

SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

WHAT'S NEW IN SCIENCE?

ISRO's AstroSat catches never-before-seen nuclear explosion in Andromeda Galaxy

Researchers had detected far-ultraviolet emissions from Novae (sudden, bright explosions on Stars) during their outbursts in the Andromeda Galaxy.

This finding was led by the Indian Institute of Astrophysics (IIA), Bengaluru (offer fresh perspective on these stellar phenomena). Novae occur in Binary Star Systems where a dense, Earth-sized white dwarf Star orbits closely with a Sun-like companion. The white dwarf Star's strong gravitational pull draws matter from its companion, creating an intense accumulation of material on its surface. This process triggers powerful thermonuclear reactions, producing a sudden bright burst visible as a Nova.

Using data from the Ultraviolet Imaging Telescope (UVIT) aboard ISRO'S

AstroSat satellite, the Researchers identified ultraviolet emissions from 42 novae.

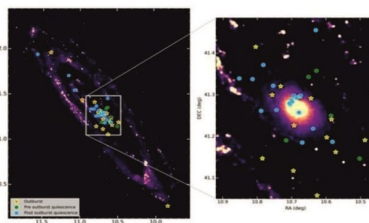
Researchers also observed periods of dimming described as a "calm before the storm", when the accumulated material acts as a shell, blocking radiation. Once conditions reach a critical threshold, a massive thermonuclear explosion occurs, ejecting matter into space and dramatically increasing the system's brightness.

The findings emphasize the importance of future ultraviolet and X-ray missions to unravel the mysteries of novae, advancing our understanding of stellar evolution and galactic Chemistry.

Author: Sibukumar Tripathi

Main Source:

<https://www.indiatoday.in/science/story/isros-astrosat-catches-never-before-seen-nuclear-explosion-in-andromeda-galaxy-2646087-2024-12-06>



SCIENTIST OF THE MONTH

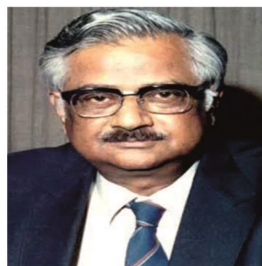
Dr. Raja Ramanna

Dr. Raja Ramanna was born on 28 January, 1925 in Tumkur district, Karnataka. He did B.Sc (Bachelor of Science) in Physics from the University of Madras, Chennai in 1945 and M.Sc (Master of Science) from Bombay University, Ph.D (Doctor of Philosophy) in Nuclear Physics from King's College, London in 1949.

Dr. Ramanna was involved in the designing of the first Indian reactor 'Apsara'. He was renowned for his contributions in the Phenomena of Nuclear fission and Neutron Thermalisation. He has created a group to

research this field and his successful direction of the research activities has earned him international recognition. He has published more than 100 research papers. He was also the Editor of the journal 'Nuclear Physics'.

He was awarded the Shanti Swarup Bhatnagar Prize in 1963, Padma Shri in 1968, Padma Bhushan in 1973 and Padma Vibhushan in 1975. He died on 24 September 2004.



Main Source: 101 Great Scientists Book/Shyum Dua

Image::

https://en.wikipedia.org/wiki/Raja_Ramanna#/media/File:RajaRamannaPic.jpg

SCIENCE FACTS JANUARY 2025



Timings
Tuesday to Sunday
& Public Holidays
9.30 am to 4.30 pm

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1 January 1925	: American astronomer Edwin Hubble announces the discovery of galaxy outside the Milky Way.
2 January 1822	: German Physicist Rudolf Clausius (Who introduced the concept of entropy) was born.
4 January 1643	: English mathematician and natural philosopher Sir Isaac Newton (established classical mechanics) was born.
4 January 1940	: Welsh Physicist Brian Josephson (Co-winner of the 1973 Nobel Prize in Physics for his theoretical predictions of the Josephson effect) was born.
*6 January 1795	: French Chemist Anselme Payen (Discoverer of the enzyme diastase and the carbohydrate cellulose) was born.
6 January 1838	: Samuel Morse successfully tested the electrical telegraph, for the first time.
7 January 1610	: Galileo Galilei observes the four largest moons of Jupiter for the first time.
7 January 1941	: English Chemist John E. Walker (Co-winner of the 1997 Nobel Prize in Chemistry for their elucidation of the enzymatic mechanism underlying the synthesis of adenosine triphosphate) was born.
8 January 1891	: German Physicist Walther Bothe (Co-winner of the 1954 Nobel Prize in Physics in recognition of his development of the coincidence counting method in the study of cosmic radiation and the discoveries he made with it) was born.
9 January 1816	: Sir Humphry Davy test the Davy lamp for miners at Hebburn Colliery.
10 January 1938	: American Physicist and radio astronomer Robert Woodrow Wilson (Co-winner of the 1978 Nobel Prize in Physics for their discovery of cosmic microwave background radiation) was born.
11 January 1787	: William Herschel discovers Titania and Oberon, two moons of Uranus.
11 January 1924	: French neuroendocrinologist Roger Guillemin (Co-winner of the 1977 Nobel Prize in Physiology Or Medicine for their discoveries concerning the peptide hormone production of the brain) was born.
12 January 1899	: Swiss Chemist Paul Hermann Muller (Winner of the 1948 Nobel Prize in Physiology or Medicine for his 1939 discovery of insecticidal qualities and use of DDT in the control of vector diseases such as malaria and yellow fever) was born.
13 January 1864	: German Physicist Wilhelm Wien (Winner of the 1911 Nobel Prize in Physics for his discoveries regarding the laws governing the radiation of heat) was born.
15 January 1895	: Finnish Chemist Artturi Ilmari Virtanen (Winner of the 1945 Nobel Prize in Chemistry for his research and inventions in agricultural and nutrition chemistry, especially for his fodder preservation method) was born.
18 January 1896	: The X-ray machine is exhibited for the first time.
20 January 1931	: American Physicist David Lee (Co-winner of the 1996 Nobel Prize in Physics for their discovery of superfluidity in helium-3) was born.
21 January 1912	: German born Biochemist Konrad Emil Bloch (Co-winner of the 1964 Nobel Prize in Physiology or Medicine for discoveries concerning the mechanism and regulation of the cholesterol and fatty acid metabolism) was born.
22 January 1908	: Soviet Physicist Lev Landau (Winner of the 1962 Nobel Prize in Physics for his pioneering theories for condensed matter, especially liquid helium) was born.
22 January 1936	: American Chemist Alan J. Heeger (Co-winner of the 2000 Nobel Prize in Chemistry for their discovery and development of conductive polymers) was born.
23 January 1907	: Japanese Physicist Hideki Yukawa (Winner of the 1949 Nobel Prize in Physics for his prediction of the existence of mesons on the bases of theoretical work on nuclear forces) was born.
23 January 1929	: Canadian Chemist John Charles Polanyi (Co-winner of the 1986 Nobel Prize in Chemistry for his research in Chemical Kinetics) was born.
23 January 1876	: German Chemist Otto Diels (Co-winner of the 1950 Nobel Prize in Chemistry for their discovery and development of the diene synthesis) was born.
25 January 1627	: Irish Chemist Robert Boyle (Known for Boyle's law) was born.
26 January 1911	: German- born Physicist Polykarp Kusch (Co- winner of the 1955 Nobel Prize in Physics for his precision determination of the magnetic moment of the electron) was born.
28 January 1922	: American Biochemist Robert W. Holley (Co- winner of the 1968 Nobel Prize in Physiology/Medicine for describing the structure of an alanine transfer RNA, linking DNA and protein synthesis) was born.
30 January 1899	: South African virologist Max Theiler (Winner of the 1951 Nobel Prize in Physiology or Medicine for developing vaccine against yellow fever) was born.

U.N. – United Nations

WHO – World Health Organization

UNESCO – United Nations Educational Scientific & Cultural Organization

Answers: 1. c 2. a 3. d 4. a 5. b

SCIENTIFIC QUESTION

What is Static electricity or electrostatics?

Static electricity, also known as electrostatics, is the accumulation of electric charge on the surface of an object. This charge can be positive or negative and occurs when the atoms of a material gain or lose electrons.

This static energy is generated when two objects rub against each other, transferring electrons from one to another. The result is that one of the materials is left with an excess of electrons (negative charge) and the other with a deficit of electrons (positive charge). A common example is the sensation of a small electric shock when touching a metal surface after walking on a rug.

How is static electricity generated?

Static electricity is produced when two different materials come into contact and are then separated. This process is known as triboelectricity, transfers electrons from one material to another, creating a charge imbalance.

The most common ways of generating static electricity are:

Friction: This is the most common method. When two materials rub against each other, the electrons move from one material to the other. For example, by rubbing a balloon against your hair, the balloon is negatively charged as it gains electrons, while your hair is positively charged as it loses them.

Contact and separation

By bringing two objects together and then separating

them, static electricity can be generated. For example, friction when peeling off a piece of adhesive tape can cause it to become electrically charged, as some electrons from the surface remain on the tape.

Induction

A charged object can influence another close by without the need to touch it. This occurs because the electric field of the charged object can move electrons in the other object. For example, when a charged comb is brought close to small pieces of paper, these pieces are brought close to the comb without direct contact.

Pressure and deformation

Some materials, such as certain plastics or glass, generate electricity when pressed or deformed. A daily example is when, after sitting on a plastic seat, you feel a small shock when getting up. This happens because the

pressure and movement can create a static charge.

Temperature

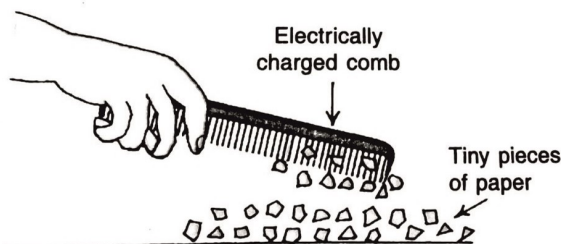
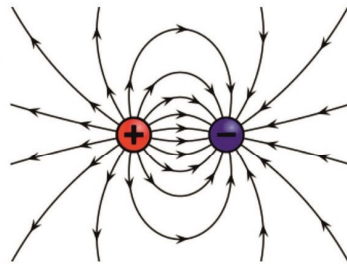
Quick temperature changes can also generate static electricity. For example, when rapidly cooling or heating a plastic bottle, you may feel a small shock when you touch it. This occurs because the change in temperature can redistribute electrons in the plastic.

Influence of external electric

fields

A nearby electric field can make a neutral material charged without the need for contact. An example is when a charged balloon gets close to a water jet; the water curves towards the balloon. This happens because the balloon's electric field reorganizes the water molecules.

Main Source: <https://www.repsol.com/en/energy-and-the-future/future-of-the-world/static-electricity/index.cshtml>



KNOW THE ENTERING INTO SPACE GALLERY EXHIBIT

SpaceTools–Spring Scale

There were strict limits on the weight of materials that could be loaded into the lunar module and returned to Earth. Spring Scales were calibrated for gravity of the Moon and were used to weight lunar rock samples.

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



PLANET JUPITER

Surat Municipal Corporation had organized night sky gazing event at Science Centre Surat in which Planet Jupiter was shown with the help of telescope on 7/12/2024 from 8.00 pm to 9.15 pm. Total 325 visitor viewed the planet in this event.



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. Kavi Shri Usnas Primary School No. 318 had participated in the Science Fair with their project on “Mulching Farming” under the sub theme of “Indigenous Technologies Agriculture.”

The aim of the project was to obtaining good agricultural production by using Mulching Farming method.

In this method, the land is first prepared for growing crops. The bet is kept 3 feet wide and 1 foot thick. At the time of making bet, 1 foot thick and 1 foot wide second bet is made. So after applying the mulching paper, soil can be taken from this bet and placed on the mulching paper thatch, dry leaves, banana's leaf, wood shavings, groundnut husks, vermicomposed manure, etc. can be used as mulch before applying the mulching paper on the main bet. After applying the mulching paper, the holes are made (with the size of crops stem) in the mulching paper at a few intervals and crops are planted in this mulching paper.



Mulching method is successfully used for growing vegetables like Tomato, Ridge Gourd, Brinjal, Bitter Gourd, Cucumber and also crops like cotton.

Advantages of mulching method:

- Vegetable crops are exempt from weed.
- Wastage of water can be avoided. More crop can be produced with less water.
- The production period comes early after planting.
- Mulching paper prevents soil erosion.

QUIZ

1. What is the name of juice secreted from the gall bladder?
a. Saliva b. Hydrochloric acid c. Bile juice d. Maltase
2. Name the metal which is easily cut by a simple knife?
a. Sodium b. Lead c. Tin d. Mercury
3. Name the fabric which is used in making bulletproof jackets?
a. Iron b. Aluminum c. Steel d. Kevlar
4. What is the scientific name of a mango?
a. Mangifera indica b. Rana tigrina c. Homo sapiens d. Felis catus
5. Who is the main producer of our ecosystem?
a. Humans b. Plant c. Animals d. Bacteria

Main source: <https://www.javatpoint.com/general-science-mcq>