

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
UNIVERSITY COLLEGE OF ENGINEERING, VIZIANAGARAM

DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING



FARADAY MEMORIAL

THE MEMOIR

Chronicles of **EEE**

Volume- 7

Sept 2020

Editorial Column

We take immense pleasure to thank all the readers of our magazine for your support to our effort. We, the Department of Electrical and Electronics Engineering, JNTUK University College of Engineering Vizianagaram, proudly present the seventh edition of our magazine

“THE MEMOIR- Chronicles of EEE”.

We would like to take this opportunity to thank our principal, Dr.G.Swami Naidu, for his constant support at all times, head of the department, Smt.A.Padmaja, who has continuously been bringing in all her prudence and extent to be the perfect motivation to each and everyone around, all the faculty, the department of Electrical and Electronics Engineering, and our fellow students, for their support in developing our magazine.

We would like to extend a special thanks to Dr.G. Saraswathi and Dr.V.S.Vakula for their approachability and constant support. We would also like to thank Smt. S.Rajitha, and all the teaching faculty of the department of Electrical and Electronics Engineering for their constant support in sharing knowledge and enlightening us. This edition is gathering of recent advancements in power generation and technologies, turning the waste into long-lived batteries, future era of smart grid. The general topics like brain teasing questions, facts, current affairs and inspiring minds were also included.

Once again, we would like to express our considerable appreciation to all authors of articles and their knowledge in carving “THE MEMOIR- Chronicles of EEE”.

We welcome your valuable suggestion to improve the standard of our magazine.

THANK YOU
-MAGAZINE TEAM

Principal's Message

I am extremely happy to note that the Department of Electrical and Electronics Engineering student community is bringing out the seventh edition of its newsletter, "THE MEMOIR".

In this connection, I invite the attention of the students towards the articles read in the magazine which paves the way to the world of innovation and invention. It also leads the students to get exposure about new technologies and improve their personality by knowing the life of the inspiring personalities read in the magazine.

I whole heartedly congratulate the the members of editorial board for their act in keeping their spirit at high. I wish them all success



HOD's Message

I am extremely delighted to note that the student community of Department of Electrical and Electronics Engineering, JNTUK UCEV in bringing out seventh edition of its yearly newsletter "THE MEMOIR". I wish them all success.



In this connection, I invite the attention of students towards the successful and inspiring personalities read in the newspaper. I would like to congratulate the effort put by them who contributed the technical and literary articles to the magazine.

I whole-heartedly congratulate the members of editorial board for keeping and continuing the spirit at high for bringing the magazine to reality.

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Motto of Magazine

The chief motto of this magazine is to promote the idea of **Green Energy**. In order to be an effective consumer of green energy, it's good to know where green energy comes from. In addition, the more you know, the better equipped you'll be to enjoy the benefits and educate others.

Let's start with the basics:

Clean: Green energy, which includes green electricity, is clean energy. This means it is produced with little-to-no environmental impact and does not dispense greenhouse gases into the air that contribute to global warming, the way fossil fuels do.

Varied: Green energy sources include wind, geo-thermal, hydro, and solar energy. Wind and hydro sources generate energy through the movement of air and water, while geo-thermal and solar sources generate energy through heat. All, however, provide reliable energy and protect the environment.

Renewable: As stated above, green energy sources eliminate the emission of greenhouse gases into the air. These sources are also renewable energy sources - meaning they are not created from finite materials like fossil fuels.

Stable: Green energy's varied forms mean more locations across the planet have the potential to harvest this renewable energy. This means more energy can be collected right here in the United States, making the country less dependent on energy from foreign countries.



Inexpensive: As the demand for green energy continues to grow, the price continues to drop thanks to economics of scale. Consider this: between the years 2010 and 2012 the costs associated with producing energy from wind dropped by 20 percent, and prices have fallen by more than 80 percent since 1980.

Right for You: You've seen the environmental and economic benefits that come from turning your home into a green home. The good news is, those benefits will increase as green energy continues to gain popularity in the market. If you're ready to make the switch to renewable energy, see what Direct Energy has to offer.

-K.Jayanth Kumar
17VV1A0226
IV B.Tech, EEE

ABOUT A SCIENTIST

ANDRÉ-MARIE AMPÈRE

French physicist

André-Marie Ampère made the revolutionary discovery that a wire carrying electric current can attract or repel another wire next to it that's also carrying electric current.

André-Marie Ampère, French physicist who founded and named the science of electrodynamics, now known as electromagnetism. His name endures in everyday life in the ampere, the unit for measuring electric current.

Known for :

- Ampère's circuital law
- Ampère's force law
- Ampère's right hand grip rule
- Avogadro-Ampère hypothesis
- Monge-Ampère equation

André-Marie Ampère was born on 20 January 1775 to Jean-Jacques Ampère a prosperous businessman, and Jeanne Antoinette Desutières-Sarcey Ampère, during the height of the French Enlightenment. He spent his childhood and adolescence at the family property at Poleymieux-au-Mont-d'Or near Lyon.[3] Jean-Jacques Ampère, a successful merchant, was an admirer of the philosophy of Jean-Jacques Rousseau, whose theories of education (as outlined in his treatise *Émile*) were the basis of Ampère's education. Rousseau believed that young boys should avoid formal schooling and pursue instead an "education direct from nature." Ampère's father actualized this ideal by allowing his son to educate himself within the walls of his well-stocked library.

In September 1820, Ampère's friend and eventual eulogist François Arago showed the members of the French Academy of Sciences the surprising discovery of Danish physicist Hans Christian Ørsted that a magnetic needle is deflected by an adjacent electric current.

Ampère began developing a mathematical and physical theory to understand the relationship between electricity and magnetism. Furthering Ørsted's experimental work, Ampère showed that two parallel wires carrying electric currents attract or repel each



other, depending on whether the currents flow in the same or opposite directions, respectively – this laid the foundation of electrodynamics. He also applied mathematics in generalizing physical laws from these experimental results. The most important of these was the principle that came to be called Ampère's law, which states that the mutual action of two lengths of current-carrying wire is proportional to their lengths and to the intensities of their currents. Ampère also applied this same principle to magnetism, showing the harmony between his law and French physicist Charles Augustin de Coulomb's law of magnetic action. Ampère's devotion to, and skill with, experimental techniques anchored his science within the emerging fields of experimental physics.

Ampère's Law:

Ampère then brilliantly found an equation connecting the size of a magnetic field to the electric current that produces it. This equation, known as Ampère's circuital law, is highly mathematical, requiring university level mathematics to use and understand. It is shown below in differential form relating the magnetic field (B) to the current density (J).

He is not only known for his electro-magnetism but also various other fields:

The Electron:

To explain the relationship between electricity and magnetism, Ampère proposed the existence of a new particle responsible for both of these phenomena – the electrodynamic molecule, a microscopic charged particle we can think of as a prototype of the electron. Ampère correctly believed that huge numbers of these electrodynamic molecules were moving in electric conductors, causing electric and magnetic phenomena.

Discovery of Fluorine:

Ampère did not restrict his interests to mathematics and physics; they were wide ranging and included philosophy and astronomy. He was particularly interested in chemistry. In fact, preceding his work in electromagnetism, he made significant contributions to chemistry.

Ampère discovered and named the element fluorine. In 1810, he proposed that the compound we now call hydrogen fluoride consisted of hydrogen and a new element: the new element had similar properties to chlorine he said. He and Humphry Davy, who was British, entered into correspondence (even though France and Britain were at war). Ampère proposed that fluorine could be isolated by electrolysis, which Davy had previously used to discover elements such as sodium and potassium.

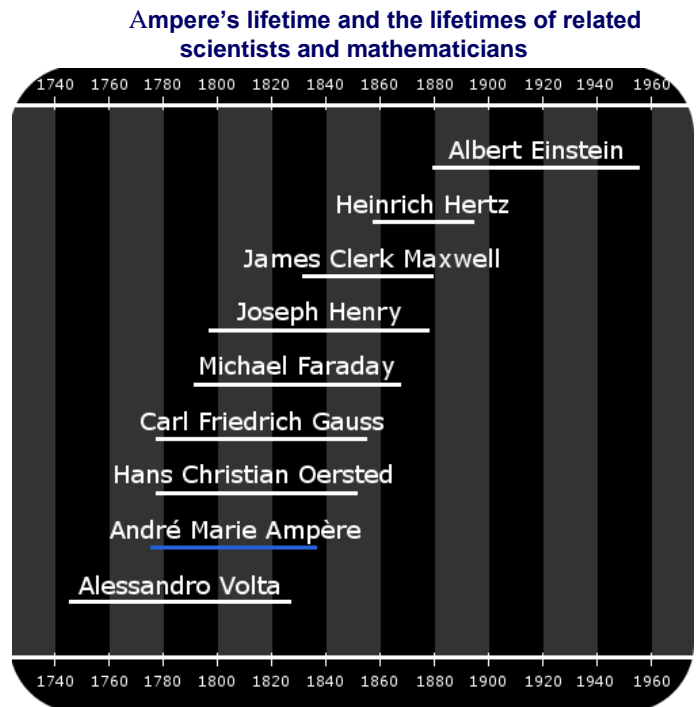
Organizing the Chemical Elements:

In 1816, 53 years before Dmitri Mendeleev published his periodic table, Ampère proposed that the chemical elements – 48 were known at that time – should be grouped according to their properties. He made a number of mistakes but successfully grouped:

- the alkali metals: sodium and potassium
- the alkali earth metals: magnesium, calcium, strontium, and barium
- the halogens: chlorine, fluorine, and iodine

Honours:

In recognition of his contribution to the creation of modern electrical science, an international convention, signed at the 1881 International Exposition of Electricity, established the ampere as a standard unit of electrical measurement, along with the coulomb, volt, ohm, and watt, which are named, respectively, after Ampère's contemporaries Charles-Augustin de Coulomb of France, Alessandro Volta of Italy, Georg Ohm of Germany, and James Watt of Scotland. Ampère's name is one of the 72 names inscribed on the Eiffel Tower.



Ch..Bindu Madhavi 17VV1A0207
Ch.Chandini Gayatri 17VV1A0213
IV B.Tech, EEE

INSPIRING MINDS

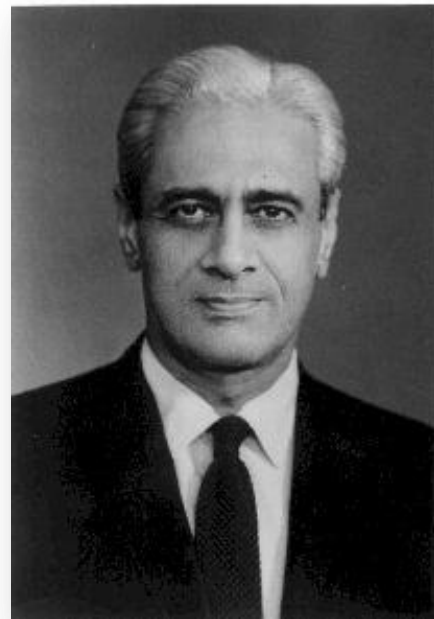
SATISH DHAWAN

(25 September 1920 – 3 January 2002)

was an Indian mathematician and aerospace engineer, widely regarded as the father of experimental fluid dynamics research in India.

Satish Dhawan was born on 25-09-1920 in Srinagar in the state of Jammu and Kashmir, India, in a Punjabi family. His father came from Dera Ismail Khan, and Satish Dhawan grew up in Lahore and Kashmir. He was married to Nalini Dhawan, a cytogeneticist, and his daughter Jyotsna Dhawan is a serving as Senior Principal Scientist in the Centre for Cellular and Molecular Biology. Dhawan was educated in India and further on in United States. Dhawan was one of the most eminent researchers in the field of turbulence and boundary layers, leading the successful and indigenous development of the Indian space programme. He succeeded M. G. K. Menon, as the third chairman of the Indian Space Research Organisation (ISRO) in 1972.

Dhawan was a graduate of the University of the Punjab in Lahore, India (now in Pakistan), where he completed a Bachelor of Science in physics and mathematics, a bachelor's degree in Mechanical Engineering and a Master of Arts in English literature. In 1947, he completed a Master of Science in aerospace engineering from the University of Minnesota, Minneapolis, and an aeronautical engineering degree from the California Institute of Technology followed by a double PhD in mathematics and aerospace engineering under the supervision of his advisor Hans W. Liepmann in 1951.



He served at IISc Bangalore, as Senior Scientific Officer from 1951, Professor and Head of Department of Aeronautical Engineering from 1955 and as Director from 1962 to 81. He served as a Visiting Professor at California Institute of Technology, US, in 1971 and 72. He then serves as the Chairman of the Research Council of National Aerospace Laboratories, Bangalore from 1984 to 93. He also was the President of Indian Academy of Sciences from 1977 to 79, Chairman of ISRO from 1972 to 84 and Chairman of Indian Space Commission in 1972 to 2002.

He was solely awarded Padma Vibhushan in 1981, Padma Bhushan in 1971, Indira Gandhi Award for National Integration in 1999, Distinguished Alumnus Award in Indian Institute of Science as well as California Institute of Technology in 1969.

-B.B.S.S.Krishna
18VV5A0265
IV B.Tech EEE

ANCIENT TECHNOLOGY

CAT FUR AND AMBER ELECTRIC GENERATOR

Humans have known about electrical effects for thousands of years, and it is impossible to say as to when electricity was discovered. However, records show that the attractive properties of amber were known to Greeks as early in 600 BC. When amber is rubbed briskly with a cloth, it attracts and pick up small, light objects such as bits of feather or straw or even thin scraps of metal.

So, there can be no doubt that ancient civilizations were aware of static electricity even if they may not have fully understood it. They also appreciated the godlike power of lightning and must have been curious to observe this effect replicated in miniature when the fur of a cat was rubbed against certain materials in a darkened room. The effects of static electricity were first recorded by a Greek philosopher, Thales of Miletus, who lived between 624 BC and 546 BC. He is said to have experimented with amber, which the Greeks referred to as Elektron, and cat fur to create an electrical discharge as well as magnetism.

From this observation a simple machine consisting of two spinning disks, one covered with leopard fur and one coated with glass or amber could be connected to gold axles and foil strips which would produce an electrical charge capable of generating sparks several inches in length. By spinning the disks in opposite directions a static electrical charge could be transferred to the gold foil strips to create visible sparks.

What is Static Electricity?

Normally, the electrons and protons in an atom balance out, but which is why most matter we come across is electrically neutral. But electrons are tiny and almost insignificant in mass, and rubbing or friction can give loosely bound electrons enough energy to leave their atoms and attach to others, migrating between different surfaces. When this happens the first object is left with more protons than electrons and becomes positively charged, while the one with more electrons accumulates a negative charge. This situation is called Charge imbalance, or net charge separation.

But nature tends towards balance, so when of these newly charged bodies come into contact with another material, the mobile electrons will take the first chance they get to go where they're most needed, either jumping off the negatively charged object, or jumping onto the positively charged one in



an attempt to restore the neutral charge equilibrium and this quick movement of electrons, called static discharge, is what we recognize as the sudden spark. Static build up is most likely to occur when one of the material involved is an insulator.

What is Amber?

Amber is fossilized tree resin that has been appreciated for its colour and natural beauty since Neolithic times. Much valued from antiquity to the present as a gemstone, amber is made into a variety of decorative objects. Amber, being a relatively neutral thing in most cases (neither very positively nor negatively charged) can easily pick up excess electrons, in this case from the cat's fur, and create a negative charge on itself, which gives us static.

Etymology of Electricity...

The Greeks first discovered electricity about 3000 years ago. It's name came from the word "electron". The Greek word for amber is electron, and it is from this root word that we got our word electricity.

A static cat: Due to a lack of humidity in the local environment, your cat's fur builds up quite the electric charge. Then, when you pet it and add friction to the mix, both you and your cat feel a shock. While some humans aren't really bothered by static electricity shocks, it might be quite annoying and maybe even painful for your cat.

Electrostatics in everyday life:

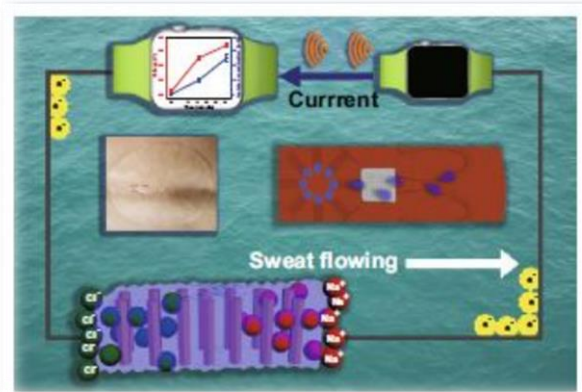
- When you take off a pullover over a nylon shirt there is a crackling sound.
- A pen rubbed with a piece of cloth will pick up small pieces of paper.
- A television screen easily collects dust.
- A small electric shock when getting out of a car
- If you roll over in bed you can sometimes see small flashes.

**-K. Suresh,
III B.Tech, EEE**

STUDENT ARTICLES

Sweat Could Power Battery

Many of us now keep tabs on how we're doing by wearing health and fitness trackers like those from Fitbit, which run on batteries that need charging. Researchers from Caltech have developed an electronic skin that can be packed with sensors, and that's powered by the sweat of its wearer.



Conclusions:

The Caltech team says that these bio fuel cells can generate enough continuous, stable electricity to power sensors for monitoring such things as heart rate, body temperature and blood sugar levels, as well as Bluetooth radio.

- D.Divija

IV B.Tech, EEE

17VV1A0216

Courtesy: theconversation.com

Introduction:

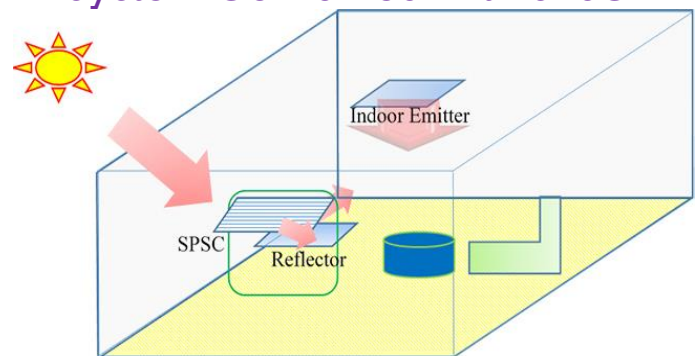
Sweat is a vital detection factor in physiological monitoring because sweat glands cover the whole body, which provides enough convenience for vitro collection, and contains many crucial physiological indicators of physical conditions and health status. Conventional methodologies for sweat analysis involve the collection using gauze pads taped to the skin and chemical compositional determination using bench top instruments

Working:

The device mainly consists of ZnO nanowires (NW) arrays and polydimethylsiloxane (PDMS) substrate. Sweat on the skin can flow into the channels of the device through capillary action and flow along the channels through ZnO NWs. This contains a platinum/cobalt catalyst.

The sweat flowing on the NWs (with lactate oxidase modification) can output a DC electrical signal and output voltage is dependent on the lactate concentration in sweat as bio sensing signal. ZnO NWs generate electrical double layer in sweat which causes a potential difference between the upper and lower ends.

High Performance Natural Lighting System Combined with SPSC.



Introduction:

Interior illumination is one of the natural ways of improving the lighting system of a building. Increasing interior illumination by natural sunlight can be affected by various factors like clouds and sun altitude which determine the sunlight intensity. Most recently, researchers have identified natural interior illumination as an opportunity to reduce electrical energy consumption in buildings. Considering that sunlight mostly illuminates areas near the windows or openings, this

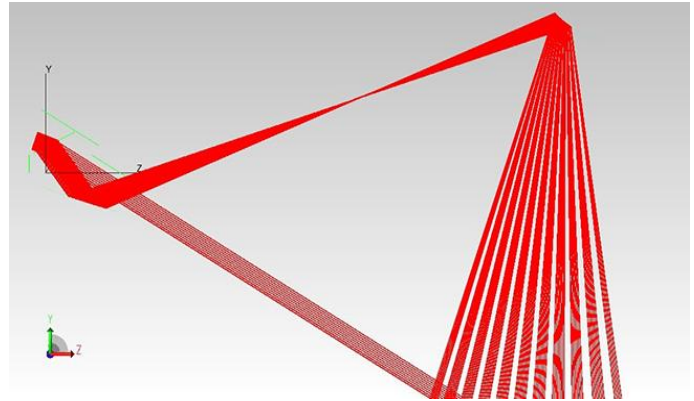
approach requires the development of artificial light systems capable of transmitting daylight to the deeper parts of the building. This natural lighting model will increase the system performance and reduce electric consumption by reducing the operation time of the lamps. Therefore, combining natural lighting models with different modules have attracted significant interest owing to its high potential energy saving.

Description:

In recent research, an associate professor at the Hungkuo Delin University of Technology in Taiwan utilized a numerical model and simulation program to investigate the characteristics of the transmitted light of symmetric prismatic sunlight collector. The proposed natural lighting system comprised of a refractive sunlight collector, guiding reflector and interior reflective emitting module. For proper analysis, the incident light beam could be divided into more than two beams due to internal reflection in the prism. The numerical model was combined with the daylight illuminances, measure during the 2016 summer, to examine the efficiency of the separate natural lighting system. Consequently, the authors also analyzed the effects of the splitting ratio of the light beam when daylight illuminates different symmetric prismatic sunlight collector apex at different times.

Results showed a significant increase in the average efficiency of the emerging sunlight transmitted from the underside of the sunlight collector during the day. For instance, more than 64% for symmetric prismatic sunlight collector with both 70° apex and 110° apex were reported. As a result, the degree for splitting for the incident sunlight for the sunlight collector was defined and its variation analyzed. The symmetric prismatic sunlight collector with 100° apex was observed to exhibit higher performance for incident sunlight distribution and especially in the period of the day that experienced more intense sunlight. Furthermore, the measured results indicated that during the 2016 summer, the New Taipei City experienced an average sunlight illuminance more than 80kLux under both clear and scattered sky

conditions. This confirmed that the distribution of the merging sunlight is dependent on both the apex and tilt angle of the symmetric prismatic sunlight collector.



Conclusion:

In summary, Dr. Shih-Chuan Yeh study focused on investigating the characteristics of splitting the light beam of asymmetric prismatic sunlight collector and its potential of improving the solar energy utilization efficiency, especially for lighting purposes. Because of the non-uniform collection of sunlight intensity during the day due to time and cloud factors, artificial lighting systems have been used in combination with the hybrid natural lighting systems to save energy by compensating for the insufficient indoor illumination. Therefore, as stated by Dr. Shih-Chuan Yeh in a statement to Advances in Engineering, the distribution of the incident sunlight of asymmetric prismatic sunlight collector has a great potential of improving the flexibility of utilizing solar energy in separate hybrid natural lighting systems with the main goal of enhancing energy consumption efficiency.

-M.Niharika
IV B.Tech, EEE
17VV1A0235

PULSE OXIMETER

A pulse oximeter is a device used to monitor the amount of oxygen present in the body.

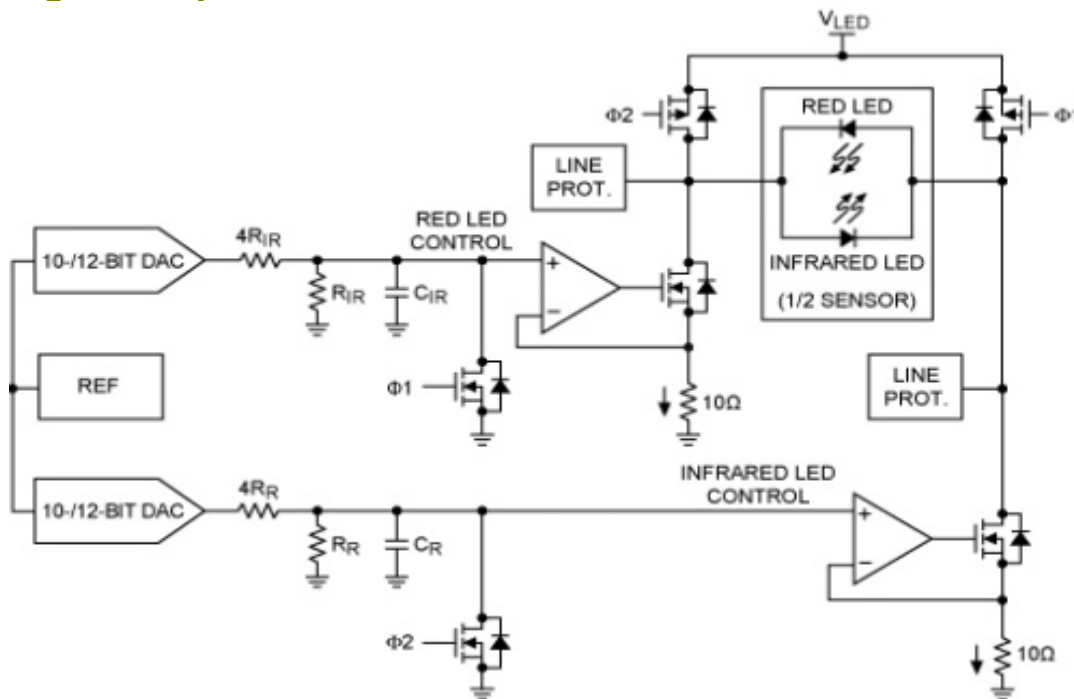
This non-invasive tool attaches to your fingertip, sending two wavelengths of light through the finger to measure your pulse rate and checks the oxygen levels in our body.

Due to seasonal change in weather, fever is a common symptom and at this condition people might think as if they were affected by corona.



Oximetry was first invented in 1935 and pulse oximetry was introduced in 1975 and BIOX was introduced in 1980.

Working & Components:



1. Biological variable:

It is the way of measuring percentage of saturation in haemoglobin molecules. For measuring it, principal is that oxygenated and deoxygenated haemoglobin have different light absorption characteristics depending on wavelength.

Because oxygenated haemoglobin is in red colour and deoxygenated haemoglobin is in deep dark red.

2. Sensors:

This consists of pair of LEDs which meet monochromatic red light at wavelength of 660nm and monochromatic infrared light which cannot be seen through naked eye, outside in the visible spectrum wavelength at 940nm.

The property of blood, oxygenated and deoxygenated showing various absorption characteristics

We have a pair of photo diodes or light sensors which detect how much light at each wavelength has passed through the tissues and converts this into an electrical signal. These sensors are surrounded by an opaque case to minimize the ambient light signal.

3. Integrators:

The integrators, which pass electrical signal. It works on physics laws. They are Beer's law and Lambert's law. These are often combined and termed as Beer-Lambert's law. Beer's law states that absorption of light as it passes through a substance is proportional to concentration of oxygenated and deoxygenated haemoglobin. Lambert's law states that absorption of light as it passes through substance is directly proportional to the distance the light has to travel. This is how it can

isolate the pulsatile component of signal. As blood moves into tissues with each cardiac contraction there is tiny increase in measurable distance between LEDs and photo detectors..

4. Output:

Numerical display with saturation % ,heart rate(pulse) and on higher quality monitors a plasma graph also appears. The number on left is spo2. This indicates the oxygen saturation percent of your blood. Spo2= oxygenated cells/non-oxygenated cells. Normal spo2 is above 95% and for person suffering from corona ,the reading will be below 95% . Display on the right shows our pulse and bar on right fluctuates ,which shows us visual representation of your heart beat. The error reading in the device may be due to too much movement, external light, poor circulation of blood. It is a highly recommended product by doctors in this pandemic situation as it has various advantages.

**-B. Sai Poornima,
N. Jyothsna,
J. Sonu[E],
III B.Tech, EEE**

Courtesy: www.sciencedirect.com

GALLIUM NITRIDE DOPED WITH BERYLLIUM

THE NEXT GENERATION OF POWER ELECTRONICS

Physicists at Aalto University have discovered a microscopic mechanism that will allow gallium nitride semiconductors to be used in electronic devices that distribute large amount of electric power

"There is growing demand for semi-conducting gallium nitride in the power electronics industry. To make electronic devices that can process the amounts of power required in, say, electric cars, we need structures based on large-area semi-insulating semiconductors.

with properties that allow minimising power loss and can dissipate heat efficiently. To achieve this, adding beryllium into gallium nitride -- or 'doping' it -- shows great promise"

- Experiments with beryllium doping were conducted in the late 1990s in the hope that beryllium would prove more efficient

- as a doping agent than the prevailing magnesium used in LED lights. The work proved unsuccessful, however, and research on beryllium was largely discarded.

- Working with scientists in Texas and Warsaw, researchers at Aalto University have now managed to show -- thanks to advances in computer modelling and experimental techniques -- that beryllium can actually perform useful functions in gallium nitride.

Depending on whether the material is heated or cooled, beryllium atoms will switch positions, changing their nature of either donating or accepting electrons.

If the beryllium-doped gallium nitride structures and their electronic properties can be fully controlled, power electronics could move to a whole new realm of energy efficiency.

"The magnitude of the change in energy efficiency could as be similar as when we moved to LED lights from traditional incandescent light bulbs. It could be possible to cut down the global power consumption by up to ten per cent by cutting the energy losses in power distribution systems," says Tuomisto

**.- S.V.brahmam
II B.Tech, EEE
19VV1A0259**

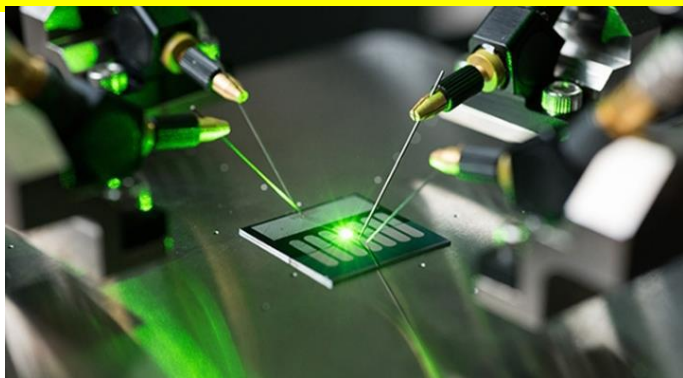
Courtesy: digitaljournal.com

OPTICAL RECTENNA

Researchers led by Baratunde Cola, an associate professor in Georgia Tech's School of Mechanical Engineering, have developed the first known optical rectenna-a technology that could be more efficient than today's solar cells and less expensive.

Introduction:

Rectennas, which are part antenna and part rectifier, convert electromagnetic energy into direct electrical current. The basic idea has been around since the 1960s, but Cola's team makes it possible with nanoscale fabrication techniques and different physics. "Instead of converting particles of light which is what solar cells do, we're converting waves of light," he explained.



be inexpensive. The technology also can be tuned to different frequencies, so the rectenna can be used as a detector or in energy harvesting.

-P. Mahitha
IV B.Tech, EEE
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Courtesy: rh.gatech.edu

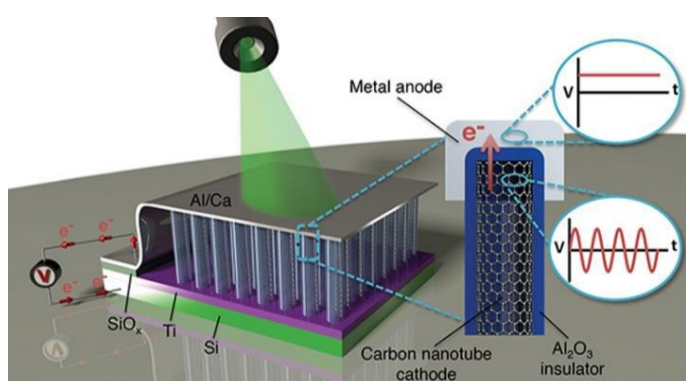
Working Process:

Key to this technology are antennas small enough to match the wavelength of light (about one micron) and a super-fast diode — achieved in part by building the antenna on one of the metals in the diode. Cola describes the process:

1. Carbon nanotubes are grown vertically off a substrate.

2. Using atomic layer deposition, the nanotubes are coated with aluminum oxide to serve as an insulator.

3. Extremely thin layers of calcium and aluminum metals are placed on top to act as an anode

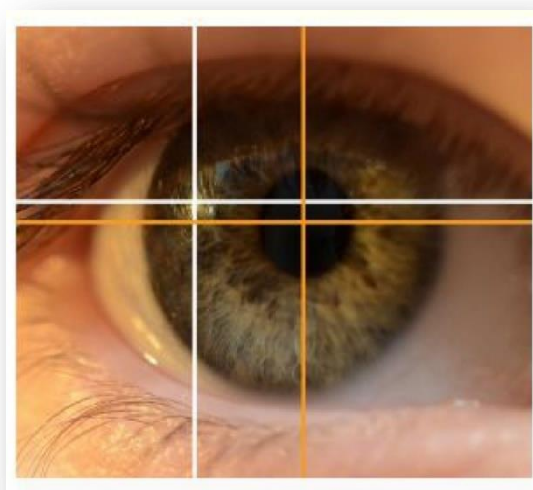


As light hits the carbon nanotubes, a charge moves through the rectifier, which switches on and off to create a small direct current. The metal-insulator-metal-diode structure is fast enough to open and close at a rate of 1 quadrillion times per second.

Conclusions:

From a performance perspective, the devices currently operate just under 1 percent efficiency. Yet because theory matches lab experiments, Cola hopes to increase broad-spectrum efficiency to 40 percent (which compares to 20 percent efficiency for silicon solar cells). Other important benefits: The optical rectenna works at high temperatures, and mass production should

EYE TRACKING



At present human computer interaction has become very important in our daily lives. Smartphone uses fingers as an input source. Eye movements are most frequent of all human movements. Eye movement is fundamental to the operation of visual system therefore the movement of user's eye can provide a convenient and natural source of input. We can measure the eye movement activity using eye tracking technology. Eye tracking gives us information about where do we look? What is ignored and how the pupil reacts to different stimuli. The eye tracking concept is basic but its process and interpretation can be very diverse and complex. ET measures the gaze points generated by our eye relative to the head. We have gone through the common use of finger print analysis and applications, eye tracking also would be a great biometric tool for analysis in various applications. In this paper we discuss eye tracking technology and its various app's. Now days, ET is being employed in almost all field including psychology, human computer

interaction, marketers, designers, academics, medical, research and many more.

Introduction

Eye tracking is the measurement of eye activity. This involves a process of using sensors to locate features of eyes and estimate where someone is looking. The process of eye tracking data is collected using either a remote or head-mounted 'eye tracker' connected to a computer. While there are many different types of non-intrusive eye trackers, they generally include two common components: a light source and a camera. The light source (usually infrared) is directed toward the eye. The camera tracks the reflection of the light source along with visible ocular features such as the pupil. This data is used to extrapolate the rotation of the eye and ultimately the direction of gaze. Additional information such as blink frequency and changes in pupil diameter are also detected by the eye tracker. The aggregated data is written to a file that is compatible with eye-tracking analysis software such as Eye Works. The accuracy of eye movement measurement heavily relies on a clear demarcation of the pupil and detection of corneal reflection.

There are 2 types of eye trackers :

Screen-based.

Glasses



Courtesy: www.tobiiipro.com

Applications:

1. Website Usability Testing- Computers have become a primary source of information; therefore, it is critical that users be able to easily locate and comprehend information on a user interface. Eye tracking is often used by Web designers and Usability Specialists to identify which elements of websites function as intended and which need to be revised.

2. Digital and Operational Training Scenarios- Eye tracking is used in different types of simulators, including driving, flight, and even operating room, to track the eye movements of trainees as they perform tasks. Military and law enforcement agencies have also used eye tracking in the field.

3. Human Behaviour- One of the most common applications of eye tracking in research is studying patterns of eye movements and their correlation with different behaviours. There is much to be discovered about how visual behavior relates to cognition and decision-making.

4. Developmental Psychology- Infants communicate and take in information about their world through their eyes before they can speak. Eye tracking can get an up close look at how babies perceive their surroundings and how visual behaviour impacts their development.

5. Human Factors Research- Eye tracking is often used to monitor and research how people interact with their environment, particularly with respect to equipment and machinery. Human factors research seeks to improve efficiency, operational performance, and safety, as humans engage with their technical and environmental surroundings.

Conclusion:

Eye-tracking technologies can be used as a research tool to investigate numerous topics related to consumer behaviour, information acquisition, and decision-making. Similarly, eye-tracking research results are beneficial for business professionals interested in knowing what consumers are looking at and how they respond to what they see.

-Kandi Kavya
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17VV1A0225

Electricity 'Out of Thin Air'

The increase in demand for electricity and also the growing issues of climate change have prompted scientists to make innovations in creating electricity. Known renewable energy technologies such as solar cells, thermoelectric devices, and mechanical devices have specific environmental requirements and limitations.

With advancements in research, using the atmospheric moisture seems to offer an alternative. However, available technologies can only produce an intermittent and brief burst of power in the ambient environment.

A new study published in the journal Nature described a thin-film device made from nanometer-scale wires gathered from *Geobacter sulfurreducens*, a type of microbe that can generate non-stop electric power. This device called "Air-gen" or air-powered generator created by the electrical engineer Jun Yao and microbiologist Derek Lovley at UMass Amherst generates clean energy out of thin air, 24 hours a day.

Air-gen is developed in Yao and Lovley's laboratory and is said to be non-polluting, low-cost, renewable and can generate power even in areas with low humidity. They say that this discovery reflects an unusual interdisciplinary collaboration.

More than 30 years ago, Lovley discovered the *Geobacter* microbe in the mud of the Potomac River and later discovered its ability to produce electrically conductive protein nanowires. Yao used to work at Harvard University where he engineered electronic devices with silicon nanowires before coming to UMass Amherst. The two scientists joined forces to know if useful electronic devices could be made with the protein nanowires they harvested from *Geobacter*.

How does Air-gen work?

The researchers explained that Air-gen requires a thin film of protein nanowires less than 10 microns thick. The bottom part of the film rests on an electrode, while another electrode, smaller in size covers only part of the nanowire film on its top. It then absorbs water vapor from the atmosphere.

To establish the conditions needed to generate an electrical current between the two electrodes, it needs a combination of the electrical conductivity and surface chemistry of the protein nanowires together with the fine pores between the nanowires within the film.

Xiaomeng Liu, a Ph.D. student at the University of Massachusetts Amherst said, "I saw that when the nanowires were contacted with electrodes in a specific way the devices get current."

He added that exposure to atmospheric humidity was essential as the protein nanowires absorbed water, enabling the production of a voltage gradient across the device.

The future of Air-gen:

The scientists also plan to make small Air-gen 'patch' versions in replacement of traditional batteries used in power electronic wearables such as health and fitness monitors and smartwatches.

In addition to that, they also aim to make Air-gen cell phone batteries to lessen the periodic charging when normal phone battery runs out of energy.

Dr. Yao said that the ultimate goal of Air-gen is to make large-scale systems. The technology may be incorporated into wall paint that could help power homes, and maybe someday develop a stand-alone air-powered generator that helps supply electricity off the grid.

"This is just the beginning of a new era of protein-based electronic devices"

-K.Jayanth Kumar
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17VV1A0226

Protection Issues in MICROGRID – A Synthetic View

The independent power systems - Microgrids are the most important solution to overcome the power blackout due to overloading of main electrical grid. As a localized power grid, microgrid has its own generation sources, and definable load systems. It also works with renewable energy sources for power generation which tends to the usage of storage resources according to the requirement. Microgrid can operate in line with the traditional grid as well it can be disconnected from the grid to operate autonomously. It tends to provide reliable, quality and efficient energy supply to customers. Apart from the major issues like power flow control, power quality, and stability still the implementation of microgrids pose some technical challenges at the protection level of microgrid. This study mainly focuses on the protection issues faced by microgrid and some possible remedies to overcome the technical challenges at the microgrid protection phase.

In recent days, the generation of electrical energy locally at distribution voltage level is emerging as Distributed Generation (DG). Usage of renewable energy sources such as photovoltaic system, wind power, hydro turbine, tidal and biogas in Distributed Generation (DG) become a vital solution to overrule the problems like energy efficiency and environmental concerns with the traditional electrical grids. The increase of DGs in distribution end leads to the formation of Microgrid. The microgrids can be defined as a subsystem or local distribution system inclusive of microsources for generation, power electronic convertors, storage resources like flywheels, energy capacitors and batteries and associated controllable and uncontrollable loads. Microgrids have the tendency to operate in line with the utility grid (grid mode) or isolated from the utility grid (island mode). Through point of common coupling (PCC) the microgrids have inline connection with u. Microgrids enable an improved energy management systems (EMS) to optimize the power flow within the network when connected with utility grid. As well focus has made to minimize the energy price and improve the power factor at PCC. When microgrids are in island mode the stabilization of voltage and frequency enables the system stability.

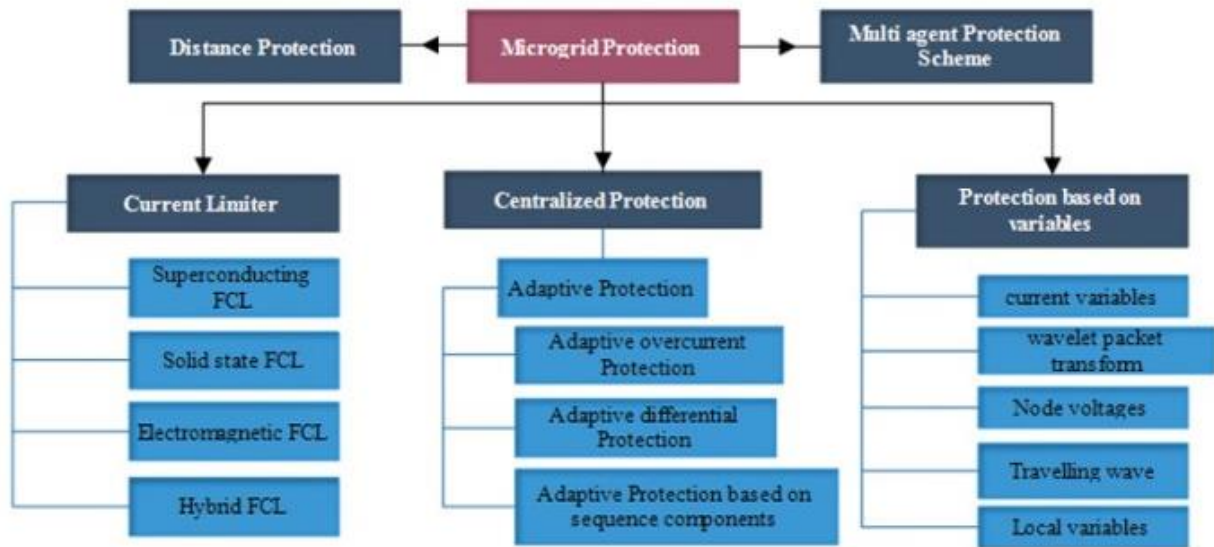
Protection Issues

The main goal of microgrid is to provide quality and reliable supply to the customers. Hence, it is necessary to isolate the microgrid if fault occurs in main grid and to isolate the minimum faulty part if fault occurs inside microgrid.

Faults during Grid Connected Mode – During the occurrence of fault in Microgrid the protection devices in distributed energy resources (DER) must respond only after the activation of protective devices provided at PCC. With the fault ride through capability (FRT), DER should continue its work. For fault within the microgrid, the designed protection strategy should disconnect the faulty portion from the rest of system. The conventional OC protection scheme is set at fault current of 10-50 times of the full load current. Some non-fault cases result in voltage unbalance at PCC. which are difficult to identify. Hence, there is a need for much effective protection schemes to avoid such unwanted situations

Changes in Fault current magnitude– The fault current level is high in grid connected mode rather than island mode. According to types of DG the fault current contribution also varies. Fault current of synchronous type DG is 5 times of the rated current and inverter fed DG is 1.5 times of the rated current. Hence, prediction of fault current is difficult because the magnitude of fault current depends upon many parameters including the mode of operation, type of DGs and number of DGs

False Tripping – It occurs when a DG is located near to the substation in a feeder and if fault current in a healthy feeder is supplemented by the DG connected in neighboring feeder then the protection device in the healthy feeder may isolate the circuit unnecessarily.



Solutions for Protection Issues:

The combination of primary and backup protective schemes should be available in a microgrid protection scheme, so that the unhealthy portions can be isolated from the rest of the system. The introduction of DGs in main grid makes the system more complicated. Hence, usage of fuse and overcurrent relays for protection makes the system very simple. Therefore, an efficient protection scheme must be developed to cope up with the above said issues.

Current Limiter – The placement of Fault Current Limiters near PCC is to limit the fault current supplied by the utility grid to microgrid and vice versa. During normal operating condition the FCL is kept in minimum position to neglect unnecessary losses and in maximum position under faulty condition.

Centralized Protection – In centralized protection, Microgrid Management System is used to supervise the status of microgrid and to set rating of the respective protection equipment. Here the communication of protective devices is based on standards IEC61850. Based on the status of the microgrid (grid connected or island) received through MMS, the protecting devices make comparison between the measured parameter and the operating curves set then provides trip signal.

-N.Mahathi 17VV1A0237,
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Courtesy: www.electricalindia.in

Condition Monitoring and Life extension of Induction Motor

Squirrel Cage Induction Motors are the most commonly used drives in industrial applications to drive majority of the production related Pumps and Compressors. Also their utilization is getting with the development of variable frequency drives for speed control. More than 50% of the world generated electrical energy is being consumed by these induction motors while driving their connected loads. They are more reliable, high efficient, rugged and simple in construction. Their cost is less when compared with others. Even though their designed shelf life is around 25 years, with proper Condition Monitoring, the breakdowns can be minimized and also their life can be extended. An attempt has been made in this paper to discuss about various faults associated with three phase Squirrel cage Induction Motor of LT category, different diagnosis methods applicable to them and the possible maintenance practices to enhance their life. One known case study is taken for analysis with its test details.

Introduction:

Squirrel Cage Induction Motor (SCIM) is the most widely used in industries for pump and compressor applications. Due to their increased use; lot of research is being done to improve their efficiency, which has crossed 95% levels now. Being faithful and more reliable equipment, it runs

continuously with maximum efficiency, it requires regular checking to take care of wear and tear and to avoid breakdowns and halt to production in any industry. The major components in a SCIM are Stator, Rotor, Bearings, Shaft, Winding Terminals, Cooling Fan and associated hardware.

The most common failure modes of SCIM:

1. Shaft and Rotor Faults: The main faults are bent Shaft, broken bars, cracked end rings etc. due to thermal, mechanical and dynamic stresses.
2. Bearing faults: High temperatures, poor lubrication, improper installation and material defects are the main causes of bearing failures. The common reasons for failure of bearings
3. There are some other faults due to irregular air-gaps, eccentricity issues and environmental conditions.

CONDITION MONITORING TECHNIQUES AND TESTS:

Even though SCIM are the most reliable electrical equipment, there are chances of failures due to various reasons mentioned above. These faults before leading to a major damage, to be identified along with a sound Condition Monitoring and Corrective Action System (CMCAS) to avoid future faults. This will avoid unwanted shutdowns and also enhances the life of motor.

The following tests are made

- Visual inspections.
- Measurement of Stator winding resistance.
- Leakage Current Measurement.
- Flux loop test

By conducting above tests, readings are to be checked frequently and if there is any deviations then necessary care should be taken to protect motors.

Conclusion:

SCIMS are more widely used in industries and other commercial establishments due to their rugged construction, economical operation and reliable service. A pre-mature failure or rigorous maintenance with more down time and costs of SCIMs are not acceptable in present modern industrial era. CM is the technique that is being extensively used aims in reducing motor failures and maintenance costs. With the practice of applicable conditions monitoring techniques and further corrective actions will increase the life of motors. Like regular medical checkups by Doctor for human to look for temperature, sugar levels and blood pressure etc., monitoring motor is required before its failure.

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18VV5A0265

Courtesy: www.researchgate.net

FIRE-FIGHTING PRECAUTIONS IN POWER SUBSTATION

The layout of the plant and the design of the building play a major part in reducing the spread of fire and the effect of explosions.

Equipment and buildings should be arranged to have vents which rupture rather than allowing an explosion to damage the main fabric. Site supervisors should ensure that these vents are never obstructed. In the prevention of fire, cleanliness and tidiness are very important, as is the careful maintenance of tools. Most fires are caused either by carelessness or fault equipment.

The choice of fire-fighting equipment is dependent on its suitability for electrical fires but also on cost and the importance of the electrical supplies at the point in question. Portable manual types are as follows: halon gas of various kinds, carbon dioxide chemical foam and powder.

Fixed systems use water sprinklers, carbon dioxide and halon gas. Both halon gas and carbon dioxide can suffocate personnel trapped in the discharge area.

Strict precautions must therefore be taken to lock-off the equipment when staff are present.

There is also the used of sand, blankets and fire hoses. Fire doors are a very important means of limiting the spread of fire, and ventilating systems should also be provided with automatic shut-down if not with automatic dampers in the event of fire. Fire drill is also important and should not be neglected on a building site.

Cabling may also be a cause of serious fires with risks of extensive damage to the installation and danger to personnel. Low smoke and fume (LSF) cables are now available in a number of forms, most of which will reduce the flammability as well as causing less poisonous gas to be released when they are heated.

The dc supplies are a particularly important and vulnerable part of any installation. They are generally derived from stationary batteries, which give off flammable and toxic gases.

Batteries should be in a separate room with an acid-resistant floor, special lighting fittings, a suitable sink and adequate water supplies. It is wise to have an acid-resistant drainage system. The room must be properly ventilated but sunlight must not be allowed to shine directly on to the cells

The major fire risks and detection difficulties in substation arise as a result of the following.

- Electrical arcing and the build-up of static electrical charge within equipment.
- Overheating of electrical control equipment, switchgear and cabling.
- Once initiated, a fire may rapidly spread due to the presence of large amounts of combustible material in the form of hydrocarbons contained in cabling and insulation.
- The environment within uninterrupted power supply areas (i.e. battery room) may become explosive from the build up of high concentrations of hydrogen gas.
- Substations are usually unmanned, thus, early intervention by staff may not be possible in the event of a fire.
- High air movement, caused by air-conditioning dilutes and disperses the smoke.
- Much of the mission critical equipment is housed within equipment cabinets and incabinet fires may take some time to be detected by ceiling mounted detection devices, especially since incabinet fires will usually have prolonged incipient (smouldering) stages.
- Underground cable trenches linking the main areas of the substation are considered hostile environments. High levels of background pollution present in these areas will affect the reliable operation of conventional detectors as well as being a source of false (nuisance) alarms.

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Courtesy: electrical-engineering-portal.com

TRANSBIODIESEL

Did you know that India produces around 9.2 million tonnes of waste cooking oil in a year (the highest in the world)? And that the cooking oil that we waste every day can be converted into biodiesel and can solve 25 percent to 30 percent of India's energy deficit?

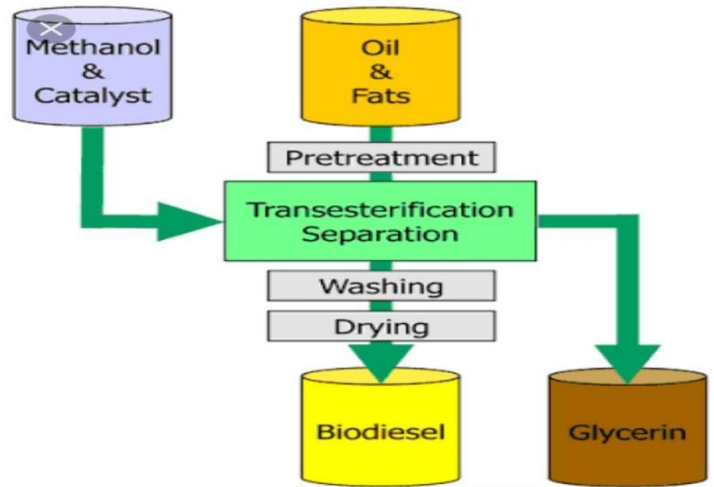
Really we need to know this....

Biodiesel is superior to fossil diesel fuel in terms of exhaust emissions, certain number, flash point and lubricity characteristics, without any significant difference in heat of combustion of these fuels. Moreover, biodiesel returns about 90% more energy than the energy that is utilized to produce it. Biodiesel mixed with conventional diesel in some proportions can be used to run any existing conventional compression ignition engine and does not require any amendments to be done to the engine. Due to benefits like renewable in nature, low cost and green house gas reduction potential, biodiesel is nowadays incorporated all over the world especially in developed countries like USA, France, Brazil in different proportions with diesel. It is also estimated that India can supplement 41.14% of its total



diesel fuel consumption, if resources like waste cooking oil and other bio wastes were used as raw material for biodiesel production.

How can we convert waste oil to biodiesel?



Increased energy consumption and the depletion of petroleum reserves have pushed up oil prices globally. The diminishing petroleum reserves are a problem inherent in this type of fossil energy. One alternative energy source that has the potential to be developed in Indonesia is biodiesel. Used cooking oil or used cooking oil is a potential raw material for making biodiesel. In this study biodiesel was made from used cooking oil and methanol using the transesterification method with KOH catalyst. The production of biodiesel from used cooking oil begins with mixing raw materials of used cooking oil collected into one. The mixture is then precipitated for 24 hours. The transesterification process was carried out by mixing KOH (1% of oil weight) with methanol (ratio of methanol: oil 6: 1) at a temperature of 65 °C. After the temperature is reached, the methanol and KOH solution is added slowly while pumping (stirring), with a variation of time 30, 45, 60.75 and 90 minutes. Biodiesel purification is done by washing using hot water (temperature 70 °C) twice as much washing. Characteristics of biodiesel based on the best conditions for density 0.886 g / mL, viscosity 5.89 cSt, FFA 0.11% , acid value 0.256 mgKOH/g and flash point 170.52 °C. The biodiesel products based on these parameters meet SNI 7182-2015 standards. Biodiesel has attracted extensive attention in the world as it is a renewable, biodegradable, nontoxic and environmentally friendly new alternative transportation fuel. It can be made from different feedstock containing fatty acids such as animal fats, nonedible oils, waste cooking oils, by products of the refining vegetables oils and algae etc. Transesterification process is a commonly employed for its formation. Heterogeneous catalysts are recommended the best catalysts in biodiesel production. Cost of biodiesel can be reduced by using waste cooking oil as biodiesel.

“DO NOT WASTE WASTE”

- U. Sai Prasuna
II B.Tech, EEE
19VV1A0260

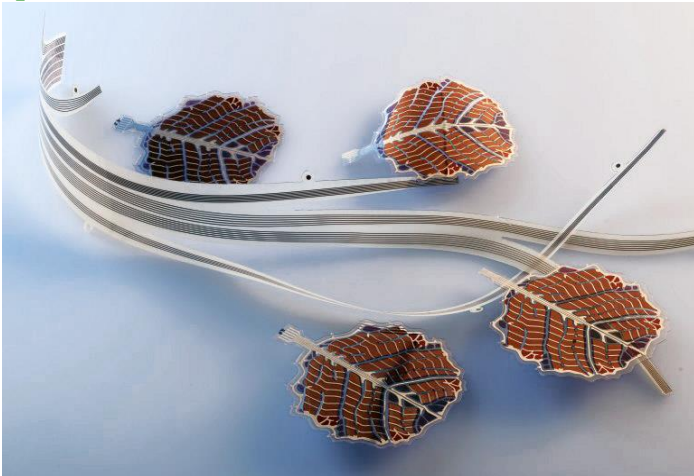
Courtesy: www.transbiodiesel.com

3D PRINTED SOLAR ENERGY TREES

3D printed solar energy trees are artificial trees for harvesting solar energy. The 3D printed stems and leaves are organic solar cells. The leaves, which are also known as solar panels, are power converters which harvest energy, and the number of solar panels determines the amount of energy harvested. The trunks of the 3D printed solar energy trees are wooden-based bio composites. Spiralling phyllotaxy technique is utilized to design 3D printed solar energy trees.



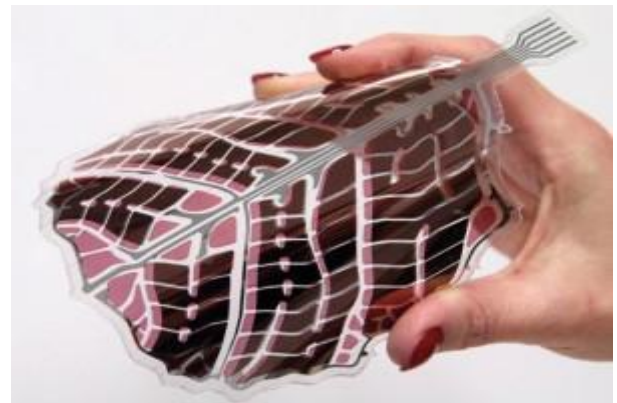
Increasing population, urbanization, and industrialization has led to increase in demand for energy from renewable sources. 3D printed solar energy trees can be installed indoors and outdoors, harvest kinetic energy from wind and temperature in the environment, and store them in the solar panels.



This has led to expansion of the 3D printed solar energy trees market. Solar energy is environmental friendly and is beneficial for developed countries where the demand of energy is high and they don't have sufficient space to producing energy. Implementations of solar collectors require large amounts of space for trapping solar energy. Demand of solar trees is rising, as the installation of 3D printed solar energy trees require less space. 3D printed leaves have a lifespan of 2 to 3 years, and the raw materials employed are recyclable. These factors

act as driving factors for the expansion of the market.

Innovative thinking about solar power is taking place all around the world. In India, researchers have unveiled a solar power tree they claim can produce 5 kilowatts of electricity while using only 4 square feet of land. For areas where open land is at a premium, the solar trees could produce significant energy in far less space than a conventional solar panel installation would require. Creative people are finding new ways to harvest the free power of sunlight every day.



Each "leaf" is just 0.2 millimeters thick and consists of electrodes and polymer layers. 200 of its leaves are good for 3.2 amperes of electricity. If they are placed on an outdoor location, one square meter of leaves can generate 10.4 watts in direct sunshine. Each "leaf" has its own micro-converter built in.

Flexible, very light, and considerably lower in efficiency than rigid, silicon-based solar panels, the "leaves" are manufactured using a roll-to-roll method capable of producing up to 100 meters of layered film per minute.

The research work with methyl ammonium lead tri-iodide, derived from the crystal perovskites, offers a great deal of promise as well. Materials scientist Yang Yang at the University of California, Los Angeles, has built a solar collection cell from it which achieved more than 19% efficiency. That output rivals crystalline silicon solar cells which can currently achieve 17-23% efficiency.

-A.Jaswanth Sai
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19VV1A0201

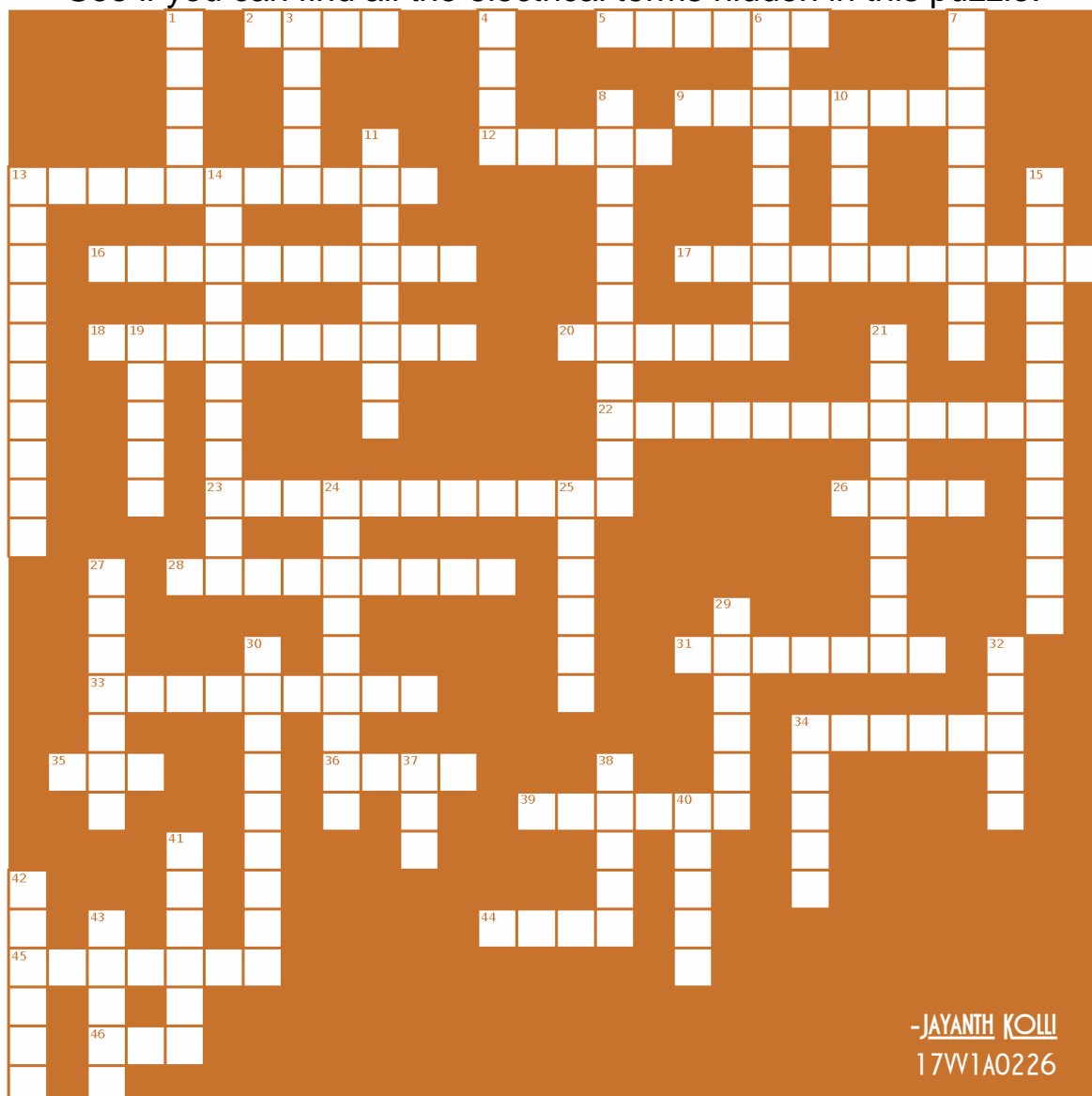
Technical Facts

- Electricity travels at 6,696,000 miles per hour.
- Electrocardiogram (ECG) machines are used in hospitals to measure the electricity flowing through a patient's heart, displaying a line that spikes with every heartbeat.
- The first successful electric car was built in 1891 by American inventor William Morrison.
- Ever wondered why birds that sit on power lines don't get electrocuted? If a bird sits on only one power line it's safe. If the bird touches any part of its body to another line, it creates a circuit, causing electrocution.
- The world's biggest light bulb is located in Edison, New Jersey. It's 14 feet tall, weighs eight tons, and sits on top of the Thomas Edison Memorial Tower.
- Thomas Edison built the first power plant, and in 1882 his Pearl Street Power Station in New York sent electricity to 85 buildings
- Refrigerators in the U.S. consume about the same amount of energy as 25 large power plants produce each year.
- The energy it takes to conduct 100 Google searches is equivalent to a 60 watt light bulb burning for 28 minutes
- One bolt of lightning can contain up to 3 million volts – that's enough to power more than 200,000 homes
- A typical microwave oven consumes more electricity powering its digital clock than it does heating food
- The element Selenium conducts electricity only when a light is shined on it. In the dark, it is an insulator.
- The lightning strikes can double the size and amount of mushrooms as the electricity powers an enzyme that spurs growth.
- Coordinated power shut off events like Earth Hour, Live Earth, and Planet Aid may actually increase carbon dioxide emission as power companies struggle to cope with fluctuating electricity usage.
- Huge amounts of renewable energy can be stored over a long period of time by using Pumped Storage Hydropower, where water is pumped up a hill with renewable electricity then sent back down the hill to generate on demand clean electricity at up to 80% efficiency.
- Electricity was introduced to Ethiopia in 1896 after Emperor Menelik II ordered two newly invented electric chairs as a form of humane capital punishment and realized they were useless in his country without electricity.
- The statue of liberty was the first light house to use electricity in 1886.
- The first bridge that use electricity was Brooklyn bridge in New York.
- The first bulb was invented by Humphry Davy not Thomas Edison. Davy invented the first bulb in 1800 and Edison invented first long lasting bulb in 1879.
- The Japanese developed an electrical car in 1949, which travels 200 km on a single charge.
- In 1832, Michael Faraday built the first electric generator laboratory models.

-B.Hema-17VV1A0205
M.Sandhya-17VV1A0236
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Crossword Genius!

See if you can find all the electrical terms hidden in this puzzle.



-JAYANTH KOLLI
17W1A0226

Across

- 2 What current is measured in.
- 5 A device for disconnecting a circuit.
- 9 Lots of sockets connected together. (4,4) (2 words)
- 12 One of the towers that carries electricity around the country.
- 13 Device for stepping voltages up or down.
- 16 What the coloured plastic coating on wire is called.
- 17 The way the current in a domestic supply constantly changes.
- 18 A resistor that reacts to heat.
- 20 The bit that remains stationary in a motor.
- 22 Measures waveforms.
- 23 The study and use of semi-conductors.
- 26 Make connection by pushing it in.
- 28 The action of removing the insulation from wire.
- 31 A device that gives DC electrical energy from chemicals.
- 33 An attractive force that makes motors and other stuff work.
- 34 Melt it to fix components to the board.
- 35 Light emitter - one way too!
- 36 Unit of resistance.
- 39 Tool that grips and cuts sometimes.
- 44 The wire melts to protect you.
- 45 Something that replenishes a battery's energy.
- 46 An abbreviation for a light sensitive device.

Down

- 1 Electromotive force and potential difference is measured in this.
- 3 What gives us turning power from electricity.
- 4 A unit that gives off light from an element.
- 6 Something that is good at passing a current.
- 7 A device that produces electricity.
- 8 The points where we attach wires or components **together**.
- 10 What we use to measure electrical energy.
- 11 A component that limits the flow of current.
- 13 Semi-conductor with 3 connections to it.
- 14 A type of lighting tube.
- 15 The box with all the fuses or circuit breakers in. (8,4) (2 words)
- 19 The unit of inductance.
- 21 Something that is bad at passing a current.
- 24 A device that stores electrical charge.
- 25 What most cables are made from.
- 27 A tool that squashes a connection onto a wire.
- 29 The unit of capacitance.
- 30 Full wave or half wave device to change AC to DC.
- 32 A portable supply of light.
- 34 Something you get when touching high voltage.
- 37 Abbreviation for a protective device.
- 38 Current only flows one way through this component
- 40 The bit that turns in a motor.
- 41 Popular brand of insulation tester.
- 42 Take the plug!
- 43 Another name for wire.

THINK OUT OF THE BOX



1. There are three oranges, and you take away two. How many will you have?
2. Two men are in a desert. They both have packs on. One of the person is dead. The person who is alive has his pack open and the person who is dead has his pack closed. What is in the pack?
3. What three letters change a girl into a woman?
4. Why can't a man living in India be buried in Bangladesh?
5. Feed me and I will live , but give me a drink and I will die?
6. Someone falls out of a thirty story building , but lives. With luck and their landing pad not being factors, how could they have survived the fall ?
7. There are a dozen eggs in a carton. Twelve people each take a single egg ,but there is one egg left in the carton. How?
8. How can you drop a raw egg onto a concrete floor, while it should not be cracked?
9. Why was six afraid of seven?
10. I am seven letter English word . I am heavy .If you take two away ,I am left with eight. What am I?
11. What needs an answer but doesn't ask a question?
12. I have keys but not doors, I have space but no rooms, I allow you to enter but you are never able to leave. What am I?
13. Which is faster HOT or COLD ?
14. In Australia you can not take a picture of a Man with a Wooden leg. Why not?
15. You have 3 gallon jug and 5 gallon jug . How do you measure out exactly 4 gallons.

It isn't enough to think outside the box. Thinking is passive. Get used to acting outside the box.

Rekha (255), Anvesh (217), Ameesha (256)
II B.Tech, EEE

ANSWERS :

1. Two (because you took two)
2. pack contains a Parachute
3. Age
4. He is still alive
5. Fire
6. The person fell out of a ground floor window
7. The last person took the carton with the egg inside
8. concrete floor is very hard to crack
9. B'caz Seven eight(ate) Nine
10. Weights
11. A telephone
12. Keyboard
13. Hot
14. You can't take a picture with a wooden leg, you need a camera
15. Hint: Total liquid usage: 10 gallons, Total liquid wastage :3 gallons, Total steps required :6

“THE PRUDENCE OF ELECTRICAL ENGINEER SHOULD CATCH WITH SPEED OF LIGHT”

It is effortless to switch on a fan but importance lies in production to supply, where in safety to mankind plays a major role. Do you know? 56% disasters in industry are due to electrical faults. Due to which enormous fire produced, which could claim several lives. Recent fire in a hydroelectric station located closed to unlimited quantities of water would seem to be a contradiction, but deadly blaze in the srissailam power plant claimed nine lives, including five engineers .

On 20 August 2020, a major fire broke in an underground hydroelectric power plant in Srisailam in the state of Telangana. It was suspected that the fire broke out due to a short-circuit situated at Srisailam's dam left bank.



Large hydroelectric power plants are usually built well below surface level, where generation, control and transmission equipment are located. Handling a fire becomes complicated in such circumstances, and safety features have to be extremely reliable. IEEE standards for substation fire protection, issued a quarter century ago, lay down norms for fixed and portable ventilation systems that can remove heavy smoke. Use of fire-retardant materials in construction, dual exits, easy vertical escape routes using staircases and alarm systems are all part of safety codes. The layout of the plant and design is required to follow safety drills.

“Electricity is not just a lifeline; it can also take away life when handled improperly”

❖ **Electrical fires are one of the main causes of fires in manufacturing plants. Here a non-exhaustive list of specific electrical hazards:**

- Wiring that is exposed or not up to code
- Overloaded outlets
- Extension cords
- Overloaded circuits
- Static discharge

Cabling may also be a cause of serious fires with risks of extensive damage to the installation and danger to personnel. Any of the above hazards can cause a spark, which can serve as an ignition source for combustible dust, as well as flammable liquids and gasses.

❖ **How to prevent electrical fire incidents**

The key to preventing electrical fires is awareness and prevention. This involves training, maintenance, and following best practices. Here are a few to put into practice right now. Fire detection system plays a major role in prevention.

Use antistatic equipment and place the batteries separately away from light

Implement a reporting system so that anyone who observes an electrical fire risk can report it without consequences.

❖ **THREE LOCATIONS TO ENSURE SAFETY**

1. Control room
2. Cable trench
3. Battery room
4. Relay room



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Current Affairs

- Bangladesh to construct monument for martyred Indian soldiers in 1971 war.
- UAE becomes first gulf nation to produce nuclear energy.
- NASA Mars Mission: NASA launches Mars Perseverance Rover 2020, to reach Mars by February 2020.
- India and UK to collaborate in anti-microbial resistance research worth 8 million pounds.
- Rohit Sharma, Vinesh Phogat, Manika Batra, Mariappan Thangavelu recommend for Rajiv Gandhi Khel Ratna Award.
- Tokyo Olympics postponed to 2021, First time in 124 years.
- PM Narendra Modi inaugurates Rastriya Swachhata Kendra at Raj That.
- Mangalyaan captures image of Mars Biggest Natural Satellite 'Phobos' on 1 at July 2020.
- “Green Railway” by 2030(Net Zero Carbon Emission) in India.
- India ranks 77th on sustainability, 131st in child flourishing index rankings: UN report.
- Viswanadhan Anand has been appointed as the ambassador of World wildlife fund (WWF).
- RBI governor shaktikanta das has been awarded national banker of the year 2020.
- 1917 film wins the best motion picture drama award in the 77th golden globe 2020.
- Kuldeep Yadav become the fastest indian spinner to claim 100 wickets in one-day internationals.
- Iran is planning to adopt new currency Toman.
- Arogya setu app has become the world’s fastest app to reach 50 million downloads in just 13 days.
- Andhra pradesh is the first state in India to launch the online waste exchange programme.
- Parasite film wins the best movie award in the 92nd Oscar academy awards ceremony.
- Rani Rampal became the first ever hockey player world wide to win the prestigious world games athlete of the year award.
- Hindi is the third most spoken language of the world in 2019 with 615 million speakers.

**R.Siri, M. Jyothsna, B. Niveditha[E]
III B.Tech, EEE**

KNOW YOUR EXAM

ISRO

Indian Space Research Organization (ISRO) was established on 15th August 1969 and it is the central organization that develops the Space Science and Space Technology in the country. It conducts the various examinations to recruit the skilled candidates for the relevant posts. Here we are providing the details about one of the exam is scientist/engineer in ISRO.

Position : Scientists/Engineers SC

Eligibility: Candidates must have qualified B.E/B. Tech or equivalent qualifying degree in first class with an aggregate minimum of 65% marks or CGPA of 6.84 on a scale of 10. ISRO is strict about the CGPA or marks and doesn't consider anything less than the given criteria.

Basic Pay: Rs. 56100/-

Age limit: 35 years as on 04.11.2019

Application Fee: Rs.100/-

Payment method: online using Internet Banking/Debit Card or Offline by visiting nearest SBI Branch.

Selection Process: written BE/B.Tech or equivalent qualification in first class with an aggregate minimum of 65% marks or CGPA 6.84/10 (average of all semesters for which results are available). The qualification prescribed and the benchmark are only the MINIMUM requirement and fulfilling the same does not automatically make candidates eligible for Written Test. Based on the academic performance and bio-data, initial screening will be conducted to short-list candidates for test.

Hiring Process: Initial screening, Written Test and Interview

SYLLABUS :

- | | |
|--------------------------------|-----------------------------------|
| 1. Physical Electronics | 8. Control Systems |
| 2. Electron Devices and ICs | 9. Communication Systems |
| 3. Signals and Systems | 10. Systems Microwave Engineering |
| 4. Network Theory | 11. Computer Engineering |
| 5. Electromagnetic Theory | |
| 6. Analog Electronic Circuits | |
| 7. Digital Electronic Circuits | |

ISRO Exam Pattern:

- In the test, candidates may attempt the total 80 questions.
- The time allotted for the examination is of 90 minutes.
- Applicants who qualify the test may go for the further process of recruitment.

Jayanth Kolli
17VV1A0226
IV B.Tech, EEE

STUDENT ACHIEVEMENTS

1. **M. Sravani** (16VV1A0249) of IV B.Tech awarded Best Outgoing student(U.G) of the Institution, JNTUK - UCEV for the year 2019 – 2020
2. **G. MuliNaidu** (18VV1D5004) of M.Tech awarded Best Outgoing student(P.G) of the Institution, JNTUK - UCEV for the year 2019 - 2020
3. **M. Sravani** (16VV1A0249) of IV B.Tech awarded Best Outgoing student of EEE department, JNTUK - UCEV for the year 2019 - 2020
4. **G. MuliNaidu** (18VV1D5004) of M.Tech awarded Best Outgoing student of EEE department, JNTUK - UCEV for the year 2019 - 2020
5. **33 Students of II B.Tech EEE** received Supreme Squaders Trophy from IIT BHUWANESWAR for their active participation in the events of Wissenaire' 20 - The Annual Techno -Management Fest conducted by IIT BHUWANESWAR.

Details of Sports Activities

- EEE Department women Throwball team stood as runners in annual day celebrations of JNTUK-UCEV, 2019-2020.
- EEE Department women Kabaddi team stood as runners in annual day celebrations of JNTUK-UCEV, 2019-2020.

Awards received in sports for the year 2019-2020:

Name	Roll No	Event	Position
CH. Narsu Naidu	16VV1A0207	4 X 200 Relay at JNTUK- UCEV	First Prize
Praveen chandu	16VV1A0219	4 X 200 Relay at JNTUK- UCEV	First Prize
K.Prasad	18VV5A0262	4 X 200 Relay at JNTUK- UCEV	First Prize
S.Pavan Kumar	17VV1A0246	4 X 200 Relay at JNTUK- UCEV	First Prize
B.Sai Kiran	16VV1A0205	Representing JNTUK university rifle/pistol shooting team in All India GVMoulankar national level tournament held at Gujarat	Represented
		Inter competition of rifle /pistol shooting in southzone	th 8 place
S. Anusha	16VV1A0248	High Jump, JNTUK- UCEV	First Prize
		Discuss throw, JNTUK- UCEV	First Prize
		Shot Put, JNTUK- UCEV	Second Prize
		200Mts Running, JNTUK- UCEV	Third Prize
		4X100 Relay, JNTUK- UCEV	First Prize
G. Pujitha	16VV1A0213	4X100 Relay, JNTUK- UCEV	First Prize
G. Niharika	17VV1A0219	4X100 Relay, JNTUK- UCEV	First Prize
K.Prasad	18VV5A0262	400 Mts Running, JNTUK- UCEV	First Prize
		200 Mts Running, JNTUK- UCEV	Third Prize
		Long Jump	Second Prize
		4X400 Relay, Aditya Engineering College, Surampalem, Kakinada	Second Prize
S.Pavan Kumar	17VV1A0246	4X400 Relay, Aditya Engineering College, Surampalem, Kakinada	Second Prize
		100Mts Running, JNTUK UCEV	Third Prize
M. Srujana	18VV1A0224	4X100 Relay, JNTUK- UCEV	First Prize
S.Vivek	19VV5A0277	Shot Put, JNTUK- UCEV	Third Prize
Jaya Krishna	18VV1A0211	Chess, JNTUK- UCEV	Second Prize
S. Naveen	18VV1A0242	Chess, JNTUK- UCEV	Second Prize

Candidates selected in campus recruitments(2019-2020)**TCS COMPANY:****N.Sharmila- 16VV1A0233****M.Sai Ramya-16VV1A0232****COGNIZANT:****S .Vineela Padma Sai- 16VV1A0242****D. Vinay Venkatesh- 16VV1A0252****HCL COMPANY:****M.Sravani- 16VV1A0249****INFOSYS:****N.Sharmila- 16VV1A0233****EFFTRONICS SYSTEM PVT.LTD:****G. Kranthi - 16VV1A0214**

MESSAGE OF MAGAZINE



Corona viruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19.

COVID-19 is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. COVID-19 is now a pandemic affecting many countries globally.

Social distancing is the measure we have to take to slow down a global pandemic. It is designed to hold back, mitigate, contain.

What it means is we all need to stay away from other people, now, today.

This is why schools are shutting down, as are public events, or any sort of gathering. If we continue to be in situations where we are surrounded by others, we will overwhelm the capacity of the health care system to keep sick people alive.

It's safe to assume that sooner or later most of us will get sick. The strategy here is to avoid it all happening at the same time.

Staying away from each other is the best thing we can do for ourselves and for everyone. It is the only way to avoid witnessing everything get worse.

-3rd EEE

Word from the Editor

We take immense pleasure to thank all the readers our magazine for your support to our effort. We, the department of Electrical and Electronics Engineering, JNTUK University College of Engineering Vizianagaram, proudly present the special edition, the seventh edition of our magazine, “THE MEMOIR- Chronicles of EEE”.

*We would also like to extend our pleasure to the head of department, **Smt.A.Padmaja** madam and also **Smt. S.Rajitha** madam, for guiding through the columns of this special edition, to make it even special, on the occasion of “Faraday Memorial”*

*We would also like to convey our gratitude towards **S.Sagar**, 4th EEE for taking active participation in gathering the articles from all the fellow students, and **S.Vivek**, **J.Sonu**, **B.Nivedita** of 3rd EEE for editing some of the esteemed articles and all our friends from the department of electrical and electronics engineering, without which this would not have been possible.*

*We would like to extend a special thanks to **Dr.G. Saraswathi** and **Dr.V.S. Vakula** for their approachability and constant support*

Once again, we would like to express our considerable appreciation to all authors of articles and their knowledge in carving “THE MEMOIR- Chronicles of EEE”.

THANK YOU

K.Jayanth Kumar
IV B.Tech, EEE

DURING INAUGURATION OF DEPARTMENTAL MAGAZINE



Previous Volumes of "The Memoir"



EEE Gallery

