Echo-6

REVERBERATIONS ’15

Celebrate Physics

A Magazine from Physics Association,

“Thamoso ma JyothirGamaya”

Department of Physics

Dwaraka Doss Goverdhan Doss Vaishnav college(Autonomous),

Chennai - 600106

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P. Haridas
Secretary

06.01.2015

MESSAGE FROM SECRETARY DESK

I am very pleased to learn that the Physics department of our college is bringing out a magazine Reverberations 15' with the Theme LIGHT. I congratulate the department for choosing the subject in this Year Of Light declared by UNESCO. Light symbolizes energy, without light there cannot be an activity. Our ancestors therefore rightly emphasized prayers on light from darkness "Thamosoma Jyothir Gamaya" Just as we cannot imagine a day without sun. We cannot see the earth without light, the entire ecology; environment depends on this source namely "The Light".

I congratulate the veteran students and the dedicated staff of this department which is bringing light to everyone. I wish this magazine will be the one which will not only be a value addition to the libraries but also a source of guide to the future scientists and this is a very appropriate decision, in this International Year Light.

With Regards

P Haridas

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Maj. Dr. M. Venkatramanan, M.A., M.Phil., Ph.D.
Principal

From the Principal's Desk

The Department of Physics has been actively engaged in various student - centric activities. Its annual magazine Reverberation'15 is yet another platform for the students to express their ideas, innovative thoughts and creativity. The students have been given various Training programmes, Robotics, Awareness programmes, workshops, Interdisciplinary trainings which helps them to evolve as Nation builders. I appreciate the Department of Physics and wish them "Best of Luck" when they are marching forward towards their Golden Jubilee celebrations.

Maj. Dr. M. Venkatramanan
Principal

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From the HOD's Desk…

The Department of Physics has been a centre of dynamic activity progressing in various dimensions. It has been enthusiastically organising programs to induce and nurture scientific temper in the minds of students. The Department, along with the Indian SpectroPhysics Association (ISPA), hosted the *National Seminar in Physical Sciences for PG and M.Phil. Students* in 2010. To keep the students informed about the latest developments in Applied Physics, a *Seminar on Recent Trends in Applied Physics* was conducted in 2012. This department has been bestowed with great teachers *Prof. S. R. Govindarajan, Prof C. Rengarajan , Prof R.Ananthan, Prof Mathrubutham, Prof G. Ramamurthy, Maj Dr. S.Srinivasan, Dr.B.Krishnan.* To show our gratitude and honour to the great teachers of the department, *Prof. S. R. Govindarajan Endowment Lecture* and *Dr.S.Srinivasan Memorial Lecture* are being organised every year. Golden Jubilee Science Lecture Series has been organized inviting eminent scientists from various institutions to motivate students towards science education and research. The Department is supported under the prestigious *DBT STAR COLLEGE SCHEME*. We are marching towards golden jubilee celebration and I am indented to the dedicated teachers of this department for its growth. The enthusiasm, creativity along with guidance as been the right ingredient nurturing this growth. Our department reverberation was born in the year 2010 as a small step to provide a platform for fresh ideas showcase innate of the students, encourage critical thinking enable them to explore and experiment with numerous possibilities. It has taken beautiful avatar severing the purpose for the past years. This sixth edition is yet another outcome nurtured by team work celebrating the International Year of Light and light based related technologies. I take this opportunity to thank our Principal and Management for their support and encouragement.

Dr. D.Uthra
Head, Dept of Physics
D.G.Vaishnav College

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EDITORIAL

The most precious possession that gave human being an advantage over every other species on this planet is their ability to conceive idea and communicate them orally or by writing, resulting in the growth of civilization. A students mind is equipped with creativity, spontaneity and originality. This indomitable urge has found its shape in the form of articles, drawings and poems.

We are elated to behold the issue of Reverberation ’15 which is enhancing the beauty of your hands. We believe that a good magazine is the real reflection of life, getting shapes in the college premises and it exhibits the endeavors made in the very temple of education. The proof of the pudding is in the eating, the worth of the magazine is in its reading. UNESCO has declared the year 2015 as International Year of Light and light based technologies. This is the global initiative which will highlight to the citizens of world the importance of light and optical technologies in their life, for their futures, and for the development of the society.

This issue Reverberation’15 celebrates International Year of Light and is filled with articles related to this theme. We are sure every article in this magazine is certain to make impact in young learners. We hope the readers too enjoy Physics as we do.

We take this opportunity to thank our Principal and Management for their support encouragement in bringing out Reverbereations’15 and for carrying out vibrant activities in our department. Also we appreciate the students for their enthusiastic participation.

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1. POLYMATHIC LIFE OF THOMAS YOUNG

Thomas Young, born on June 13, 1773 at Milverton, was not only a Physicist but also a Physician and in addition was well versed in Physiology and even in deciphering Egyptian hieroglyphs. Further he knew many languages such as Greek, Latin, French, Italian, Hebrew, German etc. But the above long list of Young's interests is not exhaustive because he was also good in music! He was predominantly a Physician but he worked as a Professor of Natural Philosophy at the Royal Institution in Great Britain for III years from 1801 to 1803. He resigned from the latter position so that he may not have to compromise his Physician duties.

He was able to clearly explain the phenomenon of superposition of light and also interference as a consequence it. He also performed the famous double slit experiment and by these contributions he added steam to the wave theory of light. He explained the concepts of superposition and interference by the following words which he read before the Royal Society of London in November 12, 1801:

“When two undulations from different origins coincide either perfectly or very nearly in Direction, their joint effect is a combination of the motions belonging to each."

"Since every particle of the medium is affected by each undulation, wherever the directions coincide, the undulations can proceed no otherwise, than by uniting their motions, so that the joint motion may be the sum or difference of the separate motions, accordingly as similar or dissimilar parts of the undulations are coincident**.”**

He also made significant contributions to the fields of physiological optics (he is considered its founder), hemodynamic and linguistics. This polymath life of Thomas Young throws light on an important fact that every scientific investigator must bear in mind. One must not stop with the knowledge of one's own domain of science alone but have a wide range of interests and pursue them too. This is because focusing one's mind on one subject alone can narrow down one's field of thought and thus hinder un conventional thinking which is a basic necessity for doing science. In general, science is innovation and innovations can happen when one is able

to relate previously thought-to-be-un relatable ideas from different fields. This can be achieved by not stopping oneself to knowledge of one's own domain but by keeping abreast of ideas in other fields also, which is, as clearly seen above, what made Thomas Young a successful scientist.

S .VENKATESH
I B.Sc. Physics

2. EYEGLASSES

We know that the spectacles or the eyeglasses which we use commonly are made up of a pair of lens. The function of lens in the eyeglasses is to focus a beam of light through phenomenon called refraction. All of us are familiar with the two types of lenses that is the convex and the concave which correct the far sightedness and the near sightedness respectively.

But the origin of eyeglasses has always remained a mystery. Several names have been associated to this invention, but the truth is that it was invented anonymously and developed over a period of time. But a widely accepted theory is that the first wearable pair of eyeglasses was made in Italy during the 13th century. Although the lenses were used prior to the 13th century, sources suggest that an Italian monk Allesandro Della Spina learnt how to make the spectacles from an anonymous person, who did not want to make it public. The monk made it for his personal use and subsequently shared it with the outer world. So we can say that Allesandro Della Spina was the person who spread it among the public, but the original ‘inventor’ had thought of keeping the invention a secret. Some evidences suggest that the person was Salvino D’Armati, but it still remains a mystery!

The first eyeglasses were made of metal or bone frames and the lenses were made of ‘quartz crystal’. Early references say that only convex lenses were made during the 13th century, but in 1451, Nicholas of Cusa in Germany made concave lenses to help people with near sightedness. The modern style of frames which could be placed over ears and nose was invented by a British optician in 1727. The American scientist Benjamin

Franklin was the one who invented the bifocal lens. It is prescribed for people having presbyopia. In short we can say that the origin of eye glasses still remains a mystery!

V. RENUKA
I M.Sc.Physics

3. HISTORY OF LASERS

LASER is the acronym for **L**ight **A**mplification by **S**timulated **E**mission of **R**adiation. Nowadays lasers are used in many fields like medicine, entertainment (laser show), computers, music and metal working etc.

Albert Einstein first explained the theory of stimulated emission in 1917, which became the basis of LASER. He postulated that, when the population inversion exists between upper and lower levels among atomic systems, it is possible to realize amplified stimulated emission and the stimulated emission has the same frequency and phase as the incident radiation. However, it was in late 1940s and fifties that scientists and engineers did extensive work to realize a practical device based on the principle of stimulated emission.

Initially, the scientists and engineers were working towards the realization of a MASER (Microwave Amplification by the Stimulated Emission of Radiation), a device that amplified microwaves for its immediate application in microwave communication systems. Townes and the other engineers believed it to be possible to create an optical MASER, a device for creating powerful beams of light using higher frequency energy to stimulate what was to become termed the lasing medium. Despite the pioneering work of Townes and Prokhorov it was left to Theodore Maiman in 1960 to invent the first LASER using ruby as a lasing medium that was stimulated using high energy flashes of intense light.

The development of Lasers has been a turning point in the history of science and engineering. It has produced a completely new type of systems with potentials for applications in a wide variety of fields. During sixties, lot of work had been carried out on the basic development of almost all the major LASER’s including high power gas dynamic and chemical LASER’s. The motivation of using high power LASER’s in a strategic

scenario was a great driving force for the rapid development of these high power LASER's. In early seventies, Megawatt class carbon dioxide gas dynamic LASER was successfully developed and tested against typical military targets. The development of chemical LASER's, free electron and X-ray LASER's took slightly longer time because of involvement of multidisciplinary approach.

The Nobel prize in physics 1964 was divided, one half awarded to Charles hard Townes, other half jointly to Nicolay Genn diyevich Basov and Aleksander Mikhailovich Prokhorov for fundamental work in the field of quantum electronics, which has led to the construction of oscillators and amplifier based on the maser-laser principle.

K. S. SRIDHARAN
I M.Sc. Physics

4. SOLAR CELLS

Solar (or photovoltaic) cells convert the sun's energy into electricity. Whether they are adorning your calculator or orbiting our planet on satellites, they rely on the Photoelectric Effect, the ability of matter to emit electrons when light is shone on it.

Silicon is a semi-conductor that shares some of the properties of metals and some of those of an electrical insulator, making it a key ingredient in solar cells. Let's take a closer look at what happens when the sun shines onto a solar cell.

Sunlight is composed of miniscule particles called photons which radiate from the sun. As these hit the silicon atoms of the solar cell, they transfer their energy to lose electrons, knocking them clean off the atoms. The photons could be compared to the white ball in a game of pool, which passes on its energy to the colored balls it strikes. Freeing up electrons is however only half the work of a solar cell. It then needs to herd these stray

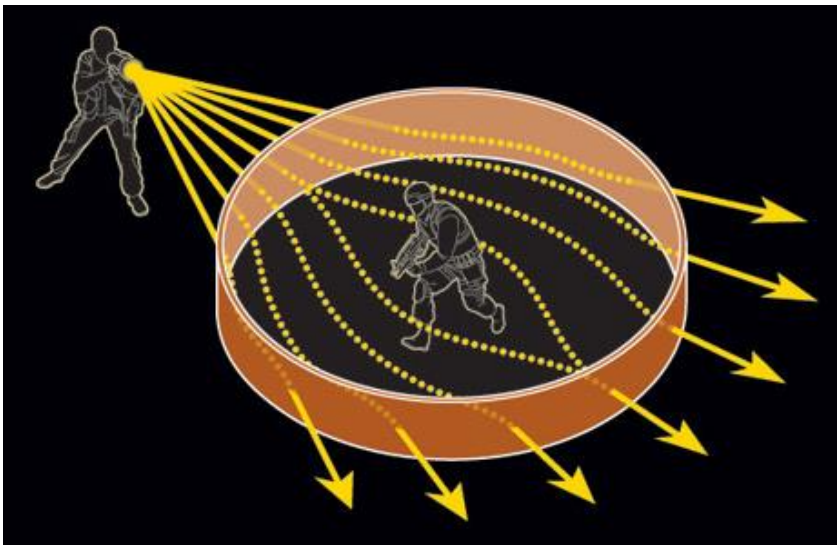
electrons into an electric current. This involves creating an electrical imbalance within the cell, which acts a bit like a slope down which the electrons will flow in the same direction. Creating this imbalance is made possible by the internal organization of Silicon. Silicon atoms are arranged together in a tightly bound structure. By squeezing small quantities of other elements into this structure, two different types of silicon are created: n-type, which has spare electrons, and p-type, which is missing electrons, leaving 'holes' in their place. When these two materials are placed side by side inside a solar cell, the n-type silicon's spare electrons jump over to fill the gaps in the p-type silicon. This means that the n-type silicon becomes positively charged, and the p-type silicon is negatively charged, creating an electric field across the cell. Because silicon is a semi-conductor, it can also act like an insulator, maintaining this imbalance.

As the photons smash the electrons off the silicon atoms, this field drives them along in an orderly manner, providing the electric current to power calculators, satellites and everything in between.

R. GOKUL
I M.Sc. Physics

5. INVISIBILITY CLOAKS

Sophisticated cloaking devices may soon hide objects from light, sound, water, even earthquakes.



Invisibility cloaks are engineered materials that bend light and other waves around an object. Because no waves bounce back to the observer, the cloaked object (or person) becomes undetectable. Back in 2006 Harry

Potter was the cause of all this rage in the engineering world. That year *a team at Duke University built the first rudimentary device for hiding objects*, akin to the boy wizard's invisibility cloak. But in technology as in the movies, Harry Potter is now old news. Over the past six years, scientists have moved beyond mere invisibility: If they could build cloaks for light waves, then why not design materials to conceal sound and even ocean waves?

A whole suite of invisibility cloaks are now under development, all building on the same basic principle as the first prototype. When we perceive an object, we are actually detecting the disturbances it creates as energy waves bounce off it. Invisibility cloak, constructed from a synthetic structure called a Meta material, prevented those disturbances by bending light waves around the object, allowing them to continue flowing like water in a stream around a rock. Sure enough, that technology is not limited to light. In the latest designs it is being applied to mask all kinds of other waves, with the potential for zeroing out sound pollution and protecting cities from earthquakes. Meanwhile, scientists continue to pursue the original invisibility concept, a work that is sparking a lot of interest in military surveillance circles.

The Tech: A group of Physicists led by Tolga Ergin and Joachim Fischer at the Karlsruhe Institute of Technology in Germany built *a light-bending fabric* last year that rendered a cloaked object invisible to the human eye from any viewing angle for the first time.

What It's Made of: A rigid synthetic polymer composed of tiny rods spaced about 350 nanometers (billionths of a meter) apart, a gap small enough to manipulate waves of visible light.

How it Works: As a test, researchers laid the cloak over a flat surface with a small bump in the middle. The cloak bent incoming light rays around the bump and bounced them back as if they had struck a flat surface. Observers would never know the bump existed.

Applications: For now, this cloak can hide only small imperfections on flat surfaces. But eventually, scientists hope to scale it up to conceal much larger objects anywhere in space. The U.S. Defense Advanced Research Projects Agency (Darpa) started investing in Meta materials way back in 2001, and while it doesn't like to reveal specific intentions, the

agency would certainly be interested in cloaks that conceal soldiers and military equipment.

Courtesy: www.discovermagazine.com

S. SAPNA
II M.Sc. Physics

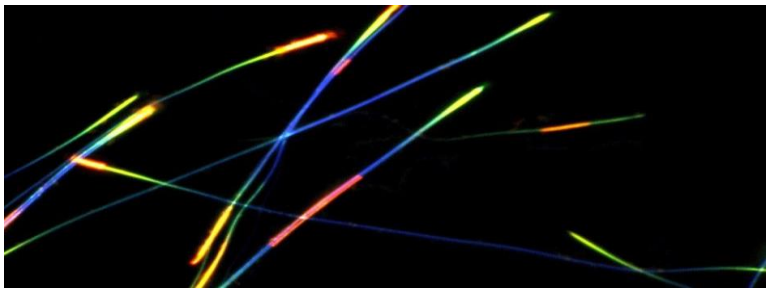
6. LASER IN DVD

A DVD player contains a laser that is used not because it produces a parallel beam, but rather because the light emerges from a tiny point, which enables it to be focused on the different layers of the disc. By moving the lens sideways or laterally, it is possible to reach areas farther in or out on the disc. By moving the lens along the beam - longitudinally, different depths can be reached in the disc. The information, ones and zeros, is stored in several layers, and only one layer is to be read at a time. Every point on a particular layer is read during every revolution of the disc. In order to make room for a lot of information on every disc, the beam has to be focused on as small an area as possible. This cannot be done with any other light source than a laser. Today this area has been reduced to about half a square micrometer, which yields 2 megabits or 0.25 MB per mm^2.

R .VINOTH KUMAR
I M.Sc. Physics

7. NANOWIRE LASER

The famous talk “There’s plenty of room at the bottom “given by Richard Feynman at the annual meeting of the American Physical Society (APS) in 1959 promoted miniaturization’s long term theme for modern technology. Thereafter reducing dimensions of electronics devices, miniaturization of photonics devices including lasers has become an increasing interest for high flexibilities, better performance and higher density integration. The combination of nanotechnology and laser Physics conceived the idea of nanowire lasers which generally refer to miniaturized lasers composed by one dimensional nanostructure such as nanowire and nanoribbons.



One dimensional active nanowires direct band gap material with large refractive index and widely available band gaps make them ideal candidates for nanowire lasers covering a broad spectral range. One dimensional geometry and high uniformity make the nanowire excellent optical wave guide for direction and recirculation of light on micro/nanometer scale. Compared to other type of nanoscale lasers such as Micro Disk Laser and Vertical Cavity Surface Emitting Laser (VCSEL) nanowire lasers are wave guide laser that benefit a more than the capability of dense integration. The output light of nanowire waveguide could be directly coupled into both photonics and plasmonics nano structure with high efficiency. The light recirculation in the sub wavelength diameter, wave guide offers opportunities for enhancing interaction with surrounding media, as well as modifying the output of the laser itself. All these merits of nanowire lasers make them fascinating building blocks for future micro/nano-photonics devices and circuits.

Courtesy: www.photonics.stanford.edu

KANCHAN SINGH MOURYA
II M.Sc. Physics

8. QUOTES ON LIGHT

- **Moonlight drowns out all but the brightest stars.**
  -J.R.R. Tolkien, The Lord of the Rings
- **It's hard to be a bright light in a dim world**
  -Garystarta
- **I will love the light for it shows me the way, yet I will endure the darkness for it shows me the stars**
  -OgMandino Gary Stay
- **Education is the movement from darkness to light.**
  -Allan Bloom

- **There are two ways of spreading light: to be the candle or the mirror that reflects it.**

-Edith Wharton

J. HARISHMA
I M.Sc. Physics

9. FACTS ABOUT LIGHT

1) Greeks thought our sight came from something dashing out of the eyes and into objects.

2) The first determination of "c", the speed of light in a vacuum, was made by a Danish astronomer Ole Roemer using the motion of the moons of Jupiter.

3) In glass, light slows down a bit, bending its trajectory and this property helps in making of lenses.

4) Particles travelling faster than light in a medium, release a form of luminous shock wave called Cerenkov radiation that we see as deep blue light.

5) Different colors have slightly different speeds in water, making them bend in slightly different angles. That causes the rainbow when water droplets are in the atmosphere.

6) Light from the sun takes 8 minutes and 17 seconds to reach us, but inside the sun the energy takes millions of years to go to from the center to the surface.

7) Humans, just like apes and monkeys, have three color receptors that allow us to see all colors. Birds and other non-mammals have a four color receptors which means they can see many more colors than we do.

8) The Hubble telescope photographed several galaxies receding from us at speeds above the speed of light

9) The difference of the speed of light according to the density of a substance is responsible for false oasis travellers see in the desert, and helps the process that allows the manufacture of fiber optics.

T.GANESH PRASHANTH
I M.Sc. Physics

10. BRAIN IMPLANT THAT USE LIGHT

A novel optical device could ultimately be used to treat neurological disease.

Researchers at Medtronic are developing a prototype neural implant that uses light to alter the behavior of neurons in the brain. The device is based on the emerging science of opto-genetic neuro-modulation in which specific brain cells are genetically engineered to respond to light. Medtronic, world's largest manufacturer of bio medical technologies, aims to use the device to better understand how electrical therapies currently used to treat Parkinson and other disorder etc.Despite their success, such neural prostheses have serious drawbacks. Beyond the blunt fact of their physical locations, they stimulate neurons near the electrode indiscriminately. That over-activity can trigger dizziness, tingling and other side effects. Also, they produce electrical "noise" that makes tracking quieter neural signals difficult and scanning systems like MRT practically impossible. While academic scientists are developing new tools to deliver light to the brain, Medtronic is developing an opto-genetically based implant for commercial use.

It uses a fiber-optic to direct light from a blue or green LED at target neurons in the brain. The module which is approximately the size and shape of a small USB flash drive has wireless data links, a power management unit, microcontroller and optical stimulator .The company plans to market the device to neuroscience researchers and use it for in house research on the effects of DBS (Deep Brain Stimulation).

Courtesy: bymarkwilliamonfeb242010

P. BHAVANI PRIYA
II M.Sc. Physics

11. RAINBOW

A rainbow is an optical and meteorological phenomenon that is caused by both reflection and refraction of light in water droplets resulting in a spectrum of light appearing in the sky. It takes the form of a multicolored arc. Rainbows caused by sunlight always appear in the section of sky directly opposite the sun.

Rainbows can be observed whenever there are water drops in the air and sunlight shining from behind the observer at a low altitude angle. Because of this, rainbows are usually seen in the western sky during the morning and in the eastern sky during the early evening. The most spectacular rainbow displays happen when half the sky is still dark with raining clouds and the observer is at a spot with clear sky in the direction of the sun. The result is a luminous rainbow that contrasts with the darkened background. The rainbow effect is also commonly seen near waterfalls or fountains. In addition, the effect can be artificially created by dispersing water droplets into the air during a sunny day. Rarely, a moon bow, lunar rainbow or night time rainbow, can be seen on strongly moonlit nights. As human visual perception for color is poor in low light, moon bows are often perceived to be white.

Multiple rainbows: Secondary rainbows are caused by a double reflection of sunlight inside the raindrops, and appear at an angle of 50–53°. The secondary rainbow appears little faded comparing to the primary rainbow.

Twinned rainbow: Thecolors in the second bow, rather than reversing as in a double rainbow, appear in the same order as the primary rainbow. The cause of a twinned rainbow is the combination of different sizes of water drops falling from the sky.

Full circle rainbow: A full circle rainbow can be seen only from above, as from an aircraft. The height of the sun when the rainbow appears determines how much of the circle can be seen; as the sun approaches the horizon, more of the circle comes into view, whereas the higher the sun is in the sky, the smaller the arch of the rainbow becomes.

Monochrome rainbow: Occasionally a shower may happen at sunrise or sunset, where the shorter wavelengths like blue and green have

been scattered and essentially removed from the spectrum. Further scattering may occur due to the rain, and the result can be the rare and dramatic monochrome rainbow.

Reflected and refraction rainbow: When a rainbow appears above a body of water, two complementary mirror bows may be seen below and above the horizon, originating from different light paths. Their names are slightly different. Reflected rainbows in the water surface may appear below the horizon, where reflection rainbow appears above the horizon.

Isaac Newton demonstrated that white light was composed of the light of all the colors of the rainbow, which a glass prism could separate into the full spectrum of colors, rejecting the theory that the colors were produced by a modification of white light. Newton's corpuscular theory of light was unable to explain supernumerary rainbows, and a satisfactory explanation was not found until Thomas Young realized that light behaves as a wave under certain conditions, and can interfere with itself. Young's work was refined in the 1820s by George Biddell Airy, who explained the dependence of the strength of the colors of the rainbow on the size of the water droplets. Advances in computational methods and optical theory continue to lead to a fuller understanding of rainbows.

K.THARANITHARAN
II M.Sc. Physics

12. LIGHT THERAPY

It involves of exposure to day light or to specific wavelengths of light using polychromatic polarized light, lasers, light emitting diodes, dichroic lamps or very bright full spectrum light. The light is administered for a prescribed amount of time and for a prescribed amount and in some cases, at a specific time of day.

MEDICAL USES

SKIN CONDITION

a. **Psoriasis**: In psoriasis, UVB phototherapy has been shown to be effective, a feature of psoriasis is localized inflammation mediated by the immune system ultra violet radiation is known to suppress the

immune system and reduce inflammatory responses light therapy for skin conditions.

b. **Vitiligo**: One percent of the population suffers from vitiligo and narrow band UVB phototherapy is an effective treatment. "NB-UVB" phototherapy result is satisfactory repigmentation in avitiligo patient and should be offered as a treatment option.

c. **Cancer**: The ultra violet light therapy may be effective in helping treat certain kinds of skin cancer and ultra violet blood irradiation treatment.

***NEONATAL JAUNDICE*:** A colored light therapy called phototherapy is used to treat cases of neonatal jaundice, this isomerizes bilirubin and consequently transforms into compound that newborn can excrete via urine and stools. In phototherapy, blue light is typically used because it is more effective at breaking down bilirubin.

V.RAMYA
II M.Sc. Physics

13. LIGHTNING ARRESTER- A RECAP!

A **lightning arrester** is a device used on electrical power systems, telecommunications systems and all tall buildings to protect the insulation and conduction of these from the damaging effects of lightning. The typical lightning arrester has a high-voltage terminal and a ground terminal. When a lightning surge (or switching surge, which is very similar) travels along the power line to the arrester, the current from the surge is diverted through the arrestor, in most cases to earth.

In telegraphy and telephony, a lightning arrestor is placed where wires enter a structure, preventing damage to electronic instruments within and ensuring the safety of individuals near them. Smaller versions of lightning arresters, also called surge protectors, are devices that are connected between each electrical conductor in power and communications systems and the Earth. Surge arresters are not generally designed to protect against a direct lightning strike to a conductor, but rather against electrical

transients resulting from lightning strikes occurring in the vicinity of the conductor. Lightning which strikes the Earth results in ground currents which can pass over buried conductors and induce a transient that propagates outward towards the ends of the conductor.

R.SUGANYA
II M.Sc. Physics

14. NEW TRENDS OF LED IN AGRICULTURE

LED is a popular light source with eco-friendly features. And with the rapid development of the agriculture and horticultural industry, the demand to improve the crop output is soaring. Generally, the sunlight has played a key role in promoting plant growth and recently LED grow light has created huge business opportunities, a slighting supplement LED grow light can effectively prolong the crops lifetime and improve the quality. LEDs enable us to plant all kinds of crops through every season.LED can directly make electric energy into light energy, causing less heat and no waste of the energy; also it does not contain mercury or lead. So it does no harm to the environment. And the life span of the product is 10 times longer than that of traditional one. Therefore, LEDs embrace new future for lighting application in greenhouse.LED manufactures have seen the potential market and dedicated in developing new lighting technology.

M.WILLIAM CARRY
II M.Sc. Physics

15. A FASTER PATH TO OPTICAL CIRCUIT

Just as electronic circuits work with electrical charges, optical circuits process pulses of light, which gives them a distinct advantage in terms of speed. EPFL (École polytechnique fédérale de Lausanne) scientists have developed a new method that can optically design a widely-used class of optical devices with unprecedented effectiveness. Their designs have been fabricated in the US, at the University of Rochester, and successfully tested in Italy, at the University of Pavia.

In order to use light for encoding information in future communication systems, it is first necessary to regulate its flow and retain it for even a fraction of a second, to avoid signal "traffic jams". This is achieved by optical nanocavities, which are arrangements of mirrors that force light to bounce between them and can therefore retain it in a small space. Optical circuits can also be integrated with electronic circuits into extremely compact structures to increase performance in information and communication technologies. The most promising optical nanocavities are built inside structures called "photonic crystals", giving them the name "photonic crystal nanocavities (PCNs)". PCNs operate like the components of an electronic circuit, except they control the flow of light instead of the flow of electrons.

The group of Vincenzo Savona at École Polytechnique Fédérale de Lausanne has developed a novel method to design, simulate and optimize PCNs and applied it to one of the most common PCN types, used widely in commercial optical circuits. “Ideally you want to confine light as long as possible and inside a volume as small as possible", says Savona. "The nano-cavities that we are optimizing are smaller than the optical wavelength itself (about 1 micrometer) and have a quality factor higher than 1 million, meaning that a photon can go back and forth inside the nanocavity more than 1 million times before escaping.

Courtesy: www.actu.epfl.ch.com

S.BALARAMAN
I B.Sc. Mathematics

16. CHRISTMAS LIGHT

Thomas Edison, the inventor of the first successful practical light bulb, created the very first strand of electric light. During the Christmas season in 1880, these strands were strung outside the Menlo Park laboratory. Railroad passengers travelling by the laboratory got their first look at an electrical light display. But it took almost 40 years for an electric Christmas light to become the tradition.

Before electric Christmas lights, families would use candles to light up their Christmas trees. This practice was often dangerous and led to

many home fires. Edward H. Johnson put the very first string of electric Christmas tree lights together in the year 1882. However, the world was not quite ready for electrical illumination. There was a great mistrust of electricity. In 1895, President Cleveland requested that the white house family Christmas tree be illuminated by hundreds of multi-colors electric bulbs. On Christmas Eve in 1923, President Calvin Colidge began the country's celebration of Christmas by lighting. The national Christmas tree with 3000 electric lights on the ellipse located south of the white house.

The wiring of electric lights was very expensive and required the hiring of the services of a wireman, our modern day electrician. Before 1903 it would have cost a lot and the amount could be considered equivalent to today's $2,000,000. By the 1920's Albert and his brothers organized the National Outfit Manufacture Association (NOMA).

Today we expect to see the holiday season become a glow with electric strands of light. Think of variety and range of lights available in today's market. We are to be grateful to Thomas Edison, Edward H. Johnson and Albert Sadacca for illuminating with bulbs.

K. SINDHUJA
I B.Sc. Physics

17. REMEMBER THIS! NOSTALGIC!!

Take a lighted candle and placed it on a table. First look at the candle flame through a straight pipe. You can very clearly see the candle flame. Now look at the candle flame through a bent pipe you will not be able to see the candle flame through a bent pipe. This activity clearly proves that light travels in a straight line. In other word, it can't be bending along the corners.

S. SIVASANKARI
II B.Sc. Chemistry

18. EVOLUTION OF ELECTRIC BULB

1802 Sir Humphry Davy discovers incandescence in a platinum wire. He also is the discoverer of the first electric lamp type: the carbon arc lamp.

1841 Frederick de Moleyns patented incandescent lamp within a glass bulb and a partial vacuum. He is one of many people working on the incandescent light bulb from 1842 to 1870's. Many French and Germans contributed to research on the incandescent bulb. Moleyns invention was exceptional and helped others build on the idea.

1879 Sir Joseph Swan began working with the incandescent light long before Edison; however his biggest breakthrough was developed at the same time as Edison. Swan used carbonized paper as a filament in a partially evacuated bulb, this lasted several hours, which was a great achievement compared to the scores of inventors who couldn't get incandescence to last. Swan continued to improve the bulb.

1879 Thomas Edison is the most celebrated of incandescent inventors. He was able to succeed in creating the first reliable (therefore marketable) light bulb. His bulbs made after 1880 lasted a whopping 600 hours. He then hired lots of talented engineers and created the world's most famous "invention factory".

1902 Werner von Bolton discovered that using tantalum for a filament increased efficiency, durability and bulb life. The age of metallic filaments had begun and Siemens and Halske held the patent.

1904 Willis Whitney counters the threat from the tantalum lamp with the GEM lamp: a unique process which creates a metalized filament. The GEM lamp is used in the Mazda series by general electric.

1904 Alexander Just and ***Franz Hanaman*** patent a sintered tungsten filament. Tungsten proves to be a good material; however it is fragile and hard to work with. It is a step towards the modern world.

1908 William D. Coolidge revolutionizes the light bulb by figuring out how to make tungsten ductile. This allows the light bulb to be more

durable, long lasting, and easily coiled (coiling is key to making more surface area and therefore more light). The invention is implemented in 1911. His invention is used in many other lamp types later on including the fluorescent, halogen, MH, mercury vapor, and other lamps.

1912 Irving Langmuir developed three important improvements to the bulb: he worked with Lewi Tonks to develop an argon and nitrogen filled bulb. He also developed the tight coiled filament, and pioneered a thin molecular hydrogen coating on the inside of the bulb. All of these dramatically improved the bulb.

1921 from Toshiba Corporation developed the double coiled filament. This greatly improved luminous efficacy and helped efficiency.

1925/1947 Marvin Pipkin developed the frosted etched bulb and later the silica coating on the inside of the bulb. These advancements helped diffuse the light, reduce glare with only 3 to 5 percentage losses in light output.

M.ABISHEK
II B.Sc. Physics

19. LIGHT- BACK TO SCHOOL DAYS

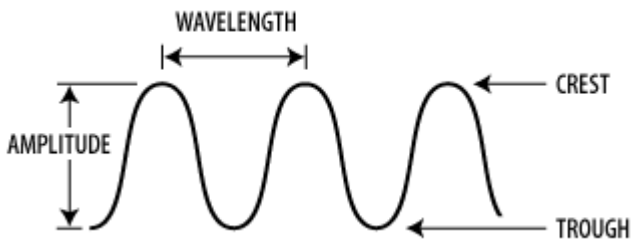
- Light usually refers to visible light which is electromagnetic radiation that is visible to the human eye and is responsible for the sense of light.
- The main source of light on earth is the sun.
- The speed of light in a vacuum is defined to be exactly 299,792,458 m/s.
- Primary properties of visible light are intensity, propagation direction, frequency or wavelength spectrum and polarization.
- The study of light and the interaction of light and matter is termed as optics.

- Some of the common examples of refractions the straw bent because of refraction of light as it enter liquid from air.
- In the evening we can see a cloud illuminated by sunlight.
- Refraction is the bending of light rays when passing through a surface between one transparent material and another.

M. SIVA
II B.Sc. PCA

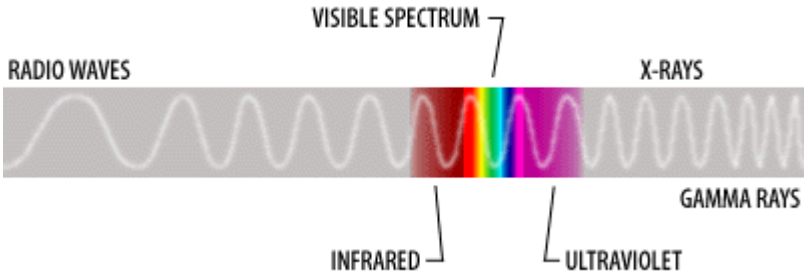
20. NATURE OF LIGHT AND COLOR

Light is electromagnetic (EM) radiation, the fluctuations of electric and magnetic fields in nature. More simply, light is energy and the phenomenon of color is a product of the interaction of energy and matter. As a reasonable starting place for discussing color, we need to take a brief look at the Physics of light and the particular nature of light sources.



Other ways of measuring EM radiation are by frequency (measured in hertz or cycles per second) and energy (measured in electron volts). Shorter wavelengths have higher frequency and higher energy; longer wavelengths have lower frequencies and lower energy.

The human eye is only sensitive to EM radiation at wavelengths that range roughly between 780 nanometers and 380 nanometers. This small segment is called the visible spectrum or visible light. This is usually what we mean when we speak of "light" (though, properly speaking, all EM radiation is light). Infrared lies just below red light; ultraviolet exists just above violet light. Both are invisible to humans and other creatures (though some reptiles can see infrared and some insects can see ultraviolet).



The visible spectrum contains numerous colors that are distinguished by wavelength and amplitude; wavelength determines color and amplitude determines brightness. Of these colors, the human eye can distinguish about 10,000. The visible spectrum, however, is often identified by the seven prominent colors we see in the rainbow. In 1666, Isaac Newton named these colors red, orange, yellow, green, blue, indigo, and violet, which are often referred to by the mnemonic acronym VIBGYOR. More commonly, however, the spectrum is arranged in order of wavelength, shortest to longest, and divided into segments identified as violet (380-450nm), blue (450-490nm), green (490-560nm), yellow (560-590nm), orange (590-630), and red (630-780):

The combination of these light waves produces white light, which is what we see from the Sun and from most artificial light sources. A breakdown of the individual colors themselves is only visible under certain circumstances. This occurs naturally in a rainbow; it also occurs when white light is refracted through a prism. In fact, it was by experimenting with a prism in 1666 that Newton conclusively proved that what we see in these refractions are the constituent colors of white light; that is, that white light is not homogeneous (as had been previously supposed), but a composite of myriad-colored wavelengths

M KRUTHIKA
I B.Sc. Mathematics (MPC)

21. FRANCESCOMARIA GRIMALDI

An Italian Physicist born in Bologna on, 2nd April 1618 and died in the same city, 28th Dec 1663 and after the usual course of studies. He spent twenty five years as professor. His tastes were however, scientific and he found, time for study and research in Physics and astronomy. Grimaldi's

most important scientific work was done in optics, in which field he became a worthy predecessor of Newton and Huygens. He made several discovery of fundamental importance, but they were much in advance of the theory of the time, and their significance was not recognized until over a century later, the first of these is the phenomenon of diffraction

Grimaldi's discovery of diffraction

Grimaldi allowed a beam of sunlight to pass through a small aperture in a screen and noticed that it was diffused in the form of a cone. The shadow of a body placed in the path of the beam was larger than that required by the rectilinear propagation of light. Careful observation is also showed that the shadow was surrounded by colored fringes, similar ones being seen within the edges, especially in the case of narrow objects. He showed that the effect could not be due to reflection or refraction, and concluded that the light was bend out of its course in passing the edges of bodies. This phenomenon, to which he gave the name of diffraction, was also studied by Hooke and Newton; but the true explanation was only given by Fresnel on the basis of wave theory. Grimaldi also discovered that when sunlight, entering a room through two small apertures, was allowed to fall on a screen, the region illuminated by the two beams was darker than when illuminated by either of them separately. He was thus let to enunciate the principle that an illuminated body may become darker by adding light to that which it already received. This is, in reality, the well-known principle of interference afterwards so brilliantly employed by the young and Fresnel. It has been questioned whether the phenomenon observed by Grimaldi was really due to interference. He himself regarded it simply as a conclusive proof of the immaterial nature of light which he was then investigating. He was likewise the first to observe the dispersion of the sun's rays in passing through a prism.

Courtesy :www.francescomariagrimaldidiffraction.com

M. ABIRAMI
I B.Sc. Mathematics (MPC)

22. QUESTIONS ABOUT LIGHT

1. Which instrument is used to measure the scattering of light by particles suspended in a light?
2. Which instrument is used to determine the intensity of color?
3. Who discovered diode bulb?
4. Light year is the unit of?
5. In the black hole ----------

Answers: 1.Nephetometer 2.Colorimeter 3.S.R.J.S Fleming 4. Distance 5.All wavelength of light is observed.

Courtesy: www.martguru.com

K.SATHYA VARDHINI
I B.Sc. Mathematics (MPC)

23. HOW IS LIGHT PRODUCED?

Light is produced through a phenomenon known as electromagnetic radiation, which is composed of both a magnetic and an electric component. Light, or visible light is merely one small part of the overall electromagnetic spectrum. The entire spectrum includes gamma rays, x-rays, radio waves, microwaves and infrared light. Light is produced through either natural or artificial means such as with the sun or light bulb, respectively.

Light is particle (photons) that behaves as a wave. This is known as the duality of light and one of the most enigmatic properties of light. Neither the electromagnetic wave theory nor the quantum theory currently explains the behavior of light at all levels both theories are needed to describe the phenomena accurately. It has also been shown that other particles such as electrons also exhibit the same wave like properties. Most recently the special theory of relativity has been employed to produce the more complete and widely accepted theory of quantum electrodynamics. Light usually refers to visible light, which is electromagnetic radiation that is visible to the human eye and is responsible for the sense of light. The main source of the light is sun. Sunlight provides the energy that green plants use to create sugar, which release energy into the living things that digest them .This process of photosynthesis provides energy. Primary

properties of visible light are intensity, propagation, direction, frequency or wavelength spectrum and polarization while its speed in vacuum 299,792,458 meters/second, is experimentally found to always move at this speed in vacuum.

In physics the term light sometimes refers to electromagnetic radiation of any wavelength, whether visible or not. In this sense, gamma rays, X-rays, microwaves and radio waves are also light like all types of light, visible is emitted and absorbed in tiny packets called photons, and exhibits properties of both waves and particles. This property is referred to as the wave particle duality. The study of light known as optics is an important research area in modern physics.

R. RAJAPRABHA
II B.Sc. Physics

24. AMAZING TRUTHS ABOUT LIGHT

1. Light can make some people sneeze: Between 18% and 35% of the human population is estimated to be affected by a so-called ”Photo Sneeze Reflex” a heritable condition that results in sneezing when the person is exposed to bright light.
2. Light pollution causes illness: Light pollution can have adverse health effects such as frequent headaches, fatigue, increased stress, decrease of libido and increased anxiety. There were also several studies which claimed that there is a link between light pollution and breast cancer because of the suppression of the normal nocturnal production of melatonin.
3. Thomas Alva Edison used a filament from burned bamboo: The first commercially viable incandescent light bulb, patented by Thomas Alva Edison in 1880 used a filament made from burned bamboo.
4. Einstein was not the first one to come up with a theory of relativity: Many people associate “The speed of light” with Einstein’s theory of relativity but the concept of relativity did not originate from Einstein proposal for relativity actually go to none other than Galileo, who was the first to propose formally that you cannot tell if a room is at rest or moving at a constant speed in one direction by simply observing the motions of objects in the room.
5. Light is the fastest thing in universe: A beam of light can get from Earth to Mars in three minutes and to the sun in eight and a half.

6. Bioluminescence lights the deep ocean: Bioluminescence is a production and emission of light by living organism. Some sea creatures lights the deep ocean. Example: Angle fish, Krill, Jelly fish.
7. Bioluminescence also in humans: All living creatures produce some amount of light as a result of metabolic biochemical reactions, even if this light is not readily visible. Back in 2009 a team of Japanese researchers reported that "The human body literally glimmers" after using sensitive cameras (the light is a thousand times weaker than the human eye can perceive) to capture the first evidence of human bioluminescence.
8. Source of light pollution: The source of light pollution is Electronic advertising boards and commercial centers, night sports ground, residential areas.

M.BELBHA
B.Sc. Mathematics (MPC)

25. LET US KNOW

What is Aurora?

Polar lights or Aurora, are bright bands of light that streak in the sky of the "Polar region". The sun emits high energy ionic particles. These electrically charged particles, also known as 'solar wind', get deflected by the earth's magnetic field. As a result they are drawn magnetically down into the ionosphere above the earth surface at the poles. There collision with the gas particles in the air causes the impressive display of color in the northern sky. The magnetic field of the earth protects us from the solar wind, which would otherwise destroy all life on the earth

What is camera Obscura?

In this camera obscura, this is the Latin word meaning 'dark chamber'. Light enters a dark room or a closed box through a small hole. If the hole was small enough, a very faint inverted image would be seen on the opposite one. At the end of the thirteenth century, astronomers made use of these to observe the sun. In this way they could study its hot surface, without having to directly look at it, today we buy a special pair of goggles to look at the sun.

N.SHANTHI
III B.Sc. Physics

26. LIGHT RIDDLE

Once I could kindle fire;
Now I am cold as ice
I have forgot desire
Buried in earth's blind vise,
Changed wholly, yet the same,
Wild with abiding flame

This constellation isn't it made
Of frozen rock or fiery gas
This galaxy but fills a glade;
These stars (they will wink inside a glass)
Are born in summer's falling shade
And fade like dew in summer grass
A crystal bicker
Guards a dark hall
Everything enters
And nothing at all

I am the window of time,
In which a single scene,
Always and never the same,
Forms on a shimmering screen;
The well of eternity,
Receding in the center
Through which infinity
Beckon where none can enter

The most successful suitors know
When not to tell the truth
When girls are young the show their age
In age we bring them youth

Ans: ***Diamond, Fireflies, Eye, Mirror, Candles***

Courtesy: www.valo.edu/vpu/tufariellolight.html

V.ABINAYASRI
I B.Sc. Mathematics (MPC)

27. TRY IT, IT'S FUN

To explore the Newton's color disc experiment, take a disc and paint seven colors of white light in seven sectors in the order of violet, indigo, blue, green, yellow, orange, red (VIBGYOR) on it. Make two holes in the disc using a sharp nails passing a long thread from one holes and then through the other hole, such that about 20cm of thread is on the either sides of the holes. Tie a small knot at the ends of the thread. Place one end of the thread in middle finger of the left hand and the other end in the middle finger of the right hand. Now loosen the hands and wheel the disc in clockwise direction so that thread on either side gets twined.

S. SIVASHANKARI
II B.Sc. Chemistry

28. QUOTES ABOUT LIGHT

- Darkness cannot drive out darkness: only light can do that. Hate cannot drive out hate: only love can do that

  -Martin Luther King
- 'We can easily forgive a child who is afraid of the dark; the real tragedy of life is when we are afraid of light'

  -Plato
- 'How far that little candle throws his beams; so shines a good deed in a weary world;

  -William Shakespeare
- 'Pointing to another world will never stop vice among us; shedding. Light over this world can alone help us'

  -Walt Whitman
- 'When you light a candle, you also cast a shadow'

  -Ursula k. le guin
- 'If there be high, then there is darkness; if cold, heat, if heat, depth; if solid, fluid; if bordsoft; if rough, smooth; if calm, tempst; if prosperity, adversity; if life, death'.`

  -Pythagoras
- 'Fear can only grow in darkness. Once you face fear with light, you win'.

  -Steve Maraboli

- ‘Light the visible remainder of invisible light’.

-T.Seliot

- ‘Too much of anything could destroy you, simon thought. Too much of darkness could kill, but too much light could blind’.

-Cassandra Clare

- ‘Nature and nature’s laws lay hid in night; god said, let Newton be, and all was light’

-Alexander Pope

K. SINDHUJA
I B.Sc. Physics

29. RAYLEIGH

Rayleigh graduated from Cambridge University in 1865 and set up a laboratory on his family estate. His early work was in the field of acoustics and optics and he did pioneering work on resonance and an explanation of the blue color of the sky as a result of the differing degrees of scattering of light. In1879, he left his personal laboratory and became Cavendish professor of experimental Physics at Cambridge. There he established standards of laboratory instruction and the redetermination of the electrical units of ohm, ampere and volt.

One day, in September 1913, the British Association for the advancement of science was discussing the problem of radiation. In the August gathering were Marie Curie, Lorentz, Lord Rutherford and Lord Rayleigh. As the septuagenarian Rayleigh was silent throughout the long discussions, Lamoure needled him into getting to say something. Rayleigh quietly replied, “in my younger days, I took many views very strongly and one among them was that a man, who had passed his sixteenth year, ought not to express himself about modern ideas. Although I must confess that today I do not take this view quite so strongly, I keep it strongly enough not to take part in this discussion”.

M .PAVITHRA
II B.Sc. Chemistry

30. THE GREATEST BRAGG

One of the original greats of science, SIR WILLAM BRAGG had a brilliant record as a mathematician at Cambridge, after which he thought and reached at the University of Adelaide in Australia for over fifteen years. Returning to England, he became the Cavendish professor at leads where he built the X-rays spectrometer. In 1950, the year that he awarded the noble prize along with his son. He became a professor of Physics London University. And he became the resident professor and director of the laboratories of the Royal Institution.

Bragg's career as a scientist was to put it mildly, unusual in "Light behaves like waves on Mondays, Wednesdays and Fridays, like particles on Tuesdays, Thursdays and Saturdays and like nothing on Sundays".

M. PAVIHRA
II B.Sc. Chemistry

31. LED's IN BIOREACTORS

- Flashing light effects and energy economy in algal culture (Chlorella Pyrenoidasa)
- Light emitting diodes were used as the sole light source in continuous culture of the green algae chlorella pyrenoidasa
- Flat air lifts fermented type continuous culture devices were used to estimate steady state growth rates of chlorella pyrenoidasa as a function of the light flux.
- Use of flashing LED's in indoor algal culture yield a major gain in energy economy in comparison to luminescent light source.

Plants will be an important component of future long term space mission light weight, reliable and durable and light emitting diodes (LED's) have the characteristics.

In this study four light source were tried:

- red and blue led-RB
- red ,blue led with green fluorescent lamps-RGB

- green fluorescent lamps-GF
- cool white fluorescent lamps-CWF

The addition of 24% green light (500 to 600nm) to red and blue LED's (RGB) treatment enhanced plant growth. The RGB gives more biomass than the CWF treatment a commonly tested light source used as a broad spectrum control.

E.PRABHAKARAN & R. RAGURAM
II B.Sc. PCA

32. POEM

LIGHT

You are the star that twinkles in the night.
You are the rainbow after the rain is done.
You are the moon that glows so bright.
You are the wind that whistles my name.
You are the love when the world is the same.
You are the flowers the bee' never miss.
You are the light when there is no sun.
Beach that warm sun kisses
Today, you are absence of light, shadow of the world.

Courtesy: www.short_love_poem.com

M. J. KIRAN
II B.Sc. Chemistry

33. NIKOLA TESLA

Born: 10 July 1856, Smirjan, Austrian empire

Significant project: alternating current, high voltage, high frequency power experiment.

Significant design: induction motor, rotating magnetic field, Tesla coil, radio, remote control vehicle order of St.Sara from government of Serbia in 1882. Elliot Cresson medal in 1894. Order of prince Danilo in 1895 Edison medal in 1916. University of Paris medal in 1937

Nikola Tesla's in producing alternating current

Definition

- Unlike direct current which flows in only one direction, alternating current can be made to flow in reverse direction. The ac current was advantageous in cost wise and also in the point of safety.
- The Tesla's system was very useful in power generation and in distribution of current in various parts of the country
- Tesla's contribution was also in the field of wireless communication and limitless free energy.

M. SIVA
II B.Sc. PCA

34. ENDOSCOPY

An Endoscope is a device using Fiber optics and powerful lens system. In early 1900s the first attempts to view inside the body with lighted telescopes were made. Fiber optic endoscope was pioneered by a South African physician BASIL HIRSCHOWITZ at University of Michigan in 1957. Endoscope is usually much shorter and flexible which must be handled with care. Flexible endoscopes are useful for looking at the digestive and respiratory tracts because they bend in places. Both use light to magnify and view the internal structure of the body, a tiny camera attached to the end. The view recorded by the camera is displayed on the computer screen for the doctors and sometimes the patients to see. Water and air, as well as surgical instruments that may be necessary to take a tissue sample, can also be passed along the hollow of the endoscope. Gas or fluid is sometimes used to move the surface tissue of organs in order to see them more clearly.

They use fiber optics to shine light into the body. The different range endoscopes are Arthroscopy, Bronchoscopy, Gastroscopy, Endoscope Biopsy, Laparoscopy, Crystoscopy, Rhinoscopy and Ductoscopy.

M. PRAVEENA
III B.Sc. Physics

35. LIGHT POLLUTION

Light pollution is an increasing problem threatening astronomical facilities, ecologically sensitive habitats, all wildlife, our energy use as well as our human heritage.

Types

1. Sky glow: This is the bright orange-pink glow that hangs over cities and towns in the night.
2. Glare: This is the effect produced when the eyes are exposed to bright light.
3. Light trespass [spill over]: This occurs when light goes over its intended range.

Effects

1. Waste of resource.
2. Loss of historical and cultural value.
3. Health Implications.
4. Our artificial lights bother small insects, birds, mammals a lot.

Prevention

Government policies on the use of lights must be stepped in a way that forces consumers to buy more energy reduced light.

Research shows that too much lights does not necessarily visibility. This means that smart choices can be made to improve visibility in the night without splashing too much light into the sky.

N. NAVEEN
II B.Sc. PCA

36. QUIZ ON LIGHT

1. The study of light is called

   a) Optics b) Photons c) Lasers

2. Where does the light independent reaction occur?

   a) Stoma b) Mitochondria c) Thylacoil

3. What provides energy for the light independent reaction?

   a) Sunlight b) ATP neighboring mitoicchande c) NADPH and ATP from the light dependent.

4. The speed of light is around

   a)186000 miles per second b) 186000 miles per minute c) 186000 miles per hours.

5. Human can see all light waves.

   a) True b) False

6. The electromagnetic radiation of a wavelength is called.

   a) Sound b) Light c) Lasers

7. Light ray has angle of incidence of 34 the reflected ray will make what angle with the reflections surface.

   a) 0 b)34 c)56

8. What catalyzes carbon fixations?

   a) Ferredoxin b)NANDP reduction c) Rubisco

9. Electromagnetic wave need matter to move

   a) False b)True

10. Energy emitted in the form of a wave as a result of the movement of electronic charges is

    a) Horsepower b) Electromagnetic c) Radiation

Answer: 1) a, 2) a, 3) c, 4)c, 5)b, 6)b, 7)c, 8)c, 9)a, 10)b.

L. SURESH
III B.Sc. PCA

37. DO YOU KNOW

1) What does it mean by saying an atom is excited?
   - An electron has more energy than in their ground state, which is where they would be if they had not gained energy in some way
2) How does the energy of the photon that is emitted by an electron jumping between two energy levels compare to the energy difference of two energy levels?
   - One exactly the same energy.
3) How is the energy of a photon released to its frequency?
   - Higher energy means higher frequency: $E = h\nu$.
4) Which has the higher frequency, red or blue light? Which has the greater energy per photon red or blue light?
   - blue
5) Why does the flame of a burning log show different colors in it?
   - Different gases in the air have different emission spectra when excited, so the colors come from electrons jumping down from different energy levels in (possibly) different atoms.
6) How does the absorption spectrum differ in appearance from an emission spectrum?
   - The absorption has dark lines which indicate which color photon were absorbed by the gas and able to excite photons up to higher levels. There are always less dark absorption line's than bright emission lines.
7) How can Astro Physicists tell whether a star is receding or approaching earth?
   - The sight is blue or red shifted.
8) How can atoms be excited?
   - By being hit by photons of the light energy or through collisions.
9) How does the avalanche of many photon in a laser beam differ from the large number of photons emitted by an Incandescent LAMP?

- A laser has light of single frequency but an Incandescent bulb has a continuous spectrum of all frequency that it emits.

10) When a gas flows, the colors are emitted or smudged?

- When the gas flows, the colors are emitted.

C. VIJAYARANI
III B.Sc. PCA

38. MY PHYSCIS TEACHER

You are magnet when you teach us!
You are a current when you scold us!
You are a positive feedback amplifier,
When you advise us!
You are emf when you encourage us!
And you are the one who teach us Physics

Courtesy: By Mark Williams on Feb 24 2010

M.BHAVANI
I M.Sc. Physics

39. CROSSWORD-1

A	B	D	U	S	D	T	O	L	R	X
L	C	T	F	S	A	D	I	X	E	U
B	L	X	C	A	Q	A	C	D	L	O
E	U	A	V	L	Y	R	A	O	L	S
R	M	O	R	A	E	H	R	C	E	K
T	B	Z	A	M	F	T	N	O	T	Q
E	D	T	M	E	D	W	A	R	D	Y
I	S	A	A	C	N	E	W	T	O	N
N	Q	K	N	E	Y	G	L	S	K	F
S	M	A	R	I	E	C	U	R	I	E
T	E	I	N	F	B	H	X	E	C	S

ANSWERS

1. Edward Teller
2. Albert Einstein
3. Isaac Newton
4. Abdus Salam
5. C V Raman
6. Marie Curie
7. Sadi Carnot

J. SATHYA
III B.Sc. PCA

40. LIGHT

James Clerk Maxwell discovered visible and invisible waves of light. Light was described by Maxwell's theory of electricity and magnetism. This theory predicted invisible light waves, like X-rays and radio waves. This theory also explained the different colors of sunlight. Light is both waves and particles! The phenomenon of interference shows the waves of light. Another phenomenon, the photoelectric effect, shows the particles of light.

Interference

Interference patterns show that light is a wave. The particle theory of light could not explain interference patterns. Only the wave theory could. All waves can create interference patterns. When similar waves from different places overlap, they can either reinforce each other to create a bigger wave or cancel each other out to produce no wave at all. Thomas Young discovered interference patterns in 1803.When Young made his discovery, explaining double refraction was still a problem for the wave theory. Young eventually realized that a transverse wave one that vibrates at right angles to the direction it travels could explain double refraction. Despite this evidence for the wave theory, many scientists remained unconvinced. Young could not give a complete account of how interference worked. This theory suggested that in the middle of a circular shadow there should be a bright spot of light, this idea was tested and proved correct. This test convinced almost everyone that light was a wave.

The photoelectric effect

The photoelectric effect shows that light is a particle. At the beginning of the 19th century, scientists were arguing whether light a wave or a particle was. By the end of the 19th century, all were agreed that light was a wave.

So it was surprising when Albert Einstein showed in 1905 that in some respects, the particle theory was right after all. Particles of light were needed to explain the photoelectric effect, where 'chunks' of light, called photons, knock electrons off a sheet of metal. Einstein showed that photons were absorbed if the light did not have enough energy to knock an electron off instantly, it would never be able to knock an electron off the sheet of metal. Light could not be absorbed slowly, like a wave, as scientists had previously thought.

N.BHARATHI KANNAN
I B.Sc. Mathematics (MPC)

41. SOLID STATE LIGHTING

Artificial lighting has proved to be an important part of Human life. Although our ancestors discovered fire around 2-6 million years ago, artificial light is still a quintessential human invention. The basic goal of artificial lighting is to enable productivity through night as same as in daytime, and has coined the phrase “artificial lighting extends the day”. Indeed the need for artificial lighting and its related technology evolved especially during the 17th, 18th and 19th centuries. With energy consumption sky rocketing as year’s progress, the demands are stressing the need for an alternative and energy efficient source.

First filament- based- incandescent- technology is giving way to gas-plasma based fluorescent technology and High-Intensity -Discharge technology (HID), maybe in 10-20 years it will give way to SSL (Solid state lighting).

Let us answer the burning question. What is SSL?

SSLs are lighting applications that use Light-Emitting Diodes (LEDs), OLEDs, or Light-Emitting polyesters. These consist of semiconductors that convert electricity into light. They have been around for a long time, but until a decade ago were used in devices. LEDs are used as signals and some limited illumination applications.

Why SSLs?

Excluding an obvious reason of energy saving, SSLs offer long life up to 50,000 hours which reduce maintenance costs, compared to incandescent bulbs which last approx. 1000 hours.LEDs have minimum ultraviolet and infrared radiation, they are generally low voltage. Their size makes them useful for lighting tight spaces. They have no filaments and can withstand vibrations.

A standard incandescent light bulb converts 90% of its consumed electricity to heat., even though there is a high availability for lighting technologies that converts a greater percentage of electricity to useful light and also technologies with increased energy efficiency like CFLs, SSLs predicted to play a larger role in dramatic decrement of energy consumption for light sources .The SSLs are a major breakthrough in lighting systems. The ongoing research is trying to break its barriers and tries to make it efficient as possible. Showing a massive progress from our current lighting systems, and successful at the same time. It is very much the right time to say "the future of lighting systems is here".

ANIRUDH SIVAKUMAR
I B.Sc. PCA

42. DIFFERENT FACES OF LIGHT

- **Light as a friend**

  When you are alone in a dark place, light helps find a path. Thus light act as a friend

- **Light as a god**

  In most religions, light is worshipped as a god

- **Light as a clock**

  In olden days, the natural light source (i.e., sun) was used to calculate time.

- **Light as a guide**

  Light house helps ships

M.PRAVEENA
III B.Sc.Physics

43. LASER IN ORTHOPAEDICS

At present, bone exercise (osteotomies) is done in orthopaedics using saws, milling machine and mechanical drill. All these instruments make physical contact and cause severe mechanical vibration and hemorrhages. Since laser possesses unique property, they can be used in the place of mechanical instrument in osteotomies. The high water content (sharp absorber of IR radiation) in the bone gives a clue that lasers can be used for this purpose. Research has proved that CO_2laser was successfully employed in osteotomies. The only disadvantage is the delayed healing. It was concluded that the 'thermal damage' of the 3 bone rim is responsible for the delay, the wavelength and pulse duration play an important role in oestomics.

Laser can also be used for arthroscopy treatments. Transmission of laser through flexible fibers is regarded as mandatory requirements for an efficient surgical procedure. Due to this constraint, CO_2 lasers are not suitable for arthroscopic treatment of the jaw point hence, optical delivery system for all it laser plays an important role in arthroscopic treatment.

Recent researches in arthroscopic treatment using lasers encourage a positive trend. The successes of He:YAG laser for the ablation of cartilage was reported by Trauner during 1990. The encouraging results of holonium and erbium lasers in minimally invasive arthroscopic surgery indicate a bright future for these lasers as valuable surgical tools.

N. SHANTHI
III B.Sc. Physics

44. LIGHT RAY

Light as a ray makes it easy to describe with great accuracy, three well known phenomena reflection, refraction and scattering.

In reflection, a light ray strikes a smooth surface such as a mirror and bounces off. A reflected ray always comes off the surface of a material at an angle equal to the angle at which the incoming ray hit the surface

‘THE ANGLE OF INCIDENCE EQUALS THE ANGLE OF REFLECTION’

When light strikes a rough surface incoming light is reflected at all sort of angles because the surface is uneven. When light hits paper the waves get reflected in all direction, which can be seen with a microscope.

In refraction, when a ray of light passes from one transparent medium (air) to a second transparent medium (water),light changes speed and the light ray bends either toward or away from the normal line.

R.MANOJKUMAR
III B.Sc.Physics

45. LIGHT EMITTING DIODE (LED)

Application

- Visual signal where light goes more or less directly from the sources to the human eye, to convey a message.
- Illumination where light is reflected from object to give visual response of these objects.
- Measuring and interacting with process involving no human vision.

Facts

Each diode in an LED is only one fourth of an inch in diameter and only needs one tenth of a watt of energy to produce light. LED’s are traditionally grouped together to provide higher amounts of lights. LED decreases in output as they age, they typically will not burn out suddenly.

V.MYTHILI
III B.Sc. Physics

46. LIGHT USED IN LASER

The word LASER is an acronym for light amplification by stimulated emission of radiation. A laser is a cavity, with mirrors at the ends, filled with material such as crystal, glass, liquid, gas or dye.

It is a device which produces an intense beam of light with the unique properties of coherence, collimation and monochromaticity. The light is a form of electromagnetic radiation without this understanding the laser would not have been invented. Physicist Albert Einstein described the theory of stimulated emission.

Based on Einstein theories Schawlow and Towns proposed the MASER (Microwave Amplification by Stimulated Emission of Radiation).Nowadays laser are used in operation theatres, beauty parlors, industry, entertainment, military, biology field, veterinary science and in our daily life.

C. INDUMATHI
III B.Sc.Physics

47. NANOPHOTONICS

Nano photonics or nano-optics is the study of the behavior of light on the nanometer scale. It is considered as a branch of optical engineering which deals with optics, or the interaction of light with particles or substances, in the realm of nano-optics include near field scanning optical microscopy (NSOM), photo system scanning tunneling microscopy and surface Plasmon optics. The scientific and industrial communities are becoming more interested in the characterization of materials and phenomenon on the scale of a few nanometers, so alternative techniques must be utilized.

The study of nano photonics involves two broad themes

1. Studying the novel application properties of light at the nanometer scale

2. Enabling highly power efficient devices for engineering applications.

S. ANUSHA
III B.Sc.Physics

48. SCIENTIFIC FACTS OF LIGHT

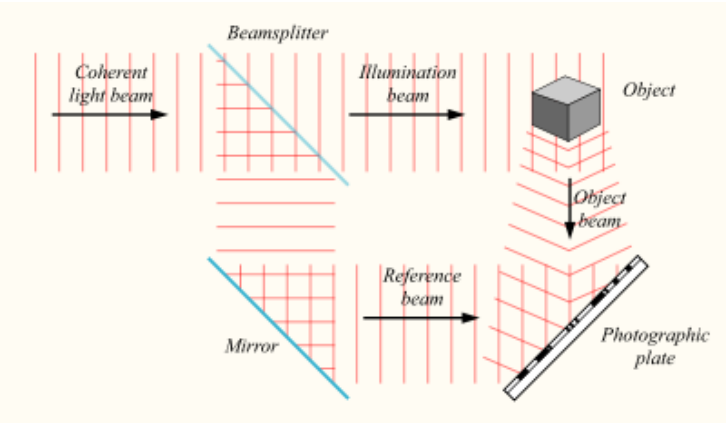
- Light is a type of energy known as electromagnetic radiation.
- Light is made up of little pockets of energy called photons.
- Light travels in a straight line.
- X-rays are very high frequency of light and carry a lot of energy. It is useful in medicine and industries to see inside things. X-ray are given by stars and strongly by some types of nebula an x-ray machine works by firing a beam of electrons at a target, if we fire the electron with enough energy, X-rays will be produced.
- A doctor will give a patient barium- meal which is a drink of barium sulphate, this will absorb X-rays, and so the patient's intestines will show up clearly on an X-ray image
- Laser can produce a concentrated, powerful beam of light and generate associated hazards.
- Light plays an important role in man's life.
- Light can act as both particle and wave.

K.KRISHNAPRIYA
II B.Sc. Chemistry

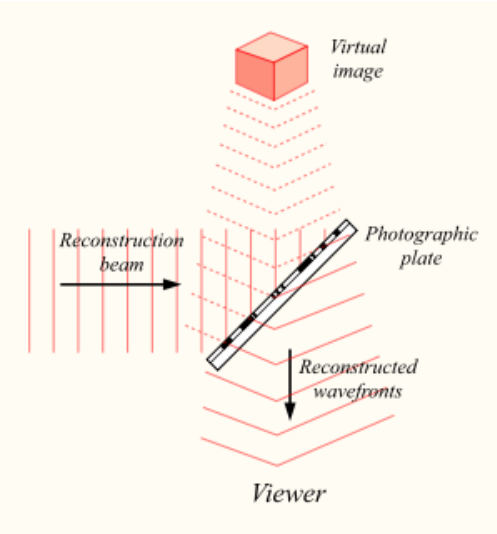
49. HOLOGRAPHY

Holography is a technique which enables 3-d images (holograms) to be made. It involves the use of a laser interference, diffraction, light intensity recording and suitable illumination of the recording. The image changes as the position and orientation of the viewing system changes in exactly the same way as if the object were still present, thus making the image appear 3-d. The holographic recording itself is not an image; it consists of an apparently random structure of varying intensity, density or profile. While Dennis Gabor was working to find a new type of electron microscope, he accidentally found this "Hologram". He was awarded Nobel Prize for this discovery in 1971.

Hologram formation and reconstruction



The above image shows how hologram is made. (The image formed on the photographic plate is an interference patterns formed by the object.)



When the reference beam if incident on the photographic plate the wave fronts again re-created and when viewed, it appears to be a three dimensional image.

Applications

- To produce the holographic image only 1/10th of the interference pattern is required. Therefore this technique can be used to store large amounts of data.
- Similarly it also can bring forth the whole fingerprint if only a part of it was obtained for security purposes.
- Anti-counterfeiting in credit card is now a common practice. In some European countries, credit cards for telephone calls use erasable holograms.

Courtesy: en.m.wikipedia.org/wiki/holography

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50. LIGHT UP PUZZLE

Light up also called "AKARI" is a binary determination. Logic puzzle published by Nikoli

RULES

- Light up is played on a rectangular grid of white and black cells.
- the player places light bulbs in white cells such that no two bulbs shine on each other's, until the entire grid is lit up
- a bulb sends rays of light horizontally and vertically, illuminating its entire row and column unless its light is blocked by a black cells
- a black cells may have a number on it from 0 to 4, indicating how many bulbs must be placed adjacent to its four sides
- for examples: a cell with a 4 must have four bulbs around it, one on each side, and a cell with a 0 cannot have bulbs next to any of its side

- an numbered black cells may have any number of light bulbs adjacent to its or none
- bulbs placed diagonally adjacent to a numbered a cell do not contribute to the bulb count

Solution method

- A typical starting point in the solution of a light up puzzle is to find a black cell with a 4, or a cell with a smaller number that is blocked on one or more sides (for example, a 3 against a wall or a 2 in a corner)and therefore has only for one configuration of surrounding bulbs. After this step, other numbered cells may be illuminated on one or more sides, narrowing down the possible bulb configuration possible.
- Another common technique is to look for a cell that is not yet lit, and determine if there is only one possible cell in which a bulb can be placed to light it up. When it is unclear where to place a bulb one may also place dots in white cell that cannot have bulbs, such as around a 0 or in places where a bulb would create radiation. For example, a light bulb placed diagonally adjacent to a 3 will block two of its surrounding cells, making it impossible to have 3 bulbs around it; therefore the diagonal cells around a 3 can never have light in them and can be always dotted. Similarly one may put dots in places where a bulb would "trap" another until cell, making it impossible to light it up without breaking the rules. More advanced technique tends to focus on different combination of clues. Two 3's that are one space apart,
- For example, with nothing between them or to the other two sides of the cell in between, must have a light bulb in that space, and the two spaces next to the two threes, on the line joining them. If not then one would have two light bulbs illuminating each other.

	3					0			
		2							
			1	0					
				1					
				2			2		
		1							
0						1			0

	*			*					
			*						
*	3	*				0			*
	*	2							
			1	0		*			
			*	1			*		
		*		2			2	*	
*									*
		1						*	
0		*				1	*		0

- Also, from this deduction, the remaining four cells surrounding the threes must contain two light bulbs. Note that as the four spaces are arranged in two rows with nothing in between, one must have one light bulb to each rows, so one can mark all other spaces in those rows as empty.

S. ASWIN
I M.Sc.Physics

51. CROSS WORD-2

A	S	C	L	U	M	I	N	O	U	S
C	S	U	N	E	W	T	O	N	A	T
	Z	L		A	D	E	S	I	V	A
L	I	T	G	H		N	I	N	G	R
D	X	R	A	Y	Z	T	D		S	O
E	C	A	V	I	O	L	E	T	I	O
R		E	C	L	I	A	P	S	E	S
A	D	I	U	M	O	M	O	O	N	A
Y	V	A	A	D	I	P	U	L	L	A
L	A	N	A	C	A	N	D	L	E	

QUESTIONS

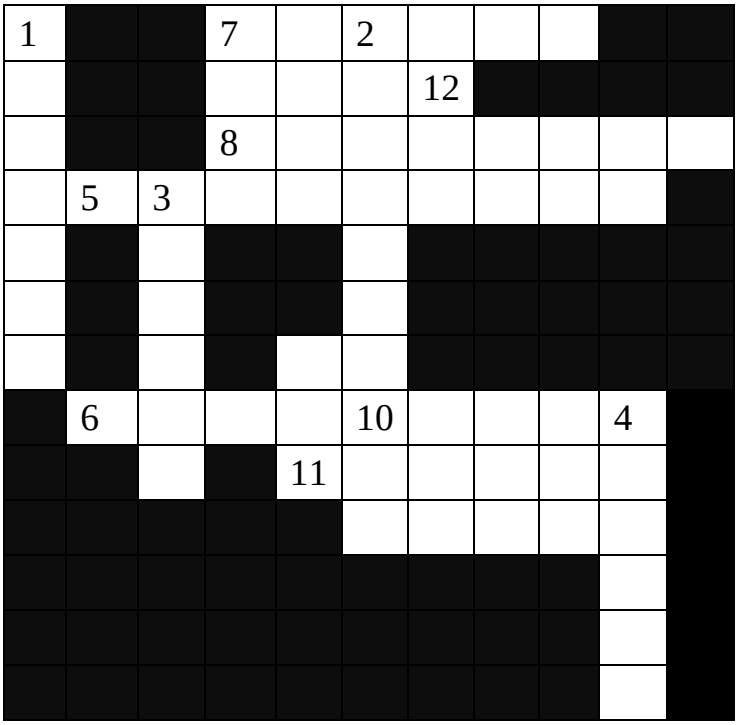
1) Less energy more brightness
2) Scientists known for his laws
3) Greatest source of energy
4) Light used for scanning
5) electric bulb
6) Light used to read compact disc
7) Rays which emerged from holes
8) Used often in absence of electricity
9) Element visible even in darkness
10) Word which is often referred for glowing

ANSWERS

1) LED
2) NEWTON
3) SUN
4) X-RAY
5) EDISON
6) ULTRA VOILET
7) CANAL RAYS
8) CANDLE
9) RADIUM
10) LUMINOUS

S.SANTHOSH KUMAR
I B.Sc. PCA

52. CROSSWORD



A) Up to Down

1. The most recognized model of how the universe begun is known as?
2. When the light bends as it enter a different medium the process is known as what?
3. Materials which do not allow light are called?
4. A magnifying glass is what type of lens?

B) Down to up

11. Conductors have a high or low resistance?

C) Left to right

5. Metals expand when heated and do what when cooled?
6. In the solar system _____ emits light of its own??

7. Light enters the eye through _____ ?

8. What is the focal length of a plane mirror?

10. What is the first name of the famous scientist who gave us Newton's three laws of motion?

11. Infrared light has a wavelength that is too long or short to be visible for humans?

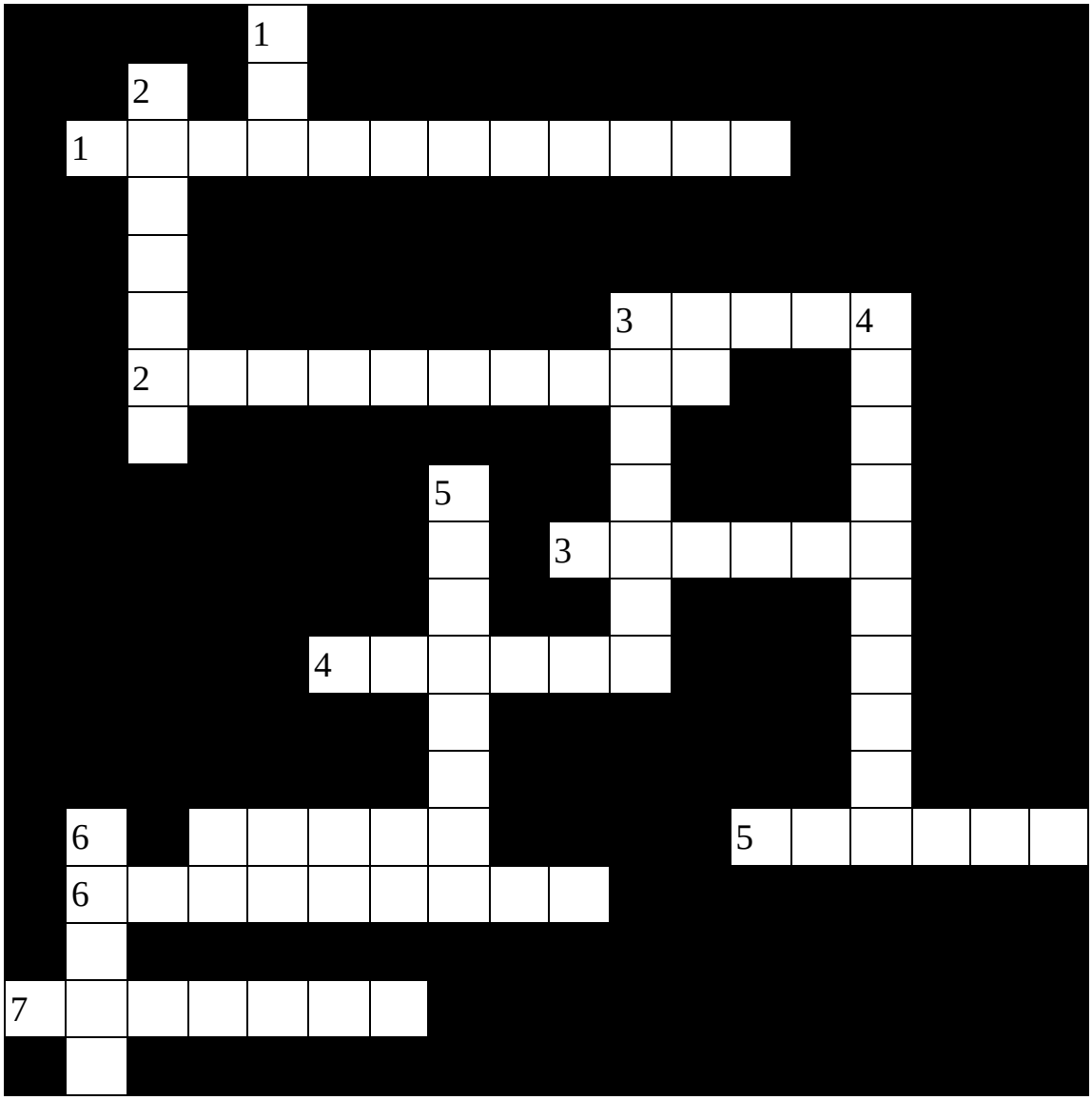
D)Right to left

12. What is the angle of reflection if a ray falls normally on a plane mirror?

(A)	(B)	(C)	(D)
1. The Big bang	11. Low	5. Contract	12) zero
2. Refraction	6. Sun		
3. Opaque	7. Cornea		
4. Convex	8. Infinity		
10. Isaac			
11. Long			

M. PRAVEENA
III B.Sc Physics

53. PUZZLE



Across

1) Substance that allows some light to pass through

2) Bending of light when it moves one transparent material to another different density.

3) An artificial source of light that converts chemical energy into light

4) Substance that doesn’t allow light to pass through

5) Lens to make things look bigger

6) When light shines on a red surface only the red colour is

7) When light shines on black surface all the colours are

Down

1) A natural source of light

2) Red, Blue, Green are ---------- colours

3) Lens that is thicker at the edge and thin in middle is known as---------- lens

4) Which occurs when light hits surface and bounces off in a different direction?

5) Light travels in a----------line

6) Block of a glass or other transport material that disperses light to form a spectrum.

Answer

Down

1. Sun, 2. Primary, 3. Concave, 4. Reflection, 5. Straight, 6. Prism

Across

1. Translucent, 2. Refraction, 3. Candle, 4. Opaque, 5. Convex, 6. Reflected, 7. Absorbed

NAVEEN KUMAR. B & DEEPAK.R
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54. தீபதரிசனம் -சிறப்புகள்

அருட்பெருஞ்ஜோதி அருட்பெருஞ்ஜோதி தனிப் பெருங்கருணை அருட்பெருஞ்ஜோதி என்ற வள்ளலாரின் இறைத்துவமும், 'தீபமங்கள ஜோதி நமோ நம' என்றவரிகளும் இறைவன் ஜோதி வடிவானவன் என்ற உண்மை நிலையை பிரதிபலிக்கின்றது. மனிதனின் அக இருள் அகன்றால் ஆத்ம ஜோதியை தன்னுள் தரிசிக்கலாம் என்ற ஞானநிலையை உணர்த்துவது தீப வழிபாடே ஆகும்.

நம் முன்னோர்கள் பகலில் ஒளிசிந்தும் சூரியனையும் இரவில் தண்ணொளிபரப்பும் சந்திரனையும் இறைசக்திகளாகப் போற்றினர். சூரியநமஸ்காரம், நவக்கிரக வழிபாடு இவற்றில் நெய்தீபவழிபாடு, எள் தீப வழிபாடு என்பது ஆன்மீக நோக்கிலும், அறிவியல் பார்வையிலும் நமக்கு உடல், மன ஆரோக்கியம் தருபவை என்றால் மிகையில்லை.

ஒளியைப் பிரதிபலிக்க, ஊடுருவ, உணர இறைவன் மனிதனுக்கு அளித்திருக்கும் இயற்கைப் புகைப்படக் கருவியே கண்கள். கண்ணின் மணிபோல் மணியின் நிழல் போல இறைவன் ஜோதிரூபத்தில் நம்மை காக்க வேண்டும் என்பதால் தீப வழிபாடு முக்கியத்துவம் பெறுகிறது. இருளைநீக்கும் விளக்காக இன்பம் ஊட்டும் விளக்காக அருளைப் பெருக்கும் விளக்காக ஆண்டுதோறும் பொன்னம் பல மேட்டில் மகர ஜோதியாக, அண்ணாமலையின் மகாதீபமாக இறைவன் காட்சியளிக்கிறான். கல்விக்கு அதிபதியாக சரஸ்வதி தேவியும், செல்வத்திற்கு லட்சுமியும், வீரத்திற்குபார்வதியும் தீபத்தின் சுடராகவும், ஒளியாகவும், வெப்பமாகவும் அருள் புரிகின்றனர்.

தீபதரிசனத்தால் மூன்று தேவியரின் அருளையும் பெறலாம். இயேசுபிரான் அவதரித்தை மூன்று நட்சத்திரங்கள் உணர்த்தின. அனைத்து சமய வழிபாடுகளிலும் தீபம் முக்கியத்துவம் பெறுகிறது. கார்த்திகை தீபத்திருநாள் இல்லத்தில் மட்டுமல்ல ஒவ்வொருவரின் உள்ளத்தும் ஒளியேற்றும் உன்னதத் திருநாள். தியாகத்தின் உருவாய், இருளை அகற்றி மங்கலப் பொருளாக, ஒளிதரும் தீபமே உன்னை வணங்குகிறோம். இயற்பியல் துறையிலும் இத்தீபமே ஒளி ஆற்றலாக ஒளிச்சிதறலாக, வானவில்லாக, நிறப்பிரிகைகளாக, பல பரிணாமங்களுடன் பிரகாசிக்கின்றது.

V. K .SATHYANRYANAN& E RAVI
Dept. of Physics

55. ஒளி - 1

கண்களால் மட்டுமே
காண முடியும் அற்புதம்!
ஒளியே
உன்னை அழகூட்டிய
அந்த அன்னை யாரோ?
சூரியனோ, சந்திரனோ
ஒளிப் பெண்ணே
நீயில்லாமல் ஒளிர்வதில்லை!
இரவுப் பெண்ணின் நெற்றித்திலகம் நீ!

மூடிய இருட்டுப் போர்வையை
அகற்றி முத்தம் கொடுக்கும்
இளம் பெண் சித்திரம் நீ!
இருள் திரையாலும்
மறைக்க இயலாத,
ஒளிர் மாது
இருளின் அழகை விலக்கி
இமைகளுக்கு காணிக்கையாக்கும்,
அற்புதச்சுடர்!

இருள் மங்கையின்
இன்னல் தீர்க்கவந்த
ஒளி தீபமே!
கார்த்திகைப் பெண் ஏந்தும் கை விளக்கு
காரிருளின் கவின் மணியே!
பொன்னை உருக்கும் பதுமையே
தென்றலின் மெல்லிசையே!
பூவின் இதழ் பெற்ற பொன் சிறகே
சூழும் சுடரே மின்மினியே!

பகலவனின் ஒளிச்சுடரே
நிலவு பெண்ணின் சித்திரமே.!
எடிசனின் மின் விளக்கோ
ரான்ட்ஜனின் எக்ஸ்ரேயோ,
ராமனின் ஒளிச் சிதறலோ
எல்லா வற்றிலும் ஒளிர்வது நீயல்லவோ

S.SANGEETHA
II M.Sc. Physics

56. வெளிச்சம்

எட்டி அணைக்க வேண்டியது வெளிச்சம் . . . . .
ஊதி அணைக்காதே . . . .
திரியில் ஏற்ற வேண்டியது வெளிச்சம்
கூண்டில் ஏற்றாதே
உன் பாதையின் இருளைக்கிழித்து
எட்டு தையல் போட்ட
அறுவை சிகிச்சையே வெளிச்சம்
கவனமாய் பார்த்துக்கொள் . . . . .
சிகரம் ஏறினாலும் உனக்கு தான்
திசைகள் மாறினாலும் உனக்கு தான்
இறுக்கிப் பிடித்துக் கொள்
உன் பாதைகளின் தலையெழுத்து வெளிச்சம்
சிக்கனமாய் பயன்படுத்து
உன் தேவைகளின் செய்முறை வெளிச்சம்.

SEYED IRSHATH
I M.Sc. Physics

57. ஒளி - 2

ஒளி பூமியை வெளிச்சம் இட்ட முகவரி
இரவை சலவை செய்து எடுத்த ஒளிக்குழம்பு

நீ நெருப்பின் மூத்த பிள்ளை என்பதால்
சூரியன் உன்னை உருக்கிவிட்டு
பூமியை பகல் ஆக்குகிறான்.
திரியில் சப்தமிட்டாலும் உன் இருப்பிடம்
எப்பொழுதுமே வெப்பத்தை விளம்பரம் செய்யும்
இருட்டின் முரணே விழியின்வரம் ஆவாய்
உன் பிம்பம் தாவரத்துக்கு இரத்த ஓட்டம் தரும்
உன் உருவம், பிடிக்க முடியாத ஒளி ஓவியம்...

T. S. P. AMARNATH
I B.Sc.Physics

58. கார்த்திகை தீபம்

கார்த்திகை தீபம் தொடர்ந்து பத்து தினங்கள் கொண்டாடும் விழா ஆகும். வீடு எங்கும் அகல் விளக்கு ஏற்றி, வடைபாயாசம் போன்ற உணவினை சமைத்து இறைவனுக்கு படைத்து வழிபடுதல் ஆகும். கார்த்திகை தீபம் அன்று தீபாவளியை போல பட்டாசு வெடித்தும், வான வேடிக்கை கண்டும் கொண்டாடுவார்கள், அதுமட்டும் இன்றி திருவண்ணாமலையில் தீபத்தை மகா தீபம் என்றும் விஷேசமாக வழிபடுவார்கள். திருவண்ணாமலையில் தீபத்தை பெரியதிரியில் எண்ணெய் ஊற்றி ஏற்றுவார்கள் பதினைந்து நாட்கள் தொடர்ந்து எரியும் என்பது இதன் சிறப்பு அம்சமாகும். இதை காண ஏராளமான பக்தர்கள் திருவண்ணாமலையில் அலை மோதுவது என்பது அந்த கோவிலின் சிறப்பு ஆகும். அது மட்டுமின்றி எல்லா கோவில்களிலும் கார்த்திகைதீபம் அன்று தீபம் ஏற்றுவார்கள்.

J. SATHISH
Lab asst., Dept. of Physics

59. ஒளி - 1

இறைவன் வடிவம் நீயே! இருளைப்
போக்கும் கதிரும் நீயே
புவியில் வேகம் நீயே! உலகை
இயக்கும் சக்தியும் நீயே!
பகலில் பரிதியாய் வந்து மக்கள்
உழைத்திட வழியைத் தந்தாய்!
இரவில் மதியாய் வந்து இருளில்
சுகமான ஒளியைத் தந்தாய்!
கருவில் இருந்த போதும் தாயின்
வழியால் உள்ளே வந்தாய்!
உறங்கும் நேரம் கூடமனிதன்
கனவாய் உள்ளே வந்தாய்!
உன்னை இழந்த விழிதான் உன்னை
வெறுக்கும் ஒரே நிலை
உன்னை விரும்பும் யாரும் உன்னை
அழைக்கும் பொன் பெயர் ஒளியே

B.PRAVEEN
I B.Sc. PCA

60. ஒளியின் பெருமை

அழகின் திருவடிவாய்
ஆதியில் தீப்பொறியாய்
இன்பம் என்னும் உயிர்ப் பொருளாய்
ஈசனும் நீயே
உச்சியில் எரியும் ஜோதியாய்
ஊர் மக்களுக்கும் நீயே,
என்றும் உன்னை வணங்கும் எமக்கு
ஏற்றம் தந்ததும் நீயே!
ஐ என்னும் தலைவனுக்கு
ஒளி தந்த சுடரொளியே

ஓய்ந்த உயிருக்கு இறுதியும் நீயே
ஔடதமாய் இன்னுலகுக்கும் நீயே

S. ARAVIND
I B.Sc.Physics

61. ஒளியின் சிறப்பு

ஒளிமயமான எதிர்காலம் என்ற பாடல் பொழுது போக்கிற்காக மட்டும் எழுதப்பட்டது அல்ல, அதுபோல உன் வாழ்வு பிரகாசமாக இருக்கும் என்று வாழ்த்துவதும் வேலையில்லாமல் அல்ல. ஒளி என்பது புத்துணர்ச்சி, மறுவாழ்வு, உணர்ச்சி மிக்க ஒன்றாகும். இருளினை விலக்கி ஒளியினை தருவது, நாம் பல்வேறு சிக்கல்களிலிருந்து வெளிபட்டு வருவதுபோல ஆகும். தமிழ்நாட்டு கலாச்சாரத்தில் ஒரு உண்மையை வெளியே கொண்டுவருவதும், விளக்கு என்ற ஒளியின் மூலம்தான், நம்மை பல்வேறு விபத்துகளிலிருந்து காப்பாற்றுவது அறிவிப்பு விளக்குகள் என்ற ஒளி தான் நாம் மூச்சுக்கு உதவும் ஆக்சிஜனை தரும் மரத்தினை துளிரவைப்பதும் ஒளிதான் -சூரியன் என்னும் ஒளிக்கடவுள்.

ஒளிக்கு என் வணக்கம்

M. POONGODI
II B.Sc. Chemistry

REVERBERATION OF ACTIVITIES IN OUR DEPARTMENT (2014-2015)

- **MEET UR ALUMNI**

Our Alumni, Mr. V. Karthigeyan, who is with Wipro Technology currently, completed B.Sc., Physics in our college during 2007-2010 interacted with our students on **11.08.2014**. He shared his views and ideas and gave tips to the students regarding how to prepare for various competitive examinations after graduation. He made the students realize that **"HARD WORK IN LIFE NEVER FAILS"**.

- **MADRAS WEEK CELEBRATION**

The Department of Physics celebrated Madras week this year. As part of this celebration our students displayed posters of historically important

places in Chennai and its significance. The other feature brought out by the students was **"Science and Madras".** Students put a quiz on posters to test the knowledge on facts connecting Science and Madras.

- **DBT LECTURE SERIES: GOLDEN JUBILEE CELEBRATIONS**

As a part of Golden Jubilee Celebration Series of Lectures by Eminent personalities in various field of Science was organized by the Department of Physics.

❖ **LECTURE I: SCENERIO OF MEDICAL PHYSICS**

Date: 18.08.2014

Dr. Aruna Ganesan Professor and Head. The Department of Medical Physics, Anna University, delivered an inspiring talk about the avenues open to the medical Physicist today and stressed the need for innovations in the field of medical Physics particularly in Radio medicines.

❖ **LECTURE II: METEOROLOGICAL OBSERVATION AND FORECASTING**

Date : 19.08.2014

Dr. S. R. Ramanan, Director, Area Cyclone Warning Centre, Regional meteorological center, Chennai, gave an interesting and informative talk about the climatic changes and the instruments used for observing the weather conditions.

❖ **LECTURE III : 100 YEARS OF X-RAYS DIFFRACTION AND STRUCTURAL BIOLOGY**

Date: 21.08.2014

Dr.D.Velmurugan**,** Professor and Head, Advanced studies **C**rystallography and Bio-Physics**,** University of Madras**,** Chennai

He focused on the history of X-Ray diffraction studies and its applications and research activities. He detailed on frontier institutes to pursue further studies and research in Crystallography.

❖ **LECTURE IV: H^2N (HEALTH, HYGIENE, NUTRITION)**

Date: 27.08.2014

A lecture program on Health, Hygiene and Nutrition for women has been delivered by **Dr. R. Premalatha**, Senior consultant, Obstetrics and Gynaecology, Dr. Mehta's Hospital, Chennai.

She aimed at creating awareness among students (Girls) about Health, Hygiene and Nutritive values. She stressed the importance of personal hygiene.

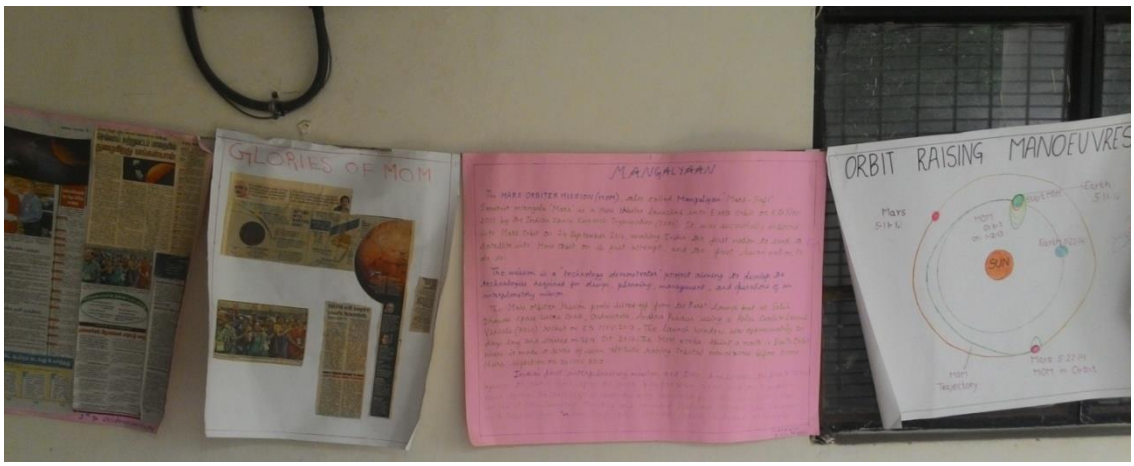

Jai Shree Krishna

- **LECTURE V: ELECTROMAGNETICS - PROSPECTS AND PROBLEMS**

  Date : 02.09.2014

Dr. T. M. Srinivasan, Dean, Yoga and Physical Sciences 'VYASA' Bengaluru, delivered a significant lecture about yoga science and its similarities with electromagnetic spectrum.

- Our Physics Department students proudly celebrated the information of the great victory of **MANGALYAAN** (MOM) Mars Orbiter Mission on 24-09-2014 in our Physics department.



PROGRAMMES

- Staff and Students of Department of Physics were taken to the 'Ramanujan' movie. It was an opportunity for the students to know about a great Indian mathematician.

- Department of Physics organized a training program for the students of Sankara Nethralaya, Chennai. About 35 students pursuing their Diploma in refraction and dispensing, Baccalaureate in Ophthalmic Dispensing (BLOOD) course and attended the hands-on training in Optics - Light based practical experiments.

- **A valedictory program** for the 3 day workshop on Robotics, Aero-modelling and Circuitry was held on 17/12/2014. Dr.T.S. Natarajan, Professor, Department of Physics, IIT, Chennai and Dr. S. P. Srinivasan, Professor and Head, Department of Mechanical engineering, Rajalakshmi Engineering College, Chennai, addressed the gathering and inspired the students to think beyond the book. He explained how even simple innovations and creative thinking can be helpful to the society.

- **Our experience on Prof.S. Ananthan's Physics classes:**

This report is about the classes conducted for our students by a retired Professor from our Physics department, Prof. S. Ananthan. Prof. S. Ananthan is a person who is very much passionate about teaching to students, especially about teaching Physics. It is by virtue of this passion that he conducts Physics classes for students even after his retirement. The students of our college who attend his classes also share his enthusiasm for Physics and hence are always looking forward to attend his classes.

In these classes Prof. S. Ananthan focuses on encouraging self learning among students. It is for this reason that he follows a question and answer approach in his teaching. Rather than just explaining the concepts by an exposition, he puts forward several interesting questions to his students and it is with their answers that he explains every concept. He is also highly patient and so is tolerant to the wrong answers that students may give to his questions. This encourages the students to think in the classroom and not just to listen. Hence they understand the concepts way better than they would in just a plain exposition.

His ability to come up with interesting analogies, instantly, for even difficult concepts, has always been a thing of wonder amidst the students. In addition, he clears misconceptions in Physics that students tend to have. His attention to even small details while teaching is also highly commendable.

The fact that in spite of the weariness that old age has brought upon him, he teaches students in such a beautiful fashion, is a clear testimony to his passion for teaching. All of his students from our college are highly grateful and thankful for his efforts and will always be ready to attend his classes even in the days to come.

- **On Wings of Imagination for Noble cause**

On January 30, 2015 Mr. Prakash Vaidhyanathan received 600 Kg of rice bags after his short story session from the representatives of all the departments of D.G Vaishnav College and handed it over to Adyar cancer institute and various orphanages.

- The department paid homage to the father of our nation – ***Sarvodaya Day*** on January 30th 2015. Staff and students offered the pray followed by bhajans.

- **Music Appericiation**

Every week thrusday our department has been organising a get together for students from various who enjoy music. This is the platform for the students to showcase their music talents to others to learn, sing choros as well learn about Indian music.

- **Ayudha Pooja Celebration**

The Staff and Students of the Deparment of physics celebrated Ayudha pooja – Saraswathi pooja in Physics Laboratory. A tradition to take time to pay gratitude to innate objects too. Our instruments give life to our laboratory, our students and us!

- **Acharya Devo Bhava**

Our Department faculty with Prof B.Krishanan

- **Poster Discussion**

Students of I B.Sc Physics displayed posters for class activity

Artistics '15 Memories …

PRIZE WON

- *S. Karthick*, *B. Aswin* and *R. Jayaprakash* of II B.Sc. Physics and *R.Ramachandran* of III B.Sc.Physics won the *2nd prize* ad-zap competition at Bakthavatchalam Memorial College on February 22nd2014.
- *R. Jayaprakash* of II B.Sc.Physics won *3rd prize* in cosmic script competition at Women's Christian College in March 2014.
- *S.Karthick* of II B.Sc.Physics won *2nd prize* in paper presentation, *Ajith Kumar* and *Jaganathan* won *2nd Prize* in face painting and*Amarnath* and *Dinesh Kumar* of I B.Sc.Physics won the *3rd Prize* in Electra'14 at Stella Maris College in September 2014.
- *S. Karthick* of II B.Sc.Physics won *3rd place* in the competition Break the Law held at Loyola College in December 2014.

- *N. Naveen* of II PCA and *S.Karthick* of II B.Sc.Physics won the *1st prize* in DEFENDRE at Loyola College in September 2014.
- *M. Priyadharshini*, *M.Sruti*and *B. Rajagopalan* of II B.Sc.Physics won the *2nd prize* in Jignyasah (quiz) Madhuliha-14 department of Sanskrit, Ethiraj College December 2014.
- *Ashish Ranka* of II B.Sc. and *S. Venkatesh* of I B.Sc.Physics won *1st prize* in Photo story competition in Ripples'14 Ethiraj College in August 2014
- *S. Sekhar* and *A. K. Aravind* of I B.Sc.Physics won the *B Zone* Level competition in Badminton at DG Vaishnav College and *3rd place* in YMCA trophy competition, 2014.
- *S. Karthickeyan* of I B.Sc.Physics won the *1st prize* in Kho-Kho at YMCA trophy competition, 2014.
- *B. Lohavaani* of I B.Sc.Physics won prize in Essay writing competition at the Inter departmental competition organized by the Hindi Department in September 2014.
- *S. Venkatesh* of I B.Sc.Physics won the *1st prize* in JAM and Debate competition at the Inter departmental competition organized by the English department in August 2014.
- *B. Aswin* of II B.Sc.Physics has won the *2nd place* in the Tamil essay competition conducted at Anna Adharsh College, on 12th Dec' 2014. He received the prize from Padma Shri Dr. Kamal Hassan.
- *D. Praveen* and *S. Santhoshkumar* I BSc PCA has won *3rd prize* in Junk art competition held at Loyola College.
- *I. Noorul Hassan* of III B.Sc.Physics participated in CMC college Chemfest 2014 inter college cultural Ad-zap and Won *2nd prize* in June 2014
- *I. Noorul Hassan* participated in KMC Prathyusha 2014 Inter College Cultural Ad-zap and won *1st place* and won best comperer award September 2014

- *I. Noorul Hassan* participated in variety performance and won *2nd place*, participated in Chennai corporation voter's awareness speech competition in our college and won *2nd place*.
- *V. Surender,* III B.Sc. Physics and *N. Prakash* of I B.Sc. Physics won '*Best Physicque award' (gold medal)* conducted by KMC hospital on October 2014.
- *M.Raghu and S.Aravindan of I B.sc Physics, M.Sakthi Haasan of III B.Sc Physics, P.Mohanam and K.K.S.Subhash of II B.Sc Physics* won *2nd place* in singing competition in "*Artistics'15"* Feb 2015.
- *V.Manikandan of I PCA* won II place in Adzap and also won I place in variety performance in Inter collegiate cultural festival *"Gustogalaxy"*on Feb 21 & 22, 2015.
- *M.Sruthi of II B.Sc Physics* participated and won I place in cooking without fire in *"Artistics '15"on* Feb 2015.

STUDENTS PARTICIPATION

1. Students of *III B.Sc.Physics* took part in '*Ilakiyathiruvizha'* organized by Tamil news daily Dhinamani and SASTRA University, Tanjore at centenary hall of University of Madras to focus on importance of Tamil literature, former President of India and Eminent Scientist Dr.A.P.J Abdul Kalam presided over the function as chief guest on 21-06-2014 & 22-06-2014.
2. *UG and PG Students* took part in a workshop titled '*Laser Technology and its application*' (WLTA'14) organized by Department of Physics -B.S.Abdur Rahaman University Chennai on 19th March 2014.
3. Six of our *II M.Sc. Student*s attended a one day guest lecture on the topic *'Lecture on Bio Technology and Nano Technology'* organized by Ethiraj College on 7th July 2014.
4. *Kanchan Singh Mourya* of II *M.Sc.Physics* attended UGC sponsored '*National Conference on Visualize Molecules and Cognize Crystal'* (NCVMCC-2014) organized by the research department of Physics

SDNB Vaishnav College on 25th and 26th February 2014 and also attended a two day national level seminar cum workshop on Quality Assurance in Teacher Education: "Trends and Challenges in India" at Loyola College of Education on 11th and 12th April 2014.

5. *A.Thangam R.Raghavi and V.Vinodh* of *II M.Sc.Physics* volunteered for '*Teaching Physics to higher secondary students at* Singaram Pillai Boys Higher Secondary School Villivakkam during 24th November 2014 to 5th December 2014.

6. M. Vignesh (2011 batch), B. Aswin, R. Jayaprakash, S. Karthick from *II B.Sc.Physics* participated in '*Mahasudarsanahomam'* held in DGVC in march 2014.

7. *M.Vingesh (2011 batch), B. AswinII B.Sc.Physics* participated in '*3rd Youth Mela'*, '*World AIDS day' -2013* and International Alliance for prevention of AIDS *(IAPA).*

8. *M. Vingesh (2011 batch), B. Aswin, R. Jayaprakash, S. Karthick,M.Priyadharshini, S. Priyanka, R. Swetha, C. Nithish* from *II B.Sc.Physics* participated in *'World Heart Day' September 2013 at DGVC.*

9. *M. Vingesh* (*2011 batch),B. Aswin, R. Jayaprakash, S. Karthick, M.Priyadharshini, R. Swetha, S. Ramya, Ramya Devi,S.K. Kokila, S. Sharmila, P. Mohanam, M. Vishali,G.Sasikala, I. Noorul Hassan* from *II B.Sc.Physics* went for a '*Software Training Workshop for Visually Challenged' held at Kola Perumal Vaishnav Chetty Senior Sec School during Dec-2013.*

10. *B. Aswin, R. Jayaprakash, S. Karthick* from *IIB.Sc.PhysicsT. Madhuvanthi*from *I B.Sc.Physics*went for a '*Sports Camp for Visually Challenged' in Dec-2014 at DGVC.*

11. *M. Vingesh (2011 batch*), *B. Aswin, R. Jayaprakash, S. Karthick* from *II B.Sc.Physics* participated in*'Run for a Nation*' September 2013 at marina.

12. *M. Vingesh*(*2011 batch), B. AshwinII B.Sc.Physics* participated in '*Thaipoosa Thiruvizha at Vadapalani' in Jan 2014.*

13. *B. AshwinII BSc Physics* participated in '*Jeevan Suicide Awareness*

Rally' held at Marina beach on Sep, 2014.

14. *A. Prassheedha, A. Divya, K. Sindhuja, R.Revathi, T. Madhuvanthi, Kinjal M. vyas, B. Logavani, P. Mathangi, S. Dinesh, M.Paneerselvam, L.AshwinKumar*, T.S.P. Amarnath, *S. Aravindhan, S.Rameshkumar, M.Suresh, M. Ragul, S.Srikanth from I B.Sc.Physics* and *B.AswinII B.Sc.Physics* participated in *TN Tourism rally on Sep , 2014.*

15. *A.Prassheedha, A.Divya., K.Sindhuja., R.Revathi, T.Madhuvanthi, Kinjal M. vyas, B.Logavani, P.Mathangi, S.Dinesh, M.Paneerselvam, L.Ashwin Kumar , T.S.PAmarnath, S.Aravindhan , S.Ramesh kumar, M.Suresh, M.Ragul, S.Srikanth* from *I B.Sc. Physics* and *B.Aswin II B.Sc.Physics* participated in *National Flag Formation* on 7th Dec '14 at YMCA ground.

16. *L.Ashwinkumar* I B.Sc.Physics and *B.Aswin II B.Sc. Physics* participated in *Swaach Bharat scheme December 2014 at marina.*

17. *S.Rajesh* from *II B.Sc*. PCA participated in *Cunnan Trophy* and *University Cricket Matches 2014.*

18. *Naveen Kumar B, Devaraj K, Kavish U, Kumar A* from *III B.Sc. PCA* and *Naveen N, Balaji.R, Raguram R, Prabhakaran.E, Balaji.K* of *II B.Sc. PCA* participated in seminar about *Education Media* by Dr. Shridhar at Periyar Science City

19. *Sethupathy B* from *III B.Sc. PCA* participated in *Inter Collegiate Cricket Competition*.

20. *Prashanth R P* from *III B.Sc. PCA* participated in *Inter Collegiate Football Competition*.

21. *Manikandan V* and *Bharath R* participated in *Debate* at M G R University.

22. The students of both UG and PG from various departments attended a three days workshop on hands on training in*"Robotics and Aeromodelling"* by *"Infinite Engineers"*– held at DG Vaishnav College during Dec 2014.

23. *Kanchan singh mourya* of II *M.Sc.Physics* underwent her internship training in Central University of Pondicherry.

24. *K.Tharani tharan and Avinash.M* of II *M.Sc.Physics* underwent summer school in theoretical physics on Quantum Mechanics in *Institute of Mathematical Science*, Tharamani.

25. *Sangeetha .V* of II M.Sc Physics did her project "Rutherford Backscattering Spectrometry and Channeling studies of InGaAs epilayers grown on GaAs crystal " in *Indhra Gandhi Centre for Atomic Research*, Kalpakkam.

26. *B.Baskar, M.Praveena and R.Karthiga of III B.Sc Physics* have been attending the training program *at MAHINDRA NAMASTE PVT.LTD* from Jan 19 2015.

27. *S. Karthick R. Jayaprakash, and Ashish Ranka of II B.Sc Physics Kinjal M vyas and T. Madhuvanthi I B.Sc Physics* has volunteered in Robotics and Artificial intelligence foundation – RAIF IIT Madras Feb 8, 2015 and anna university for school children.

28. *S. Karthick of II B.Sc Physics, A. Thangam of II M.Sc, Kinjal M Vyas , T. Madhuvanthi* of *I B.Sc Physics* have been selected to participate in three day national symposium and exhibition on innovative and futuristic approaches in science and technology, Bhopal Madhya Pradesh, Feb 26-28, 2015.

PAPER PUBLICATION AND PRESENTATION

1. *Manikandan.A (2011 batch) and Rajesh.P (2011 batch)* published a paper about *FT-IR, FT-Raman, UV-Vis Spectra and Quantum Chemical Studies on Aspartame* in International Journal of Science, Technology and Humanities.

2. Our department faculties presented paper on National conference on frontier avenues in chemistry and environment FACE 2015 held on February 11 & 12, 2015 as follows

- Growth and crystal structure determination of Zinc Hydrogen maleate dehydrate $ZnH(C_4 H_2 O_4).2H_2 O$ presented by *Dr. Z. Delci and Dr. D. Shyamala*
- Growth and characterization of sodium hydrogen maleate trihydrate single crystals presented by *Dr. Z. Delci and Dr. D. Shyamala*.
- Elemental structural characterization and electrochemical, impedance spectroscopy of the Tamarabarani river soil presented by *Mrs. K. Selva Kothai Nachiyar*
- Thermogravimetric studies and analytical calculation of L-arginine acetate single crystals presented by *Dr. V. Renganayaki*.
- Optical properties of ZnO nanoparticles doped with cobalt presented by *Dr. D. Sridevi.*

3. National conference on Recent advances in applied sciences CTTE College, Perambur, Chennai held on February 5 & 6, 2015.
   - *A. Thangam of II M.sc Physics and Dr. V. Renganayaki* presented poster on Spectroscopic studies on L-Analine hydrogen chloride single crystal
   - *Yuvashree of II M.Sc Physics* and *Dr. V. Renganayaki* presented poster on Thermogravimetric and spectroscopic studies of L-Analine hydrogen borate single crystals.

4. National conference on New Materials and Drugs SDNB Vaishnav College, Chrompet Chennai held on February 24 & 25, 2015
   - *R.Vijayalakshmi of II M.sc Physics and Dr. V. Renganayaki* presented poster on Thermoanalytical studies and Isothermal kinetics on L-Analine hydrogen chloride single crystal.

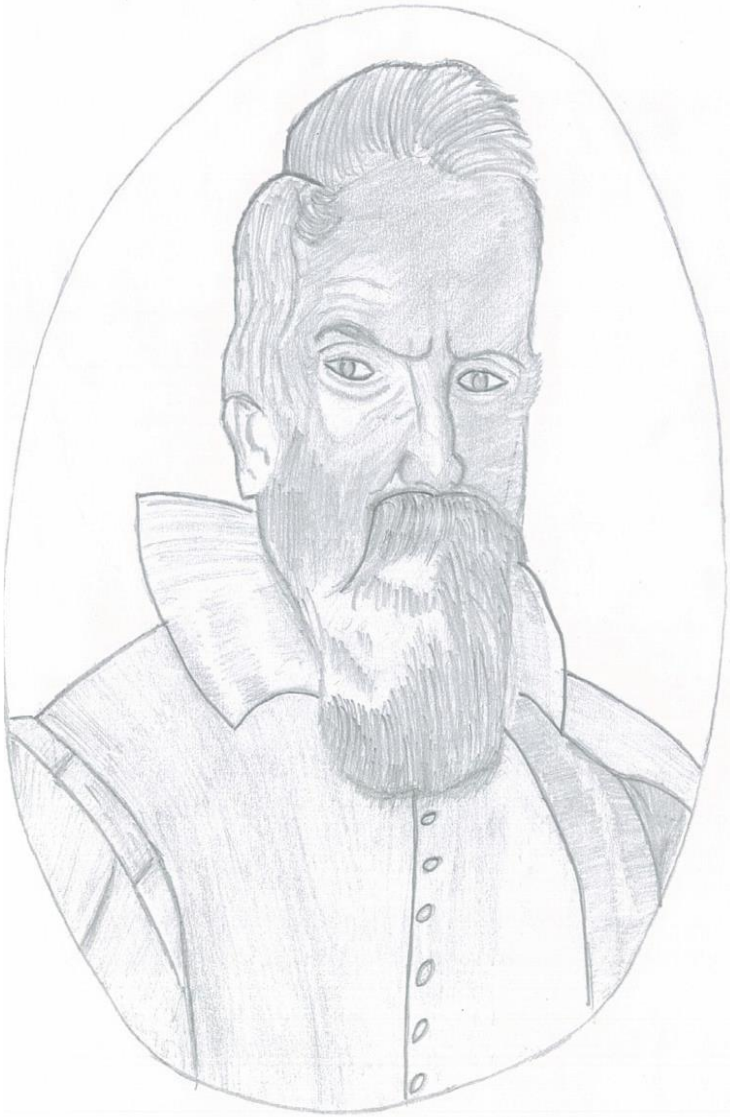
5. *R.Raghavi and V.Vinoth of II Msc Physics* presented their M.Sc project in 3rd National Conference on Hierarchically Structured Materials.

PLACEMENT

1. *Timangshu chetia-2012 batch* is selected for the project NEIST as JRF project M Parametric Geo Physical Observatory MPOG.

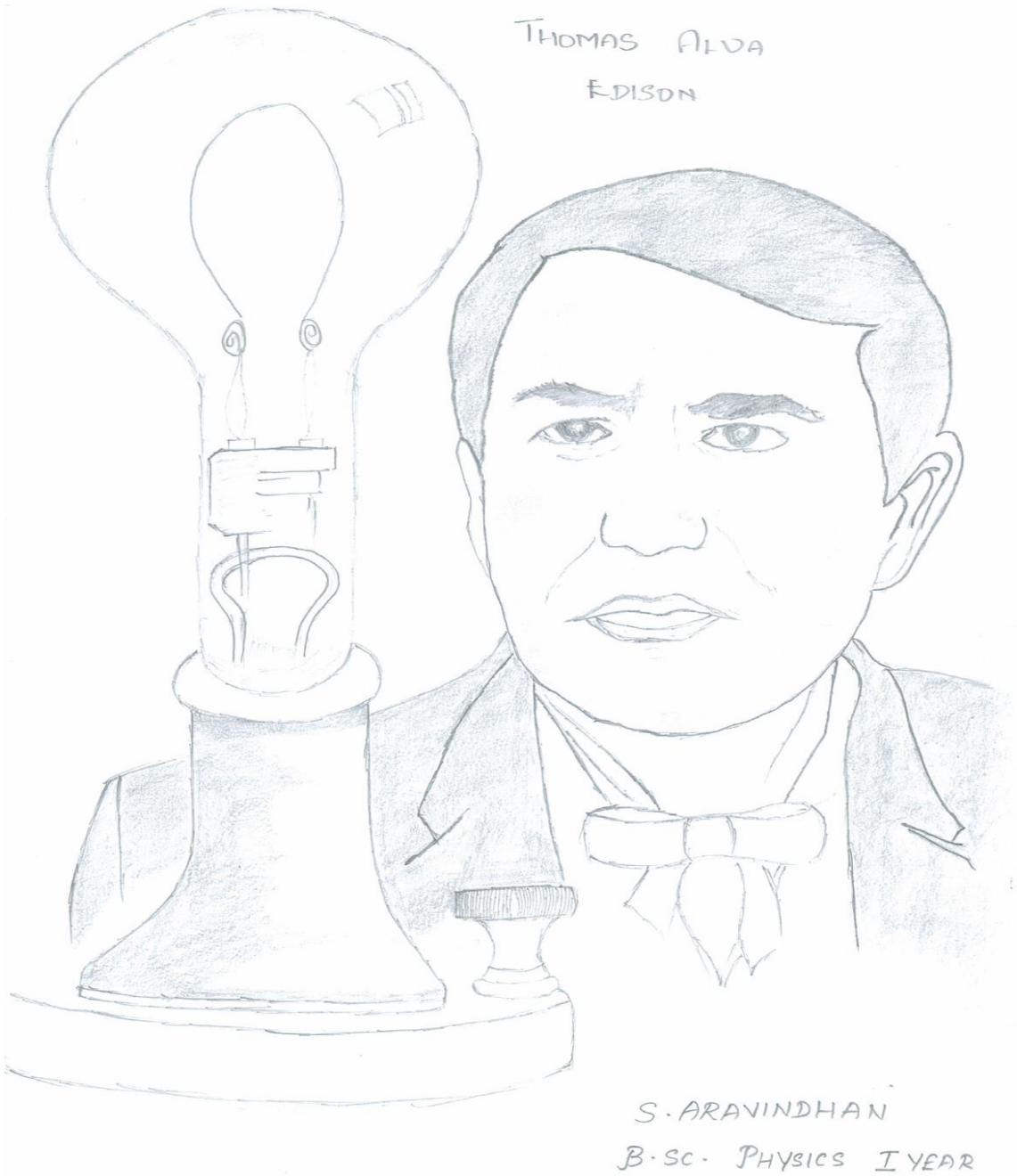
2. *M.Praveena and R.Vingeshwaran* of *III B.Sc Physics* has been selected in *TCS*.

Galileo Galilei

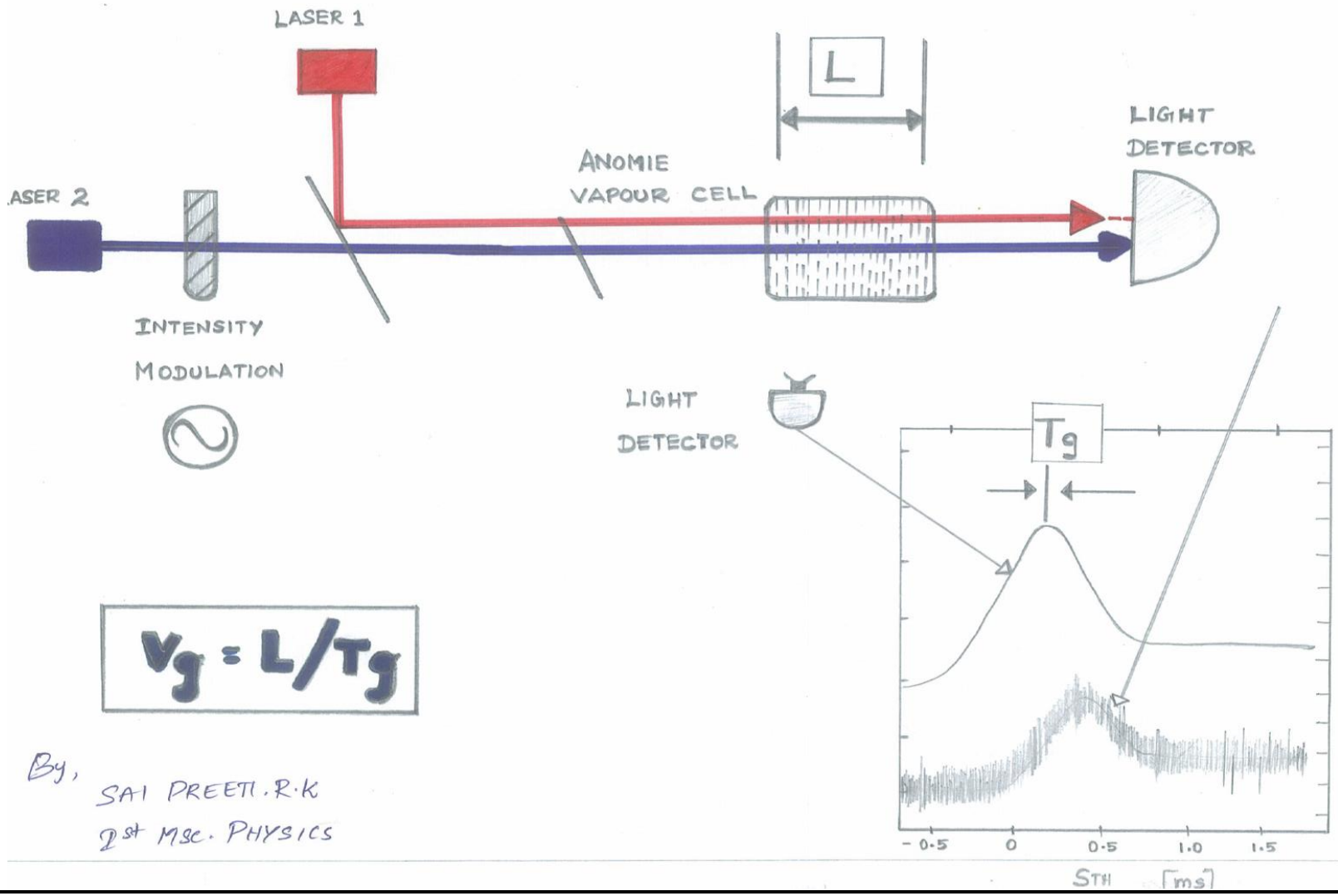


M. BHAVANI
B.SC, PHYSICS-(IYR)
DAY COLLEGE


ALHAZEN
G. Nithya
1st yr. Bsc. Physics.


THOMAS ALVA
EDISON
S. ARAVINDHAN
B.SC. PHYSICS I YEAR

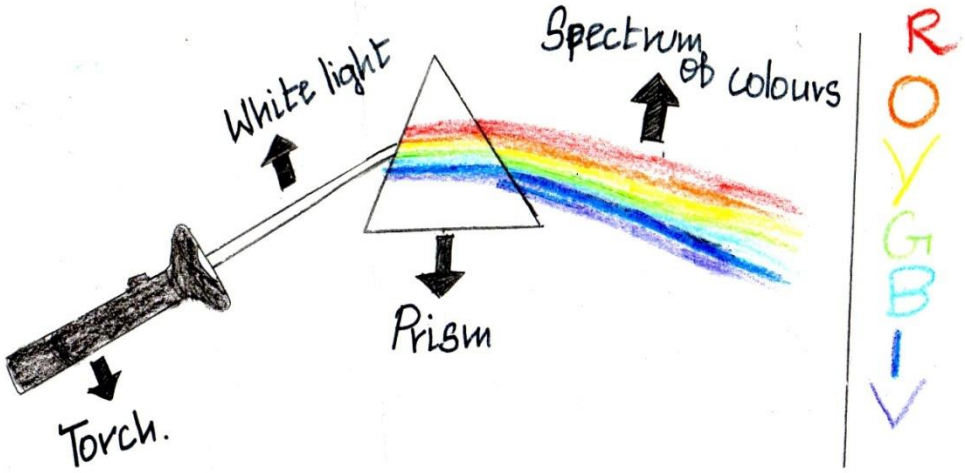
SLOW LIGHT EXPERIMENT :



$$V_g = L/T_g$$

By,
SAI PREETI. R.K
2nd MSc. PHYSICS

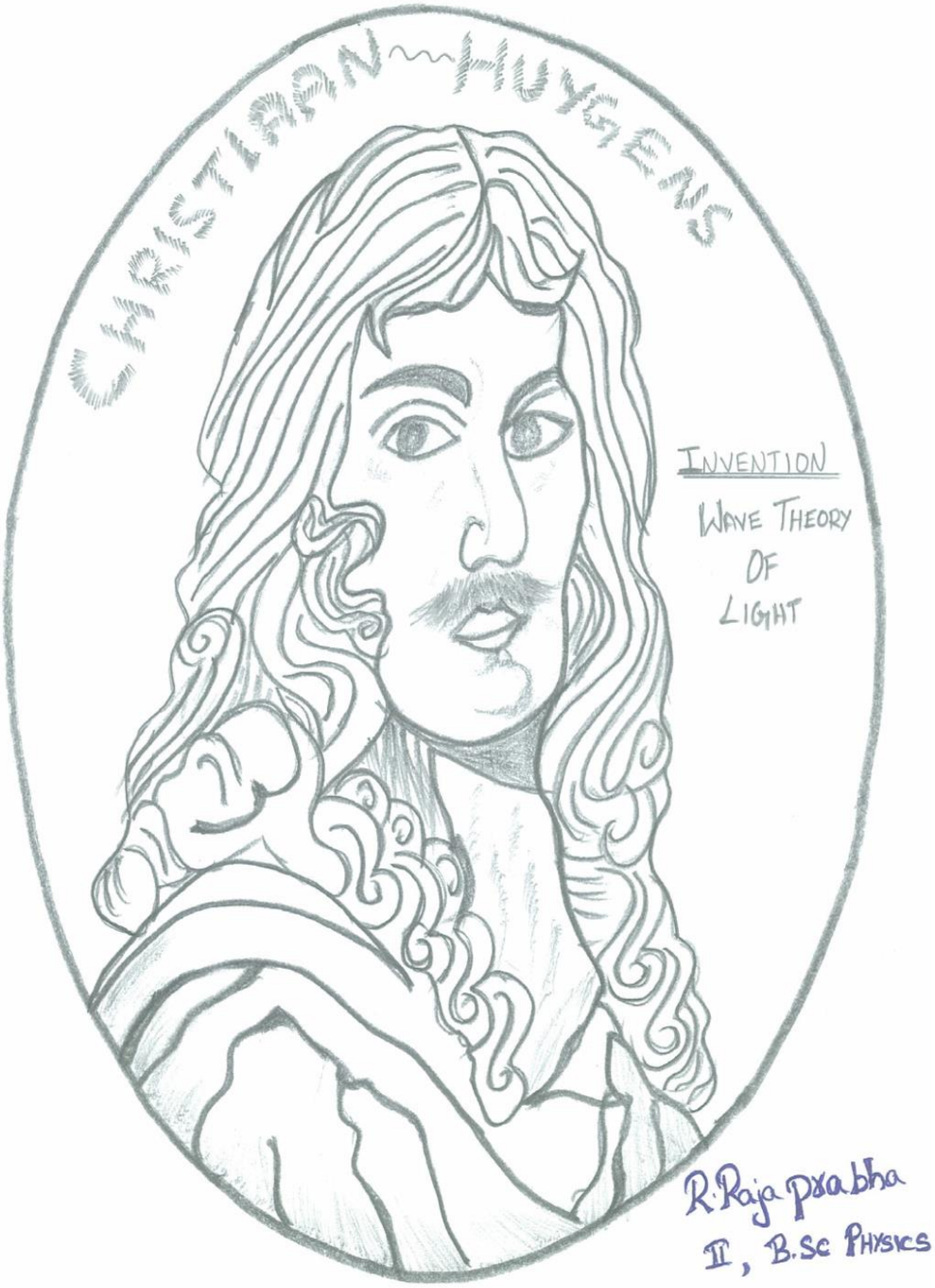
DISPERSION OF LIGHT



FACT : NEWTON DISCOVERED THAT SUN LIGHT CAN BE SPLIT IN TO SPECTRUM - ALL THE COLOURS OF THE RAINBOW.

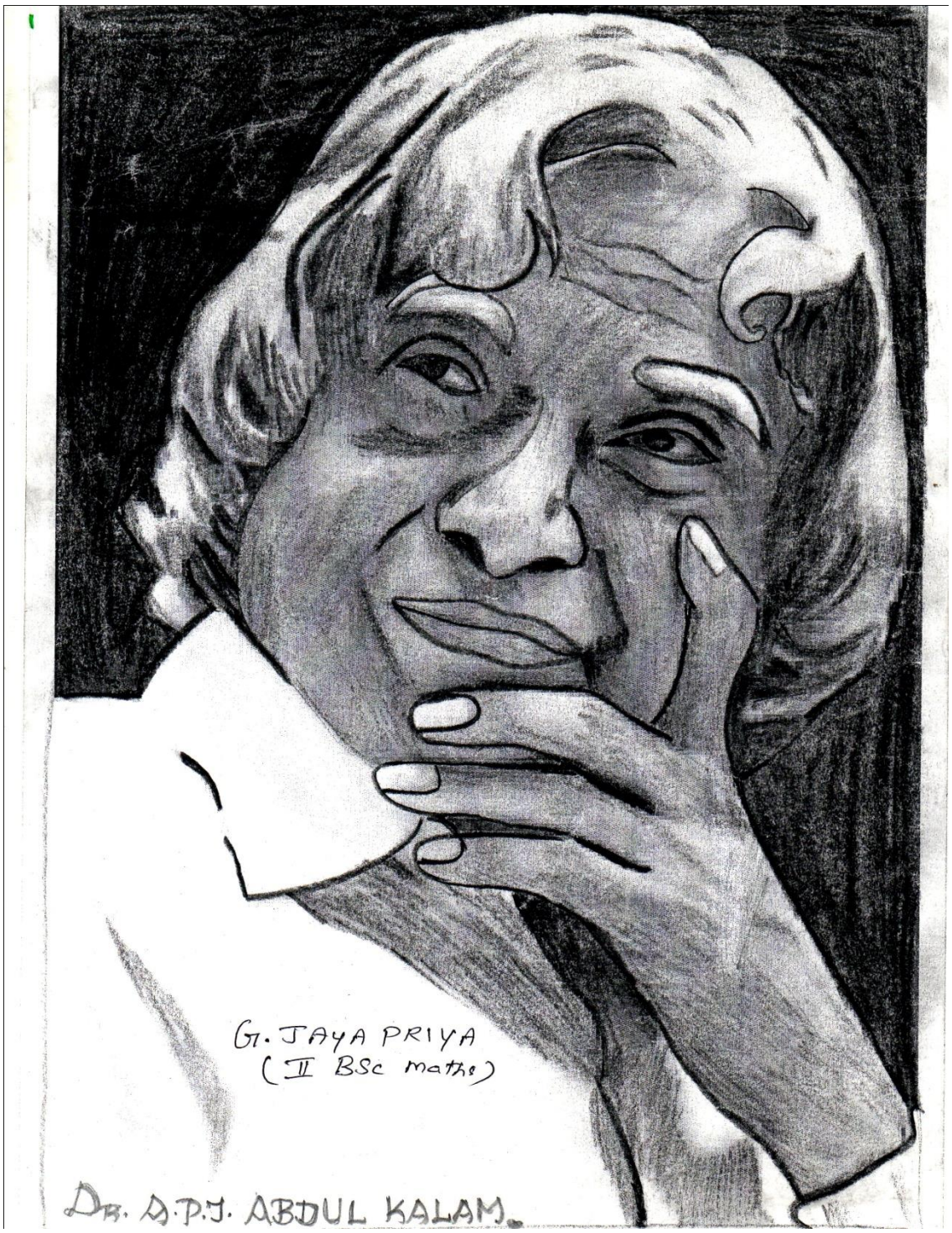
DONE BY

S. NANDINI, 5B, ANNA ADARSH SCHOOL.


CHRISTIAAN HUYGENS
INVENTION
WAVE THEORY
OF
LIGHT
R.Raja prabha
II, B.Sc PHYSICS

THOMAS YOUNG [1773 - 1829]

B. LOHAVAANI
I BSC Physics
DAY COLLEGE


G. JAYA PRIYA
(II BSc maths)
Dr. A.P.J. ABDUL KALAM.


ISAAC NEWTON
J. Sathya.
III rd pca...

HUMPHREY DAVY

By
VENNILA. R
B.Sc-Physics-Iyr
DAY COLLEGE

NIELS BOHR

By,
SAI PREETI. R.K
Ist MSC. PHYSICS

तमसो मा ज्योतिर्गमय

The Management, Principal,
Staff and the Students of Department of Physics

DWARAKA DOSS GOVERDHAN DOSS
VAISHNAV COLLEGE

in association with

THE KUPPUSWAMI SASTRI RESEARCH INSTITUTE

take pleasure in inviting you to the inauguration of the

UGC Seminar

On

Science in Ancient India

27th February, 2015
at 9.00 a.m.

Inaugural address by

Hon'ble Thiru. Justice V. Ramasubramanian
Madras High Court

Venue: Vallabhacharya Auditorium, D.G. Vaishnav College

Inauguration

Invocation	
Welcome Address	: Dr. D. Uthra, Convenor
Presidential Address	: Maj. Dr. M. Venkatramanan, Principal
Inaugural Address	: Hon'ble Thiru. Justice V. Ramasubramanian, Madras High Court
Keynote Address	: Dr. V. Kameswari, Director, KSRI
Felicitation	: Shri. P. Haridas, Secretary
Vote of Thanks	: Dr. D. Syamala

Session I – Mathematics and Astronomy in Ancient India
(10.20 a.m.)

Dr. Sita Sundar Ram Dept. of Theoretical Physics, University of Madras	: Indian Mathematics - Revisited
Ms. K. Rama Kalyani Research Scholar, KSRI	: Tamil Mathematical Works
Ms. K. Vidyuta Research Scholar, KSRI	: Approximations of π
Dr. M. Raghu Madras Sanskrit College	: Scientific Concepts in Jyotisha
Ms. R. Chitra Dept. of Sanskrit, JBAS College for Women	: Geometrical Applications

Session II - Physical Sciences in Ancient India
(1.00 p.m.)

Dr. K. S. Balasubramanian Deputy Director, KSRI	: Mining and Metallurgy
Dr. B. Rama Devi Sekhar Dept. of Sanskrit, Ethiraj College for Women	: Textiles and Dyes
Dr. V. Yamuna Devi Research Asst., KSRI	: Some Aspects of Physics and Chemistry
Ms. Jayadevi Prakash SASTRA University, Thanjavur	: Metals and Alloys
Dr. V. Soumyanarayanan Dept. of Sanskrit, D. G. Vaishnav College	: Warfare Technology

Session III - Geography in Ancient India
(3.10 p.m.)

Prof. R. Parthasarathy Former Prof. of Geography, D. B. Jain College	: Geographical knowledge of Ancient India
Dr. V. M. Ananthanarayanan Dept. of Sanskrit, National College, Trichy	: Meteorology
Dr. V. Anusha Dept. of Sanskrit, Ethiraj College for Women	: Cartography
Ms. P. Lavanya Research Scholar, KSRI	: Water divining
Mr. K. N. Srikkanth Research Scholar, KSRI	: Sunspots and Sun flares

Day 2

Session IV - Medical Sciences in Ancient India
(9.00 a.m.)

Dr. L. Kumaraswamy Dept. of Sanskrit, University of Madras	: Ayurveda and Siddha Medicine
Dr. S. Annapurna Sacred Heart Mat. School, Chennai	: Pathology
Mr. S. Gopalan Research Scholar, KSRI	: Surgical Instruments
Ms. A. Durgadevi Dept. of Sanskrit, Kanyakaparameswari College	: Aroma Therapy
Dr. S. Venugopalan Dept. of Sanskrit and Indian Culture, SCSVMV University	: Ayurveda and Yoga

Session V - Plant Sciences in Ancient India
(11.10 a.m.)

Dr. R. Ramachandran Dept. of Sanskrit, R. K. M. Vivekananda College	: General Survey of Plant Sciences
Dr. Priyadarshana Jain Dept. of Jainology, University of Madras	: Ecology in Jain Works
Ms. V. Premalatha Research Scholar, KSRI	: Plant Diseases and Treatment

Ms. V. Lalitha Research Scholar, KSRI	: Environmental Science
Ms. V. Preethi Dept. of Sanskrit, KRMM College	: Plant Propagation

Valedictory session
(2.00 p.m.)

Welcome	: Dr. D. Uthra, Convenor
Valedictory Address	: Time scale in Sanatana Dharma and Modern Science by Prof. K. Ramesh, Dept. of Applied Mechanics, IIT Madras
Report on the Seminar	: Dr. V. Renganayaki
Release of Reverberations '15	: Shri. P. Haridas, Secretary
Distribution of certificates	
Vote of Thanks	: Dr. R. Uma
National Anthem	

Celebrate India
Celebrate Science

With best compliments from:

Physics Society

Prof. Ananthan

AI 146/10, First Street,

Anna Nagar, Chennai - 600 040