

SCIENCE CENTRE NEWS LETTER

May 2015
Volume 1



Publisher

Milind Torawane
I.A.S.
Municipal
Commissioner

Editor

C. Y. Bhatt
Dy. Municipal
Commissioner

Sub Editor

Bhamini Mahida
Chief Curator

Divyesh Gameti
Curator (Science)

Co-ordinator

Dr. Pruthul Desai
Principal
P. T. Science College



SCIENCE CENTRE

Volume 1, Issue 1

WHAT'S NEW IN SCIENCE

NASA research suggests Mars once had more water than Earth's Arctic ocean.

A primitive ocean on Mars held more water than Earth's Arctic ocean, according to NASA Scientists. Who, using ground-based observatories, measured water signatures in the Red planet's atmosphere.

Scientists have been searching for answers to why this vast water supply left the surface.

Perhaps about 4.3 billion years ago, Mars would had enough water to cover its entire surface in a liquid layer about 450 feet (137 metre.s) deep. More likely, the water would have formed an ocean occupying almost half of Mars northern hemisphere, in some regions reaching depths greater than a mile (1.6 Kilometers).

The new estimate is based on detailed observations made at the European Southern Observatory's very large Telescope in Chile and the W.M.K.E.C.K Observatory and NASA infrared Telescope

facility in Hawaii. With this powerful instruments, the researchers distinguished the chemical signatures of two slightly different forms of water in Mars atmosphere. One is the familiar, the other is HDO, a naturally occurring variation in which one Hydrogen is replaced by heavier form, called deuterium.

By comparing the ratio of HDO to H₂O in water on Mars today and comparing it with the ratio in water trapped in a Mars meteorite dating from about 4.5 billion years ago, Scientists can measure the subsequent atmospheric changes and determine how much water has escaped into space.

The research team was especially interested in regions near Mars North and South poles, because the polar ice caps hold the planet's largest known water reservoir.

From the measurements of atmospheric water in the near - polar region, the researchers determined the enrichment or relative amount of the

planet's permanent ice caps. The enrichment of the ice caps told them how much water Mars must have lost - a volume in the polar caps now. That means the volume of Mars early ocean must have been at least 20 million cubic Kilometres (5 million Cubic miles).

An ancient ocean there would have covered 19 percent of the Mars surface. By comparison, the Atlantic Ocean occupies 17 percent of Earth's surface.

NASA is studying Mars with a host of space craft and rovers under the agency's Mars Exploration program, including the opportunity and curiosity rovers, odyssey and Mars reconnaissance orbiter spacecraft and the MAVEN orbiter, which arrived at the red planet in September 2014 to study the planet's upper atmosphere. In 2016, a Mars Lander mission called insight will launch to take a first look into the deep interior of Mars.

SCIENTIST OF THE MONTH

Prof. Mahadev Dananjaya Gadgil



Mahadev Dananjaya Gadgil was born on May 24, 1942 at Pune in Maharashtra. He did his Bachelors in Science from the University of Pune in 1963. He did his Masters in Science from Bombay University in 1965. He completed his Ph.D. in 1969 from Harvard University and his post doctoral research in 1969.

Prof. Gadgil, a leading ecologist of India has worked on important issues related to environment and forest research in India. He worked on the theory that evolutionary forces mould the life histories of living organisms.



Timings

Tuesday to Friday
9.30 am to 4.30 pm

Saturday - Sunday
& Public Holidays
9.30 am to 6.30 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



He also worked as a member of Editorial Board of "Survey in Evolutionary Biology". "Ethology proceedings of Indian Academy of Sciences," "current Science" and "Conversation Biology".

Professor Gadgil was awarded the Padmashri in 1981, the Karnataka State Rajyotsav award in 1983, the Rabindranath Tagore award in 1985 and the Shantiswarup Bhatnagar Prize in the year 1986. His contribution to Environmental Science is unparalleled.

SCIENCE FACTS MAY 2015

1st May	International Worker's Day
3rd May	World Press Freedom Day (By U.N.)
3rd May	International Energy Day
5th May 1961	"Freedom-7" the first piloted Mercury space craft launched by America
8th May	World Red Cross Day
11th May	National Technological Day
11th May 1998	India conducted nuclear tests at the Pokhran range in Rajasthan Desert
12th May	International Nurses Day
13th May 1857	Sir Ronald Ross (Inventor of medicine for Malaria) was born on this day
14th May 1686	Daniel Gabriel Fahrenheit (inventor of Thermometre) was born on this day
14th May 1796	Dr. Edward Jenner tested his hypothesis first time on a eight years old boy
16th May 1831	David Edward Hughes (inventor of Carbon Microphone & Tele Printer) was born on this day
17th May	World AIDS Vaccine Day
17th May 1749	Sir Edward Anthony Jenner (Inventor of smallpox vaccine) was born on this day
18th May	International Museum Day
19th May 1910	Halley's Comet brushes the Earth with its tail
19th May 1971	Soviet Union had sent "Mars-2" for journey to Planet Mars which was crashed at Mars Land
24th May 1844	First telegraphic message was sent by well known Scientist Samuel Morse
30th May 1971	America launched space craft "Mariner-9" to Planet Mars
31st May	World no Tobacco Day (by U.N.)

KNOW THE EXHIBITS AT FUN SCIENCE GALLERY

Transfer of Momentum



The apparatus consists of identical balls suspended from a rigid support so that they touch each other.

Working

Pull one ball to the left end and release it. On collision we will observe that only one ball which is rightmost goes out at the other end. If we pull two balls at a time to the left and release then two rightmost balls will go out. The same will happen for three balls pull.

What is the principle behind this?

1. Transfer of Momentum :

A body in motion has a momentum which is equal to the product of its mass and velocity.

$P = mv$

Where, $m = \text{mass}$,
 $v = \text{velocity}$,
 $P = \text{Momentum}$

When a ball strikes the one in front, its momentum is transferred to the next one, which in turn passes to the next ball and so on. The last ball having no other ball to transfer its momentum moves out with a velocity equal to that of the first ball. When two or three balls strike, the momentum is doubled or trebled and hence the last two or three balls go out when four balls strike, the momentum is quadrupled. This means that at the other end four balls should go out. That is why the central ball, in

this case, regroups itself and moves.

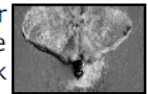
2. Newton's 3rd law of Motion :

"To every action, there is always an equal and opposite reaction."

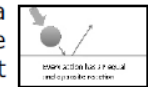
This law signifies that forces in nature always occur in pairs.

Example :

1. A swimmer pushes the water back when he moves forward.



2. When a ball hits the ground it bounces back.



ASTROPHOTOGRAPHY EXHIBITION :



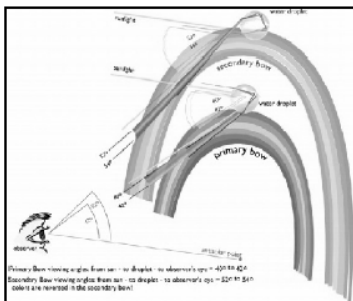
Science centre Surat has organised Astrophotography exhibition at Art Gallery from 14th April to 26th April 2015. The exhibition showed information about what is Astrophotography? There were more than 130 photographs of 21 Astro photographers of Surat displayed in the exhibition. These photographs include star trails, galaxies, night sky photography etc. Time laps videos were also shown in the exhibition.



SCIENTIFIC QUESTION

Why Rainbow has seven Colours?

Answer : A Rainbow has seven colours because water droplets in the atmosphere break sunlight into seven colours.

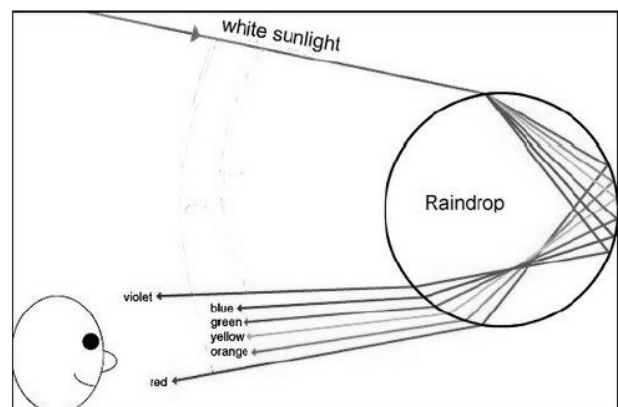


When light meets a water droplet, it is refracted at the boundary of air and water. As it enters the droplet, light is dispersed into seven colours. There is refractive index difference, this refractive index difference, this

refraction angle of refractive index is in accordance with the wavelength of light (called dispersion). In conventional media, shorter the wavelength (or the blue colour), the larger the refractive index. Refractive index of any medium water in this case is

a function of wavelength. Therefore the angle of refraction is different for different colours (wavelength) which produces spectrum.

We see the rainbow when the sun is located behind us.



The main rainbow becomes visible at an angle of around 40° from horizon.

SCIENCE QUIZ

- If the Air column is long, than the pressure at the bottom is**
A) More B) Less C) Neutral D) None of these
- In Convex Mirror, the image appears as convex mirror**
A) Big B) Short C) Thin D) Long
- Human beings can hear sound of a range of frequencies -**
A) From 20 Hz to 20 KHz B) From 20 Hz to 200 KHz C) 20 Hz D) 20 KHz
- The Big Dipper is part of which constellation ?**
A) Ursa Major B) Ursa Minor C) The Great Bear D) Both answers a) and c) above
- What are the names of the two stars in the Big Dipper used to locate Polaris ?**
A) The North seekers B) The Pointer Stars C) The Pointer Sisters D) The South Seekers
- What are circumpolar stars ?**
A) Stars that can only be seen from North Pole B) Stars that never set
C) Stars that cannot be seen from the North Pole

Answers (1) A (2) B (3) A (4) A (5) B (6) B

ACTIVITIES AT SCIENCE CENTRE SURAT



Match Stick Exhibition : Science Centre Surat had organised "Match Stick Exhibition" at Art Gallery from 20-03-2015 to 31-03-2015. This exhibition showed information about history of match stick, raw materials used in making match sticks, process of making, packaging and quality control. There were different types of match sticks displayed in the exhibition. There were models displayed in the exhibition which are made from match sticks like table-chair, Flowers, famous "Fraser Tower" of Surat, etc. Apart from this match stick boxes having pictures of heritage buildings of Surat were also displayed.

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 Fun Science Exhibits and Second floor of Science Centre showcases Diamond Gallery where as Entering into space, Textile Gallery, Power of Play 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	09:15, 11:20, 12:00, 02:40, 04:00
Hindi	10:00, 10:40, 12:40, 01:20, 02:00, 03:20	10:00, 10:40, 12:40, 01:20, 02:00, 03:20, 04:40, 05:20, 06:00
Science Centre + Planetarium + Museum + Diamond Gallery		Planetarium
Above 18 Years	Rs. 100	Tuesday to Friday
3 Years to 18 Years	Rs. 65	Saturday, Sunday & Public Holidays
Science Centre + Museum + Diamond Gallery		09:30 to 10:20 English
Above 18 Years	Rs. 60	10:30 to 11:20 Gujarati
3 Years to 18 Years	Rs. 40	11:30 to 12:20 Gujarati
Science Centre + Planetarium + Museum + Diamond Gallery + 3D Show		12:30 to 01:20 English
Above 18 Years	Rs. 120	01:30 to 02:20 Hindi
3 Years to 18 Years	Rs. 80	02:30 to 03:20 Hindi
Planetarium		03:30 to 04:20 Gujarati
Above 18 Years	Rs. 50	04:30 to 05:20 English
3 Years to 18 Years	Rs. 40	05:30 to 06:20 Gujarati
3D Show		
Above 18 Years	Rs. 60	
3 Years to 18 Years	Rs. 40	