

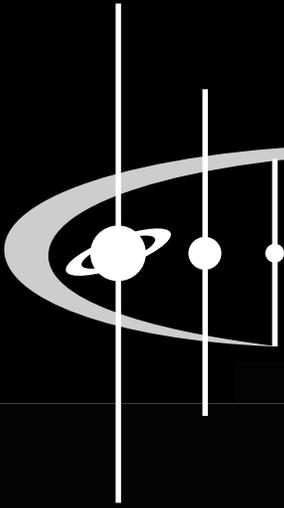


The *Voyage* exhibit was developed by Challenger Center for Space Science Education, Smithsonian Institution, and NASA.

Support for this publication has been provided by the Smithsonian Women's Committee.

Visit www.voyageonline.org

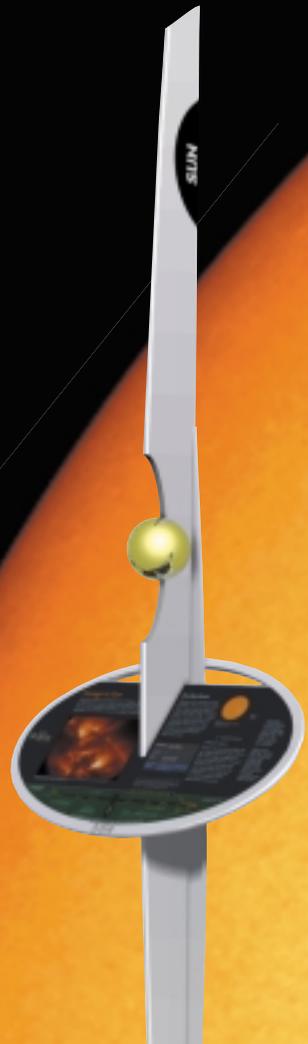




VOYAGE

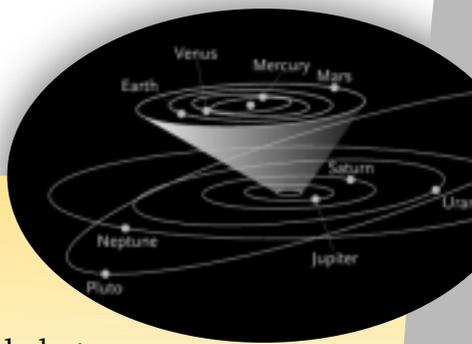
*A Journey Through
Our Solar System*

**Outdoor
Exploration
Guide**



The Solar System

Imagine that you are an explorer investigating the solar system. It's a big job, but in this model, you can walk from the Sun to Earth in just a few steps. Pluto is more than six football fields away and you'd have to walk as far as California to reach the nearest star beyond the solar system. Why don't you begin your exploration with the star of our solar system—the Sun.



Can you find? Look for Alexander Calder's mobile *Vertical Constellation with Yellow Bone* on the third floor of the Hirshhorn Museum and Sculpture Garden.

PHOTO BY LEE STALSWORTH

The Sun

Powerhouse of the Solar System

Did you know? It would take more than one million Earths to fill a sphere as large as the Sun. However, more than one billion Suns could fit inside Betelgeuse, a red giant star in the constellation Orion.

What does the model tell you? *Could the entire orbit of Earth's Moon fit inside the Sun?* Yes, the Sun is so large that the orbit of the Moon would fit inside.



Can you find? Look for *Journey of Sun to Soul*, an altar object by José Adário dos Santos in the *African Voices* exhibition at the National Museum of Natural History.

PHOTO BY JOHN STEINER, JIM DILORETO, NMNH

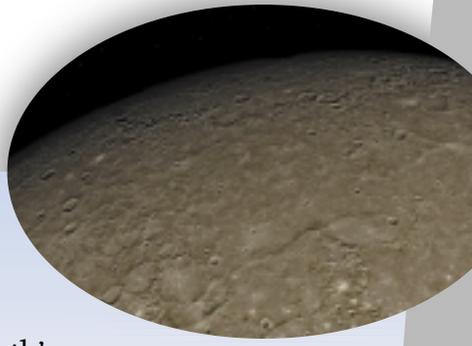


Mercury

A World of Extremes

Did you know? Viewed from Mercury, Earth's Moon does not go through phases; it is always full.

What does the model tell you? *Can you ever see Mercury in the midnight sky?* Stand near the Earth model and imagine Mercury's path around the Sun. No matter where Mercury is in its orbit, it never appears far from the Sun. Thus, you may see Mercury shortly after sunset or before dawn, but not at midnight.



Venus

Earth's Twin?

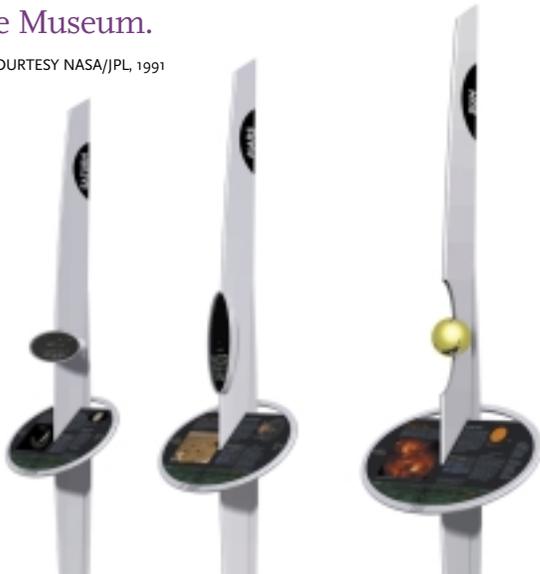
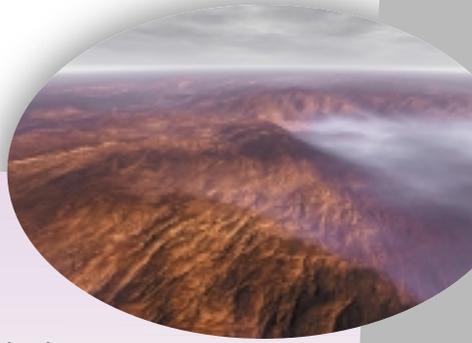
Did you know? Venus is the second brightest object in the night sky. Only the Moon is brighter. You can even see Venus during the day if you know where to look.

What does the model tell you? *If Mercury is the closest planet to the Sun, why is Venus' surface hotter?* Travel to the Venus model and learn why it's hot enough there to melt lead.



Can you find? Look for a 15-foot color mosaic of Venus in the *Exploring the Planets* exhibition at the National Air and Space Museum.

PHOTO COURTESY NASA/JPL, 1991



Earth

The Living Planet

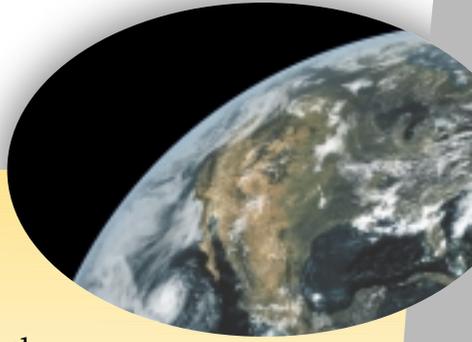
Did you know? If you wanted to gift-wrap the Moon, you'd need a piece of wrapping paper as large as Africa.

What does the model tell you? *If the Sun is so much bigger than the Moon, why do they appear to be the same size in the sky?* The Sun is 400 times wider than the Moon. If they appear to be same size, then the Moon must be 400 times closer to the Earth.



Can you find? Look for Isamu Noguchi's *Lunar Landscape* on the third floor of the Hirshhorn Museum and Sculpture Garden.

PHOTO BY LEE STALSWORTH



Mars

Our Desert Neighbor

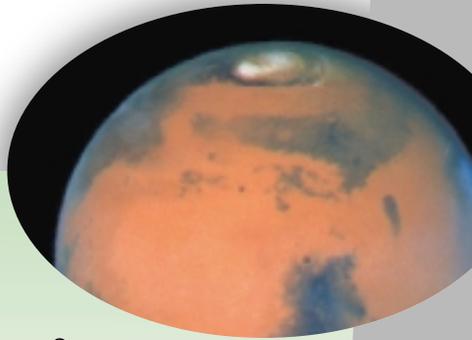
Did you know? If you explored the entire surface of Mars, you'd be exploring an area as large as all the continents of Earth put together.

What does the model tell you? *If you were standing on Mars, how big would the Sun appear in the sky?* You can tell by looking at how big the model Sun appears from the model Mars. Investigate the apparent size of the Sun from the other planets—including Earth.



Can you find? In the *Exploring the Planets* exhibition at the National Air and Space Museum, look for a meteorite from Mars that landed in Antarctica.

PHOTO COURTESY NATIONAL MUSEUM OF NATURAL HISTORY



Asteroids

Rocks in Space

Did you know? If you wanted to tie a ribbon around Ceres, the largest asteroid, you would need a ribbon long enough to go from northern Maine to southern Florida.

Comets

Speeding Snowballs

Did you know? Comets speed up when approaching the Sun, some moving nearly 300 kilometers per second. At this speed you could travel from Washington, D.C. to Los Angeles, California in just fifteen seconds.



PHOTO BY CHIP CLARK

Can you find? Look for meteorites—possibly pieces of asteroids—in the *Moon, Meteorites, and Solar System* exhibition at the National Museum of Natural History.

Jupiter

A Solar System in Miniature

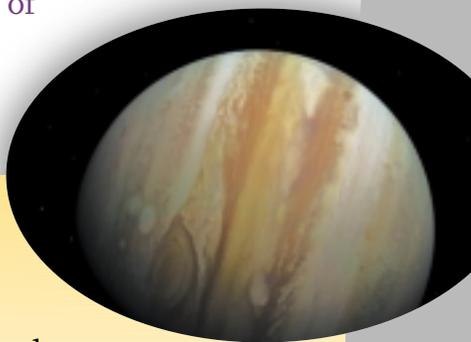
Did you know? Jupiter is the largest planet, but over 900 Jupiters could fit inside the Sun!

What does the model tell you? *If radio messages travel at the speed of light—on this scale, about 5 feet per minute—how long would a message from a spacecraft traveling near Jupiter take to reach Earth?* The model Jupiter is 206 feet from the model Earth, so a radio signal would take at least 40 minutes to reach Earth.



Can you find? Look for the prototype of *Pioneer 10*, the first spacecraft to travel to Jupiter, in the *Milestones of Flight* exhibition at the National Air and Space Museum.

PHOTO BY D. HRABAK



Saturn

Ringed with Countless Moons

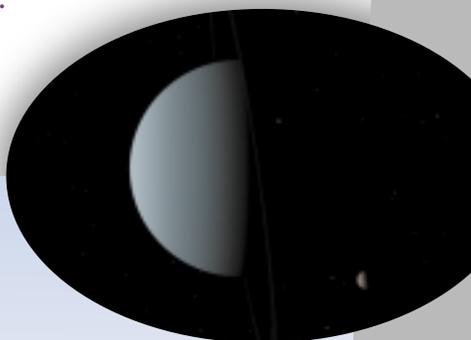
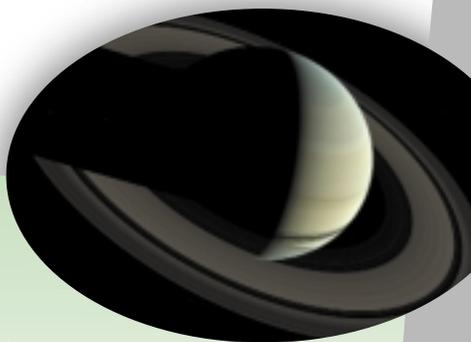
Did you know? Saturn and its rings would just fit in the space between Earth and its Moon.

What does the model tell you? Does Saturn look perfectly round? Actually, Saturn looks a bit squished. Its diameter through the poles is 7,300 miles shorter than its diameter through the equator. The difference is about the width of Earth.



Can you find? Look for *Lunar Bird*, a bronze sculpture by Joan Miró in the Sculpture Garden at the Hirshhorn Museum.

PHOTO BY LEE STALSWORTH



Uranus

A World Tipped Over

Did you know? At Uranus' distance from the Sun, you are only half way to Pluto.

What does the model tell you? Voyager 2 passed by Uranus in January 1986. On the scale of this model, Voyager 2 was traveling about 200 feet per year. Can you determine when Voyager 2 arrived at Neptune? The model Neptune is about 500 feet from the model Uranus. At 200 feet per year, it would take 2.5 years. Due to its trajectory, the real Voyager 2 took a little longer, encountering Neptune in August 1989.



Can you find? Look for the full-scale engineering model of the Voyager spacecraft in the *Exploring the Planets* exhibition at the National Air and Space Museum.

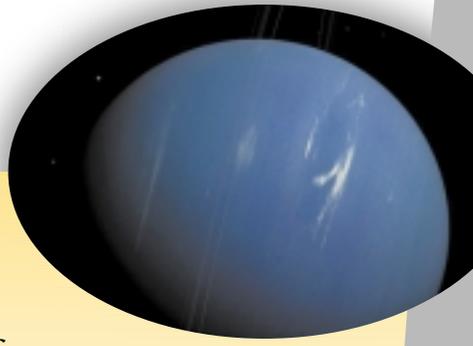
PHOTO COURTESY NASM/CEPS

Neptune

Planet of Fierce Winds

Did you know? Like Earth, Neptune has four seasons a year. However, a Neptune year is equal to 165 Earth years, so each season lasts 41 Earth years.

What does the model tell you? *How bright is the Sun when seen from Neptune?* Stand at the model Neptune and visualize the grapefruit-sized model Sun near the National Air and Space Museum. The Sun is too far away to provide much heat or daylight. From Neptune, the Sun just looks like the brightest star in the sky.

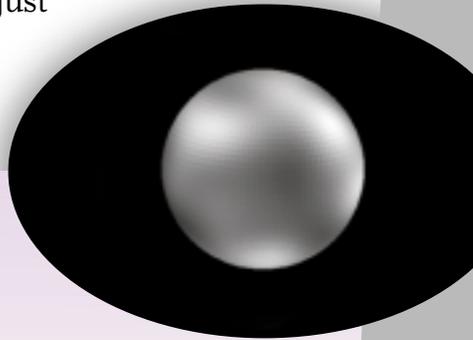


Pluto

Icy Planet or Super-Comet?

Did you know? It takes 248 Earth years for Pluto to orbit the Sun. In 2024, Pluto completes the orbit it started when the Declaration of Independence was signed.

What does the model tell you? *Voyager 1 was just beyond Pluto's orbit in February 1990. It is traveling nearly one million miles per day. On the scale of this model, how fast would it travel?* On the scale of this model, one million miles correspond to 6 inches. A model spacecraft would travel 6 inches per day.



Continue the Voyage

Although the solar system is a neighborhood of planets, moons, asteroids, comets, and our star, the Sun, it is a vast and mostly empty space. Human curiosity and exploration have revealed the solar system to us, but there is more to learn. Be an explorer and continue your voyage through the solar system and beyond at libraries and museums, then share your discoveries with family and friends.

Visit www.voyageonline.org