

# SCIENCE CENTRE NEWS LETTER

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Shalini Agarwal

I.A.S.  
Municipal  
Commissioner

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## SCIENCE CENTRE

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### WHAT'S NEW IN SCIENCE?

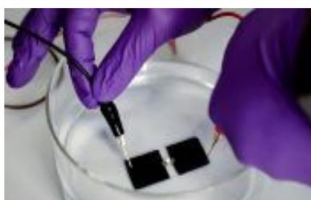
#### Scientists discovered material that can be made like a plastic but conducts electricity like metal

Scientists from University of Chicago, Illinois have discovered a way to create a material that can be made like a plastic, but conducts electricity more like a metal. The research shows how to make a kind of material in which the molecular fragments are jumbled and disordered, but can still conduct electricity extremely well. This research was published on 26th October, 2022 in Journal 'Nature'.

"In principle, this research opens up the design of a whole new class of materials that conduct electricity, are easy to shape and are very robust in everyday conditions," said John Anderson, an Associate Professor of Chemistry at the University of Chicago. Conductive materials are absolutely essential if you're making any kind of electronic device, whether it is an i-Phone, a solar panel, or a television. By far the oldest and largest group of conductors is the metals which are Copper, Gold and Aluminium. Then, Scientists were able to create conductors made out of organic materials, using a chemical treatment known as "doping".

This is advantageous because these materials are more flexible and easier to process than traditional

metals, but the trouble is they aren't very stable. They can lose their conductivity if exposed to moisture or if the temperature gets too high. But fundamentally, both of these organic and traditional metallic conductors share a common characteristic. They are made up of straight, closely packed rows of atoms or molecules. This means that electrons can easily flow through the material.



Then, the Author of this research, Jiaye Xie strung nickel atoms like pearls into a string of molecular made of carbon and sulphur and began testing. In this testing, the material easily and strongly conducted electricity and it was

very stable.

One of the material's attractive characteristics is new options for processing. For example, metals usually have to be melted in order to be made into the right shape for a chip or device. Other components of the device have to be able to withstand the heat needed to process these materials. The new material has no such restriction because it can be made at room temperature.

### SCIENTIST OF THE MONTH

#### P. S. Veeraraghavan

Parivakkam Subramaniam Veeraraghavan was born on 24th December, 1948 at Tamilnadu. Veeraraghavan studied in Gopalapuram Boys High School, Chennai. After receiving Bachelor's Degree in Electrical Engineering from College of Engineering, Guindy in 1969, he joined Master's at the Indian Institute of Technology, Madras and received M.Tech Degree in Electrical and Electronics Instrumentation in 1971. He started his career in Vikram Sarabhai Space Centre, Indian Space Research Organisation (ISRO) in 1971. His first assignment was as Engineer-in-Charge of Checkout System Development in the SLV-3 (Satellite Launch Vehicle) Project under the leadership of former ISRO Scientist & Former President of India, Dr. A. P. J.



Abdul Kalam. He was responsible for the Design and Development of the Checkout System for the first SLV-3 Project. In 2002, he took over as Director of ISRO Inertial Systems Unit (IISU) at Vattiyorkavu, Thiruvananthapuram.

Shri P. S. Veeraraghavan is a recipient of prestigious VASVIK Award (Electronics) in 1997. He is also the recipient of the ASI Award of Astronautical Society of India (ASI). The 2002 ASI award was in recognition of his contribution to Rocket and Related Technologies. He has also received ISRO's Performance Excellence Award for 2007 and the National Aeronautical Prize by Aeronautical Society of India for the year 2011.

## SCIENCE FACTS DECEMBER 2022

### AIDS Awareness Month



#### Timings

Tuesday to Sunday  
& Public Holidays  
9.30 am to 4.30 pm

#### Address

Science Centre  
City Light Road,  
Surat - 395 007

#### Contact

0261 - 2255947  
+91 97277 40807

Fax No.  
91-261-2255946

E mail  
sciencecentre@suratmunicipal.org

Web Site  
www.suratmunicipal.gov.in



1st Dec	World AIDS Day. (by U. N.)
2nd Dec 1984	Bhopal Gas Tragedy.
3rd Dec	International Day of Person with Disabilities (IDPD). (by U. N.)
3 <sup>rd</sup> Dec 1886	Swedish Physicist Karl M.G. Siegbahn (Inventor of Rontgen Spectroscope) was born.
7 <sup>th</sup> Dec	International Civil Aviation Day. (by U. N.)
7 <sup>th</sup> Dec 1972	American Space Craft "APOLLO 17" launched towards moon with Scientist.
9 <sup>th</sup> Dec 1868	German Physicist and Chemist Fritz Haber (Who discovered Haber Process) was born.
14 <sup>th</sup> Dec	National Energy Conservation Day.
15 <sup>th</sup> Dec 1852	Antoine Henri Becquerel (Who discovered Radioactivity) was born.
15 <sup>th</sup> Dec 1863	Arthur D. Little (Inventor of Rayon) was born.
17 <sup>th</sup> Dec 1797	American Scientist Joseph Henry (Inventor and Pioneer of Electromagnetism) was born.
17 <sup>th</sup> Dec 1903	Wright Brothers were the world's first successful persons who flew in an aeroplane.
17 <sup>th</sup> Dec 1908	Willard Frank Libby (Inventor of The Carbon 14) was born.
18 <sup>th</sup> Dec 1856	English Physicist Joseph John Thomson (Discoverer of electron) was born.
23 <sup>rd</sup> Dec	National Farmer's Day. (Chaudhary Charansingh's Birth Anniversary)
24 <sup>th</sup> Dec 1818	Physicist James Prescott Joule (Who discovered the Principle of Conservation on energy) was born.
27 <sup>th</sup> Dec 1571	German Astronomer Johann Kepler (Who discovered elliptical orbits) was born.
	U.N. (United Nation)

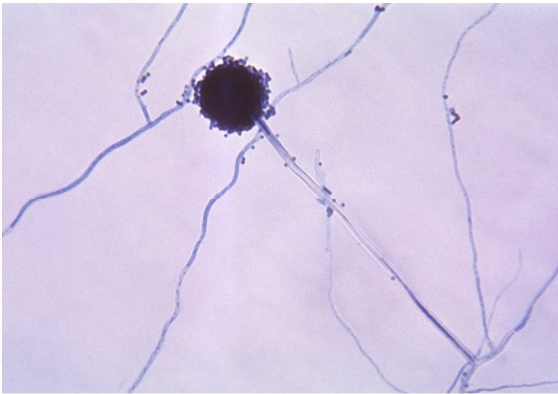
Answers: 1) c, 2) d, 3) d, 4) b, 5) c, 6) b, 7) d



## SCIENTIFIC QUESTION

### What is Aspergillus?

Aspergillus is a genus (taxonomic rank used in the biological classification of living and fossil organisms as well as virus) consisting of a few hundred mold (fungus) species found in various climates worldwide.



Aspergillus was first catalogued in 1729 by the Italian Priest and Biologist Pier Antonio Micheli. Viewing the fungi under a microscope, Micheli was reminded of the shape of an aspergillum (holy water sprinkler), from Latin spargere (to sprinkle), and named the genus accordingly. Aspergillum is an asexual spore-forming structure common to all Aspergillus species, around one-third of species are also known to have a sexual stage. While some species of Aspergillus are known to cause fungal infections. Aspergillus consists of 837 species of fungi.



Members of the genus possess the ability to grow where a high osmotic pressure exists (high concentration of sugar, salt, etc.). Aspergillus species

are highly aerobic (organism that can survive and grow in oxygenated environment) and are found in almost all oxygen-rich environments, where they commonly grow as molds on the surface of a substrate, as a result of the high oxygen tension. Commonly, fungi grow on carbon-rich substrates like monosaccharides (such as glucose) and polysaccharides (such as amylose). Aspergillus species are common contaminants of starchy foods (such as bread and potatoes) and grow in or on many plants and trees.



Species of Aspergillus are important medically and commercially. For humans, a range of diseases such as infection to the external ear, skin lesions, and ulcers classed as mycetomas (persistent fungal infection of the skin and the tissues just under the skin) are found. Members of the genus are also sources of natural products that can be used in the development of medications to treat human disease. Aspergillus spp. are known to produce anthraquinone which has commercial importance due to its antibacterial and antifungal properties. Largest application of Aspergillus niger is the major source of citric acid.

