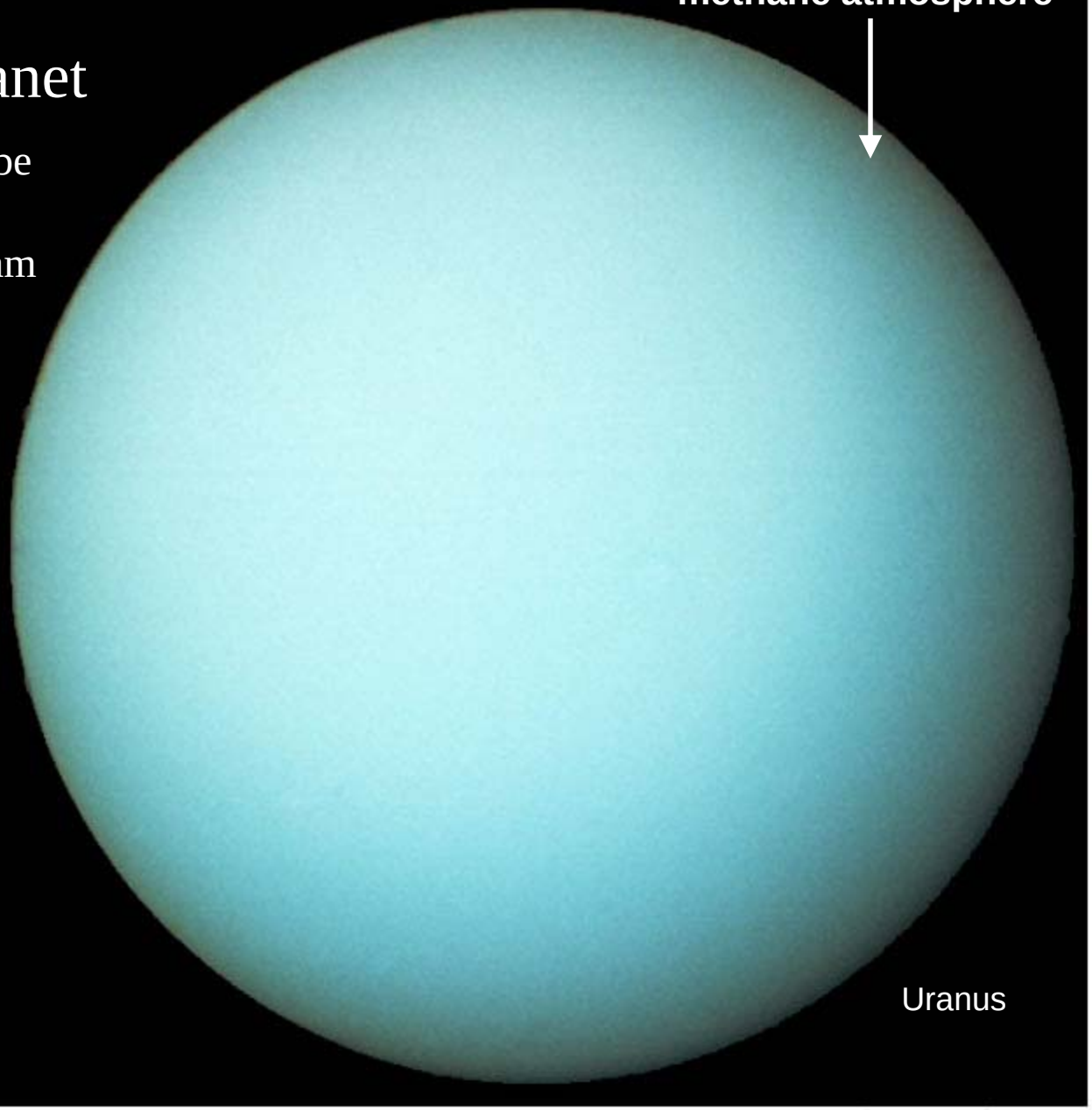
Saturn

Uranus—A Blue Planet

Uranus was the first planet to be discovered with a telescope. It happened in 1781 when William Herschel looked through a six inch telescope.

The planet has a blue-green color. Why? In addition to helium and hydrogen, the atmosphere of this planet also contains methane gas.

Average distance from Sun:
1.8 billion miles



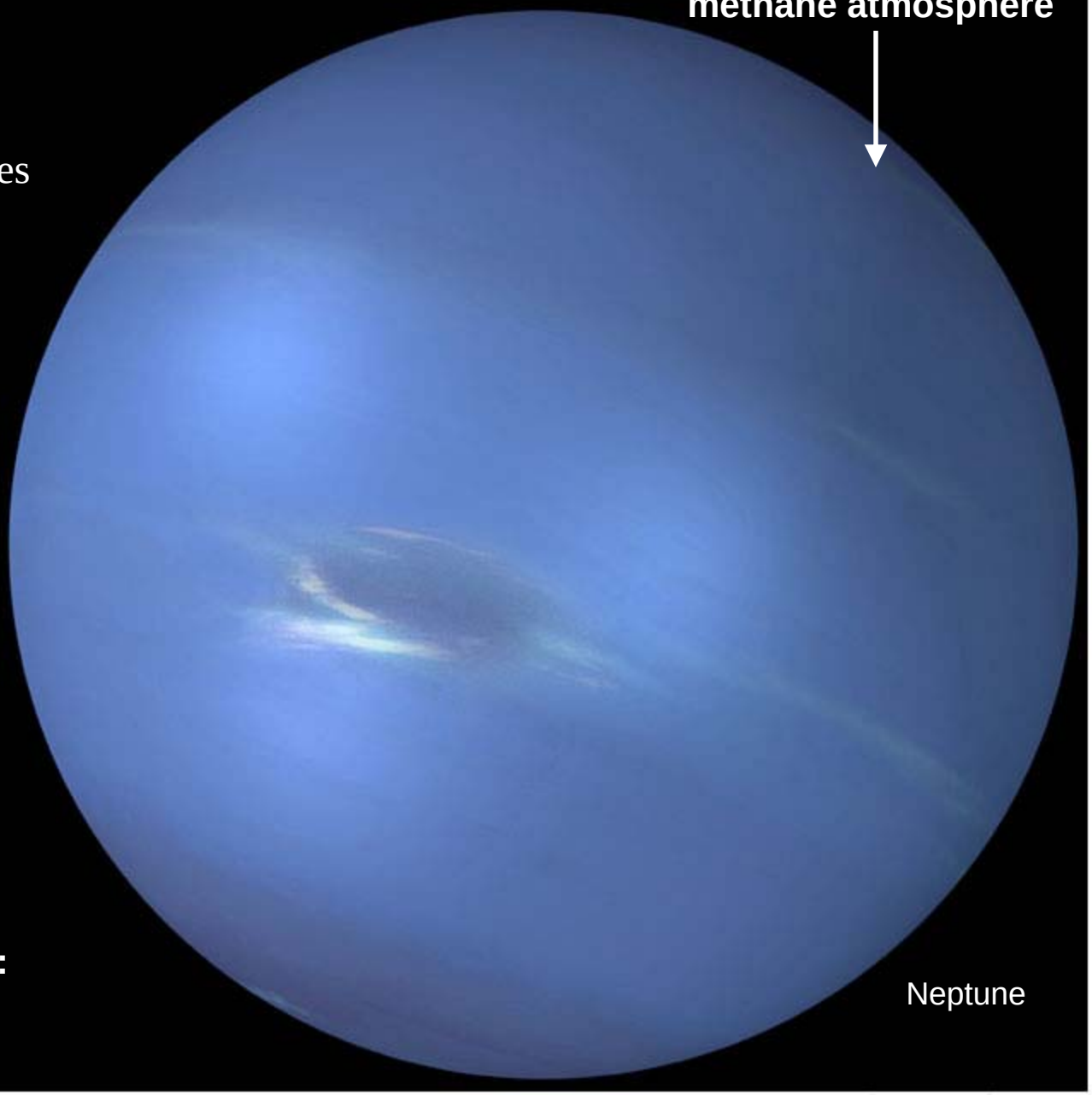
Uranus

Neptune—Far Out

Neptune is so far away it takes 165 years for this planet to orbit the Sun just one time!

Like the other gas planets, Neptune has hydrogen and helium in its atmosphere. It also contains methane which gives it a blue color. But why is Neptune such a brighter blue than the planet Uranus? Scientists just don't know yet!

Average distance from Sun: 2.8 billion miles



Neptune

Meet the Planets Teacher Notes

Earth—Home Sweet Home

Earth's unique combination of liquid water, a rich oxygen- and nitrogen-based atmosphere, and dynamic weather patterns provide the basic elements for a diverse distribution of plant and animal life. Over millions of years, landforms and oceans have been constantly changing, mountains have been raised up and eroded away, and continental plates have drifted across Earth. The atmosphere acts like a blanket, evening out temperature extremes and keeping warmth in. Without this "greenhouse effect," Earth would be about 60°F (33°C) cooler on average. Over the last few decades, scientists have measured a gradual increase in Earth's temperature. Glaciers and polar ice caps have begun to shrink. It is feared that human activity is causing this rapid change by increasing the amount of carbon dioxide and other "greenhouse gases" in the atmosphere.

As early as the 5th century BCE the Greek philosophers had proposed that Earth is spherical, and by the 3rd century BCE they had worked out a series of experiments to prove it. But it was not until the first satellites were launched in the late 1950s that humans saw what their planet looks like from space. The one feature that makes Earth unique is the great abundance of liquid water; more than two-thirds of the surface is covered with water. Water makes Earth a dynamic place. Erosion, tides, weather patterns, and plentiful forms of life are all tied to the presence of water. There is more water in the Sahara Desert in North Africa than there is on Venus.

Mercury—What a Swing!

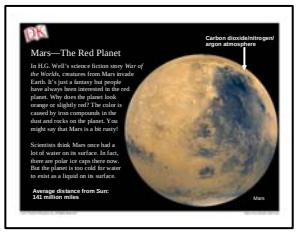
The planet Mercury is named after the Greco-Roman messenger of the gods, because it circles the Sun faster than the other planets, completing its circuit in 88 Earth days. Because it travels so close to the Sun, Mercury is often difficult to observe. Even though its reflected light makes it one of the brightest objects in the night sky, Mercury is never far enough from the Sun to be able to shine out brightly. It is only visible as a "morning" or "evening" star, hugging the horizon just before or after the Sun rises or sets. Being so close to the Sun, temperatures during the day on Mercury are hot enough to melt many metals. At night they drop to —291°F (—180°C), making the temperature range the greatest of all the planets. The gravitational pull of the Sun has "stolen" any atmosphere that Mercury had to protect itself against these extremes.

Venus—Hot, Hot, Hot!

People often mistake Venus for a star. After the Moon, it is the brightest object in our night sky. Because it is so close in size to Earth, until the 20th century astronomers assumed that it might be in some ways like Earth. The probes sent to investigate have shown that this is not so. The dense cloudy atmosphere of Venus hides its surface from even the most powerful telescope. Only radar can penetrate to map the planet's features.

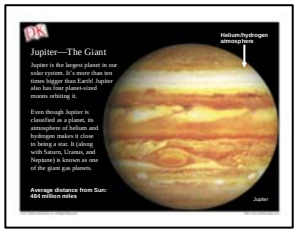
Venus' atmosphere would be deadly to humans. It is made up of a mixture of carbon dioxide and sulfuric acid that causes an extreme "greenhouse effect," in which heat is trapped by the atmosphere. The ancients, however, saw only a beautifully bright planet, and so they named it after their goddess of love. Nearly all the features mapped on the surface of Venus have been named after women, such as Pavlova, Sappho, and Phoebe.

Meet the Planets Teacher Notes



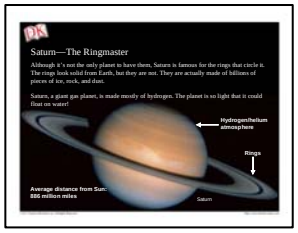
Mars—The Red Planet

Mars appears pale orange in the night sky. The Babylonians, Greeks, and Romans all named it after their gods of war. In reality, Mars is a small planet—only half the size of Earth—but there are similarities. Mars, like Earth, has a 24-hour day, polar caps, and an atmosphere. Not surprisingly, Mars has always been the most popular candidate as a site for possible extraterrestrial life. Many scientists believe that some form of life—or at least evidence of past life—may remain within the planet, but no life could survive on the surface. The atmosphere is too thin to block out deadly ultraviolet rays. Mars is also farther from the Sun than Earth, making it much colder.



Jupiter—The Giant

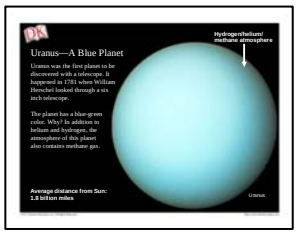
This huge, bright planet is the largest planet in our solar system; four of its moons are the size of planets. It is different in structure from the solid inner planets. Apart from a small rocky core, Jupiter is mainly hydrogen and helium. Below the cloudy atmosphere, the pressure is so great that these are liquid rather than gas. Deep down, the liquid hydrogen behaves like a metal. As a result, Jupiter has a strong magnetic field and fierce radiation belts. Jupiter emits more heat radiation than it receives from the Sun, because it continues shrinking at a rate of a fraction of an inch per year.



Saturn—The Ringmaster

The giant planet Saturn, with its flat rings, is probably the most widely recognized astronomical image. For the classical world, Saturn was the most distant known planet. They named it after the original father of all the gods. Early astronomers noted its 29-year orbit and assumed that it moves sluggishly. Composed mostly of hydrogen, its atmosphere and structure are similar to Jupiter's, but its density is much lower. Saturn is so light that it could float on water.

Though Saturn's rings look solid from Earth, astronomers have known since the 19th century that they cannot be. In fact, they consist of countless individual particles, made of ice and dust, ranging in size from specks to hundreds of yards.

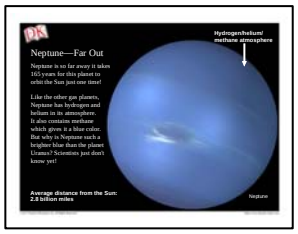


Uranus—A Blue Planet

Uranus was the first planet to be discovered since the use of the telescope. It was discovered by accident, when William Herschel, observing from Bath, England, set about re-measuring all the major stars with his 6-inch reflector telescope. In 1781 he noticed an unusually bright object in the zodiacal constellation of Gemini. At first he assumed it was a nebula and then a comet, but it moved in a peculiar way. The name of Uranus was suggested by the German astronomer Johann Bode, who proposed that the planet be named after the father of Saturn, in line with established classical traditions.

Uranus is a giant planet, four times larger than Earth. The Hubble Space Telescope took this photo of Uranus in 2004 as seen in natural color. It looks blue because of absorption by methane in the atmosphere.

Meet the Planets Teacher Notes



Neptune—Far Out

Neptune was discovered as the result of calculations. By the early 19th century, astronomers realized that Uranus was not following its expected orbit. The gravitational pull of an unknown planet beyond Uranus seemed the most likely explanation. In 1845, the English mathematician John Couch Adams (1819–1892) announced that he had calculated the probable position of a planet beyond Neptune, but his findings were ignored. In June 1846, the Frenchman Urbain Le Verrier did the same. This time, observers took notice. Johann Galle (1812–1910) of the Berlin Observatory found Neptune on September 23, 1846. Astronomers continued to speculate about another planet beyond Neptune. Pluto was eventually discovered in 1930 and was considered to be the ninth major planet until 2006. Between 1992 and 2006, hundreds of small icy bodies had been found beyond Neptune, in what is called the Kuiper belt. They include Eris, which is larger than Pluto. In 2006, astronomers decided to class both Pluto and Eris as dwarf planets.

Please note: Each slide lists the main components of a planet's atmosphere. Many of the atmospheres contain other trace elements.