

SCIENCE CENTRE NEWS LETTER

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Published by
Shalini Agarwal
I.A.S.
Municipal
Commissioner

Editor
J.M. Desai
Add. City Engineer (Civil)

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

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



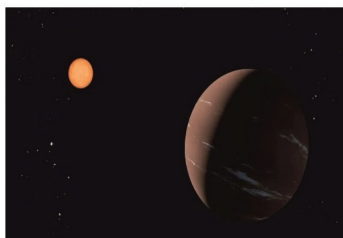
SCIENCE CENTRE

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WHAT'S NEW IN SCIENCE?

Indian Researchers discovered new planet. It's five times larger than Earth.

Researchers from the Physical Research Laboratory (PRL) Ahmadabad had announced a remarkable discovery in the field of exoplanet (it is any planet beyond our Solar system. Most of them orbit other Stars, but some free-floating exoplanets, called rogue planet, are untethered to any star) Science. Using the advanced PARAS-2 (PRL Advanced Radial Velocity Abu Sky Search-2) Spectrograph, Researchers had identified TOI-6651b, a dense, Saturn-sized exoplanet orbiting a Sun-like



TOI-6651b is a unique exoplanet, weighing around 60 times the mass of Earth and having a radius approximately five times larger than Earth's. TOI-6651b is located at the edge of "Neptunian desert" (a region where planets of this size are seldom found).

This distant planet orbits its Sun-like

host star. TOI-6651 has 5.06 day cycle, meaning its "year" is only a fraction of an Earth month. Its orbit is slightly oval in shape and has a surface temperature of about 5940°K.

The planet's high density indicates that about 87% of its mass consists of rocky and iron-rich materials, with the remaining mass forming a lighter environment of Hydrogen and Helium. This structure suggests that TOI-6651b may have undergone unique evolutionary processes, possibly merging with other objects or losing much of its original atmosphere due to tidal heating effects.

Author:

Sibu Kumar Tripathi

Main Source:

<https://www.indiatoday.in/science/story/indian-scientists-prl-ahmedabad-discover-new-planet-it-is-five-times-bigger-than-earth-2624404-2024-10-28>

SCIENTIST OF THE MONTH

Dr. Nirmal Kumar Datta

Dr. Nirmal Kumar Datta was born on 1st December, 1913 in West Bengal, Kolkata. He did M.B.B.S (Bachelor of Medicine and Bachelor of Surgery) from the Carmichael Medical College, Kolkata in 1937 and D.Phil (Doctor of Philosophy) from Oxford University in 1949.

Dr. Datta was a Specialist in Pharmacology, Chemotherapy and Microbiology. He was responsible for introducing the use of infant rabbits for the replication of human Cholera, which enabled laboratories throughout the world for the study of Cholera.

Dr. Datta made the first major breakthrough in the field of Cholera research when he discovered that Cholera vibrios produce a toxin which causes intense diarrhea in animals. He also developed a method of evaluating Cholera vaccines and antisera.



Dr. Datta was associated with the World Health Organization, serving as a member of their Experts' Panel in Bacterial Diseases and Cholera. He was a member of the Indian Pharmacopoeia Commission, the Drugs Technical Advisory Board of the Government of India and sat in the Expert Scientific Committee of Indian Council of Medical Research.

Dr. Datta won the Basanti Devi Amir Chand Prize in 1956, the Shanti Swarup Bhatnagar Prize, the Watumull Memorial Award in Medical Sciences in 1965 and the Dhanwantari Prize in 1981. He died on 2 May 1982.

Main Source:

101 Great Scientists Book/Shyum Dua

Image::

https://en.wikipedia.org/wiki/Nirmal_Kumar_Datta#/media/File:Dr._Nirmal_Kumar_Datta.jpg

SCIENCE FACTS DECEMBER 2024



Timings

Tuesday to Sunday
& Public Holidays
9.30 am to 4.30 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 December 1925	: American Scientist Martin Rodbell (Co-winner of the 1994 Nobel Prize in Physiology or Medicine for their discovery of G- proteins and the role of these proteins in signal transduction in cell) was born.
3 December 1900	: Austrian-German Biochemist Richard Kuhn (Winner of the 1938 Nobel Prize in Chemistry for his work on carotenoids and vitamins) was born.
3 December 1933	: Dutch Chemist Paul J. Crutzen (Co- winner of the 1995 Nobel Prize in Chemistry for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone) was born.
3 December 1967	: First successful heart transplant carried out by Christiaan Barnard.
4 December 1908	: American bacteriologist Alfred Hershey (co-winner of the 1969 Nobel Prize in Physiology or Medicine for their discovery on the replication of viruses and their genetic structure) was born.
5 December 1901	: German Physicist Werner Heisenberg (Winner of the 1932 Nobel Prize in Physics for the creation of quantum mechanics) was born.
5 December 1903	: English Physicist Cecil Frank Powell (Winner of the 1950 Nobel Prize in Physics for his development of the photographic method of studying nuclear processes and his discoveries regarding mesons made with this method) was born.
8 December 1947	: American Chemist Thomas R. Cech (Co- winner of the 1989 Nobel Prize in Chemistry for their discovery of the catalytic properties of RNA) was born.
9 December 1868	: German Chemist Fritz Haber (Winner of the 1918 Nobel Prize in Chemistry for his invention of the Haber- Bosch process, a method used in industry to synthesize ammonia from nitrogen gas and hydrogen gas) was born.
10 December 1934	: American geneticist Howard Martin Temin (Co- winner of the 1975 Nobel Prize in Physiology or Medicine for discovery of reverse transcriptase) was born.
11 December 1843	: German bacteriologist Robert Koch (Winner of the 1905 Nobel Prize in Physiology or Medicine for his investigations and discoveries in relation to tuberculosis) was born.
11 December 1882	: German Physicist Max Born (Winner of the 1954 Nobel Prize in Physics for his fundamental research in quantum mechanics, especially in the statistical interpretation of the wave function) was born.
11 December 1925	: American neuroscientist Paul Greengard (Co- winner of the 2000 Nobel Prize in Physiology or Medicine for their discoveries concerning signal transduction in the nervous system) was born.
12 December 1866	: Swiss Chemist Alfred Werner (Winner of the 1913 Nobel Prize in Chemistry for proposing the octahedral configuration of transition metal complexes) was born.
13 December 1923	: American Physicist Philip Warren Anderson (Co-winner of the 1977 Nobel Prize in Physics for his investigations into the electronic structure of magnetic and disordered systems, which allowed for the development of electronic switching and memory devices in computers) was born.
14 December 1546	: Danish astronomer and alchemist Tycho Brahe was born.
14 December 1909	: American geneticist Edward Tatum (Co-winner of the 1958 Nobel Prize in Physiology or Medicine for showing that genes control individual steps in metabolism) was born.
14 December 1922	: Soviet Physicist Nikolay Basov (Co-winner of the 1964 Nobel Prize in Physics for his fundamental work in the field of quantum electronics that led to the development of laser and maser) was born.
15 December 1852	: French Physicist Henri Becquerel (Co-winner of the 1903 Nobel Prize in Physics for the discovery of spontaneous radioactivity) was born.
17 December 1908	: Willard Frank Libby (Inventor of The Carbon – 14) was born.
18 December 1856	: English Physicist Joseph John Thomson (Discoverer of electron) was born.
20 December 1890	: Czech Chemist Jaroslav Heyrovsky (Winner of the 1959 Nobel Prize in Chemistry for his invention and development of the polarographic methods of analysis) was born.
31 December 1937	: Israeli biologist Avram Hershko (Co-winner of the 2004 Nobel Prize in Chemistry for his discovery of ubiquitin-mediated protein degradation) was born.

U.N. – United Nations

WHO – World Health Organization

UNESCO – United Nations Educational Scientific & Cultural Organization

Answer: 1. a 2. a 3. b 4. b 5. c

SCIENTIFIC QUESTION

Solenoid – Definition and How does it Work?

Solenoids are basically coils of wire. These generate a magnetic field, which exerts a force over a metallic element. This happens when we apply the electric current to the solenoid.

Solenoids help the energy to convert into action instantly. Therefore, these work decently for those applications which require immediate action.

Solenoid in Physics

A solenoid is a basic term for a coil of wire that we use as an electromagnet. We also refer to the device that can convert electrical energy into mechanical energy as a solenoid.

Actually it generates a magnetic field for creating linear motion from the electric current. With the use of a magnetic field.

Basic applications of the solenoids are to be used in switch for power. Like the starter in any vehicle. A valve in a sprinkler system is also an example.

How does Solenoid work?

As discussed above a solenoid is a coil of wire. It is in the shape of a corkscrew and wraps around a piston. On the other hand, it is made up of iron. Likely in all the electromagnets. When an electric current passes through the wire, a magnetic field gets generated.

More importantly, electromagnets are better as compared to the permanent magnets because they can be switched on and off by the removal of the electric current or by the application.

This makes them more useful like switches and valves and also allows them automated entirely. Likewise, all other magnets and activated solenoid's magnetic field has both positive and negative poles that result in attracting or repelling material sensitive to magnets.

Electric Solenoids

The starter solenoid in an automobile ignition system acts as a relay. This brings the metal contacts at a place that results in closing a circuit. When the motorcar's ignition activates, the starter solenoid receives a small electric current, basically by the turn of the key.

Then the solenoid's magnetic field pulls on the contact, and this process closes the circuit between the starter motor and the car's battery. In order to maintain the circuit, the starter solenoid needs a constant flow of electricity. When the engine starts then the solenoids are not most active because the engine is self-powering.

Uses of Solenoids

Solenoids are extremely useful and incredibly versatile. We can find them almost everywhere from doorbells to paintball guns and even in automated factory equipment. In doorbell, the audible sound gets generated because the metal piston strikes at a tone bar.

The magnetic field of solenoids is the force that moves the piston and this force receives the electric current when we ring the

doorbell.

Functions of Solenoid

As the electric current passes through the solenoid's coils, the creation of a magnetic field takes place. The magnitude strength is measured by the number of coils.

The armature in a solenoid is movable; therefore, a voltage passes through the coils and the armature increases the flux linkage by its movement.

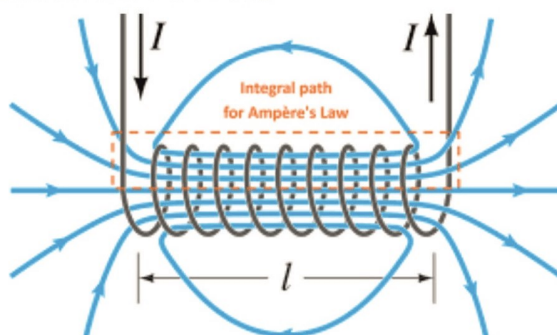
This happens due to the closing of the air gap between the two cores which are movable. They come with the spring so that the voltage is switched off the solenoid, and then solenoid gets back to its initial position.

Uses of Solenoid

The solenoids are useful in many applications, from appliances to electron hobbies. They are usually found in the applications that require a feature that can automatically turn the appliance on or off. For example, an electric torch or an engine kill switch commonly used in motorbikes nowadays.

Main Source:

<https://www.toppr.com/guides/physics/electronics/solenoid-definition-and-how-does-it-work/>

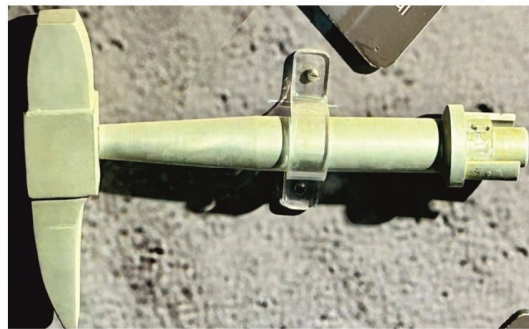


KNOW THE ENTERING INTO SPACE GALLERY EXHIBIT

Space Tools – Hammer

This is a light weight lunar hammer designed to chip a sample of rock, from a larger rock. Hammers of this style were used on Apollo 11 and 12 mission.

This exhibit is situated at “Entering Space Gallery” between Fun Science Gallery and Power of Play Gallery at the first floor of Science Centre.



SCIENCE FAIR-2024

Surat Municipal Corporation had organized “Science Fair-2024” at Art Gallery, Science Centre Surat on 16th and 17th August, 2024 for the students of Std. 8 to 12. Shreemati Savitreebai Fule Primary Girls School No. 47 had participated in the Science Fair with their project on “Eco Friendly Insecticide” under the sub theme of “Indigenous Technologies for Agriculture”

The aim of the project was to avoid the use of expensive pesticides by the farmer using low cost “Eco-Friendly Insecticide”.

This eco-friendly insecticide is hung in the field during the night with the power supply switched on. Insects are attracted to the artificial light of this machine, move towards this machine, get stuck in the fan and die.

Advantages:

- Use of this insecticide reduces the expense of the farmer.
- The side effects of the chemicals in the pesticides, available in the market, on the human body can be reduced.



QUIZ

1. Which of these is not an Element?

- a. Water b. Carbon c. Nitrogen d. Oxygen

2. Chemical symbol of Gold is _____.

- a. Au b. Ag c. Fe d. cu

3. What is the pH of a Neutral solution?

- a. 0 b. 7 c. 14 d. 1

4. What is the Chemical formula for Sulfuric Acid?

- a. HCL b. H₂SO₄ c. NaOH d. CH₄

5. Which of these is an Alkali Metal?

- a. Calcium b. Aluminum c. Lithium d. Zinc

Main source:

<https://generalknowledgequestion.com>