SCIENCE CENTRE NEWS LETTER

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SCIENCE CENTRE

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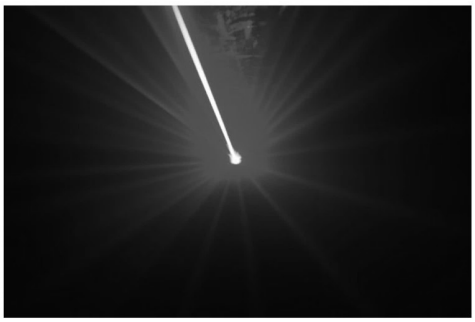
WHAT'S NEW IN SCIENCE

A new way of diagnosing and treating disease without cutting skin

Researchers from University of British Columbia have developed a specialized microscope that has the potential ability to both diagnose diseases that include skin cancer and perform incredibly precise surgery, all without cutting skin. The researchers described the technology in a study published in American Science Journal 'Science Advance' on 15th May, 2019. "Our technology allows us to scan tissue quickly, and when we see a suspicious or abnormal cell structure, we can perform ultra-precise surgery and selectively treat the unwanted or diseased structure within the tissue -- without cutting into the skin," said Yimei Huang, co-lead author of the study and a former postdoctoral fellow at the department of dermatology and skin science at UBC (University of British Columbia). The device is a specialized type of multiphoton excitation microscope that allows imaging of living tissue up to about one millimeter in depth using an ultrafast infrared laser beam. What sets the researchers' microscope apart from previous technology is that it is capable of not only digitally scan the living tissue, but also treating the tissue by intensifying the heat produced by the laser. When applied to treating diseases of the skin, the microscope allows medical professionals to pinpoint the exact location of the abnormality, diagnose it and treat it instantly. It could be used to treat any structure of the body that is reached by light and that requires extremely precise treatment, including nerves or blood vessels in the skin, eye, brain or other vital structures. The researchers have partnered with several UBC departments, including mechanical engineering, electrical engineering and ophthalmology, to develop different versions of the technology. Exploration includes research into the development of a miniature version that could be used to perform microscopic examinations and treatment during endoscopy non-surgical procedure used to examine a person's digestive tract using an endoscope.



Courtasy : M.T. Jariwala Secondary School (Eng. Medium)

SCIENTIST OF THE MONTH

Girish Saran Agarwal

Girish Saran Agarwal was born on July 7, 1946 at Bareilly, Uttar Pradesh. He did his M.Sc. from the Banaras Hindu University in 1966 and Ph.D. from the University of Rochester, U.S.A.

Professor Agarwal made immense contribution to several branches of optics which dealt with the interaction of radiation with matter, particularly in the areas of temporal coherence of the source/laser or optical phenomena, nonlinear mixing and optical phase configuration, optical visibility and co-operative resonance fluorescence quantum effects in optical phenomena and surface optics.

He has published more than 240 research papers in many reputed journals. He has served as a member of the Editorial Boards of 'Quantum Optics', UK, 'Journal of Modern Optics', 'World Scientific and Optics Communication'. He received the Shanti Swarup Bhatnagar Prize in 1982, the Meghnad Saha Award in 1987, Third World Academy of Science Prize, 1994 and Einstein Medal, 1994. He was also the Director of Physical Research Laboratory.

Courtasy : M.T. Jariwala Secondary School (Eng. Medium)

SCIENCE FACTS JULY 2019

1 July	Birthday of famous Physician & Bharat Ratna Awardee Bidhan Chandra Roy which is celebrated as 'Doctor's Day' in India.
2 July 1938	Birthday of Chandrakumar Naranbhai Patel (inventor of the Carbon Dioxide Laser).
4 July 2005	Successful collision of NASA's satellite "Deep Impact" with comet into the space was held at the distance 13.04 million km from the Earth.
5 July 1996	First Clon Mammal (Genetically identical individuals) 'Dolly' (a sheep) was born on this day
6 July 1906	Daulat Singh Kothari (well known Indian physicist) was born.
6 July 1885	Vaccine for Rabies first time used on human on this day.
7 July	International Cooperative Day (First Saturday)
11 July	World Population Day. (by U.N.)
16 July 1945	The first detonation with code name "Trinity" conducted by United States at "Los Alamesh" was done. This date is known as the beginning of Atomic Age.
16 July 1969	Successful launching of "Apollo 11" was done with the help of "Saturn V" rocket from Kennedy Space Center at Florida.
18 July	Nelson Mandela International Day for freedom, justice and democracy. (by U.N.)
18 July 1980	Launching of Indian satellite "Rohini RS-1" into the Space.
19 July 1814	Samuel Colt (inventor of Revolver) was born.
24 July 1969	Successful landing of "Appolo-11" in the pacific Ocean.
25 July 1978	"Louise Joy Brown" the world's first successful Test Tube Baby was born in Great Britain.
26 July 2019	20th Annual System Administrator Appreciation Day. (Also known as Sysadmin Day). (Last Friday)
U.N.: United Nations	

SCIENCE CENTRE SCS SURAT

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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सूरत महानगर पालिका
बहुजनहिताय बहुजनसुखाय

KNOW THE EXHIBIT AT FUN SCIENCE GALLERY

The Express Route

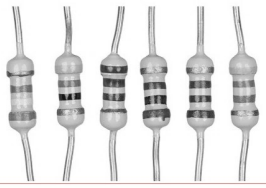
Lift two balls with your fingers along the slot right up to the top of the two channels and release them simultaneously by pressing the lever down. Observe that the ball rolling along the curved path reaches the bottom first. This curved path is in the form of a cycloid. A body experience highest average acceleration along a cycloid path and consequently rolls down quickest even through the shortest path is the straight one.

SCIENTIFIC QUESTION

What is Resistor? (Part-1)

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines and many other uses. High-power resistors that can dissipate many watts of electrical power as heat, may be used as part of motor controls, in power distribution systems, or as test loads for generators. Fixed resistors have resistances that only change slightly with temperature, time or operating voltage. Variable resistors can be used to adjust circuit elements (such as a volume control or a lamp dimmer), or as sensing devices for heat, light, humidity, force, or chemical activity.

Resistors are common elements of electrical networks and electronic circuits and are ubiquitous in electronic equipment. Practical resistors as discrete components can be composed of various compounds and forms. Resistors are also implemented within integrated circuits.The electrical function of a resistor is specified by its resistance: common commercial resistors are manufactured over a range of more than nine orders of magnitude.



Electronic symbol

Typical schematic diagram symbols are as follows:

(a) resistor, (b) rheostat (variable resistor), and (c) potentiometer

IEC resistor symbol

Theory of operation

Ohm's law

The behaviour of an ideal resistor is dictated by the relationship specified by Ohm's law:

V= I x R

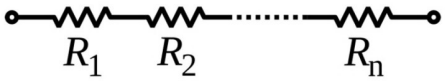
Ohm's law states that in constant physical condition the voltage (V) across a resistor is proportional to the current (I), where the constant of proportionality is the resistance (R). For example, if a 300 ohm resistor is attached across the terminals of a 12 volt battery, then a current of 12 / 300 = 0.04 amperes flows through that resistor.

Practical resistors also have some inductance and capacitance which affect the relation between voltage and current in alternating current circuits.

The ohm (symbol: Ω) is the SI unit of electrical resistance, named after Georg Simon Ohm. An ohm is equivalent to a volt per ampere. Since resistors are specified and manufactured over a very large range of values, the derived units of milliohm (1 mΩ = 10^{-3} Ω), kilo ohm (1 kΩ = 10^{3} Ω), and mega ohm (1 MΩ = 10^{6} Ω) are also in common usage.

Series and parallel resistors

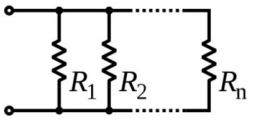
The total resistance of resistors



connected in series is the sum of their individual resistance values.

Req = R1 + R2 +…..+Rn

The total resistance of resistors connected in parallel is the reciprocal of the sum of the reciprocals of the individual resistors.



1/Req = 1/ R1 + 1/ R2 + …..+ 1/ Rn

For example, a 10 ohm resistor connected in parallel with a 5 ohm resistor and a 15 ohm resistor produces 1/1/10 + 1/5 + 1/15 ohms of resistance, or 30/11 = 2.727 ohms.

Courtesy : M.T. Jariwala Secondary School (Eng. Medium)

ASTROPHOTOGRAPHY EXHIBITION

Surat Municipal Corporation had organized Astrophotography Exhibition at first floor of Art Gallery, Science Centre Surat from 24/05/2019 to 02/06/2019. In this exhibition, the photographs on the subject of Astronomy i.e, Milky Way, Solar System (Sun, Moon, Plantes), Night Sky, Star Trail, etc. were displayed 240 photographs were displayed by 37 photographers from Gujarat (Surat & Tapi District). Total 659 nos. of visitors had visited this exhibition.

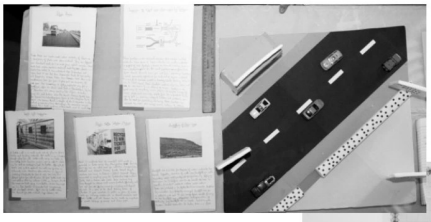
SCIENCE PROJECT

Surat Municipal Corporation had organized 'Science Fair' on the subject of 'Clean Surat-Green Surat' at Ground Floor, Art Gallery, Science Centre, Surat on 03rd and 04th August 2018. M.T. Jariwala Secondary School (Eng. Medium) had presented their project on 'Re-Usage Of Plastic Waste'.

Aim of the project was to manage the plastic waste and environment friendly re-usage. For this project we have to construct the wall by making use of waste plastic bottles, plastic roads and land filling by waste plastic. We can also make plastic waste bottle collecting machine.

Advantages :

* A multipurpose project where management of voluminous plastic litter is done in eco-friendly manner.
* Public awareness and motivating them to dump plastic bottles into collecting machines.
* Can built aesthetic wall.
* The waste land can be converted into park, garden beautifying the Surat City.



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, Cosmos Gallery under development.

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