

SCIENCE CENTRE NEWS LETTER

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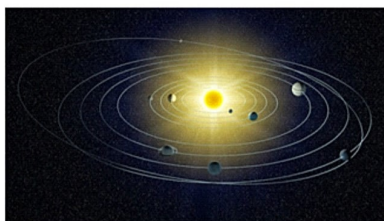


SCIENCE CENTRE

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WHAT'S NEW IN SCIENCE?

New superhighway system discovered in the Solar System



Researchers have discovered a new superhighway network to travel through the Solar System much faster than was previously possible. Such routes can drive comets and asteroids near Jupiter to Neptune's distance in under a decade and to 100 astronomical units in less than a century. They could be used to send spacecraft to the far reaches of our planetary system relatively fast, and to monitor and understand near-Earth objects that might collide with our planet.

The most conspicuous arch structures are linked to Jupiter and the strong gravitational forces it exerts. The population of Jupiter-family comets (comets having orbital periods of 20 years) as well as small-size solar system bodies known as Centaurs, are controlled by such manifolds on unprecedented time scales. Some of these bodies will end up colliding with Jupiter or being ejected from the Solar System.

The structures were resolved by gathering numerical data about millions of orbits in our Solar System and computing how these orbits fit within already-known space manifolds. The results need to be studied further, both to determine how they could be used by spacecraft, or how such manifolds behave in the vicinity of the Earth, controlling the asteroid and meteorite encounters, as well as the growing population of artificial human-made objects in the Earth-Moon system.

Courtesy: Joyous School

SCIENTIFIC QUESTION

Is time travel possible?



Time travellers already walk among us. Thanks to Einstein's theory of special relativity, astronauts orbiting on the International Space Station experience time ticking more slowly. At that speed the effect is minuscule, but ramp up the velocity and the effect means that one day humans might travel thousands of years into the future. Nature seems to be less fond of people going the other way and returning to the past, however some physicists have concocted an elaborate blueprint for a way to do it using wormholes and spaceships. It could even be used to hand yourself a present on Christmas Day, or answer some of the many questions that surround the universe's great unknowns.

In their paper, published in the Nov. 25, 2020 issue of Science Advances, the researchers observed the dynamical structure of these routes, forming a connected series of arches inside what's known as space manifolds that extend from the asteroid belt to Uranus and beyond. This newly discovered "celestial autobahn" or "celestial highway" acts over several decades, as opposed to the hundreds of thousands or millions of years that usually characterize Solar System dynamics.

Time travel is the concept of movement between certain points in time, analogous to movement between different Points in space by an object or a person, typically with the use of hypothetical device known as a time machine. Many in the Scientific community believe that backward time travel is highly unlikely. Any theory that would allow time travel would introduce potential problems of causality. The classic Example of a problem involving causality is the "grandfather paradox": a person travels to the past and kills their own grandfather before the Conception of their father or mother, which presents the time traveler's existence.

Courtesy: Joyous School



Timings

Tuesday to Friday
9.30 am to 4.30 pm

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& Public Holidays
11.00 am to 6.30 pm

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SCIENCE FACTS MARCH 2021

| | |
|---------------|--|
| 1 March | Self Injury Awareness Day. |
| 3 March 1838 | American Astronomer, George W. Hill (who plotted the Moon's Orbit) was born. |
| 3 March 1847 | Mr. Alexander Graham Bell (Inventor of Telephone) was born. |
| 3 March 1969 | India's first Rajdhani Express train having speed of 140 km/h traveled for first time between Delhi and Hawrah. |
| 4 March 1754 | Benjamin Waterhouse (inventor of Smallpox vaccine) was born. |
| 6 March 1937 | Valentina Tereskowa (Lady Astronaut who was the first lady to enter into the space) was born. |
| 8 March | International Women's Day (by UN). |
| 8 March 1879 | German physicist and chemist, Otto Hahn (Discoverer of radiothorium and actinium) was born. |
| 9 March 1934 | Uri Gagarin (world's first Astronaut) was born. |
| 10 March 1876 | Mr. Alexander Grehambel experimented for the first time to talk on telephone with his assistant Botish. |
| 13 March 1781 | Planet "Uranus" was discovered by well-known Astronomer Herschel. |
| 14 March 1879 | Sir Albert Einstein (discoverer of Theory of Relativity) was born. |
| 16 March 1789 | George Simon Ohm (discoverer of Ohm's Law) was born. |
| 18 March 1858 | German engineer, Rudolf Diesel (inventor of diesel motor) was born. |
| 21 March 2016 | It is the day when Day and Night time becomes equal.(Vernal Equinox) |
| 21 March | World Down Syndrome Day. |
| 22 March | World Day for Water. |
| 23 March | World Meteorological Day. (WMO) |
| 24 March 1854 | Start of Telegram era in India by delivering first telegram from Kolkata to Agra. |
| 27 March 1845 | Wilhelm Conrad Rontgen (Noble prize winner & inventor of invisible 'X' rays) was born. |
| 29 March 1967 | Making of world's biggest submarine "9 Redoubtable (S611)" by France, which is having weight of 7780 ton and length of 419 feet. |

U. N. : United Nations

UNESCO United Nations Educational Scientific & Cultural Organization

Ans:- 1. c, 2. d, 3. a, 4. c, 5. c, 6. d

Scientist

Prof. Jyoti K Parikh:

Today's aircraft take their inspiration from birds. Although they are heavier than air, birds generate a powerful force called lift, which counteracts the force of gravity. The first aircraft-balloons and airships-worked in a quite different way, however. They were lighter than air and floated above the ground.

No one knows who first had the idea to build hot-air balloons. About 2000 years ago, Chinese children used to set fire to dry twigs that they had placed inside upturned eggshells. As the twigs burned, they heated the air inside the shells and made them fly into the air, much like miniature hot-air balloons. By 1200 C.E., the people of Mongolia were building hot-air balloons shaped like dragons and monsters that were flown during religious ceremonies.

The first hot-air balloons may have been built by trial and error, but they were, nevertheless, based on a firm scientific idea dating as far back as 200 B.C.E.

When Greek thinker Archimedes leapt from his bath crying Eureka!- meaning "I've found it!"- he had discovered that objects float if they weigh less than the water they displace, or push out of the way. A British philosopher called Roger Bacon thought that the same idea would also apply to the air. Bacon knew that ships floated on water because of Archimedes' principle. He thought that similar vessels might be built to float in mid air.

However water and air seemed to be very different substances, why should they work in the same way? It was



in the 17th Century, with the pioneering work of Irish chemist Robert Boyle that people came to understand how this might be possible. Boyle showed that gases become less dense as they get hotter. This was the idea that eventually lifted human kind into sky.

It was not until 1783 that a hot-air balloon actually took off. French brothers Joseph-Michel and Jacques-Etienne Montgolfier built a huge balloon out of linen and lined it with thin paper with a straw and wood fire burning beneath, the balloon soared around 3,000 feet (900 m) into the air.

People soon realized that heating up air was only one way of making a balloon float. Another method was to fill a balloon with a gas that was already lighter than air. The most obvious gas to use was hydrogen, the lightest gas of all, and one that was readily produced by reacting metals with strong acids. Although simple hot-air balloons are good at lifting things into the sky, once airborne, they go wherever the wind blows

them. Modern balloonists use side vents and flaps to provide a little control, but balloons are still an impractical form of transportation.

English man Roger Bacon had speculated about ships traveling through the air, and a French man, Henri Giffard, made that possible in 1852. He built cigar-shaped structure that could be relied on to move in only one direction. To this, he added a small steam engine that would turn a propeller and drive his balloon forward. It reached a top speed of 6 mph (almost 10 km/h) and traveled 17 miles (27 km).

Courtesy: Joyous School

Quiz

1. Which one of the following disease is not transmitted by mosquito?

(a) Brain fever, (b) Malaria, (c) Typhoid, (d) Dengue

2. Which one of the following disease is not caused by bacteria?

(a) Typhoid, (b) Anthrax, (c) Tuberculosis, (d) Malaria

3. Which one of the following diseases is caused by protozoans?

(a) Malaria, (b) Influenza, (c) AIDS, (d) Cholera

4. Which one of the following has a long term effect on the health of an individual?

(a) Common cold, (b) Chicken pox, (c) Chewing tobacco, (d) Stress

5. Which of the following can make you ill if you come in contact with an infected person?

(a) High blood pressure, (b) Genetic abnormalities, (c) Sneezing, (d) Blood cancer

6. During summer, water kept in an earthen pot becomes cool because of the phenomenon of

(a) diffusion, (b) transpiration, (c) osmosis, (d) evaporation

KNOW THE ENTERING INTO SPACE GALLERY EXHIBIT

Camera

MARDI: Mars Descent Imager (MARDI) is used in Mars rovers to take pictures and videos of Martian surface. It is mounted on the foreside of the rover, pointing towards ground. It has 8GB memory storage which allows it to take over 4000 raw images which are close to 1600×1200 pixels per frame.

Junocam: Junocam is a camera cum telescope mounted on Juno spacecraft that was launched to study the planet, Jupiter. The camera uses a Kodak image sensor. It is capable of color imaging at 1600×1200 pixels. It sends about 40 megabytes of camera data to Earth during each 11-day orbital period.

MAHLI: Mars Hand Lens Imager (MAHLI) is one of seventeen cameras on the Curiosity rover on the Mars Science Laboratory mission. It is primarily to acquire microscopic images of rock and soil. MAHLI can take true color images at 1600×1200 pixels with a resolution as high as 14.5 micrometers per pixel. MAHLI has an 18.3 mm to 21.3 mm focal length.

GoPro: No special camera is used in space by astronauts to capture frames. It takes only good focusing skill and fast shutter speed to capture images from a fast moving spacecraft. Hero 4 model of GoPro is frequently used by astronauts and in spacecrafts, due to its high image processing quality, compact nature and ease to handle.



SCIENCE PROJECT

Surat Municipal Corporation had organized 'Science Fair' at Art Gallery, Science Centre, Surat on 30st and 31st August 2019. Shree Vasistha Vidhyalaya had presented their project on I.O.T. based Baby Monitoring System.

This project is about an idea and to be design a baby monitoring system. Which helps the parents to monitor their child even if they are away from home and detect every activity from any distance of the world.

In this project:-

Hardware's like:-

Node MCU

Moisture sensor

IR Sensor or Force Sensor

Software's like:-

HTML Program

Language- C / C++

Internet (IOT-Internet of things) are used

Working:-

In this project Node MCU is used. So connect 5 V pin from Node MCU to all sensors.

Similarly Node MCU and all sensor's ground pins should be grounded.

Now, connect sensor's output pins to each channels of Node MCU.

