SCIENCE CENTRE NEWS LETTER

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WHAT'S NEW IN SCIENCE?

Is Earth sitting inside a giant hole in space? Astronomers make big discovery.

Astronomers suggest Earth may sit in a giant cosmic void. This could explain the faster local universe expansion, known as 'Hubble tension.'

Astronomers have proposed a groundbreaking theory that suggests Earth and the entire Milky Way galaxy may reside within a vast, mysterious void.

This hypothesis, unveiled at the Royal Astronomical Society's National Astronomy Meeting (NAM) 2025 in Durham, aims to address the long-standing issue of 'Hubble tension,' a discrepancy between the expected and observed expansion rates of the universe.

If proven, this theory could redefine our understanding of the universe's true age, estimated at around 13.8 billion years.

The concept of the Hubble constant, introduced by Edwin Hubble in 1929, measures the universe's expansion rate through the observation of celestial objects and their velocities as they move away from us. However, current models predict a slower expansion compared to actual observations, particularly in the local universe.

"A potential solution to this inconsistency is that our galaxy is close to the centre of a large, local void," explained Dr. Indranil Banik from the University of Portsmouth.

In this scenario, gravitational forces pull matter towards denser regions outside the void. As the void empties, the velocity of objects moving away from us appears faster, giving the impression of an accelerated local expansion rate.

The idea of a local void is supported by direct galaxy counts, indicating a lower galaxy density in our vicinity compared to surrounding regions. However, this notion remains controversial as it contradicts the standard cosmological model, which expects a more uniform distribution of matter on such large scales.

Dr. Banik's presentation at NAM 2025 highlighted data from baryon acoustic oscillations (BAOs), described as the 'sound of the Big Bang.'

"These sound waves travelled for only a short while before becoming frozen in place once the universe cooled enough for neutral atoms to form," he noted. "They act as a standard ruler, whose angular size we can use to chart the cosmic expansion history."

The presence of a local void is suggested to distort the relationship between the BAO angular scale and red shift, due to increased velocities and gravitational effects.

Over the last two decades of BAO measurement analysis, this void model appears significantly more plausible than a void-free model aligned with the parameters of the Planck satellite observations.

Future research will involve comparing this local void model with other methods for estimating the universe's expansion history, such as cosmic chronometers. These methods involve analysing galaxies no longer forming stars to determine their age and expansion metrics.

By observing their spectra, astronomers can assess what types of stars they contain. The combination of these findings with galaxy redshift data provides further insights into the cosmic expansion narrative.

Main Source:-
:https://www.indiatoday.in/science/story/is-earth-sitting-inside-a-giant-hole-in-space-astronomers-make-big-discovery-2753082-2025-07-09

SCIENCE FACTS AUGUST 2025

1 August 1885	Hungarian Chemist George de Hevesy (Winner of the 1943 Nobel Prize in Chemis -try for his key role in the development of radioactive tracers) was born.
1 August 1924	Ukrainian-born Physicist Georges Charpak (Winner of the 1992 Nobel Prize in Physics for his invention and development of particle detectors) was born.
1 August 1945	American Physicist Douglas D. Osheroff (Co-winner of the 1996 Nobel Prize in Physics for their discovery of superfluidity in helium -3) was born.
2 August 1932	The positron (Antiparticle of the electron) was discovered by Carl D. Anderson.
3 August 1959	Japanese Scientist Koichi Tanaka (Co-winner of the 2002 Nobel Prize in Chemistry for developing a novel method for mass spectrometric analysis of biological micromolecules) was born.
6 August 1881	Prof. Alexander Fleming (Discoverer of Penicillin) was born.
7 August 1976	Viking 2 entered into orbit around Mars.
8 August 1901	Ernest Lawrence (Inventor of Cyclotron) was born.
8 August 1931	British Physicist Sir Roger Penrose (Co-winner of the 2020 Nobel Prize in Physics for the discovery that black hole formation is a robust prediction of the general theory of relativity) was born.
9 August 1911	American Physicist William Alfred Fowler (Co- winner of the 1983 Nobel Prize in Physics for his theoretical and experimental studies of the nuclear reactions of importance in the formation of the chemical elements in the universe) was born
10 August 1902	Swedish Chemist Arne Tiselius (Winner of the 1948 Nobel Prize in Chemistry for his research on electrophoresis adsorption analysis, especially for his discoveries concerning the complex nature of the serum proteins) was born.
11 August 1926	Lithuanian-born Chemist Aaron Klug (Winner of the 1982 Nobel Prize in Chemistry for his development of crystallographic electron microscopy and his structural elucidation of biologically important nucleic acid-protein complexes) was born.
12 August 1887	Austrian Physicist Erwin Schrodinger (Co-winner of the 1933 Nobel Prize in Physics for the formulation of the Schrodinger equation) was born.
12 August 1919	Well known Indian Scientist Dr.Vikaram Ambalal Sarabhai was born on this day.
13 August 1913	Harry Brearley invented stainless steel.
15 august 1892	French Physicist Louis de Broglie (Winner of the 1929 Nobel Prize in Physics for his discovery of the wave nature of electrons) was born.
16 August 1845	French Physicist Gabriel Lippmann (Winner of the 1908 Nobel Prize in Physics for the invention of a method for reproducing colours by photographically based on the phenomenon of interference) was born
17 August 1870	Frederick Russell (Inventor of first successful typhoid fever vaccine) was born on this day.
20 August 1779	Swedish Chemist Jons Jakob Berzelius (Credited with discovering the chemical elements cerium and selenium and with being the first to isolate silicon, thorium and zirconium) was born.
23 August 1931	American microbiologist Hamilton O. Smith (Co-winner of the 1978 Nobel Prize in Physiology or Medicine for discovering type II restriction enzymes) was born.
25 August 1900	German Physician and biochemist Hans Adolf Krebs (Co-winner of the 1953 Nobel Prize in Physiology or Medicine for his discovery of the citric acid cycle) was born.
26 August 1906	Albert Sabin (Inventor of oral polio vaccine) was born on this day.
30 August 1852	Dutch Physical and Organic Chemist Jacobus Henricus van't Hoff (The first winner of the Nobel Prize in Chemistry) was born.

U.N. – United Nations

WHO – World Health Organization

UNESCO – United Nations Educational Scientific & Cultural Organization

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Tuesday to Sunday
& Public Holidays

9.30 am to 4.30 pm

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सूरत महानगर पालिका

बहुजनहिताय बहुजनसुखाय

SCIENTIFIC QUESTION

What is the Internet, distributed networking, and why is this concept important for the Internet?

Before we cover what the Internet is, we must define what a "network" is. A network is a group of connected computers that are able to send data to each other. A computer network is much like a social circle, which is a group of people who all know each other, regularly exchange information, and coordinate activities together.

The Internet is a vast, sprawling collection of networks that connect to each other. In fact, the word "Internet" could be said to come from this concept: interconnected networks.

Since computers connect to each other within networks and these networks also are connect with each other, one computer can talk to another computer in a faraway network thanks to the Internet. This makes it possible to rapidly exchange information between computers across the world.

Computers connect to each other and to the Internet via wires, cables, radio waves, and other types of networking infrastructure. All data sent over the Internet is translated into pulses of light or electricity, also called "bits," and then interpreted by the receiving computer. The wires, cables, and radio waves conduct these bits at the speed of light. The more bits that can pass over these wires and cables at once, the faster the Internet works.

There is no control center for the Internet. Instead, it is a distributed networking system, meaning it is not dependent on any individual machine. Any computer or hardware that can send and receive data in the correct fashion (e.g. using the correct networking protocols) can be part of the Internet.

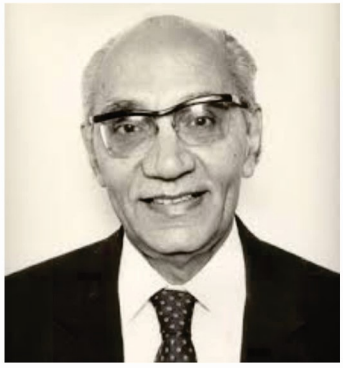
The Internet's distributed nature makes it resilient. Computers, servers, and other pieces of networking hardware connect and disconnect from the Internet all the time without impacting how the Internet functions — unlike a computer, which may not function at all if it is missing a component. This applies even at a large scale: if a server, an entire data center, or an entire region of data centers goes down, the rest of the Internet can still function.

Main Source:
https://www.cloudflare.com/learning/network-layer/how-does-the-internet-work/

SCIENTIST OF THE MONTH

Dr. Vulimiri Ramalingaswami

Dr. Vulimiri Ramalingaswami was born on 8 August, 1921 at Srikakulum, Andhra Pradesh. He did M.B.B.S and M.D. from the Andhra University, Vishakapatnam in 1944. He did D.Phil and D.Sc. from Oxford University, U.K.



Professor Ramalingaswami has done innovative work in the area of 'Protein, Calorie malnutrition'. This is the predominant cause of a widely occurring disease in India and other developing countries among young and growing children. His researches have helped in understanding how the human body responds to the deficiency of proteins and calories. He also worked on the pathophysiology of malnutrition and identified the cause of the Himalayan Endemic goiter and the way to its prevention by the use of iodised salt in the Kangra Valley. His research papers are now part of several standard books of medicine.

Dr. Ramalingaswami received the Shanti Swarup Bhatnagar Prize for Medical Sciences in 1965, the Padma Shri awarded in 1969, the Padma Bhushan awarded in 1971 and the Aryabhatta Medal in 1994.

Main Source: 101, Great Indian Scientists Book, By Shyam Dum

SCIENCE FAIR 2025

Surat Municipal Corporation is going to organize 'Science Fair-2025' at Art Gallery, Science Centre on 22th and 23th August 2025 having two groups:

Group A: Students of Std. 8 to 10

Group B: Students of Std. 11 to 12

Theme of the 'Science Fair-2025' is "Empowering Indian Youth for Global Leader in Science and Innovation for Viksit Bharat", the SubthemeS for the Science Fair are as follows:

1. Building Sustainable future of Digital India for the Global Leadership
2. Empowering youth for Viksit Bharat
3. Enhancing skill development of youth in the field of Science & Innovation

Interested Schools can download the form from www.suratmunicipal.gov.in and submit the form on sciencecentre@suratmunicipal.org or at Science centre on or before Dt. 08/08/2025 up to 16.00 hrs.

KNOW THE ENTERING SPACE GALLERY EXHIBIT

Iinternational Space Law – Signatories

107 Countries have signed these treaties and principles including India, USA, United Kingdom, Soviet Russia and others. The next section will highlight few important articles of these treaties and principles.

This exhibit is located in the Entering Space Gallery on the first floor of the Science Centre, situated between the Fun Science Gallery and the Power of Play Gallery.

Zero Shadow Day

Zero Shadow Day is a celestial phenomenon that takes place twice a year near equator, between the Tropic of Cancer (+ 23.5 degree latitude) and the Tropic of Capricorn (-23.5 degree latitute). On that day (17th July), the Sun passed over the head at 12:45 pm in Surat city. At that time, the shadow of object is in vertical direction thus one cannot see shadow of the object. Science Centre Surat had organized this event.