

SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

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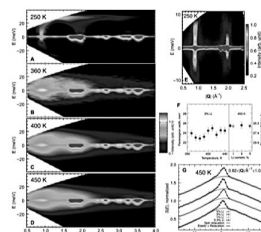
WHAT'S NEW IN SCIENCE?

A new way to turn heat into useful energy.

An international team of scientists has figured out how to capture heat and turn it into electricity. This discovery, published in the journal science advances, could create more efficient energy generation from heat in things like car exhaust, interplanetary space probes and industrial processes. "Because of this discovery, we should be able to make more electrical energy out of heat than we do today", said study co-author Joseph Heremans, professor of mechanical and aerospace engineering and Ohio Eminent scholar in Nanotechnology at The Ohio State University. "It's something that, until now, nobody thought was possible." The discovery is based on tiny particles called paramagnons bits that are not quite magnets, but that carry some magnetic flux. This is important, because magnets, when heated, lose their magnetic force and become what is called paramagnetic. A flux of magnetism, what scientists call "spins" creates a type of energy called magnon-drag thermoelectricity, something

that, until this discovery, could not be used to collect energy at room temperature.

"The conventional wisdom was once that, if you have a paramagnet and you heat it up, nothing happens," Heremans said "And we found that, that is not true. What we found is a new way of designing thermoelectric semiconductor materials that convert heat to electricity. conventional thermo electric that we have had over the last 20 years or so are too inefficient and give us too little energy, so they are not really in widespread use. This changes that understanding". Magnets are a crucial part of collecting energy from heat. When one side of a magnet is heated, the other side, the cold side gets more magnetic, producing spin, which pushes the electrons in the magnet and creates electricity. The paradox, thought, is that when magnets get heated up, they lose most of their magnetic properties, turning them into paramagnets. "almost but not quite magnets," Heremans call them.



Courtesy: M.T. Jariwala Madyamik Shala

SCIENTIST OF THE MONTH

Dr. Jyoti Bhushan Chatterjea

Dr. Jyoti Bhushan Chatterjea was born on February 16, 1919 at Kolkata, West Bengal. He completed his M.B.B.S. (Bachelor of Medicine and Bachelor of Surgery) in 1942 and M.D. (Master in Medicine) in 1949 from Kolkata University.

He did his postdoctoral research in Haematology. He elucidated the aetiopathogenetic aspects of the common disorders of human red cells that had opened up the spectrum of hereditary disorders of human haemoglobin as prevalent in India. He discovered Haemoglobin-E in Bengalis and conducted



comprehensive studies of haematological, biochemical, biophysical and genetical aspects that have provided exciting new information and greatly enriched the relevant areas of contemporary medical sciences. He has also been the author of more than 300 articles and research papers. Dr. Chatterjea received the Coates Gold-Medal in 1958, the Minto Gold Medal in 1965 and the Shanti Swarup Bhatnagar Prize in the year 1966.

Courtesy: M.T. Jariwala Madyamik Shala

KNOW THE PARK EXHIBIT

Gravity Chair

Carefully climb and sit on the chair. As you sit the chair starts moving randomly across a centre point. Observe that you do not fall from chair, even though it moves helpazardly. The chair is pivoted at a central vest. the legs of the chair are in a conical shape with equal weight all around. This brings the centre of gravity of the person below the rest point and that makes the chair stable.





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 FEBRUARY 2020

2 Feb	World Wetlands Day (recognized by U.N.).
4 Feb	World Cancer Day.
5 Feb 1971	Apollo-14 landed on the moon.
6 Feb	International Day against Female Genital Mutilation.
8 Feb 1834	Dimitri Ivanovich Mendeleiev (Formulator of Periodic Table) was born.
11 Feb 1847	Thomas Alwa Edison (Inventor of Dynamo) was born.
12 Feb 1941	Sir Alexander Fleming did first experiment of Penicillin.
13 Feb	World Radio Day (UNESCO)
14 Feb 1929	Devendra Lal (Vise President of Indian Academy of Science and Ex-Director of PRL) was born
15 Feb 1564	Galileo Galilee (Famous Astronomer) was born.
16 Feb 1919	Jyoti Bhushan Chetarjea (Discoverer of Haemoglobin-E) was Born.
18 Feb 1745	Alessandro Volta (Inventor of Electric Battery) was born.
19 Feb 1473	Nicolaus Copernicus (Famous Astronomer) was born on this day.
20 Feb	World Day of Social Justice (recognized by U.N.)
20 Feb 1962	John Glenn the first American Astronaut to orbit the Earth.
21 Feb	International Mother Language Day. (UNESCO)
24 Feb 1940	Sengamedu Shrinivasa Badrinath (Specialist in Vitreo Retina Surgery) was born.
25 Feb 1988	First successful test fire of "PRUTHVI - 1 MISSILE" by India was done.
28 Feb	National Science Day is celebrated in India to mark the discovery of the "Raman effect".
	U. N. : United Nations
	UNESCO United Nations Educational Scientific & Cultural Organization

Ans : 1.B , 2.B , 3.C , 4.A , 5.D

SCIENTIFIC QUESTION

What is Inside a Typical Satellite?

Satellites come in a variety of shapes and sizes and perform different functions but they all have several things in common.

- All of them have a metal or composite frame and body, usually known as the bus. The bus holds everything together in space and provides enough strength to survive the launch.

- All of them have a source of power (usually solar cells) and batteries for storage. Arrays of solar cells provide power to charge rechargeable batteries. Newer designs include fuel cells. Power on most satellites is precious and very limited. Nuclear power has been used on space probes to other planets. Power systems are constantly monitored and data on power and all other onboard systems is sent to Earth stations in the form of telemetry signals.

- All of them have an on-board computer to control and monitor the different systems.

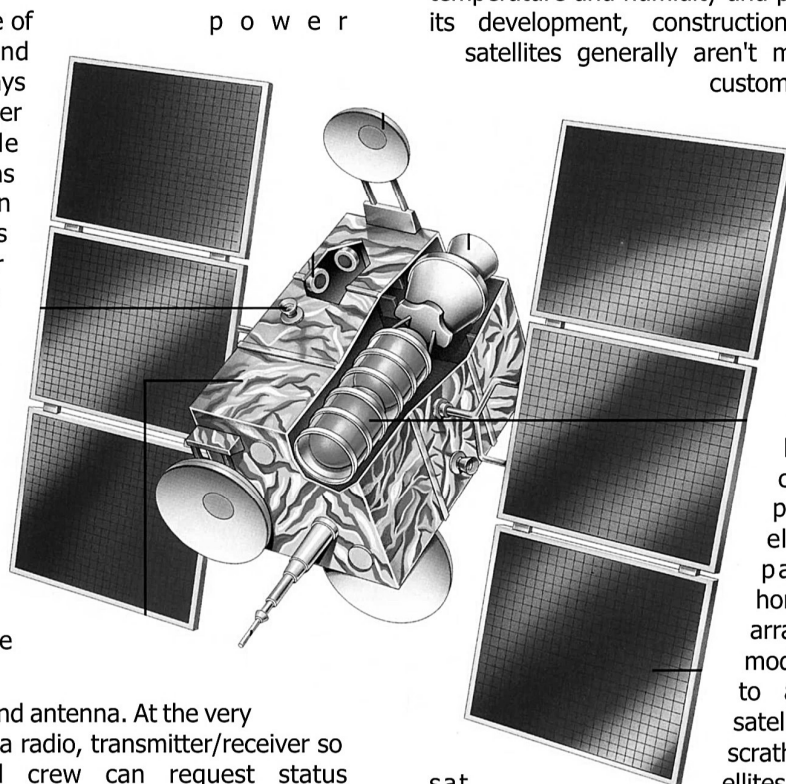
- All have a radio system and antenna. At the very least, most satellites have a radio, transmitter/receiver so that the ground-control crew can request status information from the satellite and monitor its health. Many satellites can be controlled in various ways from the ground to do anything from change the orbit to reprogram the computer system.

- All of them have an Attitude Control System (ACS). The ACS keeps the satellite pointed in the right direction.

As you might expect, putting all of these systems together

isn't easy. It can take years. Every thing begins with a mission objective. Defining the parameters of the mission enables engineers to specify the instruments needed and how they will be arranged. Once these specifications (and their budget) are approved, satellite construction can begin. This typically takes place in a clean room, a sterile environment that makes it possible to maintain a constant temperature and humidity and protect the satellite during its development, construction and testing. Artificial satellites generally aren't mass-produced. They are custom built to perform their

intended functions with that said, some companies have designed their satellites to be modular, making it possible to start with a primary structure that can be customized as needed. For example, Boeing's 601 satellites have two basic modules a chassis for carrying the propulsion subsystem, bus electronics and battery packs and a set of honeycomb shelves to hold arrays of equipment. This modularity enables engineers to assemble purpose built satellite without starting from scratch and of course, some satellites such as those in GPS and the Iridium system, work together in a coordinated network. Using a repeatable design makes it easier to set up and integrate the various components of the system.



sat
the Iridium
a coordinated network.

Courtesy: M.T. Jariwala Madyamik Shala

SCIENCE QUIZ

1. Which of the following defence of the human body against bacteria?

- A . Haemoglobin, B. Phagocytes
C. Red blood cells, D. Blood platelets

2. Which of the following nerves connected from the eyes to ears?

- A . Cerebrum, B. Cerebellum
C. Medulla, D. Spinal cord

3. What is the composition of soap?

- A . Sodium salt with fatty acids
B. Potassium salt with fatty acids, C. Both A and B
D. Sodium and Potassium salt mixed with the chemical

4. Which of the following missile works on the theory of "Fire and Forget"?

- A . Brahmos, B. Akash, C. Nag, D. Sourya

5. Which of the following wires is necessary in the house?

- A . Live wire, B. Earth wire, C. Neutral wire, D. All

SCIENCE PROJECT

Surat Municipal Corporation had organized 'Science Fair' at Art Gallery, Science Centre, Surat on 30st and 31st August 2019. M.T. Jariwala Madyamik Sala had presented their project on 'GSM and GPS based vehicle Tracking and Locking System'.

Principle:- Vehicle Tracking System (VTS) is the technology used to determine the location of a vehicle using GPS.

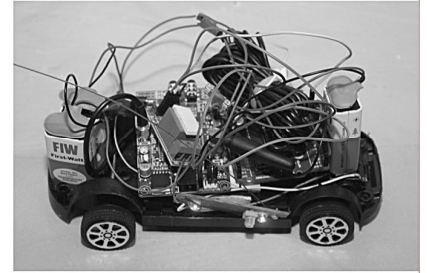
By following longitude and latitude methods the tracking system enables to calculates easy and accurate location of the vehicle. It gives vehicles information like location details, speed ,distance, travelled etc. can be viewed on a digital mapping with the help of software via internet. It is becoming increasingly popular for people having expensive cars and hence as a theft prevention and metriculal device.

Advantages:-

- very compact and light weight.
- low power consumption.
- can be made in almost size and all shapes.

Disadvantages:-

- Due to network issue the location can be changed.
- If the battery is finished the full device will stop working.



PARTIAL SOLAR ECLIPSE

Surat Municipal Corporation had organized an event to Show an astronomical phenomena of partial Solar Eclipse through telescope's Backlit projection and the projection from camera on television to the visitors at science Center campus on 26/12/2019 at 7:30 a.m. to 11:00 a.m. This astronomical event started at 8:05 a.m, maximum ecliese occured at 9:23 am and it was ended at 10:50 am. At the time of maximum ecliese the sun's intensity was reduced. Visitors had also seen this event through Solar filters. In this event Chairman of Standing comittee Mr.Anil Goplani, Dy. Comission and other officers of surat Municipal Corporation and a large number of citirens were remain present. This invincible fartial Solar eclipse was witnessed by 868 people including, students, parents and general public.



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 & Astronomy Gallery will be opening soon

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		
Above 18 Years	Rs. 60	
3 Years to 18 Years	Rs. 40	
Science Centre + Planetarium + Museum + Diamond Gallery + 3D Show		
Above 18 Years	Rs. 120	
3 Years to 18 Years	Rs. 80	
Planetarium		
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	

Planetarium			
Tuesday to Friday		Saturday, Sunday & Public Holidays	
09:30 to 10:20	English	11:30 to 12:20	Gujarati
10:30 to 11:20	Gujarati	12:30 to 01:20	English
11:30 to 12:20	Gujarati	01:30 to 02:20	Hindi
12:30 to 01:20	English	02:30 to 03:20	Hindi
01:30 to 02:20	Hindi	03:30 to 04:20	Gujarati
02:30 to 03:20	Hindi	04:30 to 05:20	English
03:30 to 04:20	Gujarati	05:30 to 06:20	Gujarati