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Just like everyone, even the TCP family is impacted by the pandemic. We are trying hard to get content together and bring the paper out but we will need a few weeks to be fully functional again.

Thanks for your support and understanding. Keep sending in your contributions and please stay safe!

Moons in our Solar System

WHAT IS A MOON?

Moons are natural satellites (anything that orbits around a planet is called a satellite). Moons' orbit six of our planets and the many dwarf planets in our solar system. They vary in shape and size.

HOW ARE MOONS FORMED?

There are 4 theories that explain the formation of moons. They are

- a. Co-formation theory – This theory suggests that the earth and the moon were formed side by side out of the same cloud of dust and gas. However, this does not explain the difference in the density of material between the earth and the moon.
- b. The second theory suggests that while travelling past the earth, the moon got trapped by earth's gravity but this did not explain their similar isotopic composition.
- c. Fission theory – According to this theory, the earth was moving so fast that a part of it separated to become the moon. But scientific calculations do not support this.
- d. Giant impact hypothesis – This model was proposed after the Apollo Missions. According to this theory about 4.5 billion years ago, an object, about half the size of earth, hit the earth. This released a lot of materials that clumped together to form a disc around the earth. This later came together to form the moon. This theory best explains the formation of the moon to date.

Our solar system has over 200 known moons. Here are the major ones.

Mercury has no natural satellite or moon because of its small size and its proximity to the Sun. Venus, the planet which is called the Earth's twin also has no moon. According to a study, a million years ago, Venus did have a moon but it slowly drifted away just like our moon is drifting away from earth.

We all know that our Earth has one moon. Mars, our neighbouring planet, has two moons - Phobos and Deimos. They are the smallest moons among the major moons in our solar system.

Jupiter is the biggest planet in our solar system. It has 79 known moons (53 are confirmed and 26 are awaiting confirmation). The major moons of Jupiter are known as Galilean moons as they were discovered by Galileo Galilei. They are Io, Europa, Callisto, and Ganymede. These are the first moons to be discovered outside the earth. Ganymede is the biggest moon in our solar system.

Saturn has 82 moons (53 are confirmed and 29 are awaiting confirmation). Some of these moons are inside the rings and help to give shape to the rings of Saturn. Saturn's well-known moons are Mimas, Enceladus, and Tethys. One of these, named Titan is the 2nd largest moon in the solar system. It even has its own atmosphere.

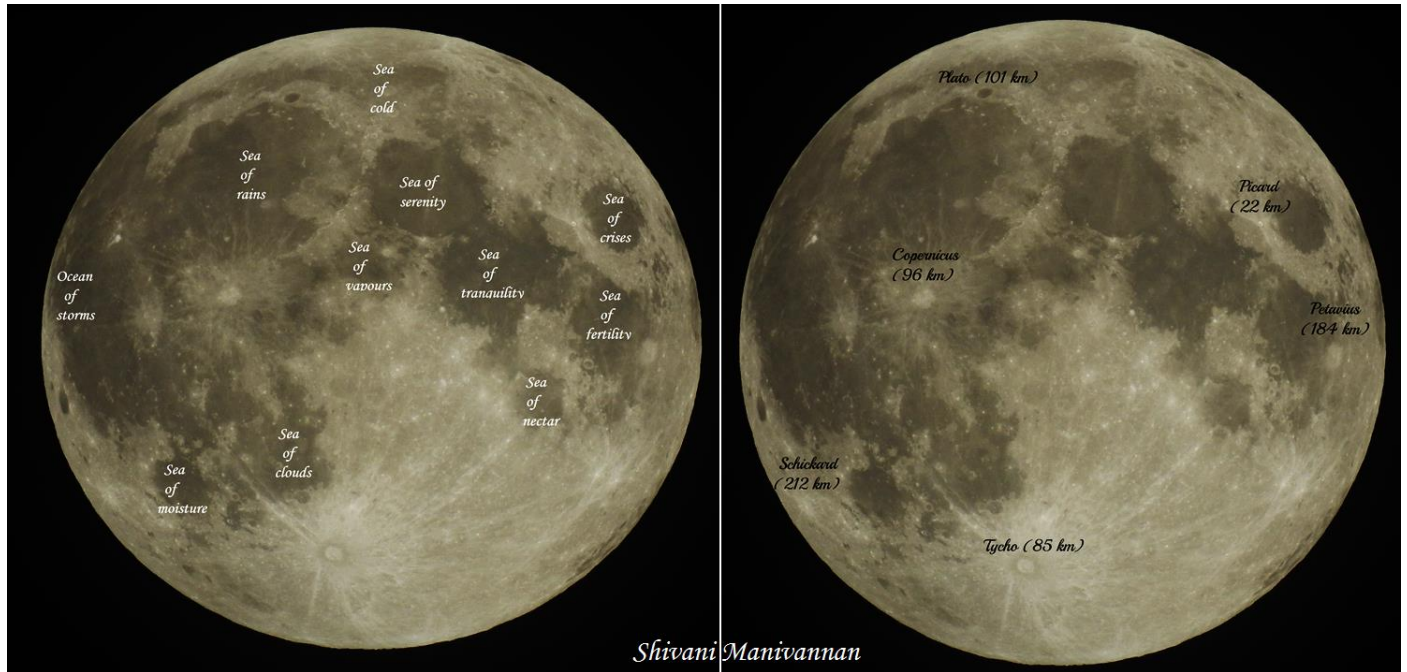
Uranus has 27 moons. Some of them have ice on them. Oberon and Titania are the largest Uranian moons. Neptune has 14 moons. One of the moons of Neptune is Triton. It is as big as the dwarf planet Pluto. Triton is unique as it circles Neptune in a direction opposite to the planet's rotation. Triton is also the coldest object in the solar system with a temperature of about -400 degrees Fahrenheit (-240 degrees Celsius). This is because the icy surface of Triton reflects back all the sunlight that reaches its surface.

Moons of the dwarf planets

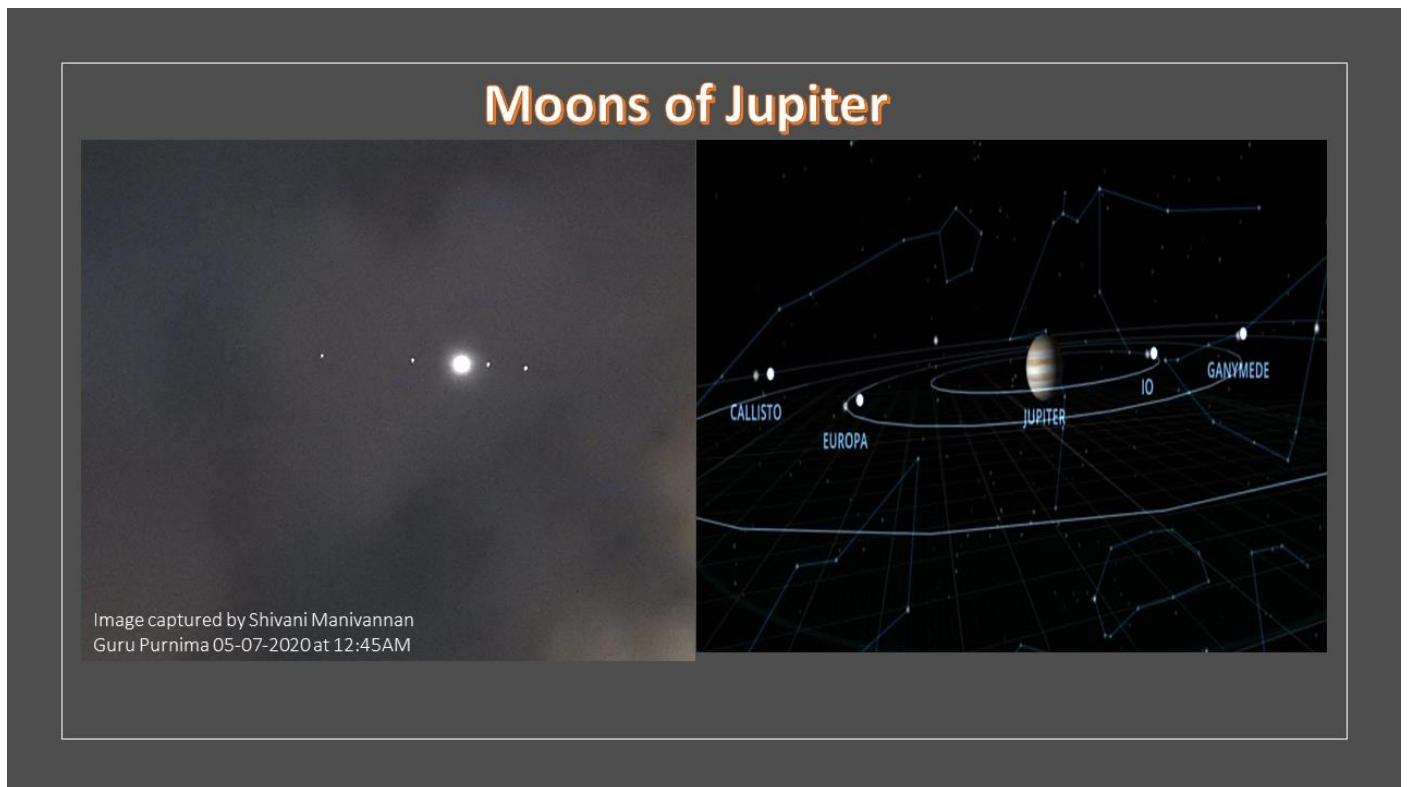
Pluto, the dwarf planet has 5 moons. Charon is the closest and Hydra is the farthest moon to Pluto. Eris is another dwarf planet. It is of the same size as Pluto but it is farthest from the sun. It has a small moon of its own, named Dysnomia. Haumea, the egg-shaped dwarf planet has two satellites, Hi'iaka (the larger moon) and Namaka (the smaller moon). Ceres, which is the closest dwarf planet to the Sun present in the asteroid belt (Between Mars and Jupiter) has no moon. Makemake is located in the Kuiper belt (a region outside the orbit of Pluto). It has one provisional moon.

Saturn's moon Titan & Neptune's moon Triton are almost the same size as our moon. Earth's Moon, along with Titan, Triton, and the four Galilean moons of Jupiter are the 7 largest natural satellites in our solar system.

This article is by our Empower Journalist Arayaa Sinha.



Photograph of Earth's moon showing the various Seas and Craters.

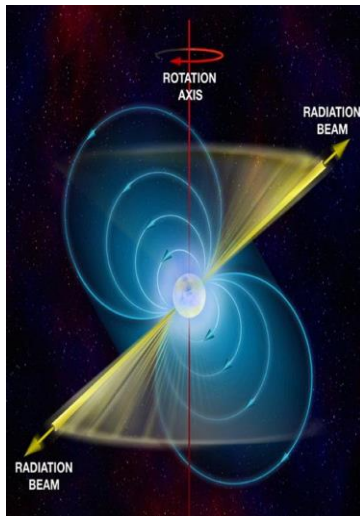


The four Galilean moons of Jupiter – Calisto, Europa, Io and Ganymede.

Photographs by Shivani Manivannan

Pulsar, a cosmic lighthouse – Sunil Kumar Behera

Lighthouse is a long tower usually built onshore that emits light from system lamps and lenses. We can compare a lighthouse to a telescope. In telescope there are glass lenses which refract the light coming from distant celestial bodies and focuses to eyes so that we can see it very closely. But in a light, there are Fresnel lenses which wrap around a light source or lamp and concentrate the ray of light from the source into a parallel and powerful beam of light. Two sets of Fresnel lenses and a rotating mechanism produces two parallel beams of light that sweep horizontally which can be seen over a distance of 25km to 30km. From a long distance it looks like pulsating light that helps to guide ships to ports at night and alerts sailors about dangerous rocky coastline, under water reefs, etc.



There are thousands of cosmic lighthouses that are spread across the universe. These cosmic lighthouses are nothing but pulsars. A Pulsar is a highly magnetized rotating compact star that emit beams of electromagnetic radiation (gamma rays, x-rays, UV rays, visible light, infrared, radio and microwave radiation) out of its magnetic poles. Just like lighthouse beacon can be seen when the observer is in the same direction of light, similarly a pulsar can be seen when its beam of electromagnetic radiation is towards the earth. The axis of rotation and the axis of magnetic poles usually do not coincide. Since the rate of rotation of pulsar is very high (700 times per second), we see pulsed emission of electromagnetic radiation. By analyzing the pulse rate, we can calculate the rotation of the pulsar.

Till date, about 2000 pulsars have been discovered. The first pulsar was observed on 28th Nov 1967 by J. B. Burnell and A. Hewish. They got radio waves and each pulse was separated by 1.33 seconds. They were coming from same location in the sky. Both of them thought this radio emission is from a distant star. It could have been sent by another civilisation or it could be a natural radio emission. They named it LGM-1, which stands for “Little Green Men”. After the discovery of a 2nd pulse in a different location of the sky, the frictional little green men idea was discarded. Later on, it was found that these emissions were from a highly magnetised rotating compact star. They named it Pulsar. Most pulsars rotate once per second. They are known as slow pulsars and some rotate more than hundreds of times per second. These are known as millisecond pulsars. Just like lighthouses, pulsars are of great use. Some astronomers call them as cosmic tools because by studying them they could solve many mysteries. Electromagnetic radiation emissions carry information about the structure, content, age, etc. of the pulsar and using these data similar objects such as neutron stars could be studied. They also help scientists to test aspects of Einstein’s Theory of General Relativity and many more.

Editorial

Hello Readers,

Happy Reading☺

Love,

-Padma Aunty
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Wednesday Champs!

The answer to last week's riddle is: No. Draw the Venn diagram to see how ☺.

Congratulations to Sanjana, Shubhangi Dash, and Sneha Vikram Vedpathak our Wednesday Champs.

A shout out to Manpreet Kaur, Pratibha Wadekar, Priyansh Jain, Kanishka Parjapat, Vanshika Gahlot, Archit Soni, Preesha Jain for giving it a try.

All pears are green.
All apples are red.
Some red things are balloons.
Are some balloons apples?
A. Yes B. No

Hurry up Champs! Send in
your answers to
tcpedit@gmail.com

Hack of the day!

If your legs hurt from all the playing, take a bucket, put some salt in warm water, and simply soak your legs. You will feel better!

Summer Recipe: Cotton Candy Shake

by Preesha Jain

Ingredients:

Cotton candy shake

Ingredients

1 glass milk

2 small packet of cotton candy

2 spoons of sugar

Some ice cubes

An ice cream (optional)

Method:

1. Add all the ingredients in a blender
2. Blend it and enjoy

Did you know?

ICICI originally stood for
Industrial Credit and
Investment Corporation of
India!

Quote of the day

The brave person is not
necessarily braver. He is
just brave 5 minutes longer.
— Unknown

Solve the puzzle based on your knowledge of the PERIODIC TABLE

1	Which is the most abundant gas in the Earth's atmosphere?		I			O		E	
2	Which element helps prevent cavities and make teeth strong?			U	O		I		E
3	Which element makes the bones strong?		A			I	U		
4	Which element is essential for blood production?	I		O					
5	Which element tells you when it is really cold?		E			U			
6	Which element lights up the signs?		E	O					
7	Which element helps you breath?	O				E			
8	Which element makes you rich?		O						
9	Which element is radioactive?	U		A		I	U		
10	Which element is used to make coins?		I			E			

Art by Bhavya Agarwal



Twist your tongue!!

I saw a kitten eating chicken in the kitchen.



3D Modeling of a Rocket
Chinmaya Manivannan

Credits and Answers

This edition has been reviewed by Amrita Agarwal and Nidhi Arora.

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