

Just Rollin' Along

How is Uranus unique?

Active Reading 11 Identify As you read the text, underline important physical properties of the planet Uranus.

The atmosphere of Uranus (YUR•uh•nuhs) is composed mostly of hydrogen and helium. However, the atmosphere also contains methane. The methane in Uranus's atmosphere absorbs red light, which gives the planet a blue-green color.

Uranus Is a Tilted World

Uranus's axis of rotation is tilted almost 98°. This means that unlike any other planet in the solar system, Uranus is tilted on its side as it orbits the sun. The planet's 27 moons all orbit Uranus's equator, just like the moons of other planets do. The ring system of Uranus also orbits the equator. Scientists are not sure what event caused Uranus's odd axial tilt. But computer models of the four gas giant planets as they were forming may offer an explanation. The huge gravities of Jupiter and Saturn may have caused the orbits of Uranus and Neptune to change. There may also have been many close encounters between Uranus and Neptune that could have tilted the axis of Uranus.

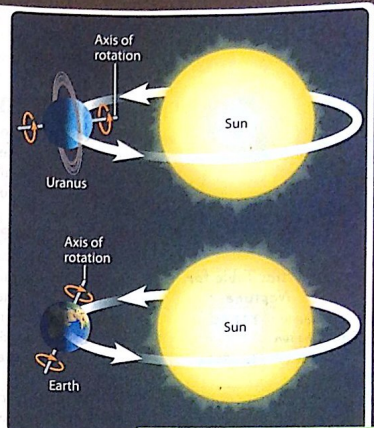
Statistics Table for Uranus

Distance from the sun	19.2 AU
Period of rotation	17 h 24 min (retrograde)
Period of revolution	84 y
Tilt of axis	97.8°
Diameter	51,118 km
Density	1.27 g/cm ³
Mean surface temperature	-210 °C
Surface gravity	79% of Earth's gravity
Number of satellites	27

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Visualize It!

12 Predict Earth has an axial tilt of 23.5°, whereas Uranus has an axial tilt of almost 98°. If Earth had the same axial tilt as Uranus, how would the conditions be different at Earth's North and South Poles?



Think Outside the Book

13 Research Astronomers are discovering planets orbiting stars in other solar systems? Find out what kinds of planets astronomers are discovering in these solar systems.

Seasons on Uranus Last 21 Years

It takes Uranus 84 years to make a single revolution around the sun. For about 21 years of that 84-year period, the north pole faces the sun and the south pole is in darkness. About halfway through that 84-year period, the poles are reversed. The south pole faces the sun and the north pole is in darkness for 21 years. So, what are seasons like on Uranus? Every place on Uranus has winter periods of constant darkness and summer periods of constant daylight. But, during spring and fall, Uranus has periods of both daytime and nighttime just like on Earth.

Uranus's Moon Miranda Is Active

Miranda (muh•RAN•duh) is Uranus's fifth-largest moon. It is about 470 km in diameter. NASA's *Voyager 2* spacecraft visited Miranda in 1989. Data from *Voyager 2* showed that the moon is covered by different types of icy crust. What is the explanation for this patchwork surface? The gravitational forces of Uranus pull on Miranda's interior. This causes material from the moon's interior to rise to its surface. What we seen on the surface is evidence of the moon turning itself inside out.

The surface of Uranus's moon Miranda



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