

SCIENCE CENTRE NEWS LETTER

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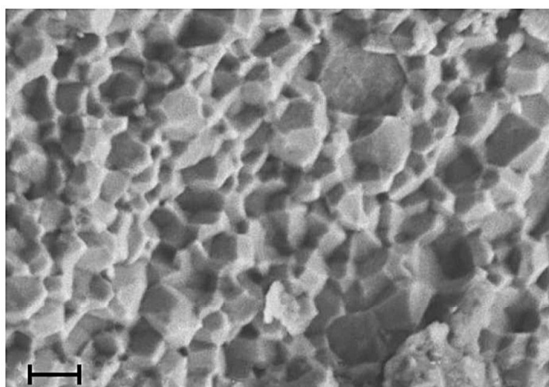
SCIENCE CENTRE

Volume 4, Issue 03

WHAT'S NEW IN SCIENCE

A better way to control crystal vibrations

Researchers have shown that by swapping out just a small fraction of a material's atoms with atoms of a different element, they can control the speed and frequencies of these vibrations. This demonstration, published in Applied Physics Letters by American Institute of Physics (AIP) provides a potentially simpler and cheaper way to tune a material's properties, allowing for a wide range of new and more efficient devices, such as in solid-state lighting and electronics. The natural vibrations of a crystalline material travel as particles called phonons. These phonons carry heat, scatter electrons, and affect electrons' interactions with light. Previously, researchers controlled phonons by dividing the material into smaller pieces whose boundaries can scatter the phonons, limiting their movement. More recently, researchers have engineered nanoscale structures, such as nanowires, into the material to manipulate



phonons' speed and frequencies. Previously, researchers assumed that any significant effect on phonons would require a very high concentration of dopants. But, the team found that doped aluminum oxide with a neodymium density of only 0.1 percent was enough to lower the phonon frequency by a few gigahertz and the speed by 600 meters per second. Boosting phonon speeds increases a material's thermal conductivity, allowing tiny transistors to cool faster. Slowing phonons, on the other hand, would be useful in making more efficient thermoelectric devices, which

convert electricity into heat and vice versa. The researchers are now applying their strategy to other dopants and materials, such as gallium arsenide, with an eye toward developing energy-efficient devices.

Courtesy : Vidhyakunj Higher Secondary School

SCIENTIST OF THE MONTH

Chandra Kumar Naranbhai Patel

Chandra Kumar Naranbhai Patel was born on July 2, 1938 at Baramati in Maharashtra. His father's name was Naranbhai Patel. He did his Bachelors in Engineering from the College of Engineering, Pune University in 1958. He did M.S from the Stanford University in 1959 and his Ph.D. in 1961. After completing his education, Patel became a member of the Technical Staff, Bell Telephone Laboratories, Murry Hill, New Jersey, in 1961. He was also fellow of American Physical Society. Later he served as a



member of the Institute of Electrical and Electronic Engineers and Sigma XI. His principal achievement is the extensive investigation of Laser action in gaseous discharge of laser radiation. He is the inventor of the carbon dioxide Laser. Chandra Kumar Naranbhai Patel received the Adolph Lomb Medal from the Optical Society of America in 1966. He has also won the National Medal of Science.

Courtesy : Vidhyakunj Higher Secondary School



Timings

Tuesday to Friday
9.30 am to 4.30 pm

Saturday - Sunday
& Public Holidays
11.00 am to 6.30 pm

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SCIENCE FACTS JULY 2018

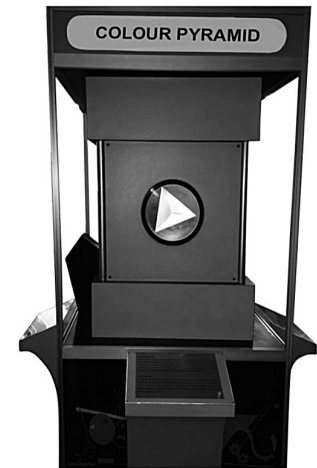
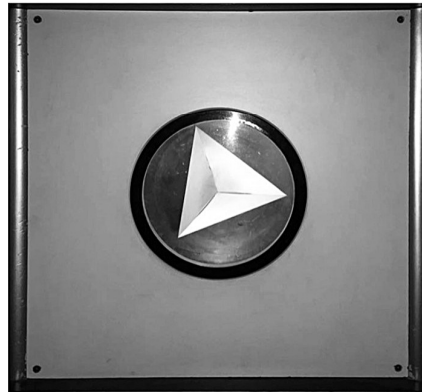
1 July	Birthday of famous Physician & Bharat Ratna Awarded Bidhan Chandra Roy which is celebrated as 'Doctor's Day' in India.
2 July 1938	Birthday of Chandrakumar Naranbhai Patel (inventor of the Carbon Dioxide Laser).
4 July 2005	Successful collision of NASA's satellite "Deep Impact" with comet into the space was held at the distance 13.04 million km from the Earth.
5 July 1996	The astronomical event "Transit of Venus" happened.
6 July 1906	Daulat Singh Kothari (well known Indian physicist) was born.
6 July 1885	Vaccine for Rabies first time used on human on this day.
7 July 2018	International Cooperative Day (First Saturday of July)
11 July	World Population Day. (by U.N.)
16 July 1945	The first detonation with code name "Trinity" conducted by United States at "Los Alamesh" was done. This date is known as the beginning of Atomic Age.
16 July 1969	Successful launching of "Apollo 11" was done with the help of "Saturn V" rocket from Kennedy Space Center at Florida.
18 July	Nelson Mandela International Day for freedom, justice and democracy. (by U.N.)
18 July 1980	Launching of Indian satellite "Rohini RS-1" into the Space.
19 July 1814	Samuel Colt (inventor of Revolver) was born.
24 July 1969	Successful landing of "Appolo-11" in the pacific Ocean.
25 July 1978	"Louise Joy Brown" the world's first successful Test Tube Baby was born in Great Britain.
27 July 2018	19th Annual System Administrator Appreciation Day. (Also known as Sysadmin Day). (Last Friday of July)
U. N. : United Nations	

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

KNOW THE EXHIBIT AT FUN SCIENCE GALLERY

Colour Pyramid

See that the Surfaces of the Pyramid are illuminated with red, blue and yellow lights. Press the switch to rotate the pyramid slowly and observe that the colours are changing. As the pyramid rotates slowly, two lights, either red-blue or blue-yellow or yellow-red are illuminating the same surface of the pyramid. They get mixed and hence produce the corresponding secondary colours.

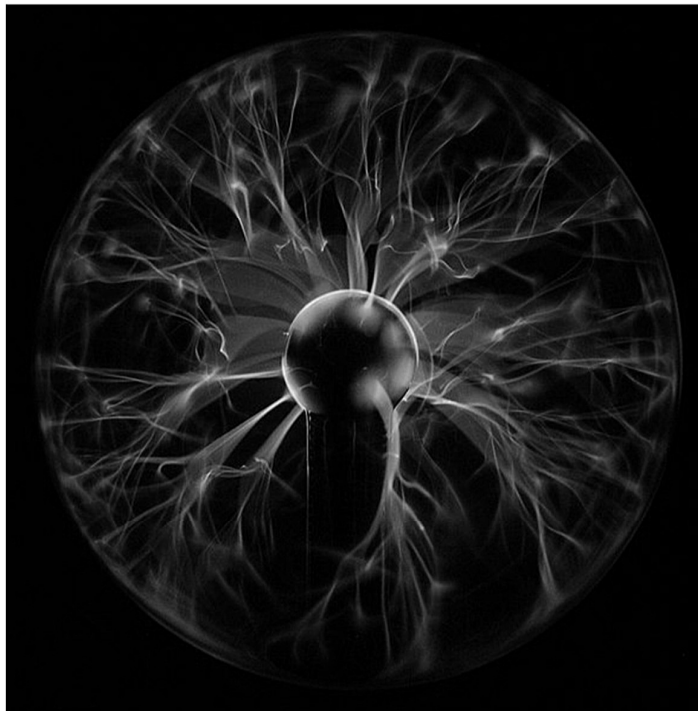


SCIENTIFIC QUESTION

How do you know plasma is real if you can't see it?

This might be a surprise, but you can see plasma. Or, technically, you can see the energy (light) given off by a plasma. The sun and all stars are composed of plasma. This strange "4th state of matter" is actually the most common form of matter in the universe. A plasma is a collection of atoms (think of a container filled with a gas) which has absorbed enough energy to cause the electrons to become separated from their nuclei. These electrically charged particles are called ions. When this happens, the plasma no longer acts like a gas. This "charged particle soup" now has electrical properties, and creates a magnetic field (because of the electrical field). The excited charged particles radiate light and other forms of electromagnetic radiation. So what can cause a container of gas to act this way? It takes energy to ionize the gas and create the plasma. We

can make it happen on Earth in neon lamps and other devices by using electrical energy. In a star, it works something like this. Large clouds of gas in space are thought to have



"condensed" into more dense blobs due to gravitational attraction within the gas. As the blobs grow more dense, the gravitational pull is stronger. Eventually, the atoms of

gas are forced into such tight spaces that they can't exist as atoms, and become ionized (the electrons are stripped away), forming a plasma. It doesn't stop there in a star. All this motion causes friction and heating. The heat helps ionize more atoms, causing more plasma to form. Deep in the core of this hot blob of plasma the nuclei of the atoms are squeezed more tightly together by gravity. Then at some point, those nuclei (protons and neutrons) can join together in the process called nuclear fusion. When fusion takes place, it releases large amounts of energy. This energy keeps heating the plasma, giving rise to more fusion, etc. So the sun is a great "plasma/fusion furnace."

Courtesy :
Vidhyakunj Higher Secondary School

Science Quiz

1. The hydraulic press depends upon

- a) Coulomb's Law b) Pascal's Principle c) Boyle's Law d) Bernoulli's Principle

2. Which device is used to measure the wave length of X-rays?

- a) Framing Square b) Spectrometer c) Manometer d) Nenumeter

3. Nails are made of which substance?

- a) Melanin b) Keratin c) Calcium d) Magnetic

4. In terms of Electricity, What does DC stands for?

- a) Direct Current b) Direct Conductor c) Dual Current d) Dual Collector

5. Which is the closet planet to the Sun?

- a) Mercury b) Saturn c) Venus d) Mars

Exhibition

Aryveda Amrutanam : Medicinal Plant Exhibition

In the Celebration of 'World Environment Day' Surat Municipal Corporation had organized 'Aryveda Amrutanam : Medicinal Plant' exhibition at first floor of Art Gallery, Science Centre from 05/06/2018 to 17/06/2018. Acquire knowledge of Herbal plants, Importance of Medicinal plant and people understand the importance of information about environment is the main aim of this exhibition. 30 medicinal plants and information about its medicinal properties were displayed. Total 751 visitor were seen this exhibition.



SCIENCE CENTRE

Science Centre forms the main part of the entire complex; it displays thematic galleries in the field of Science and Technology. The ground floor of Science Centre showcases 3D Theatre and Souvenir Shop. The first floor of Science Centre showcases Planetarium, Fun Science Gallery and Power of Play Gallery and second floor of Science Centre showcases Diamond Gallery, whereas Entering into Space, Textile Gallery, Cosmos Gallery and Polar Science Gallery are under development.

3d Show	Tuesday to Friday (Time)	Saturday, Sunday & Holidays (Time)
English	09:15, 11:20, 12:00, 02:40, 04:00	11:20, 12:00, 02:40, 04:00
Hindi	10:00, 10:40, 12:40, 01:20, 02:00, 03:20	12:40, 01:20, 02:00, 03:20, 04:40, 05:20, 06:00
Science Centre + Planetarium + Museum + Diamond Gallery		
Above 18 Years	Rs. 100	
3 Years to 18 Years	Rs. 65	
Science Centre + Museum + Diamond Gallery		Planetarium
Above 18 Years	Rs. 60	
3 Years to 18 Years	Rs. 40	
Science Centre + Planetarium + Museum + Diamond Gallery + 3D Show		Tuesday to Friday
Above 18 Years	Rs. 120	
3 Years to 18 Years	Rs. 80	
Planetarium		Saturday, Sunday & Public Holidays
Above 18 Years	Rs. 50	
3 Years to 18 Years	Rs. 40	
3D Show		
Above 18 Years	Rs. 60	
3 Years to 18 Years	Rs. 40	