

SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

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WHAT'S NEW IN SCIENCE?

ISRO Develops Satellite-Based System To Predict Lightning Events 2.5 Hours In Advance.

In a big boost for public safety, the Indian Space Research Organisation (ISRO) has developed a new system capable of predicting lightning events in India up to 2.5 hours in advance using data from Indian geostationary satellites. Atmospheric lightning is caused by interactions between weather conditions such as surface radiation, temperature, and wind, which trigger convective processes in the lower atmosphere. Prediction of lightning event assumes importance as lightning is a dominant natural hazard over the tropics, ISRO said in a release.



The researchers at ISRO's National Remote Sensing Centre (NRSC) observed lightning signatures in the Outgoing Longwave Radiation (OLR) data from the INSAT-3D satellite. A drop in OLR strength is an indicator for potential lightning occurrences. "The near real-time observations from the INSAT series satellites were utilized to detect and identify signatures indicative of lightning

occurrences," the ISRO said. To improve predictive accuracy, ISRO scientists combined this satellite data with additional parameters such as land surface temperature and wind conditions to develop a "composite variable". "To further enhance the detection of lightning activity, additional parameters such as Land Surface Temperature (LST) and wind were incorporated in the development of a composite variable to improve predictive accuracy. The developed composite variable effectively captures the variations in lightning activity observed by ground-based measurements," ISRO said.

"It provides a reliable indication of when lightning activity is likely to peak or subside, allowing for improved prediction of lightning occurrence and intensity," the Indian space agency said. "This composite variable enables the prediction of lightning occurrences with a lead time of approximately 2.5 hours," it added.

Main Source: : <https://swarajyamag.com/news-brief/isro-develops-satellite-based-system-to-predict-lightning-events-25-hours-in-advance>

SCIENTIST OF THE MONTH

Venkatraman Radhakrishnan

Venkatraman Radhakrishnan was born on 18 May 1929, in Tondiarpet, Madras. He did graduation from Mysore University before joining the Department of Physics at the Indian Institute of Science in Bangalore. The University of Amsterdam conferred the Doctor Honoris Causa degree to Prof. Radhakrishnan in 1996.

Radhakrishnan was also the Member of the Governing Council of the Physical Research Laboratory, Ahmedabad and the Scientific Advisory Committee of the Inter-University Centre for Astronomy and Astrophysics. During the period of 1973–1981. He was a member of the Indian



National Committee for Astronomy.

Radhakrishnan was selected to various scientific bodies, both national and international. He had published more than 80 papers in research journals.

Radhakrishnan also co-edited a book of conference-proceedings, "Supernovae: their Progenitors and Remnants" (1985). He was the chairman of the Editorial Board of the Journal of Astrophysics and Astronomy from 1982 to 1987. He was an Indian Space Scientist.

Radhakrishnan received the M. P. Birla Memorial Award in 2005. He died on 3 March, 2011.

Main Source:
https://en.wikipedia.org/wiki/Venkatraman_Radhakrishnan#Awards



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Tuesday to Sunday
& Public Holidays
9.30 am to 4.30 pm

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SCIENCE FACT MAY 2025

1 May 1852	:	Spanish histologist, neuroscientist Santiago Ramon y Cajal (Co-winner of the 1906 Nobel Prize in Physiology /Medicine in recognition of their work on the structure of the nervous system) was born.
1 May 1930	:	The Planet Pluto is officially named.
3 May	:	International Energy Day.
3 May 1892	:	English Physicist George Paget Thomson (Recognised for discovery of the wave properties of the electron by electron diffraction) was born.
3 May 1902	:	French Physicist Alfred Kastler (Winner of the 1966 Nobel Prize in Physics for the discovery and development of optical methods for studying Hertzian Resonance in atoms) was born.
5 May 1961	:	The first piloted Mercury space craft "Freedom - 7" launched by America.
5 May 1961	:	Alan Shepard becomes the first American to travel into space, making a sub-orbital flight of 15 minutes on the MR-3 mission.
6 May 1871	:	French Chemist Victor Grignard (Discoverer of the Grignard Reagent and Grignard Reaction) was born.
7 May 1939	:	Canadian born Molecular Biologist Sidney Altman (Worked on the catalytic properties of RNA) was born.
7 May 1952	:	The concept for the integrated circuit, the basis for all modern computers, is first published by Geoffrey Dummer.
8 May 1902	:	French Microbiologist Andre Michael Lwoff (Co-winner of the 1965 Nobel Prize in Physiology/ Medicine for their discoveries concerning genetic control of enzyme and virus synthesis) was born.
8 May 1947	:	American Biologist H. Robert Horvitz (Co-winner of the 2002 Nobel Prize in Physiology/Medicine for their discoveries concerning the genetic regulation of organ development and programmed cell death) was born.
11 May 1998	:	India conducted nuclear tests at the Pokhran range in Rajasthan Desert.
13 May 1857	:	Sir Ronald Ross (Inventor of medicine for Malaria) was born.
15 May 1859	:	French Physicist Pierre Curie (A pioneer in Crystallography, Magnetism, Piezoelectricity and Radioactivity) was born.
17 May 1749	:	Sir Edward Anthony Jenner (Inventor of smallpox vaccine) was born.
18 May	:	World AIDS Vaccine Day.
19 May 1910	:	Halley's Comet brushes the Earth with its tail.
19 May 1971	:	Soviet Union had sent "Mars-2" for journey to Planet Mars which was crashed at Mars's Land on 27 Nov, 1971.
21 May 1860	:	Dutch Inventor William Einthoven (Inventor of the first practical electrocardiograph ECG) was born.
25 May 1865	:	Dutch Physicist Pieter Zeeman (Co-winner of the 1902 Nobel Prize in Physics for his discovery of the Zeeman effect) was born.
30 May 1971	:	America launched space craft "Mariner - 9" to Planet Mars.
31 May	:	World No Tobacco Day (by U.N.).

U.N. – United Nations

WHO – World Health Organization

UNESCO – United Nations Educational Scientific & Cultural Organization

Ans. 1. c 2. b 3. c 4. d 5. c

SCIENTIFIC QUESTION

How the star dies?

Several billion years after its life starts, a star will die. How the star dies, however, depends on what type of star it is.

Stars Like the Sun

When the core runs out of hydrogen fuel, it will contract under the weight of gravity.

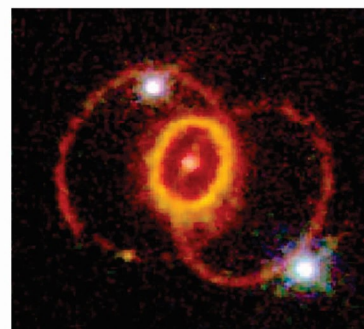
However, some hydrogen fusion will occur in the upper layers. As the core contracts, it heats up. This heats the upper layers, causing them to expand. As the outer layers expand, the radius of the star will

increase and it will become a red giant. The radius of the red giant sun will be just beyond Earth's orbit. At some point after this, the core will become hot enough to cause the helium to fuse into carbon. When the helium fuel runs out, the core will expand and cool. The upper layers will expand and eject material that will collect around the dying star to form a planetary nebula. Finally, the core will cool into a white dwarf and then eventually into a black dwarf. This entire process will take a few billion years.



Stars More Massive Than the Sun

When the core runs out of hydrogen, these stars fuse helium into carbon just like the sun. However, after the helium is gone, their mass is enough to fuse carbon into heavier elements such as oxygen, neon, silicon, magnesium, sulfur and iron. Once the core has turned to iron, it can burn no longer. The star collapses by its own gravity and the iron core heats up. The core becomes so tightly packed that protons and electrons merge to form neutrons. In less than a second, the iron



core, which is about the size of Earth, shrinks to a neutron core with a radius of about 6 miles (10 kilometers). The outer layers of the star fall inward on the neutron core, thereby crushing it further. The core heats to billions of degrees and explodes (**supernova**), thereby releasing large amounts of energy and material into space. The shock wave from the supernova can initiate star formation in other interstellar clouds. The remains of the core can form a **neutron star** or a **black hole** depending upon the mass of the original star.

Main source: <https://science.howstuffworks.com/star6.htm>

Exhibition of Fort's Photographs

Surat Municipal Corporation had organized Exhibition of Fort's Photographs at Art Gallery, situated at Historical Fort Surat from 04/04/2025 to 20/04/2025. This exhibition was exhibited as a part of commemoration of 'INTERNATIONAL DAY FOR MONUMENTS AND SITES' also known as 'WORLD HERITAGE DAY' celebrated annually on every 18th April globally. In this exhibition black and white photographs and colour photographs were exhibited which were submitted by the participants in the 'National Photography Competition' which was organized by the Surat Municipal Corporation in the year 2019.



KNOW THE ENTERING SPACE GALLERY EXHIBIT

The large box shaped scoop was used for collecting soil samples on the Moon. It was used on the Apollo 11, 12 and 14 mission.

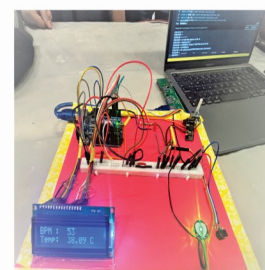
This exhibit is situated at “Entering Space Gallery” between Fun Science Gallery and Power of Play Gallery at First floor of Science Centre.



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. M.U.S. English Medium High School had participated in Science Fair with their project on “Patient Health Monitoring with Arduiano and Sensors” under the subtheme of “Indigenous Technologies for Health Care Innovation”.

The aim of the project was to develop cost-effective, real time machine. An Arduino Uno is a programming circuit. The pulse sensor and temperature sensor both gave pulse rate and temperature rate respectively and send to Arduino Uno. Arduino Uno send data to LCD (Liquid Crystal Display) and ESP8266 wiji module send data to web server. We get data from the web server. Then we can get patient body temperature and body pulse rate.



Advantages:-

1. It can lead to faster treatment.
2. Reduce hospital visits.

Quiz

1. Which Planets has more than 60 moons (Satellites)?
a. Uranus b. Neptune c. Jupiter d. Mars
2. Which of the following is not a Space Shuttle?
a. Colombia b. PSLV c. Challenger d. Discovery
3. In which part of the Space shuttle is the Parachute stored?
a. Liquid Fuel Tank b. Orbiter c. Solid Rocket Booster d. Cockpit
4. What is Silicon?
a. Insulated b. Conductor c. Superconducting d. Semiconductor
5. Which of the following is a Semiconductor element?
a. Zink b. Copper c. Germanium d. Silver