

## Astronomy for Kids - Uranus

### A Seemingly Featureless Planet

Uranus, along with Neptune and Pluto, is in the most distant region of our solar system. The giant planet, which is another of the gas giants of our solar system, is more than twice as far away from the Sun as Saturn. If you get a chance to look at Uranus through a telescope, all you will see is a faint blue disk that appears exceptionally dull and lifeless. Even pictures sent back by the Voyager mission and the Hubble Space Telescope seem to show that Uranus is a dull, unexciting place.

As always, though, things aren't what they seem. Uranus has many interesting features, including its ring system, varied moons and much more. The bland face that the planet shows to us humans hides high speed winds, the fact that Uranus is tilted on its side and a very mysterious weather system. Read on to find out more about this mysterious world!

### A Pale Blue-Green Disc

Although the Voyager spacecraft visited the seventh planet during its epic journey through our solar system, the pictures it sent back from Uranus were somewhat disappointing. We had hoped to see some color bands like there are on Jupiter or at least some faint colors, but the face the planet presents doesn't seem to vary, regardless of how close or far away from it you are.

Uranus, unlike Jupiter or Saturn, does not seem to have a solid core of any kind. The planet does contain some rocky material, but the planet is almost all gas, with the outer layer of methane providing the blue color we see in the picture at the right.

The pale blue image we see of Uranus hides the fact that the surface of the planet is swept by "winds" moving along at several hundred miles per hour. Scientists were able to determine this by carefully studying the images that Voyager sent back.

### A World on Tilt

When Voyager arrived at Uranus, it discovered a number of moons that were unknown to us. In addition, we found out that the planet is tilted on its side! All the other planets in our solar system pretty much have their equator lined up directly with the Sun. Uranus's equator is tilted at almost right angles to the Sun, which gives the planet very unusual seasons and gives us a different view of the planet depending on when we look at it. This proves once again that things are hardly ever as they seem on the surface.

Click on the link at right to find out more about the planet's tilt and what effects it has.

#### Uranus Facts

<b>Distance from Sun</b>	Approximately 1.8 billion miles
<b>Number of Moons</b>	At least 21
<b>Diameter</b>	Approximately 32,000 miles
<b>Length of Day</b>	17 Earth hours
<b>Length of Year</b>	84 Earth years
<b>Name</b>	Ancient Greek god.
<b>Visited by</b>	Voyager 2

#### Uranus from Voyager



A picture of Uranus taken by the Voyager 2 spacecraft.

#### A Tilted World



Click [here](#) to learn more about the tilt of Uranus.

## Astronomy for Kids - Uranus

### A Wide Variety of Very Unusual Moons

Before the Voyager mission arrived at Uranus, we knew that Uranus had five moons, but we didn't really know much about them because of the planet's great distance from the Sun. What a surprise we had waiting for us!

Not only did Voyager show us that there were eleven more moons orbiting the giant planet, it also revealed that the moons were very interesting in their own right.

There was a moon with cliffs on it higher than Mount Everest here on Earth, one with one very smooth side and one very rough side and much, much more. Click on the link at right to find out more about the some of the fascinating moons of Uranus.

#### The Moons of Uranus



Click [here](#) to learn more about the moons of Uranus.

#### Find Out More About Uranus

##### [Uranus Page at the Nine Planets Site](#)

The Uranus section of the Nine Planets site has more detail about this mysterious world.

##### [The Voyager Mission](#)

The Voyager mission sent back almost all of the pictures of Uranus that we have used in this section.

## Astronomy for Kids - Uranus from Voyager 2

### Uranus from Voyager 2



Image courtesy of: NASA, Voyager 2 Mission

During its epic journey through our solar system, the Voyager 2 spacecraft sent back this image of Uranus. The plain, blue image you see here disguises all the interesting things we have learned about the planet.

## Astronomy for Kids - A World on Tilt

### Uranus's Tilt in 1998

We have seasons here on Earth because our planet is tilted on its axis. As our planet makes its way around the Sun, the tilt of Earth means that different amounts of our planet receive more direct sunlight than others. When the northern hemisphere of Earth is tilted towards the Sun, it has summer and the southern hemisphere has winter. Six months later, the weather is reversed. Uranus also has "seasons", but the extreme tilt of the planet makes the seasons vary widely. The high degree of tilt also gives us a much different view of the planet depending on when we see it during its eighty-four year long trip around the Sun. When Voyager arrived at Uranus in 1986, the planet's pole was facing the sun. In 1998, the Hubble Space Telescope took this picture of Uranus and its rings and the tilt has changed.

Uranus from Hubble



Image courtesy of: Hubble Space Telescope

### Uranus's Tilt in 2002

In December of 2002, the European Southern Observatory took this amazing picture along with six of the giant planet's moons. Not only is this an excellent picture of the planet, along with its rings and several of its moons, it also shows that in a relatively short period of time, the tilt of the planet seems to have changed.

Actually, the tilt of the planet has not changed, but its position relative to Earth and the Sun has changed, so we see a very different view than we had just a few short years before.

Uranus in 2002

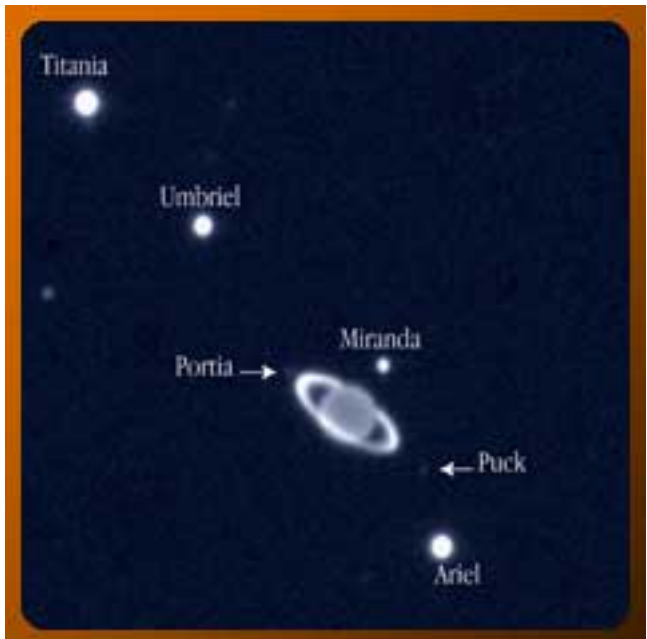


Image courtesy of: European Southern Observatory

## Astronomy for Kids - The Moons of Uranus

### The Five Largest Moons of Uranus



Image courtesy of: NASA-Voyager mission

Currently, we know that Uranus has at least twenty-one moons. The above image is a "family portrait" of the five largest moons of the planet. From left to right, they are Miranda, Ariel, Umbriel, Titania and Oberon. The Voyager mission discovered ten more moons when it visited the planet in 1986 and since then, astronomers have discovered six more.

### Miranda

Although it is the smallest of the five larger moons of Uranus, Miranda nonetheless has presented us with a number of puzzles. If you look closely at the picture at the right, you will notice that about half of the moon looks like a lot of the other moons in our solar system. It has lots of craters that tell us that it has been hit by many objects during its long life.

The other half of the moon is covered by what appear to be giant cliffs, grooves, gullies and other features a lot like you might find in the American West, although much, much larger. What has caused all of these unusual features? In all honesty, nobody really knows, and the only we will find out is to send another spacecraft to the distant planet for an extended visit.



Image courtesy of: NASA - Voyager mission

The half of Miranda that is covered with canyons, valleys and giant ridges is the most interesting part of this tiny world. Among the fascinating features of this region is the giant cliff shown in the picture at right.

Although the moon is a little under three hundred miles in diameter, the ridge shown in the picture is taller than Mount Everest here on Earth. How did such a small world become the home of such a large cliff? It is one of the many questions that remain unanswered.



Image courtesy of: NASA

## Astronomy for Kids - The Moons of Uranus

### Ariel

The second of the large Moons of Uranus is Ariel. Ariel, with a diameter of almost 720 miles, is much larger than Miranda and is made up mostly of rocky material and ice. The picture at right shows an interesting world that one side has lots of craters much like our own Moon, but the other side is criss-crossed by what appear to be large grooves of some kind.

What causes such unusual features? One explanation may be that at some time in the distant past Ariel might have been much warmer than it is now. If this is the case, some of the ice in the moon may have melted and smoothed out the surface of the moon and then more recent geological activity may have formed the long, wide grooves we see in the picture.

Once again, it's a question that only extended research will provide the answer to.



Image courtesy of: NASA - Voyager mission

### Umbriel

The third in the family of the five largest moons of Uranus is Umbriel. Although Umbriel is about the same size as Ariel, the family resemblance ends there.

Where Ariel shows us a face that has lots of interesting and mysterious features, Umbriel is more like what most moons look like. It does have lots of impact craters, but other than that, it's a pretty cold, plain place.

The only really interesting feature of this moon is the bright crater you can see at the top of the picture at the right. This crater is very large, almost seventy miles across, and is also very bright, compared to the surface of the rest of the moon.

Does the interior of this moon contain material that is actually much lighter in color or was the crater just created recently? Either of these would provide an explanation as to why the crater is so much brighter than the rest of the surface.

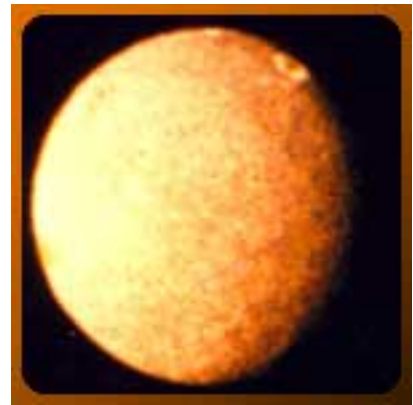


Image courtesy of: NASA - Voyager mission

### Titania

At a little over 980 miles in diameter, Titania is the largest moon of Uranus, as befits its name. Like the other moons of the planet that we have seen, Titania is made up of rocks and ice.

Another thing that Titania has in common with its family members is the fact that part of its surface is heavily cratered, and part of it has lots of ridges, gullies and other features that look like erosion features that we see here on Earth and on Mars. What special set of circumstances have occurred during the planet's history could have caused this?

Hopefully, some future mission to the planet will provide answers to the many questions we have.



Image courtesy of: NASA - Voyager mission

## Astronomy for Kids - The Moons of Uranus

### Oberon

The last of the largest moons of Uranus is Oberon. At a little over 945 miles in diameter, this moon is just a little smaller than Titania.

What Oberon doesn't have that its other family members have is a region that is covered with ridges and gullies. This moon is almost entirely covered by impact craters, much like most of the other moons in the solar system.

If you look closely, though, at the bottom left hand side of the image you can just barely make out what appears to be a "mountain" rising from the surface of the moon. This mountain is over three miles high and is the most interesting feature on the surface of this moon.



Image courtesy of: NASA - Voyager mission