



The Solar System: Sun and Planets

- Solar system video

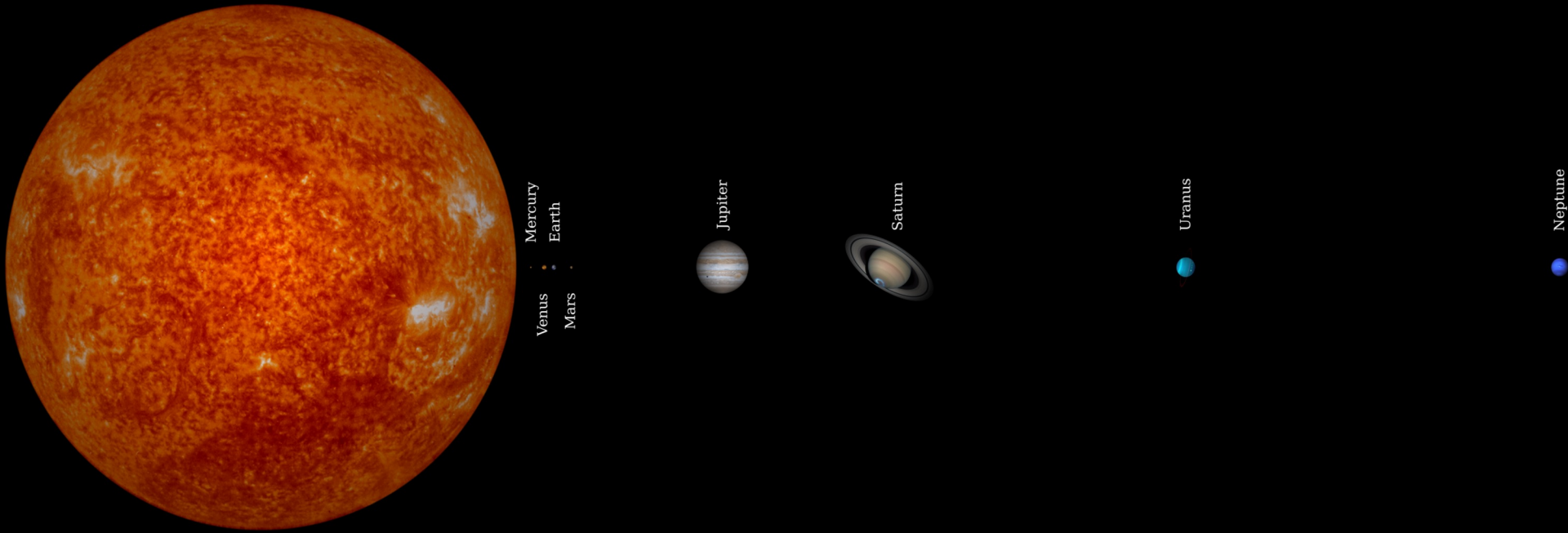
The Solar System

- The **Solar System** consists of the Sun and the other gravitational bodies
- The four smaller inner planets, **Mercury**, **Venus**, **Earth** and **Mars**, also called the terrestrial planets, are primarily composed of rock and metal
- The four outer planets, the jovial planets, are substantially more massive than the terrestrials
- The two largest, **Jupiter** and **Saturn**, are composed mainly of hydrogen and helium (gas giants); the two outermost planets, **Uranus** and **Neptune**, are composed largely of ices (ice giants)

Formation Of The Solar System

- **The formation and evolution of the Solar System is estimated to have begun 4.568 billion years ago with the collapse of a small part of a giant molecular cloud.**
- **Electrostatic forces made dust particles stick together to form clusters, which in turn stuck together to form rocks.**
- **The gravity caused these rocks to come together, eventually to form planets.**

The sun is the center of our solar system and makes up 99.8% of the mass of the entire solar system.



Sun Facts

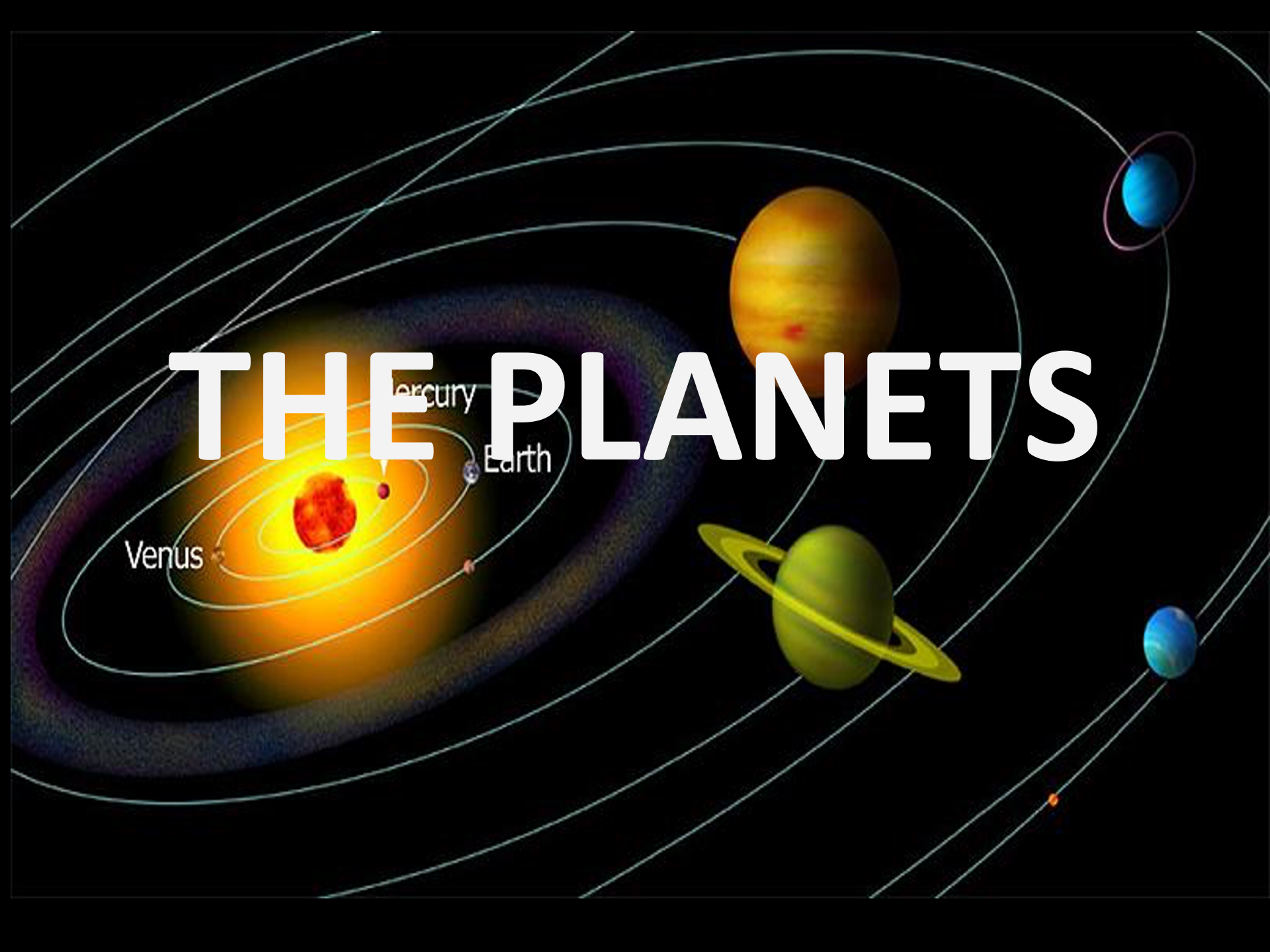
- The Sun is the Solar System's star and is at the center of the solar system.
- *The Sun's mass consists of mostly hydrogen and helium. The remainder consists of oxygen, carbon, neon and iron, among others.
- It is almost perfectly spherical and consists of hot plasma
- Surface temperature is over 5000 degrees C
- Sunlight is Earth's primary source of energy.

The Solar System consists of the Sun, planets, moons, asteroids, meteoroids, comets, dust, gases and primarily empty space



THE PLANETS

Mercury
Earth
Venus



What is a Planet?

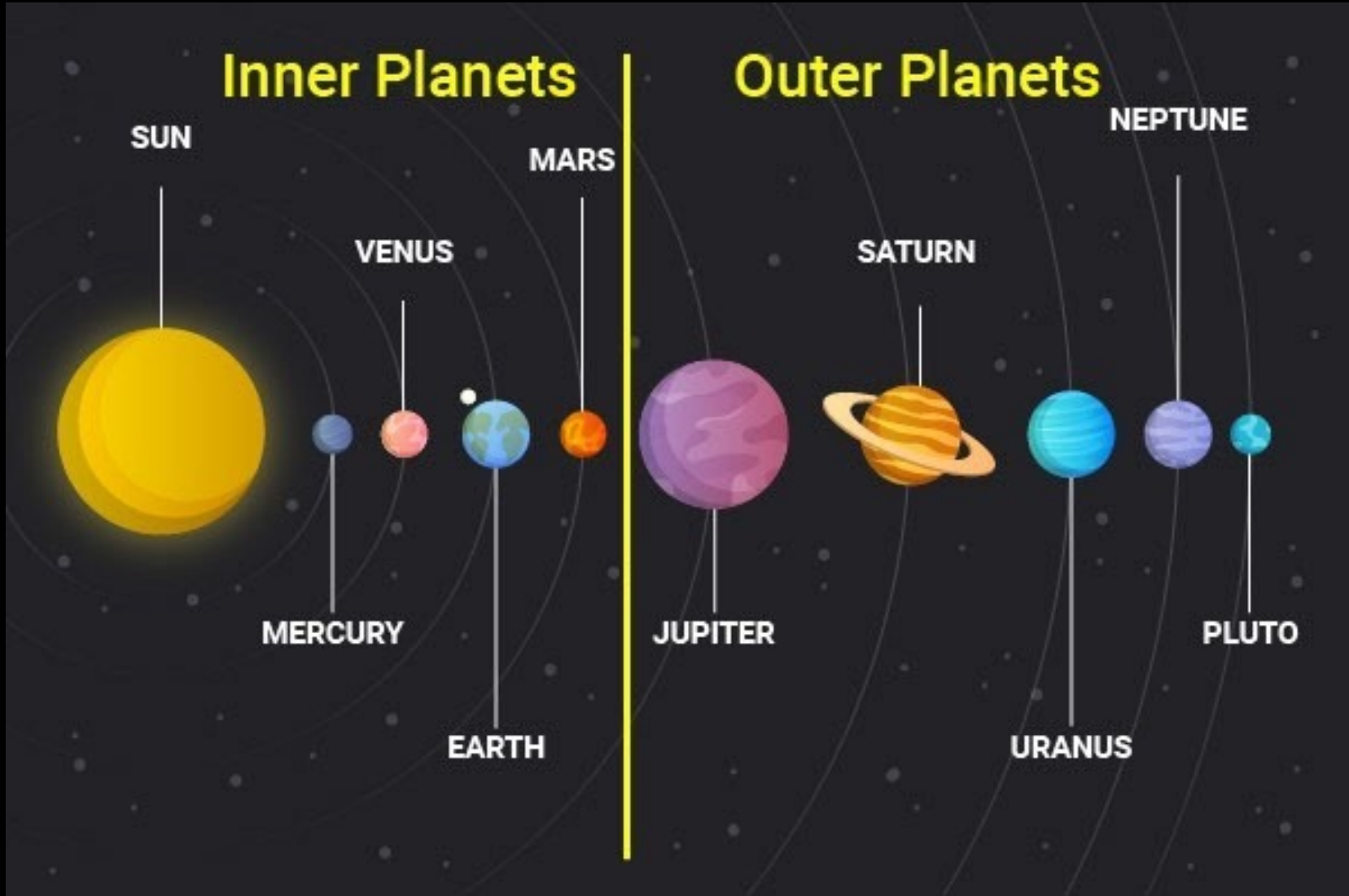
- A planet is a large round object that is orbiting a star
- Planets have a clear orbit area
- Planets use many methods, including capture, collision, and gravitational disturbance, to get rid of smaller space objects that enter the area near their orbits.
- However, dwarf planets are not able to clear objects that exist in the space around their orbits because their mass is not significant enough to do so

**My
Very
Educated
Mother
Just
Served
Us
Nachos**

**Mercury
Venus
Earth
Mars
Jupiter
Saturn
Uranus
Neptune**



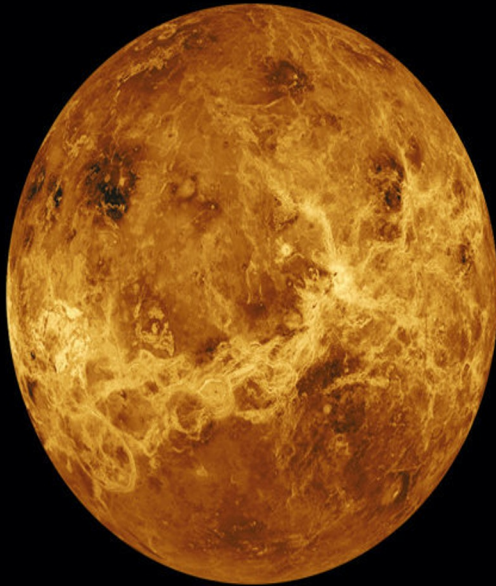
The planets are classified as: Inner Planets and Outer Planets



The inner planets (terrestrial) include Mercury, Venus, Earth and Mars.



Mercury



Venus



Earth



Mars

Caption: A comparison of terrestrial planets

Credits: ESA ID number: SEMNA1908BE

MERCURY



VENUS



EARTH



MARS



- MADE OF ROCKY MATERIAL
- SURFACES ARE SOLID
- DON'T HAVE RINGS
- VERY FEW MOONS
- RELATIVELY SMALL

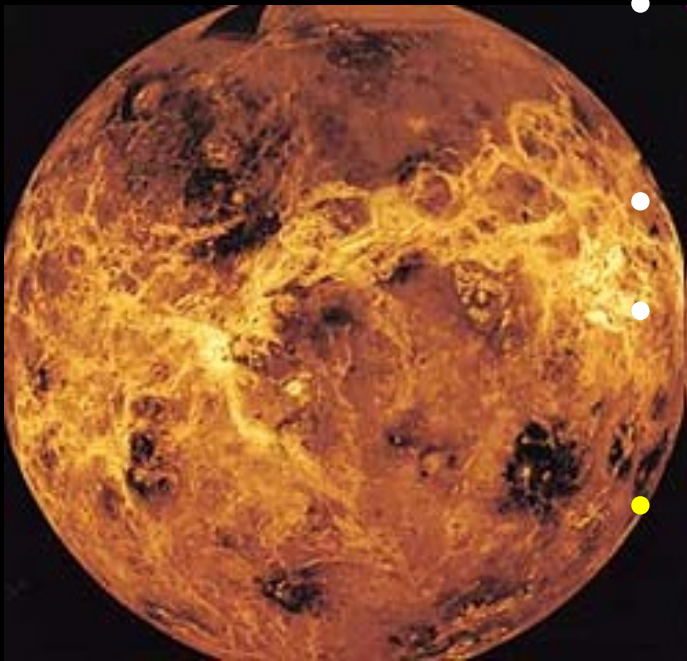


Mercury

- On Mercury you weigh only 38% of what you weigh on Earth.
- ***Fastest orbiting planet (3 earth months)**
 - ***Because it is the nearest planet to the sun** (highest speed, shortest orbit)
- One side of the planet can be 400 degrees Celsius when the other can be -175 degree Celsius at the same time.
- **0.39 AU from sun**

Venus

- On Venus you weigh 91% of what you weigh on Earth.
- Venus has 90 times the pressure of Earth
- Considered to be Earth's twin because they are similar in size
- 0.72 AU from sun
- One time there were oceans before they boiled away.
- ***Is the hottest planet due to an atmosphere full of CO₂**



Earth



- 1 AU from sun
- 71% of surface is water
- Earth is warm enough to keep most of its water from freezing and cold enough to keep it's water from boiling
- Only planet in our solar system that can sustain life (still searching on mars)
- *Earth is the only planet in our solar system that currently has water in liquid form on its surface



Mars

- *Mars is mostly a frozen desert with an average temperature of -60 degrees Celsius
- Evidence that water was there at one time
- pressure on Mars is 1% of what it is here on Earth because of a very small atmosphere containing mostly CO₂
- It has the tallest mountain of the planets (Olympus Mons) 3x's size of Mt. Everest.
- 1.52 AU from sun

Outer Planets (Jovial Planets)

Jupiter



Saturn



Uranus



Neptune



JUPITER

A detailed illustration of the planet Jupiter, showing its characteristic bands of orange, white, and brown, with the Great Red Spot visible.

SATURN

A detailed illustration of the planet Saturn, showing its pale yellowish-tan color and its prominent, multi-layered ring system.

URANUS

A detailed illustration of the planet Uranus, showing its cyan color and a thin, dark ring system.

NEPTUNE

A detailed illustration of the planet Neptune, showing its deep blue color and a faint ring system.

- MULTIPLE MOONS
- NO SOLID SURFACE

- SUPPORT RING SYSTEMS
- IMMENSE IN SIZE

NOT TO SCALE

GAS GIANTS



**PREDOMINANTLY HELIUM
AND HYDROGEN**

Jupiter

- *Largest planet in the Solar System
- Has a Great Red Spot from a storm system that is more than 400 years old (It is larger than Earth!)
- 9 hours and 54 min=1 Jupiter day (shortest day)
- 5.2 AU from sun



Saturn



- 2nd Largest planet in the Solar System
- 9.5 AU from sun
- *Saturn has the largest rings of any planet, the rings are made of icy particles.
- Most moons of any planet.
- Rings were likely once one or more moons that broke apart.

The image features two stylized planets against a dark, star-filled space background. The planet on the left is a vibrant cyan color and has a thin, white, ring-like structure around its equator. The planet on the right is a lighter, pale blue color. Both planets are rendered with a slight gradient and a soft glow. The text is presented in white, bold, sans-serif font within black rectangular boxes with white corner brackets.

ICE GIANTS

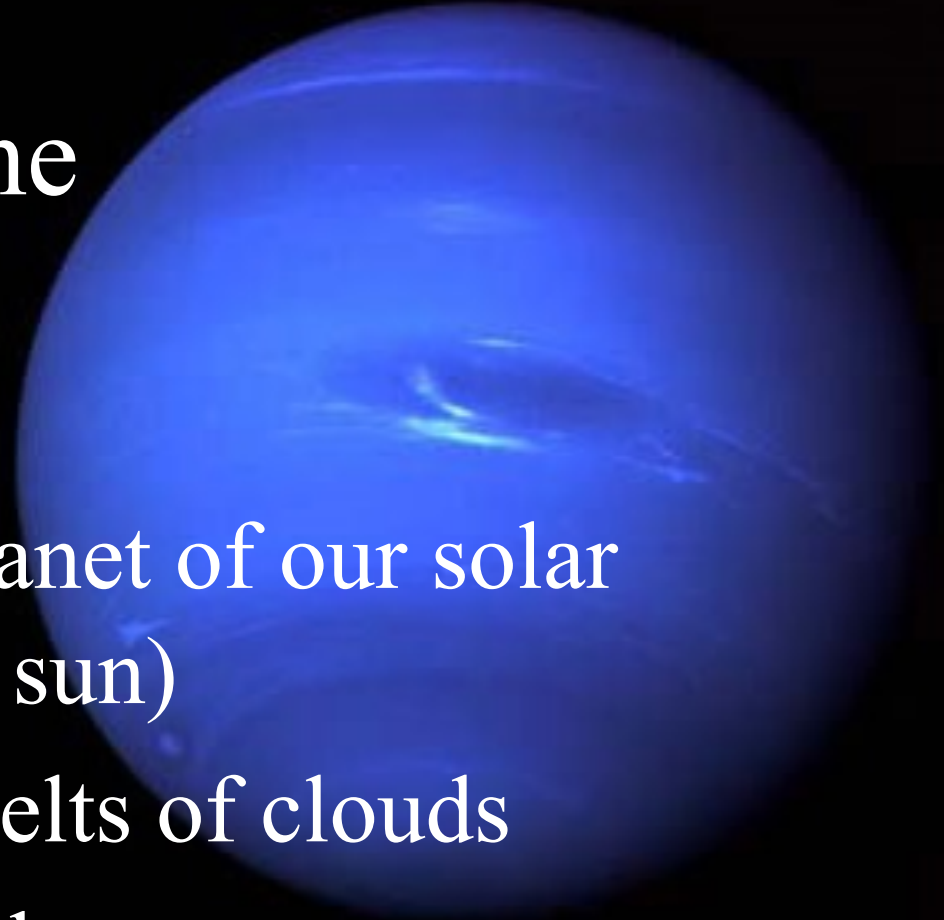
CONTAIN ROCK, ICE, AND MIXTURE
OF WATER, METHANE, AND AMMONIA



Uranus

- 19.1 AU from sun
- Uranus appears blue-green in color due to the high level of methane gas in its atmospheres
- ***It's axis of rotation is tilted 98 degrees**
- Moons are named after Shakespearean plays and formed from other broken moons.

Neptune



- It is the outermost planet of our solar system (30 AU from sun)
- Neptune has visual belts of clouds
- Only planet in our solar system not visible to the naked eye
- Takes 165 years to orbit the sun

QUICK REVIEW

Word Bank

- full moon
- waxing gibbous
- waning gibbous
- first quarter
- third quarter
- waxing crescent
- new moon
- waning crescent

