

SCIENCE CENTRE NEWS LETTER

April 2019
Issue 48



Published by
M. Thennarasan
I.A.S.
Municipal
Commissioner

Editor
A. M. Dube
Addi. City Eng.(Civil)

Sub Editor
Bhamini Mahida
Chief Curator
Divyesh Gameti
Curator (Science)

Co-ordinator
Dr. Pruthul Desai
Principal
P. T. Science College



SCIENCE CENTRE

Volume 4, Issue 12

WHAT'S NEW IN SCIENCE

Tiny Neptune moon spotted by Hubble may have broken from larger Moon

After several years of analysis, a team of planetary Scientists using NASA's Hubble Space Telescope has at last come up with an explanation for a mysterious moon around Neptune that they discovered with Hubble in 2013. The tiny moon, named Hippocamp, is unusually close to a much larger Neptunian moon called Proteus. Normally, a moon like Proteus should have gravitationally swept aside or swallowed the smaller moon while clearing out its orbital path. So why does the tiny moon exist? Hippocamp is likely a chipped-off piece of the larger moon that resulted from a collision with a comet billions of years ago. The diminutive moon, only 20 miles (about 34 kilometers) across, is 1/1000th the mass of Proteus (which is 260 miles [about 418 kilometers] across).



This is supported by Voyager 2 images from 1989 that show a large crater on Proteus, almost large enough to have shattered the moon. "In 1989, we thought the crater was the end of the story," said Mark Showalter of the SETI Institute in Mountain View, California. "With Hubble, now we know that a little piece of Proteus got left behind and we see it today as Hippocamp". The orbits of the two moons

are now 7500 miles (about 12070 kilometers) apart.

Neptune's satellite system has a violent and tortured history. Many billions of years ago, Neptune captured the large moon Triton from the Kuiper belt, a large region of icy and rocky objects beyond the orbit of Neptune. Triton's gravity would have torn up Neptune's original satellite system. Triton settled into a circular orbit and the debris from shattered Neptunian moons re-coalesced into a second generation of natural satellite. However, comet bombardment continued to tear things up, leading to the birth of Hippocamp, which might be considered a third generation satellite.

Hippocamp is a Mythological animal, half-horse half-fish from Greek mythology. The scientific name of the seahorse is Hippocampus, also the name of the important part of the human brain. The rules of the International Astronomical Union require that the moons of Neptune are named after Greek and Roman mythology of the undersea world. The paper was appeared in the February 21, 2019 issue of the science journal 'Nature'.

Courtesy : Shree Maharshi Karve Primary School No.-162

SCIENTIST OF THE MONTH

Kailasavadivoo Sivan

Kailasavadivoo Sivan was born on 14 April, 1957 (age-61) in Sarakkalvilai, near Nagercoil in Kanyakumari district of Tamil Nadu state of India. Sivan is popularly known as the "Rocket Man" for his significant contribution to the development of cryogenic engines for India's space program.

Sivan graduated with a Bachelor's degree in Aeronautical Engineering from Madras Institute of Technology in 1980. He then got a Master's degree in Aerospace Engineering from Indian Institute of Science, Bangalore in 1982 and started working in ISRO.

Sivan worked on the design and development of launch vehicles for Indian Space Research Organization (ISRO). He joined ISRO in 1982 to participate on the Polar Satellite Launch Vehicle (PSLV) project. He was appointed as the Director of ISRO's Liquid propulsion system centre on 2 July, 2014. He is the Chief Architect of 6D trajectory simulation software, SITARA which is the back-bone of the real-time and non-real-time trajectory simulations of all



ISRO launch vehicles. He developed and implemented an innovative day-of launch wind biasing strategy which has made possible rocket launch on any day of the year at any weather and wind conditions. He evolved novel strategies for launching India's MARS mission endeavor through PSLV. During his career at ISRO, he held many responsibilities like Group Director, Aeronautics Entity, Deputy Director, Structures Entity, Project Director, GSLV Chief Controller, etc. It was sivan's expertise that gave ISRO the ability to send 104 satellites in a single mission, setting a world record on 14 February 2017. Sivan was appointed the Chief of ISRO in January 2018.

He was awarded by Shri Hari Om Ashram preit Dr. Vikram Sarabhai Research Award in 1999, ISRO merit award in 2007, Dr. Biren Roy Space Science Award in 2011 and Distinguished Alumnus Award in 2013 from MIT Alumni Association, Chennai.

Courtesy :

Shree Maharshi Karve Primary School No.-162

SCIENCE FACTS APRIL 2019



Timings

Tuesday to Friday
9.30 am to 4.30 pm

Saturday - Sunday
& Public Holidays
11.00 am to 6.30 pm

Address

Science Centre
City Light Road,
Surat - 395 007

Contact

0261 - 2255947
+91 97277 40807

Fax No.

91-261-2255946

E mail

sciencecentre@suratmunicipal.org

Web Site

www.suratmunicipal.gov.in



1 April 1962	Decimal weight measurement system was made compulsory in India.
2 April	World Autism Awareness Day. (UN)
2 April 1618	Mathematician and Physicist, Francisco M. Grimaldi (discoverer of light diffraction) was born.
3 April 1984	Indian Astronaut Mr.Rakesh Sharma traveled into Space.
7 April	World Health Day (WHO) (UN)
12 April	International Day of Human Space Flight (UN)
12 April 1961	First Russian Astronaut Yuri Gagarin traveled into Space.
16 April 1853	First Indian Steam Engine train was started from Mumbai to Thane.
16 April 1867	Wilbur Wright (co-inventor of the first manned aeroplane) was born.
19 April 1912	American Chemist, Glen T. Seaborg (discoverer of plutonium) was born.
19 April 1971	Russia had launched world's first unmanned Space research station "Salyut-1" in Space.
19 April 1975	India entered in Space Era. "Aryabhatt" Satellite was launched from Soviet Union.
22 April	International Earth Day.
22 April 1799	Jean Poiseuille (discoverer of blood pressure) was born.
23 April	World Book & Copyright Day (UNESCO)
23 April 1858	German Physicist, Max Planck (who wrote the Planck Constant) was born.
25 April	World Malaria Day (WHO)
25 April 1874	The great Scientist Mr. Marconi (inventor of Radio) was born.
27 April 1791	Mr. Semual Morse (inventor of Postal Service & Telegram) was born
28 April	World Day for Safety & Health at Work
30 April 1895	French Scientist Mr. Rontgen discovered X-rays.
U. N. : United Nations	
WHO : World Health Organization	
UNESCO : United Nation Educational Scientific and Cultural Organization	

Ans:- 1 a, 2 b, 3 a, 4 b, 5 c

KNOW THE EXHIBIT AT FUN SCIENCE GALLERY

Floating Ball

Press the switch with your finger and observe how the ball floats in Air. Bend the flexible nozzle to make the ball move around in air without falling.

According to the Bernoulli's Principle, the high speed air jet creates a drop in static pressure along its path. Surrounding air at higher pressure rushes into this low pressure area from all sides and holds the ball floating in its position.



SCIENTIFIC QUESTION

How do we get more energy from the Sun? (Part-3)

(A) Generating Heat Passively with

Solar energy:

Just as sunlight is used to heat the circulating oil at a solar power plant, we passively use the heat of the sun's rays in our everyday life. When sunlight hits something, it generates heat, or thermal energy. On a sunny day, the sunlight hits your car and heats up the inside.

Passive solar heating systems rely solely on this principle. They do not concentrate the energy and there is no mechanical system. Therefore, no electricity is used. The problem with these systems is they rely on good sunshine and they function best in moderate climates.

Heating Water: Houses can use passive solar heating to provide hot water for showers and washing dishes. Thin rectangular tanks with a glass front are positioned on the roof. The water circulating through the tank is heated by the sun's energy. The system relies on gravity to deliver hot water on demand.

Heating Spaces: Greenhouses use passive solar heating but houses and buildings can too. Glass windows are transparent to visible light, which warms in interior space. However, glass is opaque to infrared wavelengths given off by the interior, so the heat is trapped (thus the "greenhouse effect"). In warmer weather, an overhang can prevent sunlight from entering through the windows.

(B) Generating Heat Actively with

Solar Energy:

Active solar heating systems combine the mechanical components of a regular heating system with a passive solar system. Heat is collected with a solar collector.

1. Solar Thermal Collector: Just like passive solar systems, heating water with an active system requires a flat plate collector to absorb the sun's energy. Mounted on the roof, the flat tank contains a black surface to maximize

heat absorption. Tubes attached to the surface circulate water. As the black surface collects heat, it gets trapped in the tank and raises the temperature of the circulating water.

2. Primary Circuit: The solar collector and external part of the tank comprise the primary circuit.

3. Water Storage Tank: Just like an electric or gas-driven hot water system, an insulated tank is used to store hot water until needed.

4. Pump: Rather than relying solely on gravity, active systems use pumps to circulate the water. Cold water is pumped into the collector where it heats up. Then it's pumped to the storage tank. Hot water is pumped from the tank throughout the house.

5. Water Heater: Some systems use a backup water heater. The heater can

supply extra hot water to the storage tank if needed.

Benefits and Challenges of Solar Energy:

Benefits:

- It's limitless and available worldwide.
- It does not pollute the water or air
- It is essentially free. After the initial investment, the sun's energy is virtually free
- It has lots of flexibility because it can be used as is or help add energy to the grid. It can also be used in conjunction with other sources
- It has numerous applications for supplying heat and power.
- It's a perfect match for supplying high energy demands of the summer seasons.

Challenges:

- It's not constant. It varies depending on weather conditions, time of day, time of year and location.

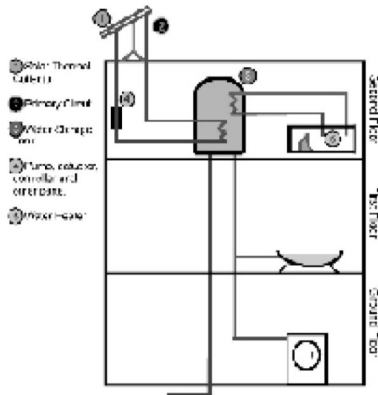
-In some location, it supplies only a small amount of energy. Lots of surface area is required to collect it.

-Setting up systems requires substantial initial monetary investment.

-A small amount of environmentally harmful toxic waste is produced while manufacturing photovoltaic cells.

-Solar power plants can harm desert ecosystems.

-PV cells are relatively expensive.



Courtesy :

Shree Maharshi Karve Primary School No.-162

SCIENCE QUIZ

1) Which technique requires to traced out the Radio-active elements in living cell?

- a) Auto radiography b) Chromatography c) Centrifugation d) All the techniques

2) Why clear nights are colder than cloudy nights?

- a) Insolation b) Radiation c) Condensation d) Conduction

3) Which of the following is used to split white light to different colours?

- a) Prism b) Glass slab c) Convex lens d) Concave lens

4) Through which sound can not pass?

- a) Air b) Vacuum c) Steel d) Water

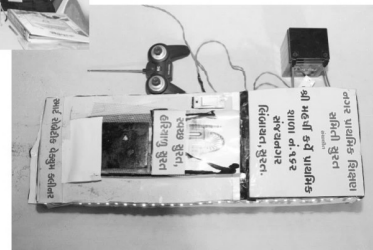
5) In a photocell, light energy is converted into which energy?

- a) Heat energy b) Potential energy c) Electrical energy d) Chemical energy

SCIENCE PROJECT

Surat Municipal Corporation had organized 'Science Fair' at Ground Floor, Art Gallery, Science Centre, Surat on 03rd and 04th August 2018. Shree Maharshi Karve Primary School No.-162 had presented their project on 'Smart Robotic Vacuum Cleaner'.

This project is used to clean the house, office through the vacuum cleaner and it is used in dispose of waste and maintains cleanliness in various places like hospitals, laboratories and schools. It is used to clean dirt on various items in the house. It can also used disposal of waste from the roads and clean the roads. The place where man cannot go, the disposal of waste can be done by vacuum cleaner. The purpose of this project is: 1. Students understand the importance of cleanliness. 2. Students learn to make vacuum cleaner. 3. By the use of vacuum cleaner maintain cleanliness in house and office. 4. Students can familiar with modern technology. 5. Student's imagination power can develop



SCIENCE CENTRE

Science Centre forms the main part of the entire complex; it displays thematic galleries in the field of Science and Technology. The ground floor of Science Centre showcases 3D Theatre and Souvenir Shop. The first floor of Science Centre showcases Planetarium, Fun Science Gallery and Power of Play Gallery and second floor of Science Centre showcases Diamond Gallery, whereas Entering into Space, Cosmos Gallery under development.

3d Show	Tuesday to Friday (Time)	Saturday, Sunday & Holidays (Time)
English	09:15, 11:20, 12:00, 02:40, 04:00	11:20, 12:00, 02:40, 04:00
Hindi	10:00, 10:40, 12:40, 01:20, 02:00, 03:20	12:40, 01:20, 02:00, 03:20, 04:40, 05:20, 06:00
Science Centre + Planetarium + Museum + Diamond Gallery		
Above 18 Years	Rs. 100	
3 Years to 18 Years	Rs. 65	
Science Centre + Museum + Diamond Gallery		Planetarium
Above 18 Years	Rs. 60	Tuesday to Friday
3 Years to 18 Years	Rs. 40	Saturday, Sunday & Public Holidays
Science Centre + Planetarium + Museum + Diamond Gallery + 3D Show		09:30 to 10:20 English
Above 18 Years	Rs. 120	11:30 to 12:20 Gujarati
3 Years to 18 Years	Rs. 80	10:30 to 11:20 Gujarati
Planetarium		11:30 to 12:20 Gujarati
Above 18 Years	Rs. 50	12:30 to 01:20 English
3 Years to 18 Years	Rs. 40	01:30 to 02:20 Hindi
3D Show		02:30 to 03:20 Hindi
Above 18 Years	Rs. 60	03:30 to 04:20 Gujarati
3 Years to 18 Years	Rs. 40	04:30 to 05:20 English
		05:30 to 06:20 Gujarati