



VASAVI'S ELECTRONIC
MAGAZINE

NEWTON'S APPLE

**DON'T
BE A
FOSSIL
FOOL**

OCTOBER'S EDITION



**Time
famine**

What do I do?
When can I do it?
How well do I do it?

PREFACE

Dear readers,

Welcome to the comeback edition of our departmental magazine. It gives us immense joy and satisfaction to finally re-introduce the “Newton’s Apple”.

In this edition, we have tried to bind together the topics from diverse fields to give you an intriguing experience. It represents the creative side of our students to a fair degree - something that we all need to reconnect with, amidst our busy schedules of semester exams and all those assignments that often make us bang our heads against the wall.

We thank all of those who stood by us patiently and helped in the development of this comeback edition of our magazine when there were days on which the only thing we had to offer was our own confusion. Be sure to know that there is more to be written and certainly more to be read in the forthcoming editions. So brace yourselves to be amazed and enlightened.

Any suggestions to improve the quality of the magazine would be gratefully received and incorporated in the subsequent editions. Hope each one finds this informative and creative.

Happy Reading !

- TEAM NEWTON’S APPLE

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ROBOTRYST

4.0

It's the beginning of the week and the last week of August, but this time it seems and sounds completely different from our routine, the reason being either that our seniors were at back of us or that we were for the first time learning something not just for marks or that ultimately our seniors were preparing us as their perfect heirs.

Before getting into any confusion regarding the title, let us see what it means - It is "a summit regarding robots". The workshop was not conducted for money but was done so for a cause. Ofcourse every team was expected to contribute some money, but that was in fact to facilitate ourselves to be a part of the grandeur of acumen - the **College Techfest**.



With that said, let's get into the brief of agenda of the week, wherein, each team was provided with an IOT equipment (like the Node MCU, LEDs, ultrasonic etc.) and were guided by their respective mentors regarding the progress in learning and also understanding the code snippets behind the working.

VIVA SESSIONS



This workshop was the basic treaty designed for us to deploy our thoughts and actions through out the week into one icon of IOT. A verse of the treaty, which infact was really interesting, is the VIVA session. This was intentionally conducted for few negligent students to encourage them, by making them learn atleast through the viva. The key highlights of the week were the stay-back sessions and the viva sessions which inturn depicted immense effort from both the intents - one to learn and the other to teach.

" Knowledge shared is knowledge squared "

LEARN TO THINK AND THRIFT

THE FINAL LEAGUE

All for a day and All for a moment ...

" All for a day and all for a moment, it's better to be prepared that just being despaired". This is what actually happened for the whole week . Whole week got shrunk into 3 hours of workshop, yet intensified with hall filled with eager minds and brilliant souls (our seniors) . To a surprise, this time the topic accended to a next level, designated as the " MQTT PROTOCOLS " . The acronym for MQTT is - Message Queuing Telemetry Transport. In this interactive first half of the session, we were taught mainly regarding the subscriber and publisher model, advantages of MQTT over HTTP. The session began with an introductory video on IOT. By this session, we got clarified with the words that were often buzzing in our eats - the IOT and Cloud. There are numerous IOT platforms such as Adafruit, Google Cloud, Thingspeak, IBM Watson. In an irony, only few among them are free such as Adafruit and Thingspeak.



The second half of the session was the Practical session. As a start, we connected our microcontroller (in our case it's NODEMCU) to Adafruit by creating feeds in the dashboard. The task which was assigned to us was to update the distance measured by ultrasonic into the cloud and plot a graph on distance against time. Once after we connected our microcontroller to a network, we can monitor the distance measured by it remotely. The basics learnt in this workshop gave us an idea on how to apply IOT to automate our houses.

*On a whole, this is the basic version of our thoughts regarding the workshop - the one which privileged our seniors as our teachers. Special thanks to **V.Krishna Mohan sir** who made things possible through this event, forever cherished as - " **THE ROBOTRYST** " .*

Article by :

Rohit Lingala
&
Vishnu Vardhan

B.E.2/4
E.C.E. - A

CHANDRAYAAN

2

Exploring the Unknown ...

EXPANDING THE BOUNDS OF HUMAN KNOWLEDGE

The moon has never failed to captivate a child's imagination. No one's childhood is complete without stories of moon! Almost every one of us can recall watching the moon through our windows, listening to our grandmothers narrate popular folk tales about it. When I was a kid, I used to run with my friends watching the moon and telling them that the moon was also running with us. The Earth and the moon have more in common than just the space they occupy in our lives. On the top, they both are part of the Milky way galaxy, both are primarily rock-based bodies and the composition of the moon is isotopically similar to that of Earth. Studying these commonalities will help us understand our own planet better and this is what the pursuit of the scientists at the Indian Space Research Organization (ISRO) who had a determined plan that only the most brilliant can pursue.

CHANDRAYAAN 2

Why the Moon's South Pole?

The world over, countries, companies, and even individuals are turning to the Moon — vying with each other to fly their flags on the lunar South Pole.

Its craters have been untouched by sunlight for billions of years — offering an undisturbed record of the solar system's origins

Its permanently shadowed craters are estimated to hold nearly 100 million tons of water

Its regolith has traces of hydrogen, ammonia, methane, sodium, mercury, and silver — making it an untapped source of essential resources

Its elemental and positional advantages make it a suitable pit stop for future space exploration

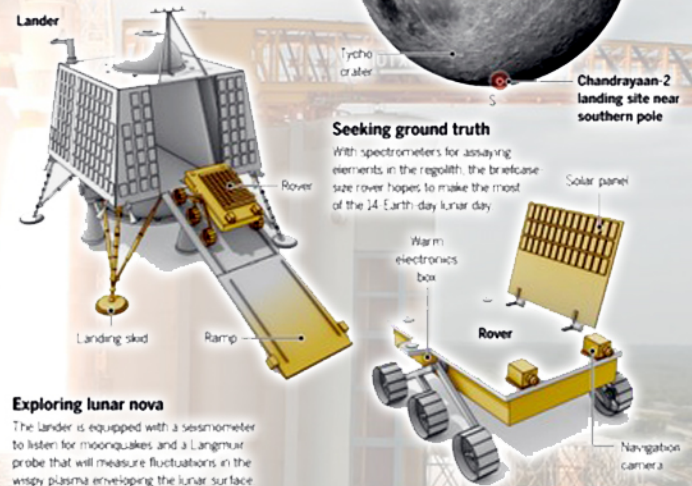
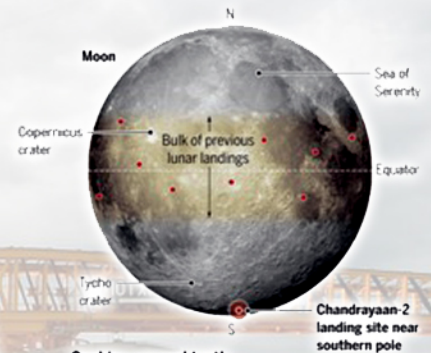
To find out more about ISRO and Chandrayaan-2, follow us on [f](#) @ISRO | [t](#) @ISRO | [v](#) ISRO Official

Mission Chandrayaan-2 is the second lunar exploration mission developed by the ISRO. Indian at heart, Indian in spirit! What would make every Indian overjoyed is the fact that Chandrayaan-2 is a fully indigenous mission. It comprises an orbiter for remote sensing the moon and also a lander-rover module including the lander 'Vikram' named after the renowned scientist and the father of Indian space program Dr. Vikram Sarabhai and a rover 'Pragyaan' for analysis of lunar surface. Chandrayaan-2 is truly unique because it would explore and perform studies on the south polar region of the lunar terrain which is not explored by any past mission. It would achieve the feat that makes India the fourth country to have done a soft landing on the moon and the first country to explore the mysterious south pole of the moon. The mission is primarily designed to expand the lunar scientific knowledge through detailed study of topography, seismography, mineral identification and distribution and surface chemical composition leading to a new understanding of the origin and evolution of the Moon.

The majestic lift-off of the Geosynchronous Satellite Launch Vehicle Mark-III (GSLV Mk-III) took place at around 2:43 p.m. IST on 22nd of July, 2019 from Sriharikota as the India's most powerful launcher to date carried the hopes of 1.3 billion Indians riding on Chandrayaan-2. After the injection of Chandrayaan-2, a series of maneuvers were carried out to raise its orbit and on August 14, 2019, following Trans Lunar Insertion (TLI) maneuver, the spacecraft escaped from orbiting the Earth and followed a path that took it to the vicinity of the moon.

Pole position

If all goes to plan, India's Chandrayaan-2 mission this summer will attempt a soft landing on an ancient high plain of the moon, some 600 kilometers from the south pole. It would be the first landing so far from the equator.



Seeking ground truth

With spectrometers for assaying elements in the regolith, the briefcase-size rover hopes to make the most of the 14 Earth-day lunar day.

Exploring lunar nova

The lander is equipped with a seismometer to listen for moonquakes and a Langmuir probe that will measure fluctuations in the wispy plasma enveloping the lunar surface.

On August 20, 2019, Chandrayaan-2 was successfully inserted into lunar orbit. While orbiting the moon in a 100 km lunar polar orbit, on September 02, 2019, Vikram lander was separated from the orbiter in preparation for landing. Subsequently, two de-orbit maneuvers were performed on Vikram lander so as to change its orbit and begin circling the moon in a 100 km x 35 km orbit. Vikram lander's descent was as planned and normal performance was observed upto an altitude of 2.1 km. Subsequently, communication from lander to the ground stations was lost!

GSLV

Mk III

GSLV Mk III ready for lift off at SRIHARI KOTA...



JOURNEY TO MOON

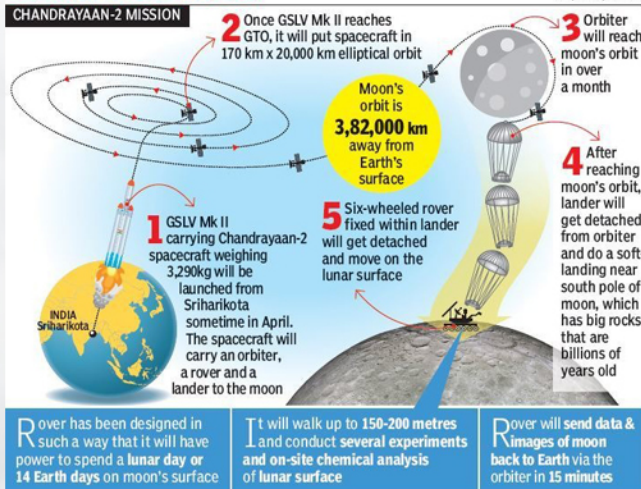


Image courtesy: Times of India

The orbiter placed in its intended orbit around the moon will enrich our understanding of the moon's evolution and mapping of the minerals and water molecules in polar regions using its eight state-of-the-art scientific instruments. The orbiter camera is the highest resolution camera (0.3 m) in any lunar mission so far and will provide high resolution images which will be immensely useful to the global scientific community. The precise launch and mission management has ensured a long life of almost 7 years instead of planned 1 year. Its electrical power generation capability is reportedly 1000W and is capable of communicating with the Indian Deep Space Network (IDSN) at Byalaly while weighing just over 2000 kilograms.

VIKRAM - THE LANDER

The lander - Vikram is designed to have a soft landing with on board central-mounted propulsion system, to make a vertical descent onto a predetermined landing site near south polar region of moon. ISRO's Space Application Centre (SAC) developed sensors to ensure that lander can navigate and touch down safely. It includes Lander Position Detection Camera (LDPC) and Lander Hazard Detection and Avoidance Camera (LHDAC). The payloads that are onboard the lander include the Langmuir probe, thermal probe and a seismometer to measure electron temperature, vertical temperature gradient and detect tiniest ground displacement, velocity and acceleration that occurs whenever there is a lunar quake. After its detachment from the orbiter, the lander has to go through complex maneuvers using these sensors which include both rough and fine braking to stabilize the landing. Unfortunately during the rough braking phase of landing which lasted for a nail-biting 15 minutes, the communication from the lander was lost since it reportedly had a hard landing!

PRAGYAAN - THE ROVER

Pragyaan which translates to 'Wisdom' in Sanskrit, is a robotic vehicle that can traverse on the lunar surface with 6 wheels coated in tricolor. It is equipped with two instruments to test minerals and chemical composition, seismic activity on the lunar surface.

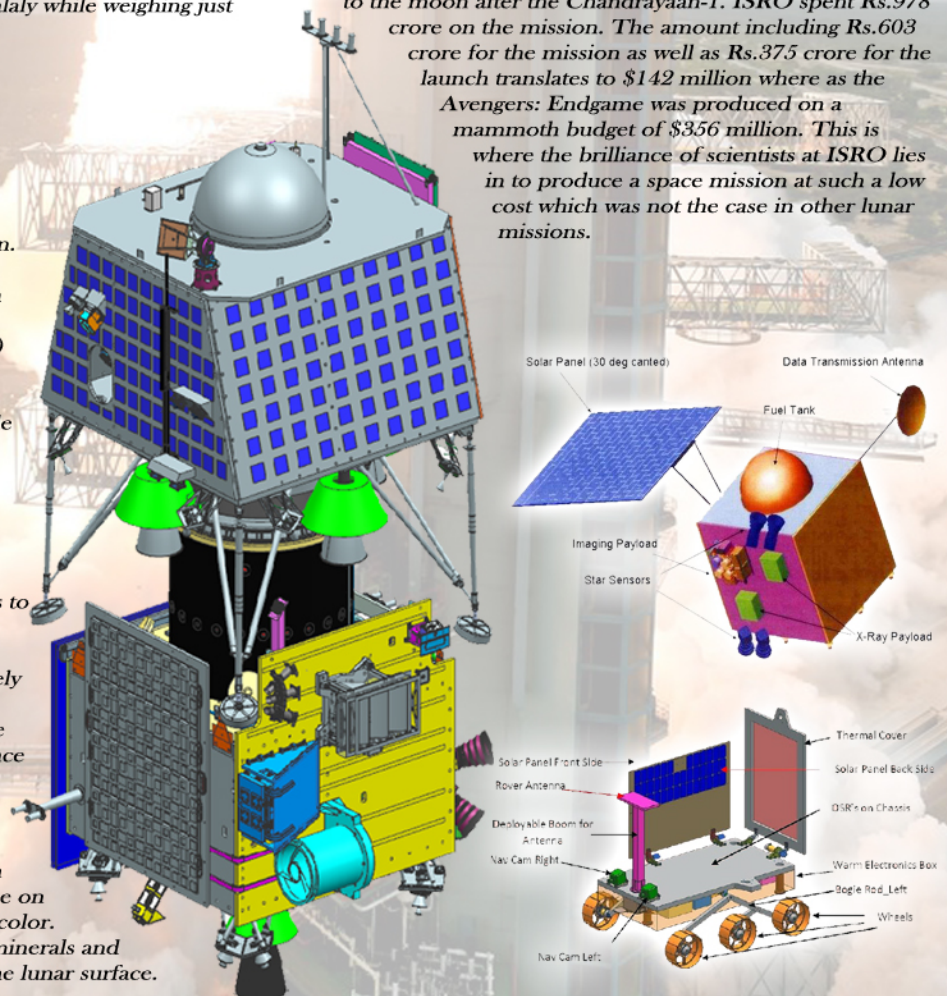
One of the instruments is namely Laser Induced Breakdown Spectroscope (LIBS) which helps to identify the elements present close to it. This instrument is an outcome of the Make in India initiative, developed by The Laboratory for Electro Optic Systems situated in Bengaluru. Intended task is accomplished by firing laser pulses at various locations and radiation from decayed plasma is analyzed. The other instrument onboard the rover is the Alpha Particle Induced X-Ray Spectroscope (APIXS). Its primary objective is to look at the composition of elements. Lunar surface is bombarded with alpha particles to detect major rock forming and other trace elements. The most significant design part was the creation of the limbs of the rover with wheels attached to them. Its limbs can work independently to help the rover carefully negotiate the lunar surface. Entire rover is powered by solar energy and can spend a total of 14 earth days carrying out its experiments.

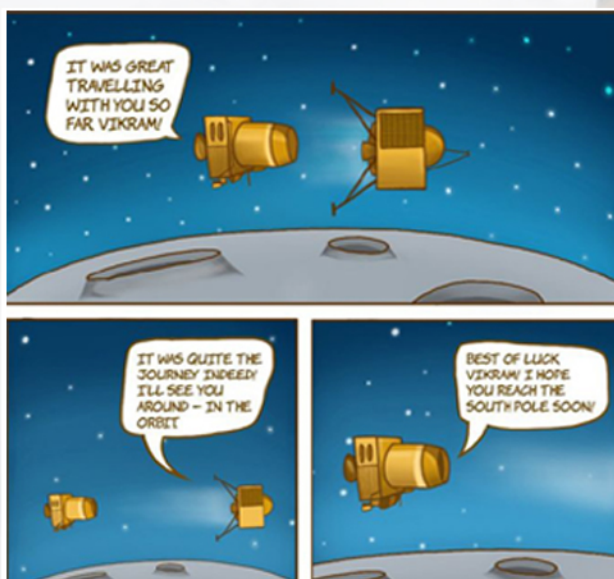
ELECTRONIC AND TECHNOLOGICAL INPUTS

- > Momentum Wheel Assembly (MWA)
- > Reaction Wheel Assembly (RWA)
- > Dynamically Tuned Gyroscope (DTG)
- > ISRO Laser Gyroscope (ILG)
- > Advanced Inertial Navigation System (AINS)
- > Rate Gyro Electronic Package Device (RGPD)

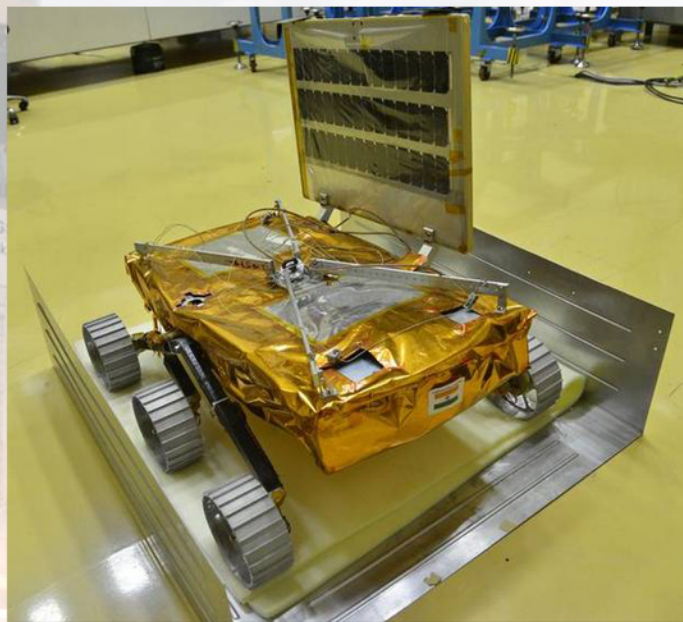
These are some cutting edge electronic technologies involved in the lander-rover module.

Chandrayaan-2 mission is a highly complex mission, which represents a significant technological leap compared to the previous missions of ISRO, which brought together an orbiter, lander and rover with the goal of exploring the south pole of the moon. Infact, many big budget Hollywood movies including the Avengers: Endgame are way expensive than India's second mission to the moon after the Chandrayaan-1. ISRO spent Rs.978 crore on the mission. The amount including Rs.603 crore for the mission as well as Rs.375 crore for the launch translates to \$142 million where as the Avengers: Endgame was produced on a mammoth budget of \$356 million. This is where the brilliance of scientists at ISRO lies in to produce a space mission at such a low cost which was not the case in other lunar missions.





An animation tweeted by ISRO on the occasion of lander separation from orbiter.
Image courtesy : twitter\ISRO



Space is hard and the attempt by ISRO is truly commendable. *“As important as the final result is the journey and the effort. Our effort and journey to the moon was worth it. There are no failures in science, only experiments and learning. There will be a new dawn and a brighter tomorrow soon.”* These were the words by the Indian prime minister Narendra Modi as he consoled ISRO scientists for the loss of signal with lander at the ISRO Control Centre, Bengaluru on 7th of September, just 5 hours after the accident had taken place at 3:00 a.m. IST. The team at ISRO led by the mission director Ritu Karidhal has ventured where no one previously went. ISRO will surely continue to keep going forward – propelled by the dreams of Indians across the world as it confirms the Gaganyaan manned space mission with 3 crew members by 2022. **JAIHIND!**

BY
**Neeraj
&
Ashrith**

**DID
YOU
KNOW?**

Vikram is nearly as heavy as 10 Sumo wrestlers
Chandrayaan-2's orbiter weighs close to three nano cars
Pragyaan weighs about as much as 960 tea bags.



ARTIFICIAL 3D PRINTED HEART

The Bio-Ink

World's First 3D Printed Heart Could Revolutionize Organ Transplants ...

University of Tel Aviv's Tal Dvir presents his team's 3D-printed heart.



University of Tel Aviv's Tal Dvir presents his team's 3D-printed heart.

Previously, 3D printer was used to print model of the patient's hearts which doctors can use to plan surgery, and even do practice operations. The printer uses images from patients' MRI or CT scan images as a template and lays down layers of rubber or plastic. Doctors can operate on them with regular surgical tools "again and again and again" until you think of the optimal way to do surgery.

There is one real life example where the 3D printed heart model saved a girl's life. A 4-year old girl named Mia Gonzalez needed an operation to close off the part of her aorta that was putting pressure on her windpipe and making it hard to breathe, swallow and get rid of phlegm when she got a cold. With the help of this 3-D-printed model of a girl's heart, surgeons in Miami were able to plan her complicated surgery.

Dr. Redmond Burke, director of pediatric cardiovascular surgery at Nicklaus Children's Hospital, meditated on the model of Mia's heart for a couple of weeks. Burke finally had the "Aha!" insight. Instead of making an incision on the left side for this type of heart defect, called double aortic arch, he should cut into Mia's chest from the right. Using the model, "there was no doubt, and surgeons hate doubt," Burke said. Four months later, the surgery seems like ancient history to Mia. She is doing perfectly fine. Although she has had some minor colds, none has landed her in the hospital.

Eventually, the printers are being used to produce actual organs that can be transplanted into patients by just replacing the rubber and plastic printer "ink" with human cells.

"This is the first time anyone anywhere has successfully engineered and printed an entire heart replete with cells, blood

vessels, ventricles and chambers," Professor Tal Dvir of Tel Aviv University's School of Molecular Cell Biology and Biotechnology and the leader of the team of scientists who created the heart said in a statement.

Cardiovascular disease is the leading cause of death in the developing world. Heart transplantation is the only way to treat end-stage heart failure, highlighting the importance of developing techniques such as 3D printing, according to the authors.

The heart doesn't beat and is too small for use in people — it's only about the size of a rabbit's heart. But the little organ is considered a big advance in the ongoing effort to find new treatments for heart disease.

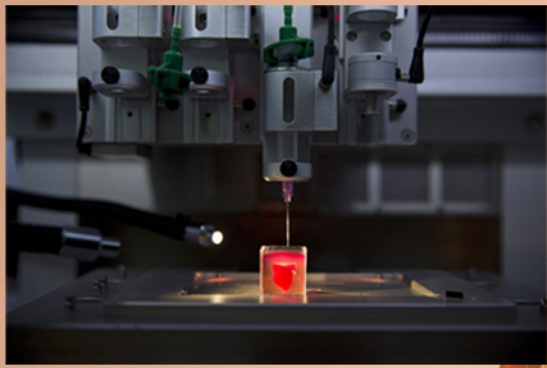
Dvir also explained that using the patient's own cells is key to engineering the tissues and organs. Previously, scientists were able to 3D-print heart structures that lacked cells or blood vessels. But the new 3D-printed heart contains cells, blood vessels, chambers and other structures a heart needs to function normally.



Mia Gonzalez holding one of the 3D prints of her heart.

The process of printing the heart involved a biopsy of the fatty tissue that surrounds abdominal organs. Researchers separated the cells in the tissue from the rest of the contents, namely the extracellular matrix linking the cells. The cells were reprogrammed to become stem cells with the ability to differentiate into heart cells; the matrix was processed into a personalized hydrogel that served as the printing "ink". The cell-containing "bioink" was added to a 3D printer. The cells and hydrogel were first used to create heart patches with blood vessels and, from there, an entire heart.

Tal said the next step for his team would be to explore ways to 'teach' 3D-printed hearts to function normally. "The cells need to form a pumping ability; they can currently contract, but we need them to work together", Tal explained. If researchers are successful, they plan to transplant the 3D-printed heart in animal models.



A 3D printer builds a heart with human tissue during a presentation at the University of Tel Aviv on April 15.

The scientists will also explore the feasibility of 3D-printing larger hearts, with the ultimate goal of building functional human hearts. That might be even harder than it sounds.

"Maybe, in ten years, there will be organ printers in the finest hospitals around the world, and these procedures will be conducted routinely," Dvir said.

Facts about 3D printing in medical field:

- ♥ *Bioprinting, a technique for 3D printing living tissue has led to the making of a fully functional, artificial 3D printed organ!*
- ♥ *In 2007, one of the first bio-printing companies was founded: Organovo.*
- ♥ *Organovo created a mini human liver that actually works -- except it lasts only 40 days.*
- ♥ *In 2012, a 3D-printed titanium jaw was implanted into an 83-year-old woman, while a man in the US has been walking around with a 3D-printed plastic skull since 2013.*
- ♥ *Cornell bioengineers crafted a faux ear (which works just fine, by the way) out of living cells and injectable gels.*

Thank you !

Article by ...

Sahaja Puligadda

B.E. 2/4
ECE-B

DON'T BE A FOSSIL FOOL

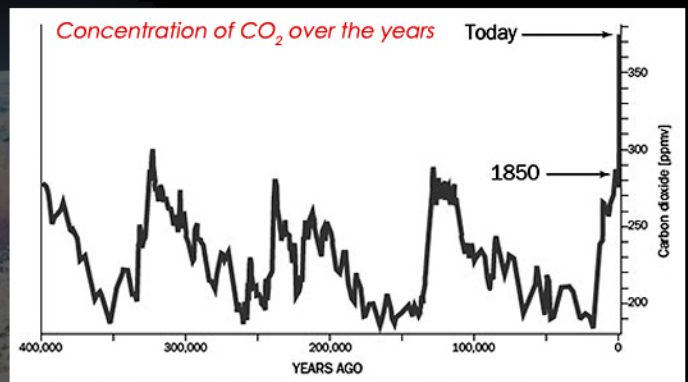
- An Article on Climate Change -

"This is all wrong. I shouldn't be standing here. I should be back in school on the other side of the ocean. Yet you all come to me for hope? How dare you! You have stolen my dreams and my childhood with your empty words. And yet I'm one of the lucky ones. People are suffering. People are dying. Entire ecosystems are collapsing. We are in the beginning of a mass extinction. And all you can talk about is money and fairytales of eternal economic growth. How dare you!"



This is how 16 year old Greta Thunberg started her powerful speech at the United Nations Climate Action summit. You've probably heard about how Greta Thunberg, a teenager from Sweden, is leading the revolution against the ongoing climate crisis. Let us see why Greta has to do all of this in the first place.

Climate change is very real. Many of the world's population haven't come to terms with this fact. At least 21 cities in India including Delhi, Bengaluru, Hyderabad and Chennai, will run out of groundwater by the year 2020. Carbon dioxide levels in the atmosphere hit a record breaking high this May; the highest ever since the evolution of humans. The level of carbon dioxide has risen an average of 2.5 ppm per year over the past decade. This level is only going to go higher from here if we don't act accordingly. 18 of the 19 warmest year records on this planet have occurred since the year 2000. 97 percent of climate scientists worldwide agree that climate change is real and driven by human activity. Eleven percent of the world's population is currently vulnerable to climate change impacts such as droughts, floods, heat waves, extreme weather events and sea-level rise.



How is the most intellectual creature to ever walk on earth destroying the planet?

We are eroding the very foundations of our economies, livelihoods, food security, health and quality of life worldwide. Approximately 60 billion tonnes of renewable and non-renewable resources are now extracted globally every year, nearly double the amount from three decades ago. Surges in demand have had a dramatic effect on the natural world, with three-quarters of the world's landmass and 66 percent of all marine environments now judged to have been "severely altered" by human actions. It's time political and corporate leaders stopped making empty promises and started acting to prevent us sliding towards another mass extinction of life on Earth. As consumption swells, so does the amount of waste being dumped by humans. In the last three decades alone, plastic pollution has sky-rocketed tenfold. Meanwhile, the use of fertilizers, which threaten to poison entire ecosystems and wreck soil's carbon-absorption rates, has doubled in the last 13 years.

We Need to Change !!

We need to change the way we think about what a good life is, we need to change the social narrative that puts an emphasis on a good life depending on a high consumption and quick disposal. We need to change the stories in our heads, because they are the ones that are now enacted in decisions all the way from the individual up to the government.

Here is how Greta Thunberg is trying to bring in some change ...



She launched the Fridays for Future movement, in 2018, encouraging students to skip school to demand action on climate change from their governments. Now, young people in 125 countries have joined Greta in her Fridays for Future movement. They demand more robust climate policies and the reduction of greenhouse gases emissions.

Forests are a stabilizing force for the climate. They regulate ecosystems, protect biodiversity, play an integral part in the carbon cycle, support livelihoods, and supply goods and services that can drive sustainable growth. Few of the forests such as the Amazon Rainforests in Brazil and the Aarey forests in Mumbai are under threat.



The Amazon rainforest, also called as the lungs of our planet Earth has seen a massive surge in wildfires this year. More than 70,000 fires have been detected in this year alone. The Amazon rainforest produces 20% of Earth's oxygen and without Amazon our entire climate might collapse. Meanwhile, BMC approved cutting down of 2,700 trees in Aarey forest, the lungs of Mumbai. Focusing development over conservation, the BMC gave this permission to Mumbai Metro Rail department to make way for car shed for the Mumbai Metro project. In Telengana and Andhra Pradesh, there is a proposal to chop down a part of Nallamalla forest for uranium mining. You don't have to be an environmentalist to understand that there won't be consequences for these actions.

Here is what we can do to preserve this planet for future generations to come ...

- Say no to plastic
- Use alternative fuels
- Create awareness & Volunteer
- Prefer public transport
- Eat your food rightly and do not waste it
- Consume less energy or use energy efficient devices



By,
Akash Pujari
2/4, ECE-A

A MINUSCULE - YET A MIGHTY DEVICE !!

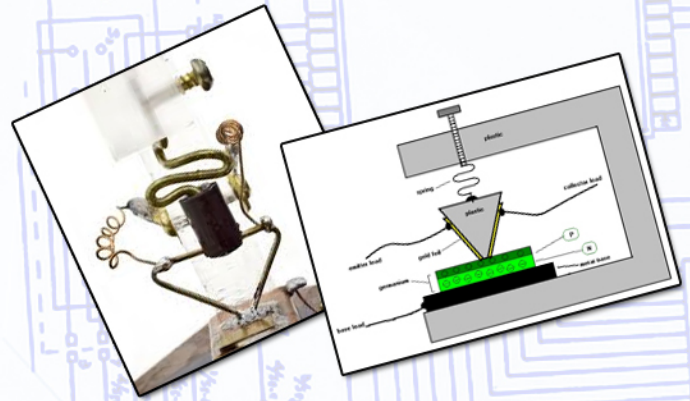
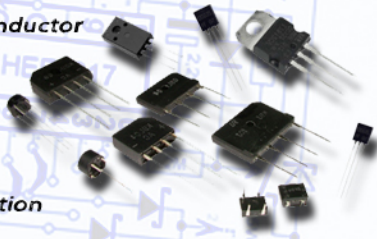
The history, importance and evolution of the transistor which was the base for the development of modern day electronics and computing gadgets.



What do you think are the most remarkable inventions which changed the world? The car? The bulb? Or the internet? What if it was said that transistors deserve a place in this list, would you agree to it?

TRANSISTOR :

A transistor is a semiconductor device used to amplify or switch electronic signals and electrical power. It is composed of semiconductor material usually with at least three terminals for connection to an external circuit.



A BRIEF HISTORY :

The word transistor is an abbreviation made out of the words 'transconductance' or 'transfer' and 'varistor'. The first patent for the field effect transistor was filed by Julius Edgar Lilienfeld on October 22, 1925 and in 1934, Dr. Oskar Heil patented another field effect transistor, but neither of them published any research articles, as a result their ideas didn't reach the industry. On the back drop of World War-2, there was an active research on producing pure Germanium diodes. These solid-state devices were being used at Bell Labs as switches, as the vacuum tubes were slow, work on semi-conductor substitutes for triode began as the solid state devices showed a promising future.



The understanding of surface physics, carrier mobility in semi-conductors and carrier injection and persistent efforts of researchers lead to the development of the first working transistor on 15 December, 1947 at Bell Labs, it worked as an amplifier. J. Bardeen and Walter Brattain were behind this invention. This model was improvised by William Shockley in 1951, this improvised model went on to become BJT. The triad of J. Bardeen, Walter Brattain and William Shockley received Nobel Prize for the invention of the transistor in 1956.

"The first transistor had two sharp gold contacts with a Germanium substrate. Modern day transistors use Silicon instead of Germanium and closely coupled PN-junctions instead of gold contacts."

THE IMPACT OF TRANSISTORS :

Why do they say that transistor made a huge impact in electronics and computing ?

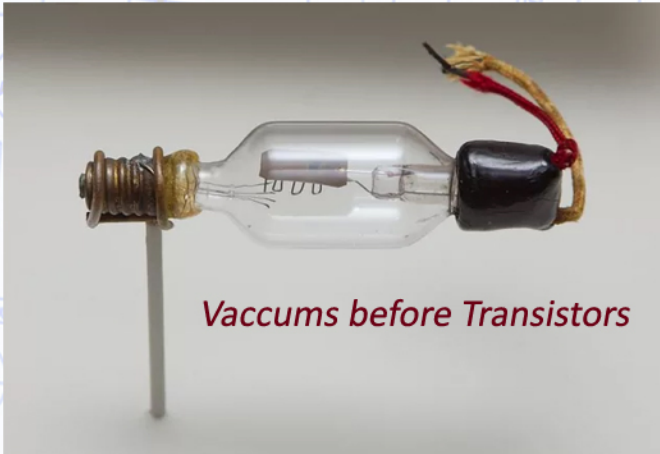
Firstly, we should know how data is stored, processed and retrieved from memory by a computer, the data is converted to binary and machines can only understand binary instructions.



Binary code is composed of 1s and 0s, the circuitry differentiates 1s and 0s by the nature of electric signal, for example, if current is flowing then it is considered as 1, if it is not then it is considered as 0, similarly voltage may also be used as signal. Back in the day, vacuum tubes were used. A vacuum tube is primarily a heavy evacuated glass tube which has an anode, a cathode and a grid which are all electrodes. Vacuum inside tube favors easy flow of electrons and as the electrons are emitted from the cathode due to heat, they experience a potential difference, they then reach the anode and circuit is complete. By adjusting the grid voltage as per our requirement, the flow of current can be controlled, and by applying negative grid voltage, current flow can be obstructed.

The vacuum tubes consumed a lot of power and were difficult to maintain, however they could perform computations way faster than a human being. The triode tube action can be achieved using a transistor which is way smaller in size and less power consuming compared to vacuum tubes.

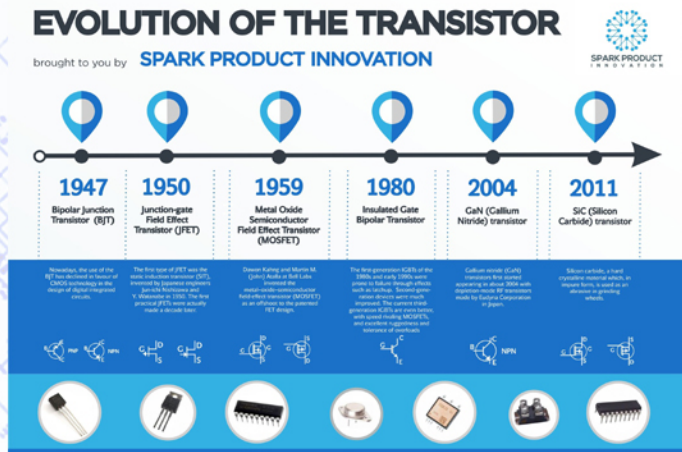
The transistors which we can see and hold in our hands are the discrete transistors, which are commonly found in electronic devices like calculators, radios, etc. Transistors are the basic components of microprocessors and ICs. In modern microprocessors transistor count hits the order of million or billion.



Vaccums before Transistors

If not for the transistors, we wouldn't be having our desktops, laptops or other computing devices as they are today. Apart from their application in computing devices, they are also a part of most common consumer electronics. Their specific applications include signal amplification, power regulation, analog and digital switching.

EVOLUTION OF TRANSISTORS :



The first transistor was invented in 1947 which was a point contact transistor, the commercial version of the point contact transistor came in 1948 with slight modifications for a consistent performance. The 1950s saw BJT, by 1960s the production of transistors integrated over ICs began, there was a shift from Germanium to Silicon as Germanium broke down at higher temperatures. Next came the field effect transistors, unlike a BJT, they rely upon a channel of charge carriers for conduction. Their ease of construction over the microprocessors and integrated circuits made them the preferable transistors of modern day.

Fun Fact!

- A pin head of 1.5 mm diameter can hold nearly 100 million 22nm tri-gate transistors.
- Guess which was the first commercial consumer electronic gadget to use a transistor?
It was the Regency TR-1, a pocket radio.
- Can regular transistors be used with bioelectronic devices?
We may use them but a long term usage may harm living beings, they are not bio-compatible as such, hence organic transistors (made out of carbon and hydrocarbon derivatives) and transistors like IGT, EGOFET and OECTs are being developed for usage in bioelectronic devices.

BY
Anish Sai Vardhan
&
Teja Sai
B.E. 2/4
ECE B

TIME FAMINE



“ No rains lead to a water crisis, no adequate farming lead to a food crisis. Similarly, as technology is updating it is leading to a Time crisis, which experts named it as TIME FAMINE. We often listen to people ‘I don’t have time’ many times a day irrespective of age, but these experts say that each individual is in a race against time in this technical world. ”

REASONS FOR THIS 'TIME FAMINE'

- Curious to do many things in less time
- No proper plan on how to utilise time
- Daydreaming
- Worrying that the time is insufficient to do given tasks.



How does this harm us?

For this, I want to narrate a story as a reference ...

A student came to a guru for learning a course. He asked the guru that if he studies hard how much time does it take to complete and become efficient in the course.

Guru smiled and answered that it will take two years.



Again the student asked if he would study harder then how much time does it take.

Guru again smiled and said it would take 4 years.

Student asked again that if he would study day and night every day then how much time does it take to complete.

Guru replied that it would take 6 years.

The student was confused and thought that it would take less time if we put more effort but this case is different.

By seeing his confused face guru smiled and answered that “Firstly your attention is on completion of course so you will have only half attention towards the course which will take more time to complete”.

The student realized his mistake. Students are in the state to do things out of their limits, due to which they are suffering from time stress, losing their confidence and feeling depressed when they not able to finish those works.

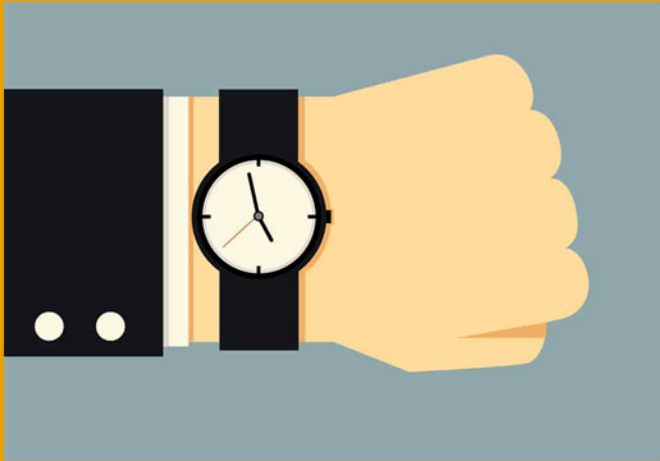


Career vs Time

Experts suggest that those who organize their time can have a relaxed mind which gives creative and innovative ideas. These ideas can change our life beautifully or can be asserted to our progress.

Rather working for more and more hours, without any new ideas does not give any progress.

Is there any way to get rid of this crisis ?



One of the ways is the method of "Buying time promotes happiness"

In this method, we can save time by hiring people for cooking, washing, cleaning, etc. which can save some time. For those who can't afford money the other way and a simple solution is "Time management".

How to achieve this?

1. Divide the works daily and plan the works for a week or month in advance and do them accordingly.
2. Don't try to complete the work alone and in a short time, rather divide the work and then do it.
3. Plan some time for eating, sleeping, workouts, and extra activities for refreshments.
4. Organize the time for family, personal care, social works, etc.
5. Smartphones and social media kill our time, so keep an alarm for giving a remainder about how much time we are using to decrease the usage.
6. Postponing works may give temporary relief but it burdens in the future so stop postponing things to avoid difficulty.
7. Dreaming is good but it should not burn the time out. So better stop daydreaming and start working for it.

GET the FACTS

On an average we waste time per day as -

- 35 min on what to eat
- 16 min on what to wear
- 10 min to decide whether to go for a walk or exercise or not
- 10 min for every hour on social media
- 2 to 4 hours on tv
- 1 and 1/2 hour browsing unnecessary websites or apps
- 1 and 1/2 hour for phone calls and chatting
- 1/2 hour in meetings

- Analysis by Hue Calver -

By -
J. Sai Vamshi
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PORTABLE ELECTRONICS



In recent years the portable electronics are playing major role. Some examples of these portable electronics are smart phones, tablets, electronic document readers, drones etc. Many new inventions are going on in order to invent portable electronics and one of the inventions is a stretchable and flexible biofuel cell that runs on sweat. A unique new flexible and stretchable device, worn against the skin and capable of producing electrical energy by transforming the components present in sweat, was recently developed and patented. This cell is already capable of continuous lightening an LED, opening new avenues for the development of wearable electronics powered by autonomous and environmentally friendly bio devices.



The potential use of wearable electronic devices continues to increase, especially for medical and athletic monitoring. Such devices require the development of a reliable and efficient energy source that can easily be integrated into the human body. Using bio fuels present in the human organic liquids has long been a promising avenue.

Scientists, who specialize in bio electrochemistry, decided to collaborate with an American team from the university of San Diego in California, who are

experts in Nano machines, bio sensors and Nano bioelectronics. Together they developed a flexible conducting material consisting of nanotubes, cross linked polymers and enzymes joined by stretchable connectors that are directly printed on to the material through screen- printing.



The **biofuel cell**, which follows deformations in the skin, produces electrical energy through the reduction of oxygen and the oxidation of the lactate present in perspiration. Once applied to the arm it uses a voltage booster to continuously power an LED. It is relatively simple and inexpensive to produce, with the primary cost being the production of enzymes that transform the compounds found in the sweat. The researchers are now seeking to amplify the voltage provided by the biofuel cell in order to power larger portable devices.

There are many things to be developed in the world and definitely electronics will play a major role in it. In the future many developments in technology will happen for sure and electronics and communication will evolve everywhere. The smart inventions are going on like portable electronics which can lead a human life with ease and comfort.



INTERESTING FACTS

- ❁ Portable voice recorders, hearing aids, electric shavers and heart pacemakers do not need to be shut off at any time during a flight because their signals doesn't interfere with aircraft systems.
- ❁ The devices which are less than 2 pounds are considered to be portable electronic device.
- ❁ The estimated no of using portable electronic devices in this world are 4.02 billion people.
- ❁ According to research from business insider, more than 24 billion internet connected devices(IOT) will be installed around the world by 2020, that's more than 4 devices for every person on the planet.

Article by

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Rumours Cost Lives

An engineering student, very active, brilliant but not handsome, had very sacred feelings for one of his fellow classmate from his very first year of college. He was very genuine about her.

He wanted to express her about his love, but couldn't because of his own perception that he is not smart enough to deserve her, held him back. As time flew, they were about to passout of the college, then he had finally decided to propose her. He went to her and expressed his feelings for her, but unfortunately she rejected him very politely. She conveyed him very convincingly stating her aim to make her father proud by cracking civil exams. He understood her and conveyed his best wishes and then went back home.

The next day, when his friends asked him about his proposal, he was afraid of saying got rejected and said that she accepted his proposal but asked him to keep it secret and also said they had a coffee together in the nearby cafe. Actually what had happened was completely different. Out of that grief, this fellow worked hard and cracked GRE and left that place to forget her memories and went to States and settled there and one final day, got married to someone and laid his life there.

But the mistake he did, i.e. told his friend that she accepted him and both went to cafe. This rapidly passed throughout the college to an extreme where it started with meeting in cafe to going to movies & parks. This rumor reached her cousin who was studying in the same college and this rumor reached the girl's father which disturbed the daughter-father belief.

Her father did not reveal the rumor he got to know and forced her to get married to her father's nephew to avoid all this distractions. Her dreams were shattered and the man she got married is an alcoholic and died in an accident just 6 months after their marriage.

She laid her remaining life as a widow. Both of them died after living for 70-80 years. Here the most ironic part is that neither the girl nor the boy knows that the rumor, the boy unintentionally passed had costed the girl's life. There ends the story.

My View:

The boy would have conveyed the same what was actually happened. He would have told his friend that he was very proud of that girl saying about her goal and ambitions and most importantly her love for her father. If this would have reached the girl's father as that of the rumor in previous case, may be the father would have felt proud and supported his daughter to achieve her goals. She would have been successful in her career. May be she also had some feelings for that boy but felt to convey after being successful.

On a final note, I would like to conclude to be honest and do good, may be the same good knocks your door.

*- Dinesh Reddy
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Approach for ECE related Competitive Exams



"COMPETITIVE EXAMS" - It is an event conducted to eliminate incompetent people and to select the most deserving candidates who will be trained and released into the community. To keep it simple you call it "Survival of the fittest".

Whether you can get admission in top-notch M.Tech/ME/MS institutes depends largely on your GATE result. Doing your master's course in reputed institutes of India will give you a chance to learn the core engineering concepts from the best faculties in the country. GATE is also the qualifying test for many PSUs like Power Grid, IOCL, etc. So if you want a high paying job with the security of a PSU, GATE is the only option for you.

PSU
Recruitment
through
GATE 2020
for
Electronics &
Communication



Options available after completing GATE exam for electronic and communication are :

Now let's see the competitive exams for ECE students. The most familiar exam is GATE (Graduate aptitude test in Engineering). The GATE exam is a gateway for admission to the various postgraduate engineering programs offered by the IITs, NITs, IIITs and other CFTIs as well as high pay PSU jobs. Many other institutes apart from the IITs, NITs, IIITs and GFTIs also consider GATE score for offering admission to the candidates.

How to prepare for GATE ?

1. Know the syllabus.
2. Start self-preparation.
3. Select some specific topics.
4. Don't waste time reading all the books for a single topic.
5. Don't lose your hope and confidence in preparation.
6. Start preparation with easy subjects.
7. Finally, make self-assessment time to a very important time.



There are also many opportunities in the central government departments like Defense, Railways, All India Radio, Airport Authority of India, Post and Telegraph, Indian Engineering services, etc... One can get a job in central government departments by qualifying in the tests conducted by union of public service commission (UPSC) and staff selection commission (SSC).

One can start a career in public sector firms. Some of the public sector firms that recruit candidates through GATE score are listed below :

1. Indian Space Research Organization.
2. Bharat Electronic limited
3. Bharat Electrical Limited
4. DRDO
5. SAIL
6. GAIL

These companies conduct written tests and interviews, one can find the notifications for these jobs in their official websites and the leading newspapers.

If you are will to go abroad, you can prefer MS one has to appear for Graduate Record Examinations (GRE) and or Test of English as a foreign language (TOEFL) or International English Language testing system (IELTS) for doing MS in foreign countries.

If the one is not selected in competitive exams needs to prepare again and attempt the exam or need to choose another profession.

- Article by -

Kyathi

**B.E. 2/4
ECE - B**



सेल SAIL



TECHNOLOGY TODAY

Technology has advanced with years and it has changed the way we purchase products, the way we live, the way we communicate, the way we travel, the way we learn and so many changes have been brought about by these continuous technological advancements.



Technological advancements have helped businesses and organizations save time and cost of production, which has been an advantage to all business, they manage these advancements to gain competitive advantage. A good example is the 3G or 4G broadband, small businesses have taken advantage of this super fast internet to reach target markets with less costs of operation.

Smart phone Ultrasound :

Using a \$100,000 which was provided by Microsoft, experts at the Washington University in St. Louis managed to integrate a USB-based ultrasound probe with a Smart phone. The main goal was to create a simple hand sized "Ultrasound device" that can enable doctors in remote areas to image a patient's kidney, liver, bladder, eyes, veins and arteries so that they can easily detect any infections. This type of device can be of a good use in many developing countries and it can help in saving lives. Doctors without boundaries can use this mobile ultrasound to help out many patients in remote areas.

Technological Advancements In Education :



- Used blackboards - - Using Smart board -

Technology advancement has greatly changed the education sector. We now days learn through mobile gadgets and tablets. Technology has simplified the way teachers reach their students and it has also helped students learn from anywhere as well as enable them access academic information at any time from anywhere. Information is power, so both students and teachers can use advanced technologies for education to make research on subjects of interest. Some of the most popular technology advances which have changed the face of education include: Use of smart phones in classroom, use of tablets and mobile computers in education and classroom, use of smart whiteboards for visual illustration in the classroom, use of internet for long distance learning, Use of social media to connect students with teachers for example - pizza.com



"Information technology and business are becoming inextricably interwoven. I don't think anybody can talk meaningfully about one without the talking about the other".

- Bill Gates

Graphene:

Graphene is a disruptive technology; one that could open up new markets and even replace existing technologies or materials. It is when graphene is used both to improve an existing material and in a transformational capacity that its true potential can be realised.

" COMBINING ALL OF GRAPHENE'S AMAZING PROPERTIES COULD CREATE AN IMPACT OF THE SCALE LAST SEEN WITH THE INDUSTRIAL REVOLUTION. "

The vast number of products, processes and industries for which graphene could create a significant impact all stems from its amazing properties.

No other material has the breadth of superlatives that graphene boasts, making it ideal for countless applications.

- It is many times stronger than steel, yet incredibly lightweight and flexible.
- It is electrically and thermally conductive but also transparent.
- It is the world's first 2D material and is one million times thinner than the diameter of a single human hair.



- Graphene Applications -

Article by ...

Fyjaan

B.E. 2/4
ECE - A

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