

	<h1>SCIENCE SCOPE</h1> <p>DEPTT. OF SCINEC & TECHNOLOGY OF TCV GOPALPUR</p>	
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Editorial Desk;

On the July 22, 2009, many parts Asia witnessed solar eclipse. There have been several popular superstitions attached with the eclipse and have been passed down the generations. Pregnant women are advised not to go outside during the eclipse to avoid having a blind baby or one with a cleft lip. It is also suggested that food cooked before the eclipse should be thrown out afterward as it becomes impure. Another interesting story attached with the eclipse is that those who are holding a knife or axe or any other sharp instrument during the eclipse will cut themselves.

In this issue of science scope we have chosen solar eclipse, lunar eclipse and polar light, some natural phenomenon to present to you. So that you may understand that the sun isn't eaten by the dragon (Chinese's myth on the occurrence of solar eclipse), nor is the moon gobbled up by the dead spirits (Serrano Indians' version of lunar eclipse) and the fairies are not dancing in the air (The Cree People's belief of Polar lights).

Enjoy reading!

KNOW THE GREAT SCIENTISTS!

TYCHO BRAHE

Tycho Brahe (1546-1601) was a Danish astronomer. Brahe developed a systematic approach for observing the planets and stars. He stressed the importance of making such observations on a regular basis. The telescope had not yet been invented, and so Brahe used his eyesight and such instruments as astrolabes and quadrants to estimate the positions of celestial's objects. His observations were far more precise than those of any earlier astronomer.

Brahe's observations of planetary motion revealed that the tables then in use to predict the positions of the planets were inaccurate. His sighting of a supernova (type of exploding star) in 1572 helped disprove the ancient idea that no change could occur in the heavens beyond the orbit of the moon.



SUNITA WILLIAMS

Sunita Williams (born September 19, 1965) is a United States Naval officer and a NASA astronaut. She was assigned to the International Space Station as a member of Expedition 14 and then joined Expedition 15. She holds the record of the longest spaceflight (195 days) for female space travelers. As NASA's official public spokesperson, she was selected to appear on the Colbert Report to announce the name for Node 3 of the ISS. She was born in Euclid, Ohio to Dr. Deepak Pandya and Bonnie Pandya. Her parents now reside in Falmouth, Massachusetts. Deepak Pandya is a famous neuroanatomist. Williams' roots on her father's side go back to Gujarat in India and she has been to India to visit her father's family. She is of Slovene descent from her mother's side. Williams received her commission as an ensign in the US Navy from the US Naval Academy in May 1987. She was designated a Naval Aviator in 1989, and graduated from the Naval Test Pilot School in 1993



-One of the most inspiring things about science is the change of our understanding of the world undergoes in the light of new finding.

SCIENCE UPDATE;

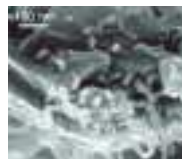
2. Nano tube wires:

1. Wabot-2



Building this kind of a robot is a challenging task because the ability of the human hand is perhaps the most difficult function to recreate mechanically. Its technical accuracy is extremely high.

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Nanotube wires just 10 atoms wide lies in small nonobots. These wires can be seen only if observed under a microscope by magnifying 120,000 times. The wires, which is 0.0000015(0.0000001 inch) in diameter is an example of the type of circuitry that might be used in new generation computer technology, such as molecular computers.

Thoughts For Tomorrow

Students' Write Up

Importance of Mathematics in Science

Basically, Mathematics is the Science of number and space. Science is probably incomplete without Mathematics. It is Mathematics that has given a sound footing to the scientific laws. For the real understanding of Science, the knowledge of Mathematics is important. There are a great many topics which are constantly used in Science.

Example:

decimals, proportion inverse ratio, equation, graph etc.

Physics is such a subject that can not precede even a step without Mathematics. It is necessary to have some Mathematical background before starting a particular topic in Science.

Example:

The quantitative work in gas laws and calculation of chemical equations should come after proportion has been studied in Mathematics, simple idea of statistics is essential before dealing with genetics and other statistical calculations; the knowledge of trigonometrical ratios is very helpful in mechanics and light, and so on. It is therefore, important to correlate Science and Mathematics to bring about coordination of the two subjects and to remove any omission or duplication in either of the subjects.

Mr. Anurag Sharma
(Class X science teacher)



What in science fascinates me the most?

-Phuntsok Dolma (XI "C")

We wouldn't go further to search what science is. Science is everything that is proved through experiment and has evidence how it came. Everything around us is due to science.

If we observe 21 century world carefully there is a dramatically change and replacement of the primitive world. These are due to the development and advantage of science and technologies.

Humans have went to moon and return back, spent lots of time in space, we can challenge every serious and danger diseases, can manufacture what we need, can travel to where we are longing for, can consume what we are found of and so on. In this hectic world, we find clever



and brilliant people who can develop various machines, gadgets and bombs, which if we press a button, can destroy and damage whole world at a friction of time. So, these things are pretty shocking. But...but the most fascinating thing in Science is the communication facility- WEB. Because through web, we can do everything as we don't need a phone to call our dears, post office to mail to our friends and parents and it isn't necessary to have a television to see the fantastic world, we also need not radio and newspapers to have up to date news. We don't need to pay extra charge to advertise to commercialize our products, as all these work can be done through the web.

-Nothing has the capacity to interact with and exert influence on other phenomena, but that there is cause and effect.

Through the web, we can get the oldest things of the world and the latest news of the world too. Through the web, we can book any kind of tickets; communicate in to every corner of the world in a friction of time. It is available with all kinds of information about any typical thing or person. And it makes our world very tiny as if our world is in our palms. Don't worry, web can do whatever you need and long for. We can call it as our little world. If you face any problems, try the web, it works better than the human brain and solves a lot of problems. This fact really fascinates me.

One incident that made me astonished is, talking to my parents and seeing them through the web, I felt like as if they are with me and talking with them is like a dream. I'm still surprised and wondered about this advanced facility.

In a nutshell, due to development of science, our world becomes both more attractive and wonderful to live in.

What in science fascinates me the most? -
-Siral Number:45(XII "d")

When the word Science flashes in my mind, I could perceive the development of modern nano-mechanic devices. In fact, science is a very broad subject that we could hardly reach the depth of it. The science that I have learnt was only a drop from the vast ocean of itself. And according to my knowledge of science, I have felt that science is one of the subjects which keep me thinking again and again. When the Science teacher starts their lessons, especially during Biology, I wouldn't know how the period was gone, as I was totally fascinated and engulfed by the subject. Why am I so interested in Biology?



When this question came, I could say that biology mainly deals on the species and plants so it is very dear to us. Knowing about one's own organs functions and structures really fascinates me. Since biology is related to our day to day life, it is vital for us to know about it. When I learnt that the fundamental building block of human is cell, it is so much related to our religious teaching on inter-dependence. In biology, it states that there is many more sub-division of this tiny cell and compilation

of cells becomes tissue, then organs and body as a whole, like wise in our Buddhist way of saying that everything is consisted of small particles and once we disintegrate the things into its constituents then nothing is left as a result. This is called emptiness in Buddhism and in science too there is a similar concept.

Studying of the organs that existed within our body deeply fascinates me as I could visualize and know the way of their function and also it would inspire me how to take care of them. The way of their function teaches me how human beings are consisted and formed. Thus, knowing these things fascinates me a lot as I do also have all the parts of organs like brain, heart, kidney, liver and nerves.

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Amazing Facts

*Scientist has discovered 20 planets, that have a sun like ours, and that might contain alien life.

*There are at least 100,000 million other galaxies like our galaxy -the Milky Way.

*The earth is orbiting the sun at more than 107,000 km/hrs; but we feel as if we are standing still.

*Highs are cool and dry: lows are warm and wet.

*Wind is due to unequal cooling that causes air pressure differences.

*The star with the longest name in astronomy is 'Shurnarkabdishashutu' which is Arabic for 'under the southern horn of the bull'

*Light takes1.25 seconds to travel from the moon to earth;8 minutes 27 seconds to travel from the sun to earth; 6 hours to travel from Pluto to earth.



*The most inaccurate estimate of the sun's size was made in the sixth century B.C by a Greek astronomer Heraclites.

He decided that the sun was 30cm (1 ft) across; in fact, it is nearly 1.4 million km (870,000miles) across.

30 years to reach Saturn, 61 years to reach Uranus, 96 years to reach Neptune, and 126 years to reach Pluto.

*Apollo astronauts took 3 days to travel to the moon. At these speeds astronauts would take 11 months to reach Venus, 1 year 8 month to reach Mars, 2 years to reach Mercury, 13 years to reach Jupiter,

*The longest a total eclipse of the sun can last is 7 minutes 31 seconds. An annular eclipse can last for

12 minutes 24 seconds. A lunar eclipse can last much longer up to 104 minutes.

*A new star is born in our galaxy every 18 days. About 20 new stars are born each year. For comparison, there are about 100,000 million stars in our galaxy.

*If you drove a car from earth at a speed of 160km/hrs (100 mph), it would take about 221,000 million years to reach the centre of the milky way.

SPOTLIGHT:



Solar Eclipse

A solar eclipse occurs when the Moon passes between the Sun and the Earth so that the Sun is fully or partially covered. This can only happen during a new Moon, when the Sun and Moon are in conjunction as seen from the Earth. At least two and up to five solar eclipse can occur each year on Earth, with between zero and two of them being total eclipse. Total solar eclipses are nevertheless rare at any location because during each eclipse totality exists only along a narrow corridor in the relatively tiny area of the Moon's umbra.

A total solar eclipse is a spectacular natural phenomenon and many people travel to remote location to observe one. The 1999 total eclipse in Europe helped to increase public awareness of the phenomenon, as illustrated by the number of journeys made specifically to witness the 2005 annular eclipse and the 2006 total eclipse. The recent solar eclipse of January 26, 2009 was an annular eclipse, while the solar eclipse of July 22, 2009 was a total solar eclipse.

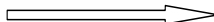


In ancient times, and in some culture today solar eclipse have been attributed to supernatural causes. Total solar eclipse can be frightening for people who are unaware of their astronomical explanation, as the Sun seems to disappear in the middle of the day and the day and the sky darkens in a matter of minutes.

There are four type of solar eclipse:

- A total eclipse occurs when the Sun is completely obscured by the Moon. The intensely bright disk of the Sun is replaced by the dark silhouette of the Moon, and the much fainter corona is visible. During any one eclipse, totally is visible only from at most a narrow track on the surface of the Earth.
- An annular eclipse occurs when the sun and moon are exactly in line, but the apparent size of the moon is smaller than that of the sun. Hence the sun appears a very bright ring, annulus, surrounding the outline of the moon.
- A hybrid eclipse (also called annular/total eclipse) transition between a total and annular eclipse. At some point on the surface of the Earth it is visible as total eclipse, whereas at other it is annular, Hybrid eclipse are comparatively rare..
- A partial eclipse occurs when the Sun and Moon are not exactly in ant the Moon only partially obscures the sun. This phenomenon can usually be seen from a large part of the Earth outside of the track on annular or total eclipse. However, some eclipse can only be seen as a partial eclipse, because the umbra never intersects the Earth's surface.



-Nagarjuna: "There is an unmistakable resonance between the notion of emptiness and the new physics. If on quantum levels, matter is revealed to be less solid and 

The match between the apparent size of the Sun and Moon during a total eclipse is considered coincidental. The Sun's distance from the Earth is about 400 times the Moon's distance, and the Sun's diameter is about 400 times the moon's diameter because these ratios are approximately the same, the sizes of the Sun and the Moon as seen from Earth appear to be approximately the same: about 0.5 degree of arc in angular measure.

- An eclipse when the moon is near its closest distance from the earth can be a total eclipse because the moon will appear to be large enough to cover completely the sun's bright disk, or photosphere; a total eclipse has a magnitude greater than one.
- The moon transiting in front of the sun as seen from STEREO-B on February, 25 2007 at 4.4 times the distance between the earth and moon.
- The moon's orbit around the earth is an ellipse, as is the earth's orbit around the sun; the apparent size of the sun and moon therefore vary.
- The magnitude of an eclipse is the ratio of the apparent size of the moon to the apparent size of sun during an eclipse.
- conversely, an eclipse when the moon is near to its farthest distance from the earth can only be an annular eclipse because the moon will appear to be slightly smaller than the sun.
- The magnitude of an annular eclipse is less than 1. Slightly more solar eclipses are annular than total because, on average, the moon lies too far from earth to cover the sun completely.
- A hybrid eclipse occurs when the magnitude of eclipse transitions during the event from smaller than one to larger than one –or vice versa- so the eclipse appears to be total at some locations on earth and annular at other locations.
- The earth's orbit around the sun is also elliptical, so the earth's distance from the sun varies throughout the year. This also affects the apparent sizes of the sun and moon, but not so much as the moon's varying distance from the earth.
- When the earth approaches its farthest distance from the sun in July, this tends to favor a total eclipse. As the earth approaches its closest distance from the sun in January, this tends to favor an annular eclipse.



The next non-central solar eclipse will be on April 29, 2014. This will be an annular eclipse.

The next non-central total solar eclipse will be on April 9, 2043.

During the period 2001 to 2100 there will be 224 solar eclipses of which 77 will be partial, 72 will be annular, 68 will be total and 7 will be hybrids between total and annular eclipses.

The longest duration of totality was on July 22, 2009, whilst the longest annular eclipse will be on January 15, 2010. The eclipse of May 20, 2050 will be the second hybrid eclipse in the span of less than one year, the first one being on November 25, 2049.

The Lunnar Eclipse:

A lunar eclipse is an eclipse which occurs whenever the moon passes behind the earth such that the earth blocks the sun's rays from striking the moon. This can occur only when the Sun, Earth, and Moon are aligned exactly, or very closely so, with the Earth in the middle. Hence, there is always a full moon.



definable than it appears, then it seems science is coming closer to the Buddhist insights of emptiness and interdependence.

the night of a lunar eclipse.

The type and length of an eclipse depend upon the Moon's location relative to its orbital nodes. The next total lunar eclipse occurs on December 21, 2010. The next eclipse of the Moon is a penumbral eclipse on August 6, 2009. There will be 230 lunar eclipses during in the 21st century (2001-2100): 87 penumbral, 58 partial and 85 in total.

Eclipses are listed in sets by lunar years, repeating every 12 months for each node. Ascending node eclipses are given a red background highlight.

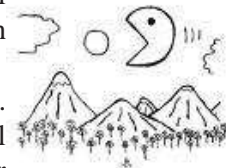
Types of lunar eclipses:

The shadow of the Earth can be divided into two distinctive parts: the umbra and penumbra. Within the umbra, there is no direct solar radiation. However, as a result of the Sun's large angular size, solar illumination is only partially blocked in the outer portion of the Earth's shadow, which is given the name penumbra.

1. A penumbral eclipse occurs when the Moon passes through the Earth's penumbra. The penumbra causes a subtle darkening of the Moon's surface. A special type of penumbral eclipse is a total penumbral eclipse, during which the Moon lies exclusively within the Earth's penumbra. Total penumbral eclipses are rare, and when these occur, that portion of the Moon which is closest to the umbra can appear somewhat darker than the rest of the Moon.

2. A partial lunar eclipse occurs when only a portion of the Moon enters the umbra. When the Moon travels completely into the Earth's umbra, one observes a total lunar eclipse. The Moon's speed through the shadow is about one kilometer per second (2,300 mph), and totality may last up to nearly 107 minutes. Nevertheless, the total time between the Moon's first and last contact with the shadow is much longer, and could last up to 3.8 hours

3. A selenelion or selenhelion occurs when both the Sun and the eclipsed Moon can be observed at the same time. This can only happen just before sunset or just after sunrise, and both bodies will appear just above the horizon at nearly opposite points in the sky. This arrangement has led to the phenomenon being referred to as a horizontal eclipse.



Recent and upcoming lunar eclipse events:

- March 3, 2007, lunar eclipse - the first total lunar eclipse of 2007 occurred on March 3, 2007, and was partially visible from the Americas, Asia and Australia. The complete event was visible throughout Africa and Europe. The event lasted 01h:15m, began at 20:16 UTC, and reached totality at 22:43 UTC
- August 2007 lunar eclipse - August 28, 2007, saw the second total lunar eclipse of the year. The initial stage began at 07:52 UTC, and reached totality at 09:52 UTC. This eclipse was viewable from Eastern Asia, Australia and New Zealand the Pacific, and the Americas
- February 2008 lunar eclipse - The only total lunar eclipse of 2008 occurred on February 21, 2008, beginning at 01:43 UTC, visible from Europe, the Americas, and Africa .
- The next partial eclipse of the Moon will occur on December 31, 2009.
- The next total eclipse of the Moon will occur on December 21, 2010.

Eclipse cycles:

Every year there are usually at least two partial lunar eclipses, although total eclipses are significantly less common. If one knows the date and time of an eclipse, it is possible to predict the occurrence of other eclipses using an eclipse cycle like the Saros cycle. Unlike a solar eclipse, which can only be viewed from a certain relatively small area of the world, a lunar eclipse may be viewed from anywhere on the night side of the Earth.



-One of the most extraordinary and exciting things about modern physics is the way of the microscopic world of quantum mechanics challenges our commonsense understanding.

Polar Light OR Aurorae:



➤ Auroras, sometimes called the northern and southern (polar) lights or aurorae (singular: aurora), are natural light displays in the sky, usually observed at night, particularly in the Polar Regions.

➤ They typically occur in the ionosphere. They are also referred to as polar auroras. In northern latitudes, the effect is known as the aurora borealis, named after the Roman goddess of dawn, Aurora, and the Greek name for north wind, Boreas by Pierre Gassendi in 1621

➤ The aurora borealis is also called the northern polar lights, as it is only visible in the sky from the Northern Hemisphere, the chance of visibility increasing with proximity to the North Magnetic Pole, which is currently in the arctic islands of northern Canada.

➤ Auroras seen near the magnetic pole away, they illuminate the northern a faint red, as if the sun were rising



may be high overhead, but from further horizon as a greenish glow or sometimes from an unusual direction.

➤ The aurora borealis most often occurs from September to October and from March to April. The northern lights have had a number of names throughout history.

➤ The Cree people call this phenomenon the “Dance of the Spirits.” Auroras can be spotted throughout the world. It is most visible closer to the poles due to the longer periods of darkness and the magnetic field.

➤ Its southern counterpart, the aurora australis or the southern polar lights, has similar properties, but is only visible from high southern latitudes in Antarctica, South America, or Australia. Australis is the Latin word for “of the South.”



➤ Benjamin Franklin first brought attention to the “mystery of the Northern Lights.” He theorized the shifting lights to a concentration of electrical charges in the Polar Regions intensified by the snow and other moisture

DIY (Do it yourself)

Make your own rock candy



Requirements:

- 15cm piece of string
- A pencil
- A paper clip (or large plastic bead)
- 1 cup of water
- 2 cups of sugar
- A glass jar

Procedure:

1. Tie the 15 cm piece of string to the middle of the pencil.