

SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

WHAT'S NEW IN SCIENCE?

Indian team of Scientists reveals day-night secrets of Mars's magnetic field

Scientists from the Indian Institute of Geomagnetism (IIG), who have a long history of studying Earth's magnetic fields, have expanded their research to Mars.

Indian scientists studying Mars have discovered that the planet's crustal magnetic field has a significant effect during the day but is nearly absent at night.

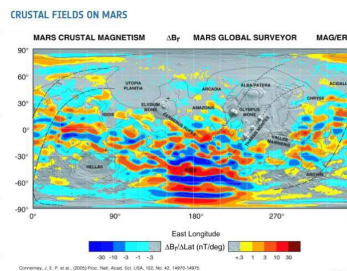
This discovery is important for understanding Mars's magnetic environment, which could impact future human and robotic missions.

Unlike Earth, Mars does not have a global magnetic field. Instead, it has scattered crustal magnetic fields located primarily in the southern hemisphere, specifically poleward of 30°S latitude and between 120°E to 240°E longitude.

These fields create local magnetic effects, which vary greatly between day and night.

Their team, consisting of C. Nayak, E. Yigit, B. Remya, J. Bulusu, S. Devanandhan, S. Singh, A.P. Dimri, and P. Padhye, conducted a detailed study on how Mars's weak crustal magnetic fields affect its ionosphere.

Their research found that during the daytime, these crustal magnetic fields have a strong influence on the ionosphere, especially in the southern hemisphere, where the effect is much stronger than in the northern hemisphere.



Date: 18 October 2005
Satellite: Mars Global Surveyor
Dataset: Mars' crustal magnetism
Copyright: NASA



At night, however, this control weakens, causing the differences between the magnetic fields of hemispheres to disappear. The researchers observed that this daytime control of the crustal magnetic fields remains consistent regardless of the season or the distance between Mars and the Sun. This suggests that the daytime effects of the magnetic fields are stable and unaffected by these factors. The findings were published in the Journal of Geophysical Research: Space Physics in which the team conducted their study using nearly eight years of data from NASA's MAVEN (Mars Atmosphere and Volatile Evolution) satellite, which has been orbiting Mars since 2014. The MAVEN satellite provided detailed measurements of electron density and magnetic fields around Mars, helping scientists understand how the crustal magnetic fields influence the Martian ionosphere.

This research is a step forward in understanding Mars's magnetic environment, which could be crucial for planning future missions to the Red Planet.

Main Source :
<https://www.indiatoday.in/science/story/indian-team-reveals-day-night-secrets-of-marss-magnetic-field-2590839-2024-08-30>

SCIENTIST OF THE MONTH

Dr. Gopalamudram Narayanan Ramachandran

Dr. Gopalamudram Narayanan Ramachandran was born on 8 October 1922, in Ernakulam, Cochin, India. He did B.Sc (Bachelor of Science) in Physics from St. Joseph's College, Tiruchirappalli, Tamil Nadu in 1939 and M.Sc (Master of Science) in Physics from the University of Madras, Chennai in 1942. He did Ph.D (Doctor of Philosophy) in X-ray diffuse scattering and its application to Elastic constants from the Cavendish Laboratory, Cambridge, UK in 1949. He mostly studied Crystal Physics and Crystal Optics. During his studies he created an X-ray focusing mirror for the X-ray Microscope.

Dr. G. N. Ramachandran was an Indian

Physicist who was known for his work that led to his creation of the Ramachandran Plot for understanding Peptide Structure. He was the first to propose a 'Triple-Helical Model' for the structure of Collagen.



Dr. G. N. Ramachandran received the Shanti Swarup Bhatnagar Award in 1961, the Jawarharlal Nehru Fellowship in 1968 and the International Union of Crystallography honored him with the Ewald Prize for his 'Outstanding Contributions to Crystallography' in 1999. He died on 7 April, 2001.

Main Source and image:-
https://en.wikipedia.org/wiki/G._N._Ramachandran

SCIENCE FACTS OCTOBER 2024



Timings

Tuesday to Sunday
& Public Holidays
9.30 am to 4.30 pm

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2 October 1852	: Scottish Chemist William Ramsay (Winner of the 1904 Nobel Prize in Chemistry who discovered the noble gases) was born.
2 October 1917	: English born Biologist Christian de Duve (Co-winner of the 1974 Nobel Prize in Physiology/Medicine for their discoveries concerning the structural and functional organization of the cell) was born.
3 October 1904	: American Chemist Charles J. Pedersen (Co-winner of the 1987 Nobel Prize in Chemistry for describing methods of synthesizing crown ethers) was born.
4 to 10 October	: World Space Week (by U.N.)
4 October 1916	: Russian Physicist Vitaly Ginzburg (Co-winner of the 2003 Nobel Prize in Physics for their pioneering contributions to the theory of superconductors and superfluids) was born.
4 October 1957	: Soviet Union launched first artificial Earth Satellite named "Sputnik-1"
5 October 1882	: American rocket scientist Robert Goddard was born.
6 October 1903	: Irish Physicist Ernest Walton (Co-winner of the 1951 Nobel prize in Physics for their work on the transmutation of the atomic nuclei by artificially accelerated atomic particles) was born
7 October 1885	: Danish Physicist Niels Bohr (Who made foundational contributions to understanding atomic structure and quantum theory) was born.
7 October 1939	: English Chemist Harold Kroto (Co-winner of the 1996 Nobel Prize in Physics for their discovery of fullerenes) was born.
8 October 1917	: English Biochemist Rodney Robert Porter (Co-winner of the 1972 Nobel Prize in Physiology/Medicine for determining the chemical structure of an antibody) was born.
9 October 1852	: German Chemist Hermann Emil Fischer (Winner of the 1902 Nobel Prize in Chemistry in recognition of the extra ordinary services he has rendered by his work on sugar and purine syntheses) was born.
11 October 1884	: German Chemist Friedrich Bergius (Co-winner of the 1931 Nobel Prize in Chemistry in recognition of their contributions to the invention and development of chemical high- pressure methods) was born.
13 October 1773	: The Whirlpool Galaxy is discovered by Charles Messier.
14 October 1914	: American Physicist Raymond Davis Jr. (Co-winner of the 2002 Nobel Prize in Physics who detect neutrinos emitted from the Sun) was born.
18 October 1967	: The Soviet probe Venera 4 reaches Venus and become the first spacecraft to measure the atmosphere of another Planet.
20 October 1891	: English Physicist James Chadwick (Winner of the 1935 Nobel Prize in Physics for his discovery of the neutron in 1932) was born.
22 October 1881	: American Physicist Clinton Davisson (Co- winner of the 1937 Nobel Prize Physics for his discovery of electron diffraction in the famous Davisson- Germer experiment) was born.
22 October 1903	: American Geneticist George Wells Beadle (Co-winner of the 1958 Nobel Prize in Physiology/Medicine for their discovery of the role of genes in regulating biochemical events within cells) was born.
22 October 2008	: India launches its first unmanned lunar mission Chandrayaan-1.
23 October 1905	: Swiss Physicist Felix Bloch (Co-winner of the 1952 Nobel Prize in Physics for their development of new ways and methods for Nuclear Magnetic Precision measurements) was born.
28 October 1914	: British Biochemist Richard Laurence Millington Syngé (Co-winner of the 1952 Nobel Prize in Chemistry for the invention of Partition Chromatography) was born.
30 October 1939	: American scientist Leland H. Hartwell (Co-winner of the 2001 Nobel Prize in Physiology/Medicine for their discoveries of protein molecules that control the division[duplication]) was born.
31 October 1835	: German Chemist Adolf von Baeyer (Winner of the 1905 Nobel Prize in Chemistry in recognition of his services in the advancement of organic chemistry and the chemical industry, through his work on Organic Dyes and Hydroaromatic compounds) was born.

U.N. – United Nations

WHO – World Health Organization

UNESCO – United Nations Educational Scientific & Cultural Organization

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

SCIENTIFIC QUESTION

What is India's Sub-Orbital Space Tourism Mission?

There is a great news for Spaceenthusiast who dreams of taking a trip to travel outside Earth. After seven years one can be able to do that.

Earlier the Space tourism was viewed as a Science fiction, which is now becoming a real.

We are currently in a new era of space tourism, with an increasing number of people leaving earth for limited periods.

The time is about to come when regular long-duration space trips can become a reality.

The Government of India is taking measures to augment domestic capacity for future realization of space tourism. ISRO has also carried out a few feasibility studies for a Sub-Orbital Space Tourism Mission. ISRO is engaged in development of various technologies, which are essential building blocks for human space missions. "Gaganyaan" is India's maiden human spaceflight programme.

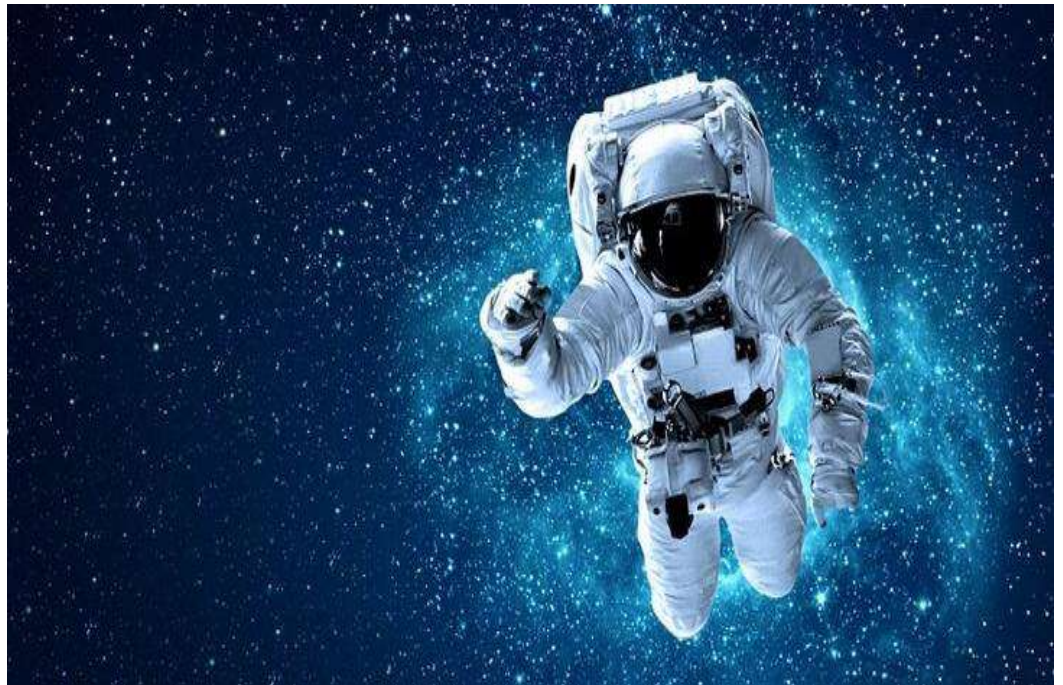
Indian Space Research Organisation (ISRO) Chairman Dr. S. Somnath has said in 2023, "Work is in progress around India's very own space tourism module, which is both safe and reusable. The ticket per person price is likely to be around Rs. 6 crore. People who take the trip will also be able to call themselves astronauts," Putting a timeline on the space travel module, the ISRO chairman added that enthusiasts will be able to take a trip to space by 2030.

The main difference between Sub-Orbital and Orbital Space Travel is the speed at which a vehicle is travelling. An orbital spacecraft must achieve what is known as orbital velocity, whereas a suborbital rocket flies at a speed below that.

Sub-Orbital trips generally involve spending 15 minutes at the edge of space, experiencing a few minutes in a low-gravity environment, before the spaceflight descends back to Earth.

Earlier, in February, 2022 Union Minister of State (Independent Charge) for Science and Technology, Atomic Energy, and Space, Dr. Jitendra Singh, had gave a written reply to the Rajya Sabha that ISRO has already started carrying out feasibility studies for India's sub-orbital space tourism mission.

Scientists from ISRO told that ISRO is likely to partner with private firms for the development of the space travel module via the Indian National Space Promotion and Authorisation Centre (IN-SPACe).



Commenting on the safety aspect of the space trip, the ISRO chairman said that they are using the Reusable Launch Vehicle-Technology Demonstrator (RLV-TD) to gain more knowledge about the safety of the spaceflights.

"Along with the Gaganyaan mission, we are also gaining knowledge from our Reusable Launch Vehicle-Technology Demonstrator (RLV-TD). Since we are bringing space experiences to the common people, we have to ensure that these trips are extremely safe and our technologies pass safety clearances," Dr. Somnath said.

Main Source:

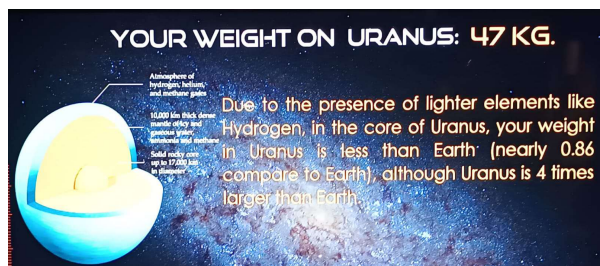
<https://www.indiastrategic.in/isro-plans-to-start-space-tourism-the-next-frontier-by-2030/>

KNOW THE ENTERING INTO SPACE GALLERY EXHIBIT

Your weight Vries

Person has to stand on the platform of the Exhibit. The weight of a person on the different planets will be shown on screen.

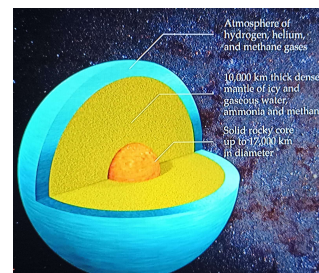
Due to presence of lighter elements like Hydrogen, in the core of Uranus, person's weight in Uranus is less than Earth (nearly 0.86 less compare to Earth), although Uranus is 4 times larger than Earth.



The radioactive chemical element Uranium, discovered in Earth, in 1789, was named after the newly discovered planet Uranus. Uranus is the first planet discovered with the use of a telescope.

Uranus has the coldest temperature than any planet with minimum atmospheric temperature of -224°C . Uranus is the coldest planet in the Solar system.

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 PROJECT

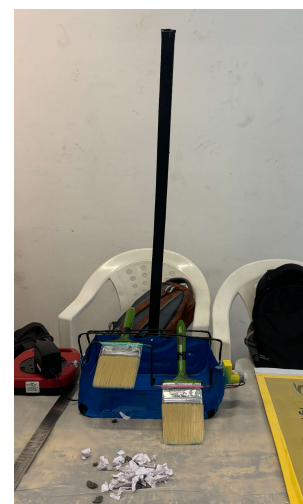
Surat Municipal Corporation had organized "Science Fair-2024" at Art Gallery, Science Centre Surat on 16th and 17th August, 2024 for the students of std. 8 to 12. Gurukrupa Vidhyalaya had participated in the Science Fair with their project on "Electric Cleaning Apparatus" under the sub theme of "Indigenous Technologies to improve Human life"

The aim of the project was "EK KADAM SWACCHATA KI AUR (one step towards cleanliness)". It works on the principle of conversion of Electrical Energy into Mechanical Energy.

When switched on gear motor rotates as an electric current passed through it. The brush rotates as the gear motor rotates and can do cleaning accurately.

Advantages:

1. Time can be saved
2. Cleaning can be done quickly.



QUIZ

1. What type of Chemical reactions take place when Electricity is passed through water?
 - a. Decomposition
 - b. Combination
 - c. Displacement
 - d. Double Displacement
2. What is the main function of the Cerebrum (Brain)?
 - a. Thinking
 - b. Hearing
 - c. Memory
 - d. Balancing
3. What the longest fiber on the cell body of a neuron is called?
 - a. Axon
 - b. Sheath
 - c. Cytoplasm
 - d. Dendrites
4. The blue appearance of the Sky is due to:
 - a. Atmospheric Refraction
 - b. Scattering of light
 - c. Presence of plants in water
 - d. None of this
5. What term is used to refer to the Genetic makeup of an individual organism?
 - a. Allele
 - b. Homozygous
 - c. Genotype
 - d. Phenotype

Main Source: <https://www.jagranjosh.com>