Course Name-Physical Geography
Course Code- (GEOGP101CC)

PREPARED BY:

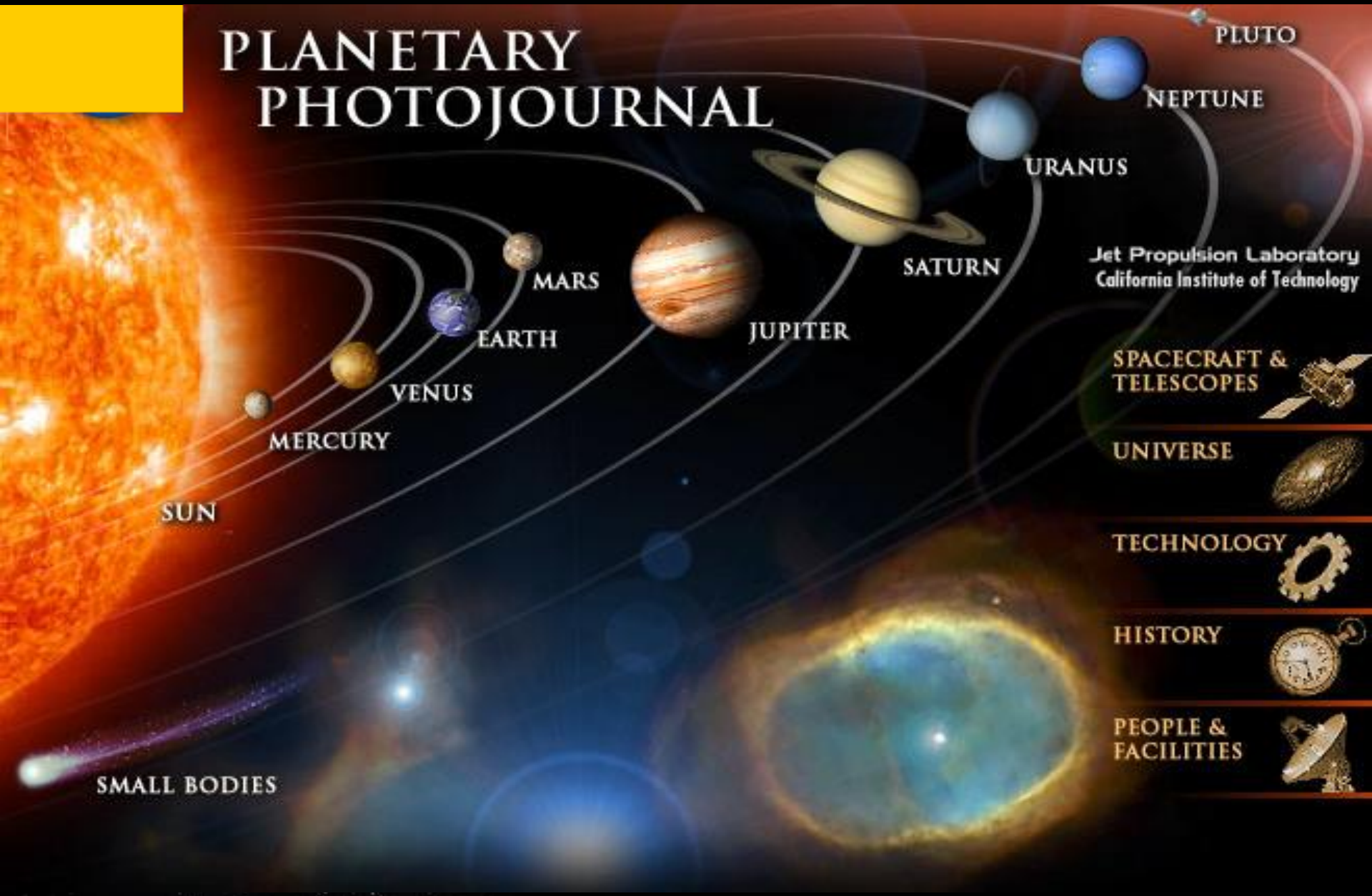
KHYAL CHAND ASSISTANT PROFESSOR GEOGRAPHY G.C.SERAJ AT LAMBATHACH (H.P.)

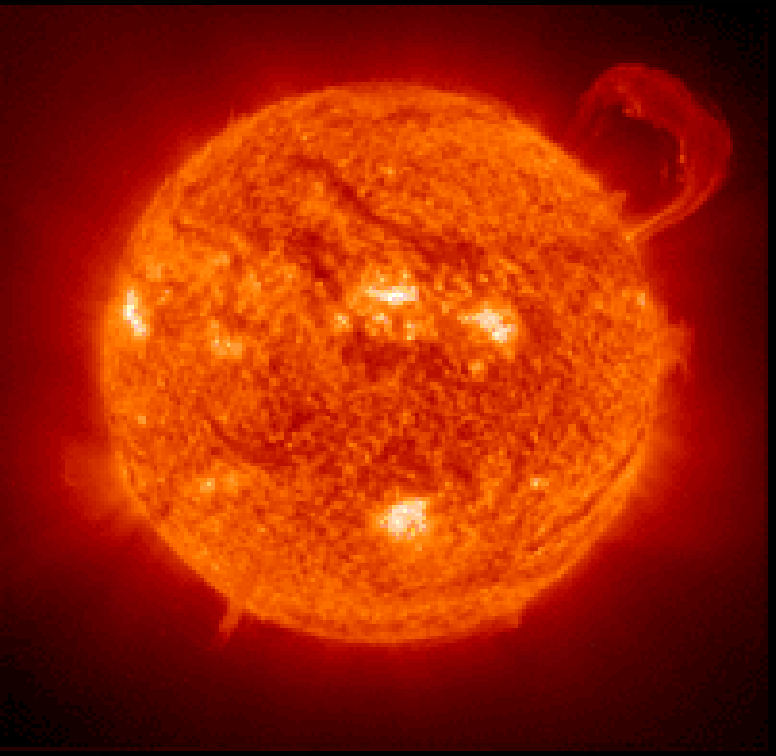
Khyal.hpu@gmail.com

https://www.linkedin.com/in/khyal-chand-16b5a688/

https://twitter.com/khyalgeographer

Introduction

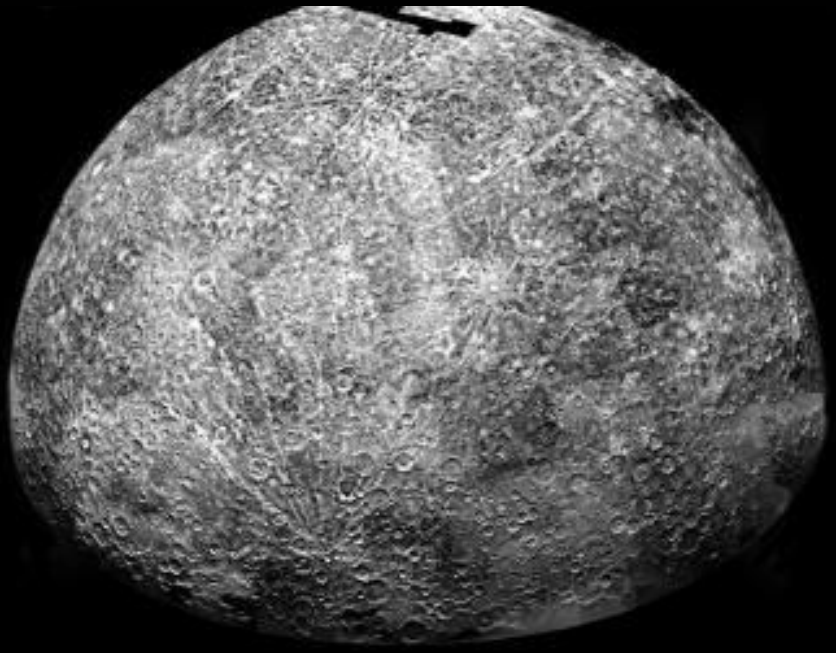




SUN

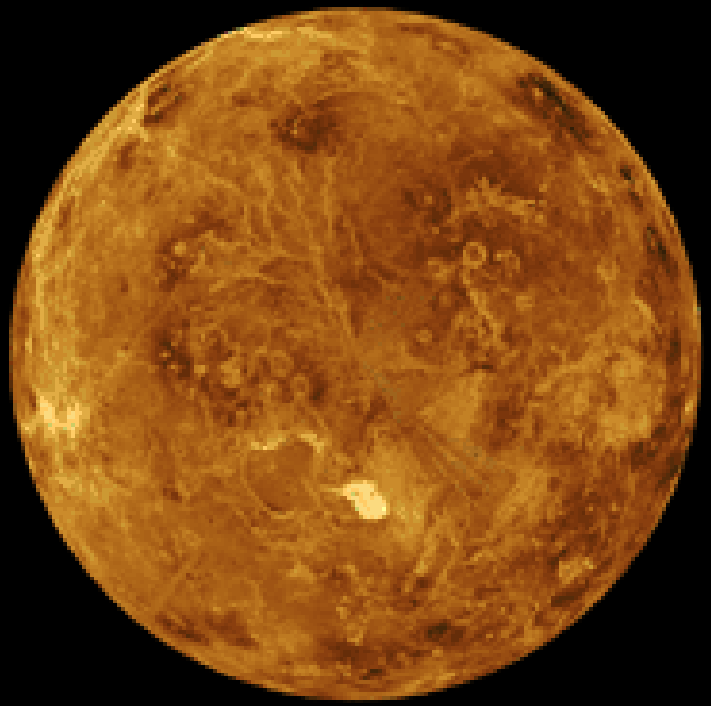
- The Sun is a star at the center of our solar system.
- It is estimated to be 4.5 billion years old.
- It supports all life on Earth through photo-synthesis and is the ultimate source of all food and fossil fuel.
- It is 333,400 times more massive than the Earth (this means that 333,400 Earths can make up the Sun).
- 99.86% of all the mass of the solar system is found in the Sun.
- The core of the Sun is 16 million °C.
- The surface of the Sun is 7000° C
- It takes several hundred thousand years for photons to escape from the dense core and reach the surface.
- The Sun generates energy the equivalent of 100 billion tons of TNT exploding every second.

Mercury



Relative position: ***1st*** planet out from the sun.
Appearance: Resembles Earth's Moon, scarred by thousands of impact craters. There are areas of smooth terrain as well as cliffs, some soaring a mile high, formed by ancient impacts.
General composition: Rocky material. It is a terrestrial planet.
Density: 5.43 g/cm^3
Atmosphere: Almost ***no*** atmosphere. The very little atmosphere that exists is composed chiefly of oxygen, sodium, and helium.
Size: .054 the volume of the Earth
Planetary satellites (Moons): None
Rotation: 58.65 days (very slow rotation)
Revolution: 88 days to go around the Sun once.
Temperatures: High: 467 °C on the sunny side of the planet. Low: -183 °C on the dark side of the planet.

Venus



Relative position: ***2nd*** planet out from the sun.
Appearance: It is covered by thick, rapidly spinning clouds. Due to its thick cloud layer reflecting sunlight, it is the brightest planet in the sky
General composition: Rocky material. It contains an iron core and a molten rocky mantle. The crust is a solid, rocky material. It is a terrestrial planet.
Density: 5.24 gm/cm^3
Atmosphere: Consists mainly of carbon dioxide, nitrogen, and droplets of sulfuric acid; it contains almost no water vapor. This thick atmosphere traps immense amounts of heat in a large-scale greenhouse effect.
Size: .88 the volume of the Earth
Planetary satellites (Moons): None
Rotation: -243 days (retrograde)
Revolution: 225 Earth days. Its day is longer than its year.
Temperature: 450 °C. It's hotter than Mercury due to the greenhouse effect. It is actually hot enough to melt lead.

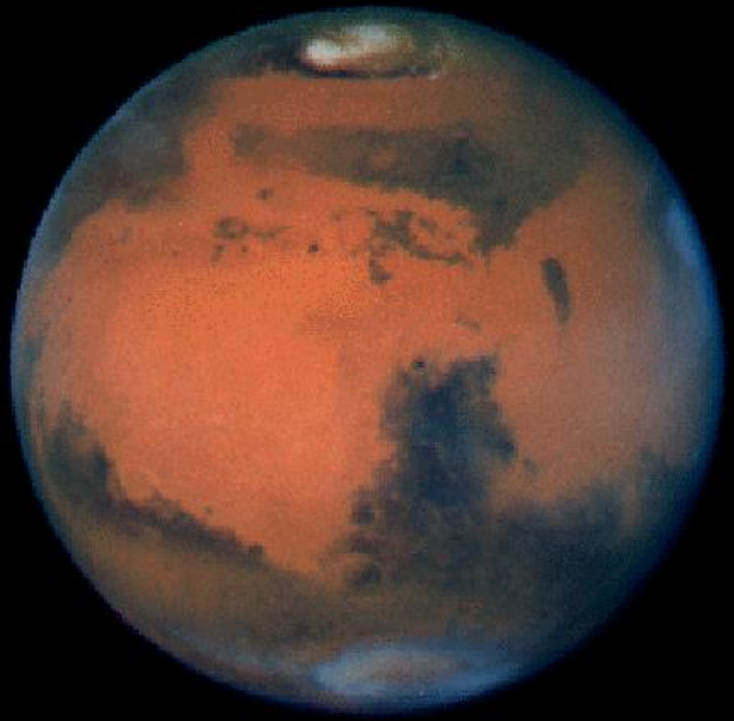
EARTH

Relative position: ***3rd*** planet out from the sun.
Appearance: The Earth looks blue and green from space with clouds moving through the atmosphere. The surface of the Earth is 70% water and 30% land.
General composition: Rocky material. It is a terrestrial planet. It has a nickel-iron core with a molten mantle and solid rocky crust.
Density: 5.52 gm/cm^3
Atmosphere: Mostly oxygen (21%) and nitrogen (78%). Some argon, carbon dioxide, and water vapor.
Size: 40,000km (24,8000miles) around at the equator.
Planetary satellites (Moons): 1 - The Moon
Rotation: 23 hours, 56miutes (1 day)
Revolution: 365.25 days
Temperature: Mean surface 15 °C to 20 °C

The Moon

- The Moon is the Earth's only natural satellite.
- The Moon contains no water and has no atmosphere
- Its has about 1/6 the mass of the Earth, therefore it has 1/6 the gravitational pull of the Earth.
-
- It is 384 401 km from the Earth.
- It takes 27.32 days to orbit the Earth once.
- The gravitational pull of the Moon is responsible for the Earth's tides.
- The surface of the Moon is covered with craters and flatlands. The craters are due to repeated meteorite bombardments while the dark, flatlands are the result of ancient lava flows.

Mars



Relative position: ***4th*** planet out from the sun.
Appearance: Mars appears red due to the iron oxide in its soil. It has polar ice caps that grow and recede with the seasons, and it has dust storms, which cause giant dunes, wind streaks, and wind-carved features.
General composition: Rocky material. It is a terrestrial planet.
Density: 3.94 gm/cm^3
Atmosphere: Mostly carbon dioxide, nitrogen, and argon.
Size: .149 times the volume of the Earth.
Planetary satellites (Moons): 2 Moons
Rotation: 24 hours, 33 minutes.
Revolution: 686.67 days.
Temperature: -87 °C to -5 °C

Moons of Mars

Phobos

Gouged by a giant impact crater and beaten by thousands of meteorite impacts, Phobos is on a collision course with Mars. It may collide with Mars in 50 million years or break up into a ring.

Deimos

It is also heavily cratered with a small lumpy appearance.

Jupiter

Relative position: ***5th*** planet out from the sun.

Appearance: It is sometimes called a “mini-solar system” because of its numerous moons and several rings. Jupiter appears striped because light and dark belts are created by strong east-west winds.

General composition: It is a *gas giant*, meaning it is mostly made of gases. Jupiter's core is probably not solid but a dense, hot liquid with a consistency like thick soup.

Density: 1.76 gm/cm^3

Atmosphere: Mostly hydrogen, helium and methane.

Size: 1316 times the volume of the Earth. It is the planet with the ***highest gravity*** in the solar system.

Planetary satellites (Moons): 63 Moons; some of them have been named and some have alphanumeric designations.

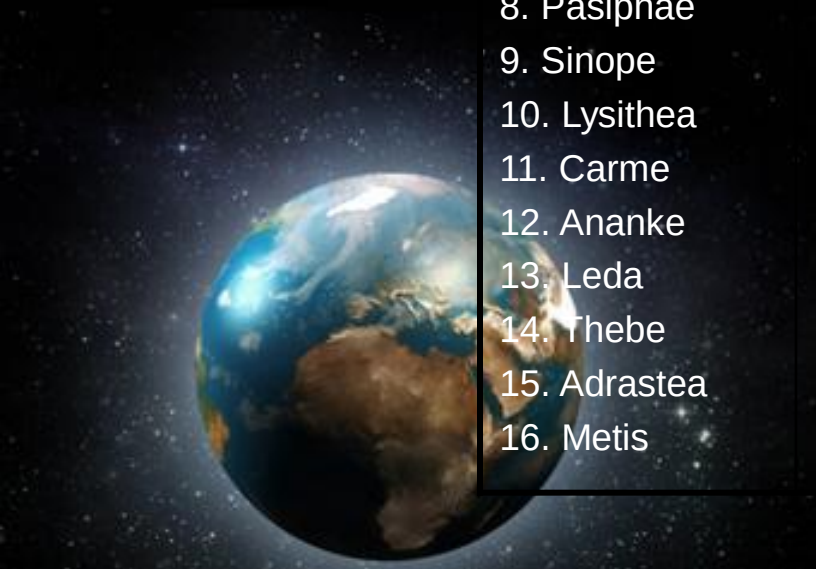
Rotation: 9 hours, 54 minutes

Revolution: 11.86 Earth years

Temperature: -108 °C

Moons of Jupiter

1. Io
2. Europa
3. Ganymede
4. Callisto
5. Amalthea
6. Himalia
7. Elara
8. Pasiphae
9. Sinope
10. Lysithea
11. Carme
12. Ananke
13. Leda
14. Thebe
15. Adrastea
16. Metis
17. Callirrhoe
18. Themisto
19. Megaclite
20. Taygete
21. Chaldene
22. Harpalyke
23. Kalyke
24. Iocaste
25. Erinome
26. Isonoe
27. Praxidike
28. Autonoe
29. Thyone
30. Hermippe
31. Aitne
32. Eurydome
33. Euanthe
34. Euporie
35. Orthosie
36. Sponde
37. Kale
38. Pasithee
39. Hegemone
40. Mneme
41. Aoede
42. Thelxinoe
43. Arche
44. Kallichore
45. Helike
46. Carpo
47. Eukelade
48. Cyllene
49. Kore
50. S/2003 J2
51. S/2003 J3
52. S/2003 J4
53. S/2000 J11
54. S/2000 J5
55. S/2003 J9
56. S/2003 J10
57. S/2003 J12
58. S/2003 J15
59. S/2003 J16
60. S/2003 J17
61. S/2003 J18
62. S/2003 J19
63. S/2003 J23



Saturn (Planet)

Relative position: ***6th*** planet out from the sun.

Appearance: Saturn has a large system of rings, and the yellow and gold bands in its atmosphere are caused by super-fast winds combined with heat rising from its interior.

General composition: It is a *Gas giant*, meaning it is mostly made of the gases hydrogen and helium.

Density: .70 gm/cm^3 (This low density means that Saturn could float on water if their was a body of water big enough).

Atmosphere: Mostly hydrogen and helium.

Size: 755 times the volume of the Earth.

Planetary satellites (Moons): 60 Moons; some have been named and others have alphanumeric designations

Rotation: 10 hours, 38 minutes

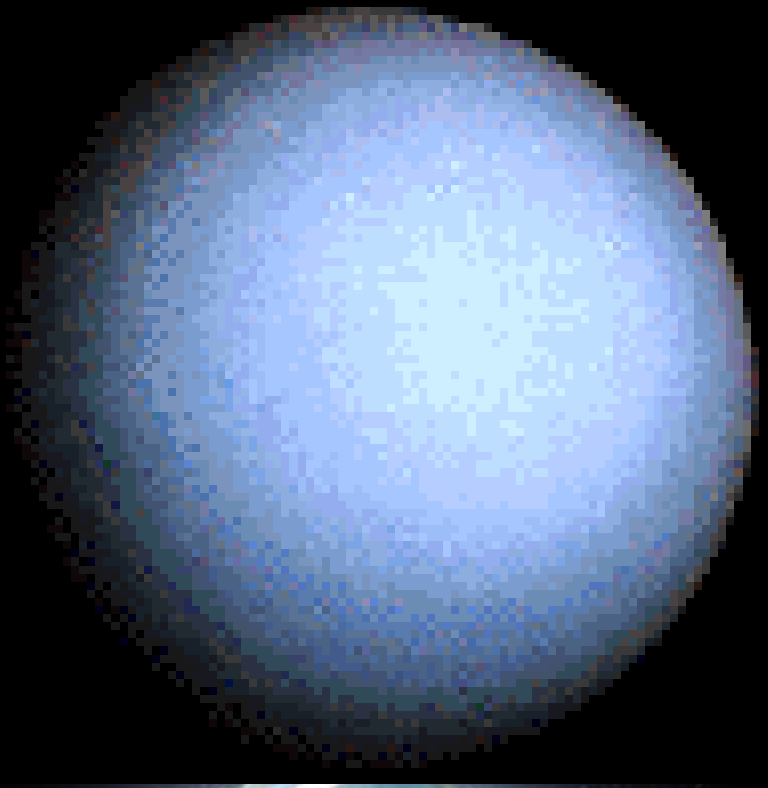
Revolution: 29.45 Earth years

Temperature: -139 °C

Moons of Saturn

1. Mimas
2. Enceladus
3. Tethys
4. Dione
5. Rhea
6. Titan
7. Hyperion
8. Iapetus
9. Erriapus
10. Phoebe
11. Janus
12. Epimetheus
13. Helene
14. Telesto
15. Calypso
16. Kiviuq
17. Atlas
18. Prometheus
19. Pandora
20. Pan
21. Ymir
22. Paaliaq
23. Tarvos
24. Ijiraq
25. Suttungr
26. Mundilfari
27. Albiorix
28. Skathi
29. Siarnaq
30. Thrymr
31. Narvi
32. Methone
33. Pallene
34. Polydeuces
35. Daphnis
36. Aegir
37. Bebhionn
38. Bergelmir
39. Bestla
40. Farbauti
41. Fenrir
42. Fornjot
43. Hati
44. Hyrokkin
45. Kari
46. Loge
47. Skoll
48. Surtur
49. S/2004 S7
50. S/2004 S12
51. S/2004 S13
52. S/2004 S17
53. S/2006 S1
54. S/2006 S3
55. Greip
56. Jarnsaxa
57. Tarqeq
58. S/2007 S2
59. S/2007 S3
60. Anthe

Uranus

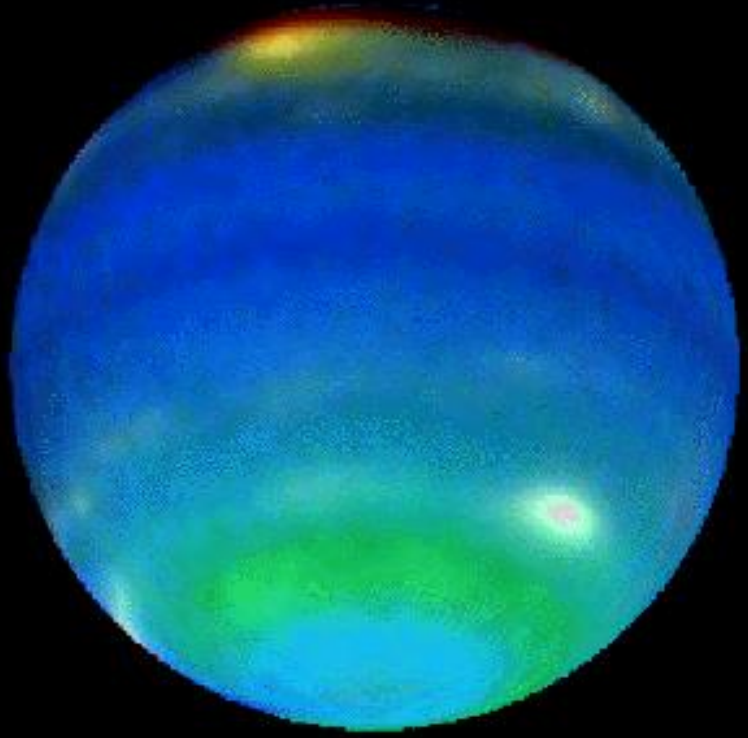


Relative position: ***7th*** planet out from the sun.
Appearance: It has a blue-green color from the methane gas above the deeper clouds. Methane absorbs red light and reflects blue light. It does have a small system of rings.
General composition: It is a *Gas giant*, meaning it is mostly made of the gases hydrogen and helium, with a small amount of methane and traces of water and ammonia. It has no solid surface, but it does contain a liquid core made mostly of "icy" materials (water, methane, and ammonia)
Density: 1.30 gm/cm^3
Atmosphere: Mostly hydrogen, helium, and methane.
Size: 52 times the volume of the Earth.
Planetary satellites (Moons): 27 Moons
Rotation: 17 hours, 11 minutes
Revolution: 84.02 Earth years
Temperature: -197 °C

Special feature
side. This

Moons of Uranus

1. Cordelia
2. Ophelia
3. Bianca
4. Cressida
5. Desdemona
6. Juliet
7. Portia
8. Rosalind
9. Mab
10. Belinda
11. Perdita
12. Puck
13. Cupid
14. Miranda
15. Francisco
16. Ariel
17. Umbriel
18. Titania
19. Oberon
20. Caliban
21. Stephano
22. Trinculo
23. Sycorax
24. Margaret
25. Prospero
26. Setebos
27. Ferdinand



Neptune

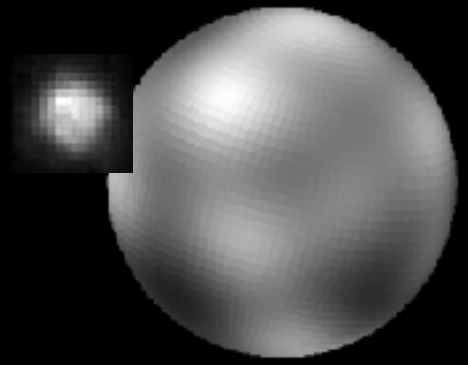
Relative position: ***8th*** planet out from the sun.
Appearance: Neptune has a blue color because of the methane in its atmosphere. The methane reflects blue light while it absorbs red light. It has a small system of rings and periodically *Great Dark Spots* (hurricane-like storms) appear.
General composition: It is a *Gas giant*, meaning it is mostly made of the gases hydrogen, helium, and methane. It has no solid surface, but its liquid core is composed of water and other "melted ices."
Density: 1.76 gm/cm^3
Atmosphere: Mostly hydrogen, helium,and methane.
Size: 44 times the volume of the Earth.
Planetary satellites (Moons): 13 Moons
Rotation: 16 hours, 4 minutes
Revolution: 164.79 Earth years
Temperature: -200 °C

Special feature
Sun for a
unusual

Moons of Neptune

Nereid
3. Naiad
4. Thalassa
5. Despina
6. Galatea
7. Larissa
8. Proteus
9. Halimede
10. Psamathe
11. Sao
12. Laomedeia
13. Neso

Pluto (Dwarf Planet



Relative position: ***9th*** planet out from the sun.
Appearance: A large frozen ball of ice.
General composition: Rocky core surrounded by water ice.
Density: 2.0 gm/cm^3
Atmosphere: Frozen most of the time. When it is closest to the Sun the bright layer of frozen methane, nitrogen, and carbon monoxide thaws out and gives it a thin atmosphere.
Size: .005 the volume of the Earth. It is the planet with the *lowest gravity* in the solar system.
Planetary satellites (Moons): 3

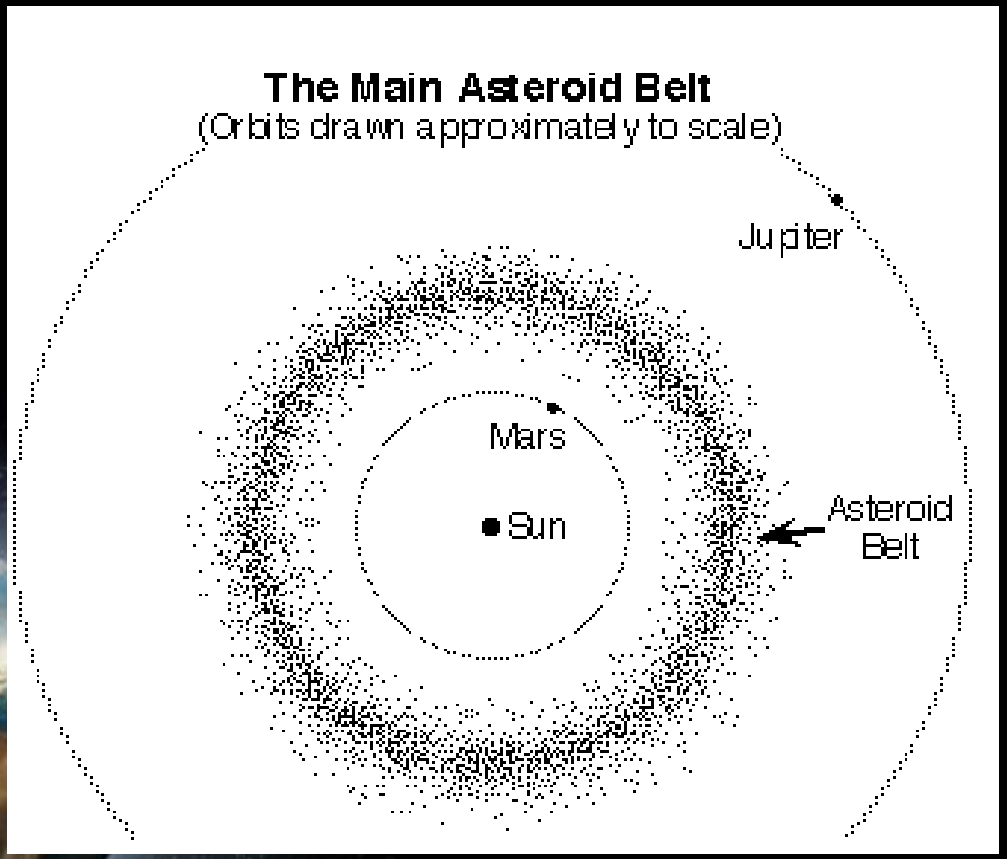
1. Charon
2. Hydra
3. Nix

Rotation: -6.39 days (retrograde)
Revolution: 247.9 Earth years
Temperature: -233 °C

Asteroids

- Asteroids are either rocky or metallic objects that orbit the Sun. They are too small to considered planets but are sometimes called planetoids.
- They can be anywhere from the size of a pebble up to a 1000km (620 miles) in diameter; the asteroid Ceres is an example of an asteroid that is this large.
- They have been found inside Earth's orbit and all the way out past Saturn's orbit. Most asteroids, however, are located in the asteroid belt which exists between the orbit's of Mars and Jupiter.

Asteroid Belt



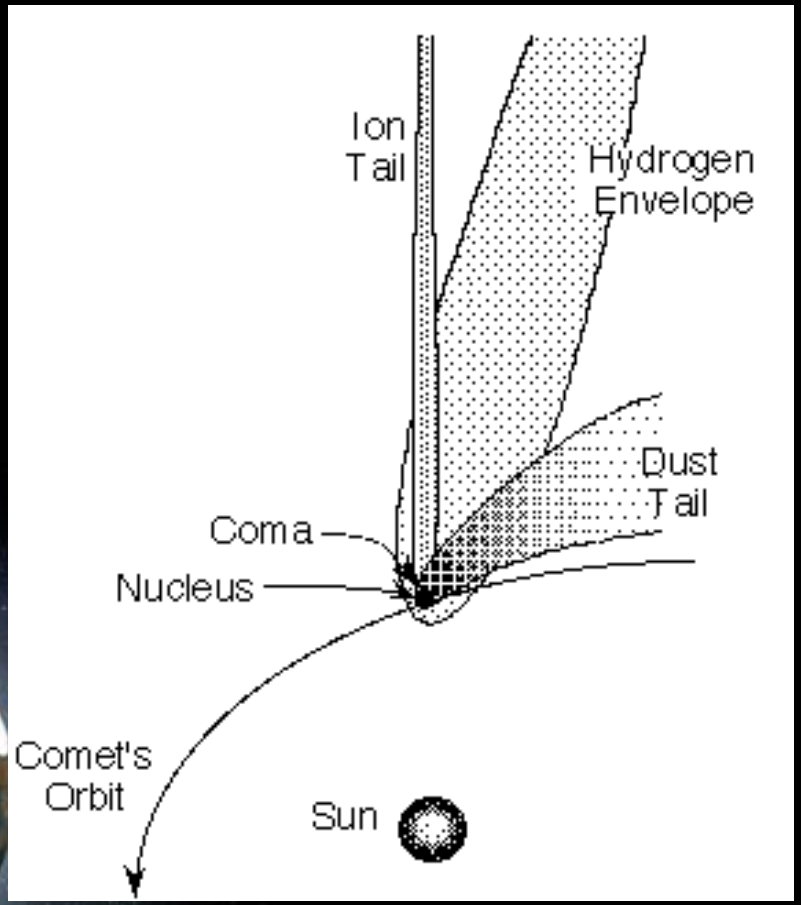
Comets

non-volatile grains and frozen gases. Components of Comets can be seen by clicking on the link.

- Their orbits are elliptical (oval) or parabolic (U-shaped). The orbit brings them in very close to the Sun and swings them far out into space, sometimes out past Pluto. Example of a comet's orbit.

- As comets approach the Sun, radiation from the Sun evaporates the ice and gases, creating the lone tail. The closer to the Sun, the longer the tail of the comet. The tail of the comet always faces away from the Sun because of the solar wind coming from the Sun.

Components of Comets



Meteors, Meteoroids, and

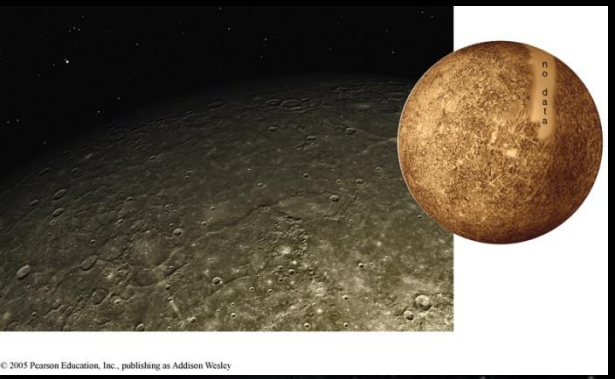
asteroids
collision course with Earth.

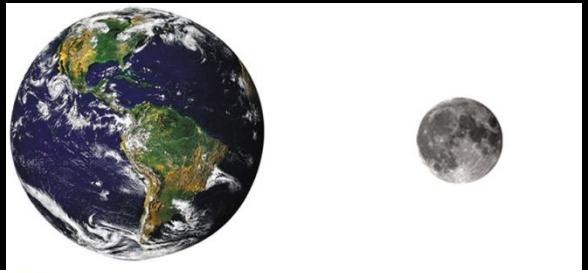
- **Meteor** - streak of light created when a meteoroid strikes our atmosphere at high velocity and friction causes the chunk of space matter to burn up.
- **Meteorite** - what is left that strikes the Earth's surface if the meteoroid does not burn up completely.
- 92.8% of all meteorites are composed of silicate (stone), and 5.7% are composed of iron and nickel; the rest are a mixture of the three materials.
- Stony meteorites are the hardest to identify since they look very much like terrestrial rocks.

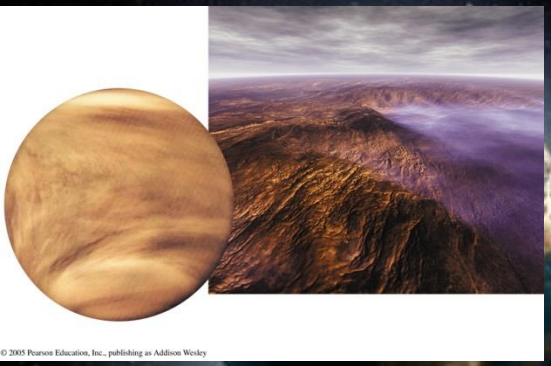
What do the inner planets look like?

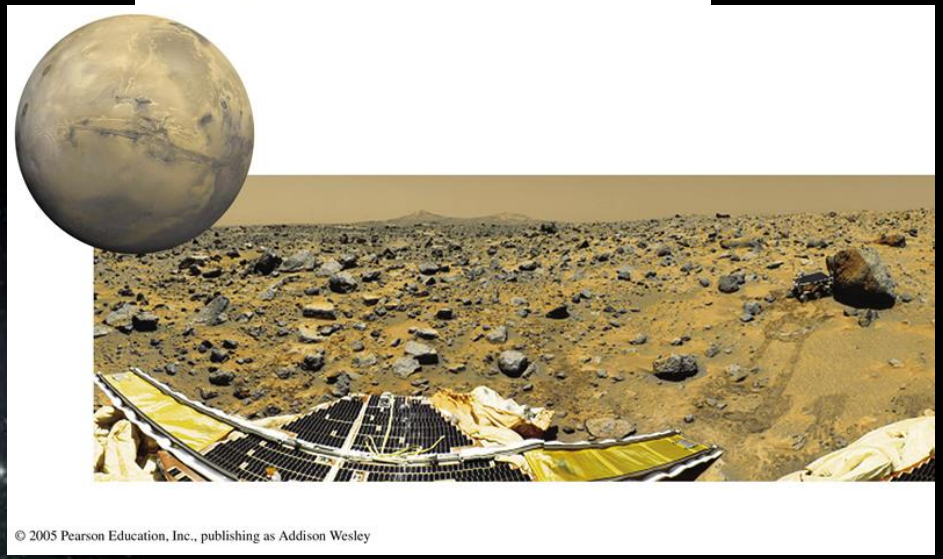
They are all…

- rocky and small!
- No or few moons
- No rings

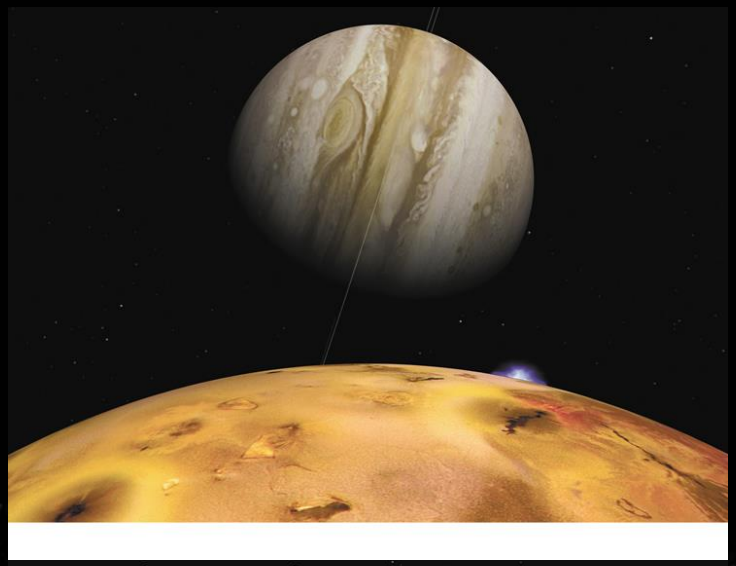


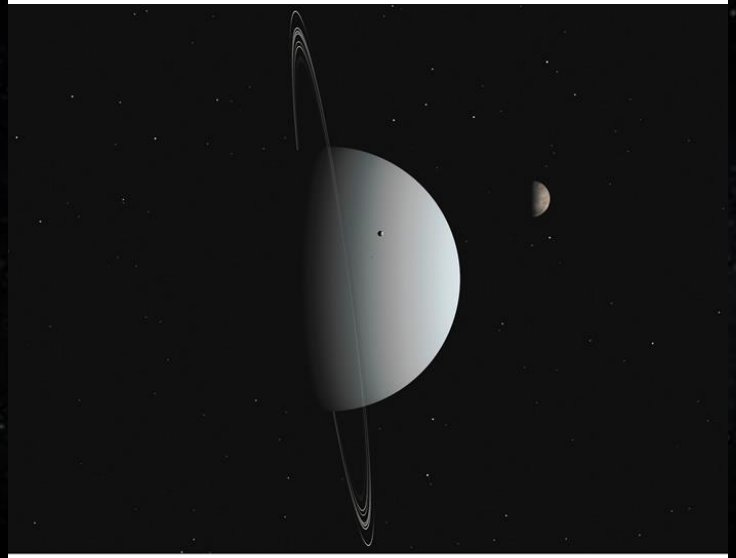


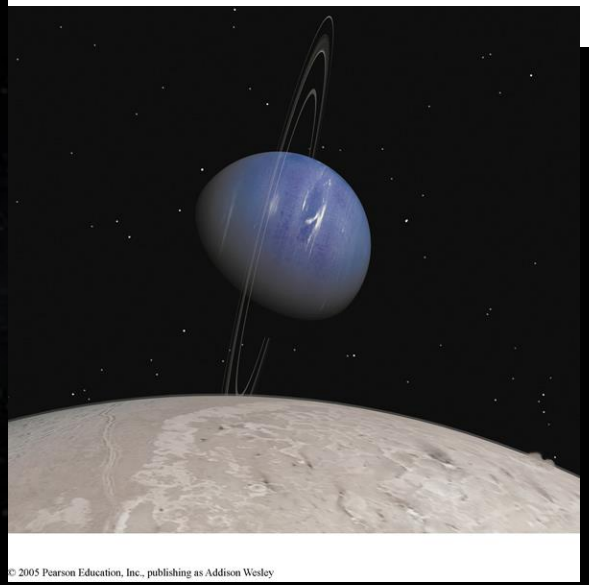




The Jovian Planets

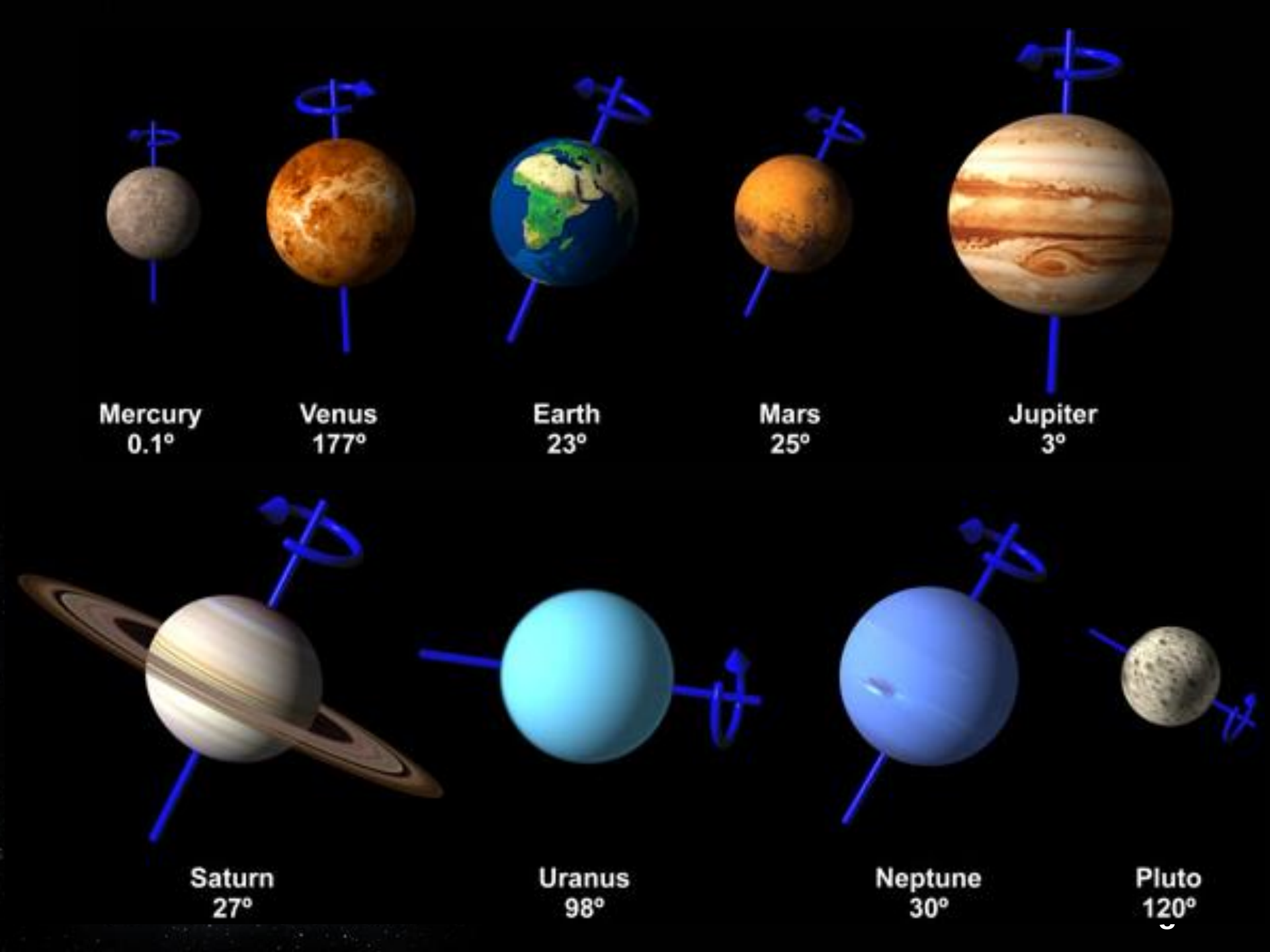






They are all…

- gaseous and **BIG**!
- Rings
- Many moons


Mercury
0.1°
Venus
177°
Earth
23°
Mars
25°
Jupiter
3°
Saturn
27°
Uranus
98°
Neptune
30°
Pluto
120°

Disclaimer: The content has been developed for the teaching purpose only from various published and unpublished sources. I do not claim that originally it belongs to me