SCIENCE CENTRE NEWS LETTER

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WHAT'S NEW IN SCIENCE?

Study suggests we don't just hear music, but 'become it'.

An international study co-authored by McGill University's psychologist Caroline Palmer suggests our brains and bodies don't just understand music, they physically resonate with it. These discoveries, based on findings in neuroscience, music, and psychology, support Neural Resonance Theory (NRT).

NRT maintains that rather than relying on learned expectations or prediction, musical experiences arise from the brain's natural oscillations that sync with rhythm, melody and harmony. This resonance shapes our sense of timing, musical pleasure and the instinct to move with the beat.

"This theory suggests that music is powerful not just because we hear it, but because our brains and bodies become it," said Palmer, Professor in the Department of Psychology at McGill University and Director of the Sequence Production Lab. "That has big implications for therapy, education and technology." The study's publication in Nature Reviews Neuroscience marks the first time the entire NRT is being published in a single paper, she said.

The theory suggests that structures like pulse and harmony reflect stable resonant patterns in the brain, shared across people independent of their musical background. According to NRT, how we hear and produce music can be explained by fundamental dynamical principles of human brain mechanisms that apply from the ear all the way to the spinal cord and limb movements.

Researchers say potential applications of the theory include:

1. Therapeutic tools for conditions like stroke, Parkinson's and depression
2. Emotionally intelligent AI that can respond to or generate music more like humans
3. New learning technologies to support rhythm and pitch education
4. Cross-cultural insight into why music connects people around the world

The study was led by Edward Large (University of Connecticut) and co-authored by Caroline Palmer. The study was funded in part by a Canada Research Chair and a NSERC Discovery Grant.

Main Source:-
https://www.sciencedaily.com/releases/2025/05/250506170920.htm

KNOW THE ENTERING SPACE GALLERY EXHIBIT

International Space Laws – Introduction

International Space Laws refer to the legal frameworks governing activities in outer space. These laws are designed to promote scientific progress in space while ensuring the security and well-being of humanity. They are established to safeguard mankind, irrespective of social or economic status, caste, race, or any form of discrimination.

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.

SCIENCE FACT JUNE 2025

1 June 1917	:	American Chemist William S. Knowles (Co-winner of the 2001 Nobel Prize in chemistry for his work in asymmetric synthesis, specially in hydrogenation reactions) was born.
3 June 1924	:	Swedish neuroscientist Torsten Wiesel (Co-winner of the 1981 Nobel Prize in Physiology/Medicine for their discoveries concerning information processing in the visual system) was born.
4 June 1877	:	German Biochemist Heinrich Wieland (Made research into the bile acids) was born.
5 June	:	World Environment Day
6 June 1850	:	German Physicist Karl Ferdinand Braun (Co-winner of the 1909 Nobel Prize in Physics for their contributions to the development of wireless telegraphy) was born.
6 June 2012	:	The astronomical event "Transit of Venus" happened on this day
7 June 1862	:	Austrian Physicist Philipp Lenard (Worked on cathode rays and the discoveries of many of their properties) was born.
7 June 1896	:	American Physical Chemist Robert S. Mulliken (Responsible for the early development of molecular orbital theory) was born.
8 June 1916	:	English Molecular Biologist Francis Crick (played crucial roles in deciphering the helical structure of the DNA molecule) was born.
12 June	:	World Day against child labour
12 June 1899	:	American Biochemist Fritz Albert Lipmann (Co- discoverer of coenzyme A) was born.
13 June 1831	:	Scottish Physicist James Clerk Maxwell was born.
13 June 1911	:	American Physicist Luis Alvarez (Winner of the 1968 Nobel Prize in Physics for his discovery of resonance states in particle physics using the hydrogen bubble chamber) was born.
13 June 1983	:	"Pioneer 10" becomes the first manmade object to leave the Solar System.
14 June	:	World Blood Donor Day (WHO)
15 June 1917	:	American Chemist John Fenn (Worked in mass spectrometry) was born.
16 June 1897	:	German Chemist Georg Witting (Reported the method of synthesis of alkenes from aldehydes and ketones using compounds called phosphonium ylides) was born.
18 June 1918	:	American Chemist Jerome Karle (Winner of the 1985 Nobel Prize in Chemistry for the direct analysis of crystal structures using X-ray scattering techniques.) was born.
19 June	:	World Sickle cell Anaemia Awareness Day
19 June 1623	:	French mathematician Blaise Pascal was born.
20 June 1877	:	Alexander Graham Bell installs world's first commercial telephone service in Hamilton, Ontario, Canada.
22 June 1973	:	Successful landing of the astronomer of Skylab in Pacific Ocean after revolving around the earth for 28 days
22 June 2006	:	The newly discovered moons of Pluto are officially named Hydra and Nix by the international Astronomical Union.
24 June 1927	:	American Physicist Martin Lewis Perl (Winner of the 1995 Nobel Prize in Physics for his discovery of the tau lepton) was born.
25 June 1911	:	American Chemist William Howard Stein (Co-winner of the 1972 Nobel Prize in Chemistry for their contribution to the understanding of the connection between chemical structure and catalytic activity of the active centre of the ribonuclease molecule) was born.
28 June 1943	:	German Physicist Klaus von Klitzing (Winner of the 1985 Nobel Prize in Physics for discovery of the integer quantum Hall effect) was born.
30 June 1880	:	Longest total Solar Eclipse of millennium

U.N. – United Nations
WHO – World Health Organization
UNESCO – United Nations Educational Scientific & Cultural Organization

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

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

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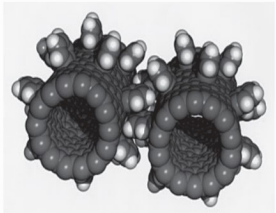
बहुजनहिताय बहुजनसुखाय

SCIENTIFIC QUESTION

What is Nanotechnology?

Nanotechnology is the manipulation of matter with at least one dimension sized from 1 to 100 nanometers (nm). At this scale, commonly known as the nanoscale, surface area and quantum mechanical effects become important in describing properties of matter. This definition of nanotechnology includes all types of research and technologies that deal with these special properties. It is common to see the plural form "nanotechnologies" as well as "nanoscale technologies" to refer to research and applications whose common trait is scale. An earlier understanding of nanotechnology referred to the particular technological goal of precisely manipulating atoms and molecules for fabricating macro-scale products, now referred to as molecular nanotechnology.



Nanotechnology defined by scale includes fields of science such as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, engineering, micro-fabrication, and molecular engineering. The associated research and applications range from extensions of conventional device physics to molecular self-assembly, from developing new materials with dimensions on the nanoscale to direct control of matter on the atomic scale.

Nanotechnology may be able to create new materials and devices with diverse applications, such as in nano-medicine, nano-electronics, agricultural sectors, biomaterials energy production, and consumer products. However, nano technology raises issues, including concerns about the toxicity and environmental impact of nonmaterial, and their potential effects on global economics, as well as various doomsday scenarios.

Main source: https://en.wikipedia.org/wiki/Nanotechnology

SCIENTIST OF THE MONTH

Dr. Padmanabha Krishnagopala Iyengar

Dr. Padmanabha Krishnagopala Iyengar, born on 29th June 1931 in Tirunelveli, Tamil Nadu, was an eminent Indian nuclear physicist. He completed his undergraduate and postgraduate studies in Science from H. H. Maharaja's University College, Trivandrum (Tirunelveli). He then pursued a Ph.D. in Nuclear Physics from the University of Mumbai.

In 1990, Dr. P. K. Iyengar was appointed Chairman of the Atomic Energy Commission of India and Secretary to the Department of Atomic Energy. Additionally, he served as the Chairman of the Nuclear Power Corporation of India. Under his leadership, the Department of Atomic Energy made significant strides in India's nuclear power program,including the commissioning of two new power reactors at Narora and Kakrapar. Furthermore, Dr. Iyengar championed the development of new reactor systems, such as liquid-sodium-based fast reactors.

He was the recipient of numerous prestigious awards, including: Bhatnagar Award in 1971, Padma Bhushan Award in 1975, Raman Centenary Medal in 1988, Bhabha Medal in 1990, R. D. Birla Award 1992, Jawaharlal Nehru Birth Centenary Award in 1993 and Homi Bhabha Medal in 2006. Dr. P. K. Iyengar passed away on 21st December 2011.

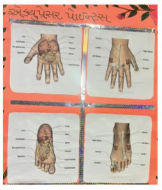
Main Source:- https://en.wikipedia.org/wiki/P._K._Iyengar

SUMMER CAMP 2025

The Surat Municipal Corporation has organized a Summer Camp at the Science Centre, Surat, from 10th May 2025 to 20th May 2025. A total of 60 students participated in the camp, which included educational activities in Paper Art, Basic Science, Basic Astronomy, Basic Physics, Art (Lipan, Warli, Mandala, Madhubani, Handmade Jewelry), Robotics, and Drone technology.

SCIENCE FAIR-2024

The Surat Municipal Corporation organized the "Science Fair-2024" at the Art Gallery, Science Centre Surat, on 16th and 17th August 2024, for students from grades 8 to 12. Smt. V. B. N. Shah Jeevan Bharti Uchchater Madhyamik Vidhayalay participated in the Science Fair with their project on the "Treatment of Diseases by Acupressure," under the subtheme of "Indigenous Technologies for Health Care Innovation."The objective of the project was to raise awareness about acupressure as a traditional healing method.



'AYUSH' includes various disciplines of medicine: A- Ayush, Y- Yoga, U- Unani, S- Sidda and H- Homeopathy. In which, Acupressure is a therapeutic method incorporated in Yoga and Naturopathy.

According to the World Health Organization (WHO), 70% of people suffer from ailments such as headaches, neck pain, back pain, and knee pain. The points corresponding to various internal organs of the human body are located on the palms of the hands and the soles of the feet. By applying pressure to these specific points, these issues can be alleviated.

Advantages of Acupressure:

1. Simple and easy to apply
2. No side effects or adverse reactions
3. No special equipment required
4. Highly effective

Quiz

1. How many meters is 10 nanometers?
a. 10^{-8} b. 10^{-7} c. 10^{-9} d. 10^{-10}

2. What is the size of a nanometers?
a. 100 to 1000 nm b. 0.1 to 10 nm c. 1 to 100 nm d. 0.001 to 1 nm

3. How many nanometer is the diameter of Hydrogen atom?
a. 1 b. 0.1 c. 0.01 d. 10

4. What type of bond do Carbon atoms from with other Carbon atoms?
a. Covalent b. Ionic c. Metallic d. Hydrogen

5. How many Carbon atoms is a Fullerene made of?
a. 100 b. 25 c. 75 d. 60

Main Source: Navneet MCQs Science and Technologies. Std 10