

DEPARTMENT OF ELECTRONICS AND COMMUNICATION

EXPLORE, DREAM, DISCOVER

ISSUE 47

MONTHLY NEWSLETTER

DECEMBER 2021

GENESIS

IGNITING THOUGHTS

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Vision:

To be recognized at the national and international level for excellence in education and research in Electronics and Communication Engineering.

Mission:

- Inculcating leadership qualities, adaptability, and ethical values
- Imparting quality education in the field of electronics, communication, and related areas to meet the challenges in the industry, academia, and research
- Nurture the growth of each individual by providing a dynamic and conducive learning environment.

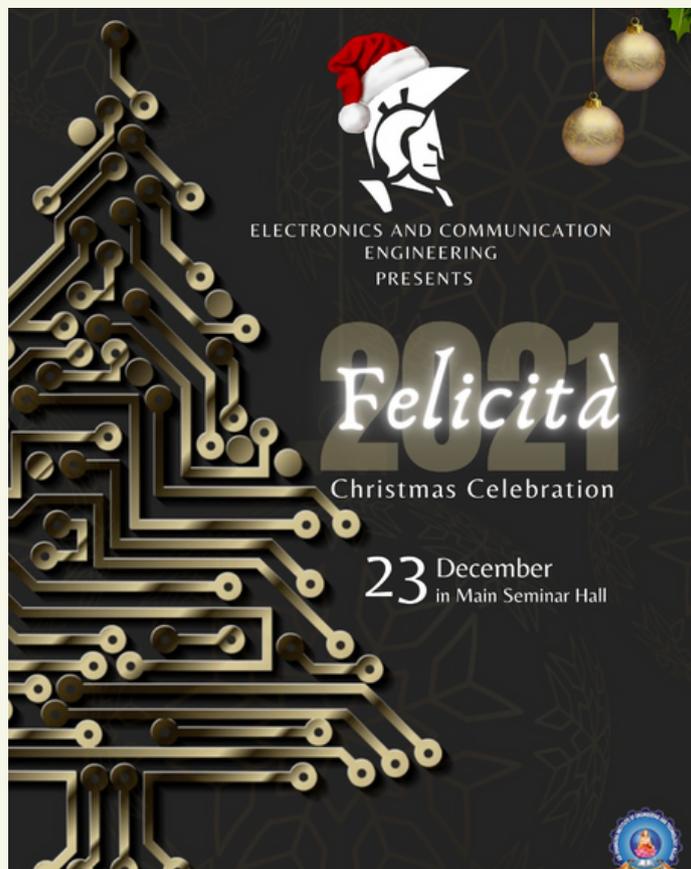
DEPARTMENT ACTIVITIES & ACHIEVEMENTS

FELICITA2021

Christmas is the season of joy and cheers, the time of the year to celebrate the culmination of yet another beautiful year. The electronics and communication department here at Adi Shankara Institute of Engineering and Technology celebrated this year's Christmas in all its grandeur with an array of events in place, under the title " Felicity 2021". The celebration kick-started with the merry tunes of Christmas carols sung by the students from S5.

The crowd jumped into a festive mood once Santa Claus made his entry followed by a series of scintillating performances by the students and faculty of our department which included music performances (solo and duet) piano solo, mimicry, musical story recital, and rocking dance performances that set the stage on fire. Christmas Cake was cut after the events and was relished by all. The program throughout was held in the seminar hall decorated with beautiful embellishments and stunning lighting making it a perfect space for a riveting dance party.

The memory of the celebration still lingers in our minds as a very memorable and joyous event. What better way to conclude another adventurous year and welcome a new year with hope, zest, and zeal! Wishing all a fresh start filled with happiness, success, and good health. Happy new year to all!

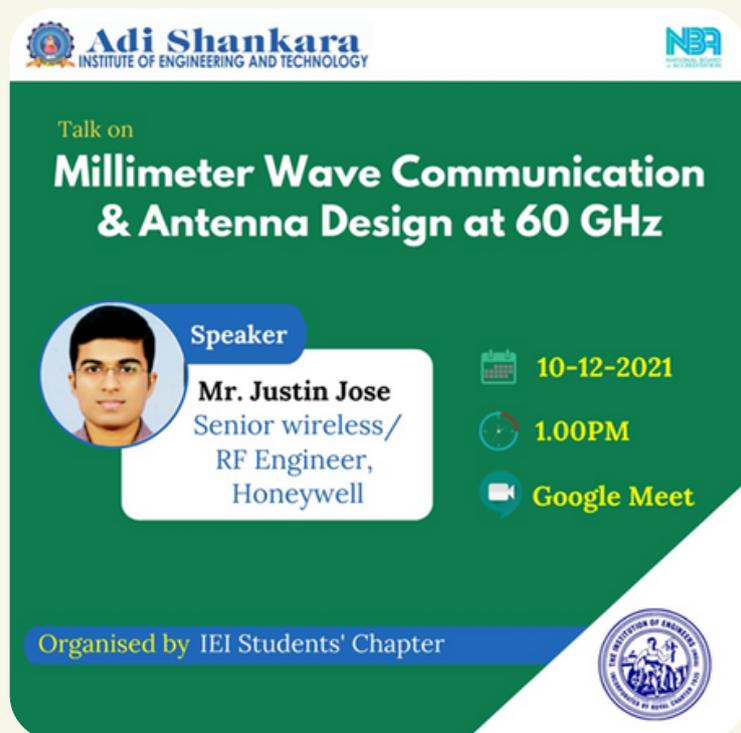


TALK ON MILLIMETER WAVE COMMUNICATION & ANTENNA DESIGN AT 60GHZ

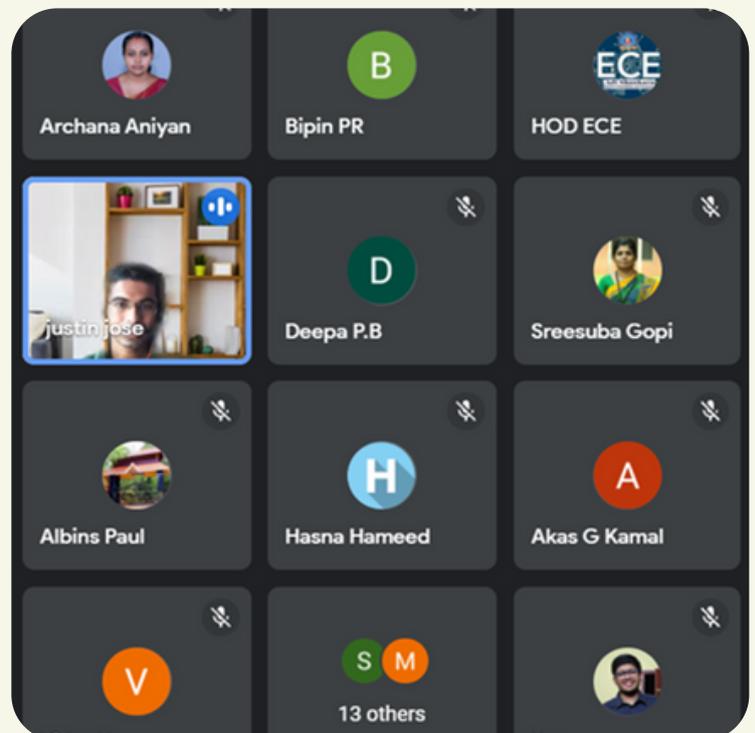
"Millimeter Wave Communication & Antenna Design at 60GHz" was organized by IEI within our esteemed institution ADI SHANKARA INSTITUTE OF ENGINEERING AND TECHNOLOGY, ERNAKULAM through Google meet on 10 December 2021.

The Talk started at 1:00 pm. The IEI Students Branch chairman (ASIET) gave the welcome address and invited the Resource person. The session began with a small introduction on the topic by Mr. Justin Jose. He is working as a senior wireless/RF Engineer at Honeywell. Honeywell is a major MNC based in North America. Mr. Justin was a former EC Student at ASIET.

Followed by these, was a wonderful interactive session where the audience interacted with the speakers clarifying their doubts and asking interesting questions. around 50 members including HOD of EC Dept. Dr. Bobby Mathews, IEI Faculty Advisor Dr. Ajay Kumar, and students attended the talk. The session ended at around 2:10 pm followed by a vote of thanks by IEI SB Secretary (ASIET).



The poster features the logo of Adi Shankara Institute of Engineering and Technology (ASSET) and the NBA logo. The text reads: "Talk on Millimeter Wave Communication & Antenna Design at 60 GHz". The speaker is identified as Mr. Justin Jose, Senior wireless/RF Engineer at Honeywell. The event is scheduled for 10-12-2021 at 1.00PM via Google Meet. It is organized by the IEI Students' Chapter.



A screenshot of a Google Meet grid showing 12 participants. The participants are: Archana Aniyan, Bipin PR (HOD ECE), Justin Jose (the speaker, in a larger window), Deepa P.B., Sreesuba Gopi, Albins Paul, Hasna Hameed, Akas G Kamal, and a group of 13 others. Each participant has a small circular icon with a letter or name.

MY STORY - MOTIVATIONAL SESSION BY A SUCCESSFUL ENTREPRENEUR.

Department of Electronics and communication in association with IIC cell and IEI Students Chapter organized an interactive session titled " My story" handled by Mr. Paul Alex, Co-founder and Chief Technology Officer at Hound Mobility, serial entrepreneur, and Ted- Ex speaker. This motivational session held on 26th November 2021 apart from effectively guiding the participants through entrepreneurship, also filled their hearts with enthusiasm and a passionate drive to work towards achieving their goal. The session throughout was interactive and the students received the opportunity to clarify their doubts during the question-answer session towards the end of the webinar.

The poster features the logos of Adi Shankara Institute of Engineering and Technology and the Institution's Innovation Council. The main title is "My Story - Motivational Session by Successful Entrepreneur". Below it, it says "An Interactive session with Mr. Paul Alex, Co-founder and Chief Technology Officer at Hound Mobility | Serial Entrepreneur | TEDx Speaker | Electric Mobility Enthusiast". The date and time are "26 Nov 2021 | 7.00PM" and the Google Meet link is "gqr-jgyv-vyx". It is organized by the Dept. of Electronics and Communication Engineering in association with IIC Cell & IEI Students' Chapter.

The screenshot shows a Google Meet interface. The main slide displays two panels: "Your plan" with a simple line drawing of a person on a bicycle reaching a flag, and "Reality" with a more complex line drawing showing a person on a bicycle navigating a winding, hilly path with various obstacles and flags. The meeting controls at the bottom show 65 other participants and a list of names on the right.

PENCIL DRAWING COMPETITION ON NATIONAL POLLUTION CONTROL DAY

On the occasion of National Pollution Control Day celebrated on second December 2021, the Department of Electronics and Communication of ASIET in association with IIC and IEI successfully organized a Pencil Drawing Competition as an initiative from the Sustainable Engineering faculty with the purpose of sensitizing the students to go green and protect our earth from pollution. The event was held at the Drawing hall starting from 1: 20 pm and was open to all the students of semesters three and five.



Let's!

CONGRATULATE

Anuroop K B Asst Professor, got selected for the Ph.D program at IIIT KOTTAYAM.



Best outgoing students 2017-22 BATCH

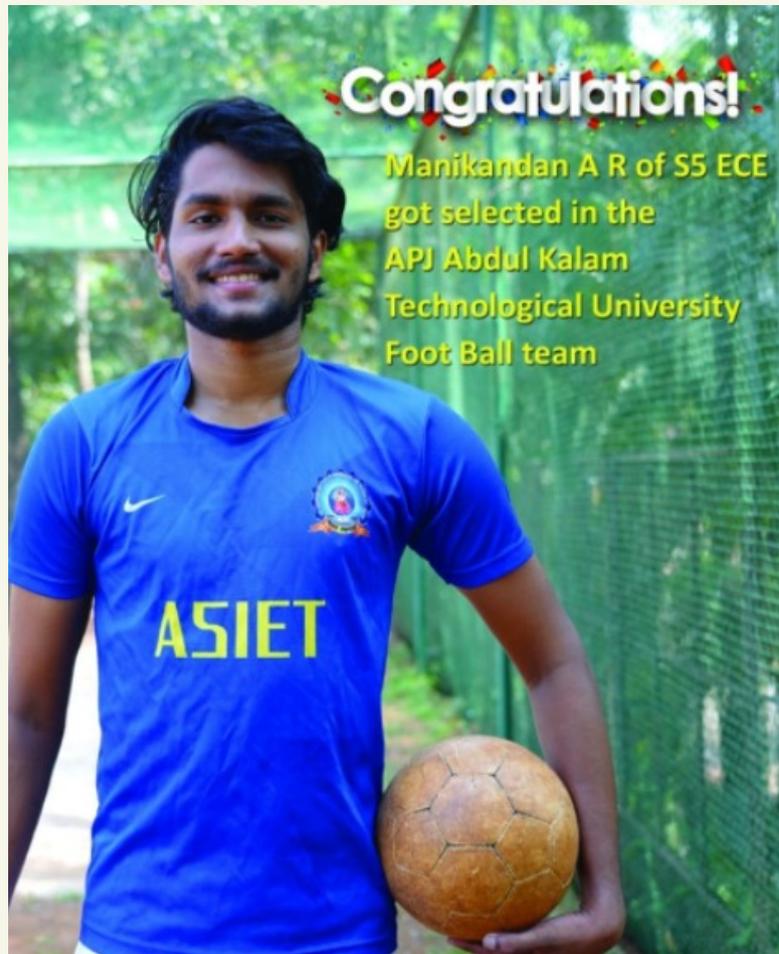


DEVIKA RAJAN (A BATCH)



PANKAJ KUMAR DWIVEDI (B BATCH)

CONGRATULATIONS



RECENT PLACEMENTS

Bob Jacob Benny (2021 batch) got selected to Ola Electric as Graduate Engineer Trainee.



Congratulations!

suyati
access to fluid cx

For getting placed at
Suyati Technologies

2018-2022
BATCH

 Lakshmi Nandana N R	 Chris K Shily	 Aisha Mehrin K I	 Abin P Xavier	 Kavva G Padiyar	 Aravind Narayanan
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Congratulations!

Tech Mahindra

For getting placed at
Tech Mahindra

2018-2022
BATCH

 Rahul G Krishna	 AkhilKumar A
--	---

Congratulations!



For getting placed at
Wipro

2018-2022
BATCH



Aswathy Babu



Devapriya S



Harshit Kumar



Hridaya U Mallia

Congratulations!



For getting placed at
IBS Software

2018-2022
BATCH



Ashna Biju



Daniel Besant

Congratulations!



For getting placed at
Experion Technologies

2018-2022
BATCH



Ajmal Ali K M

Congratulations!



BORN TO ENGINEER

For getting placed at
Quest Global

2018-2022
BATCH



Malavika J



Mishal C J



Parvathy S Kumar



Jayakrishnan

Congratulations!



For getting placed at
UST Global



Preethesh K



Harshit Kumar



Safar K Naizam



Govind V J



Ajmal Ali K M



Jagannath U



Anna Paul



Aswathy Babu

Congratulations!



For getting placed at
UST Global



Athulya Mathews



Krishna Priya Boban



Divya D Menon



Varsha T R



Hridaya U Mallia



Devapriya S

Congratulations!



For getting placed at
Marlabs



Hridaya U Mallia

2018-2022
BATCH

Congratulations!



For getting placed at
GadgEon Smart Systems Pvt. Ltd.



Anjana V P

2018-2022
BATCH

Congratulations!



For getting placed at
QBurst



Narayanan Seshan



Neaha Rose Noble



Ajmal Ali K M

2018-2022
BATCH

TECH TALKS

TEACHER'S ZONE

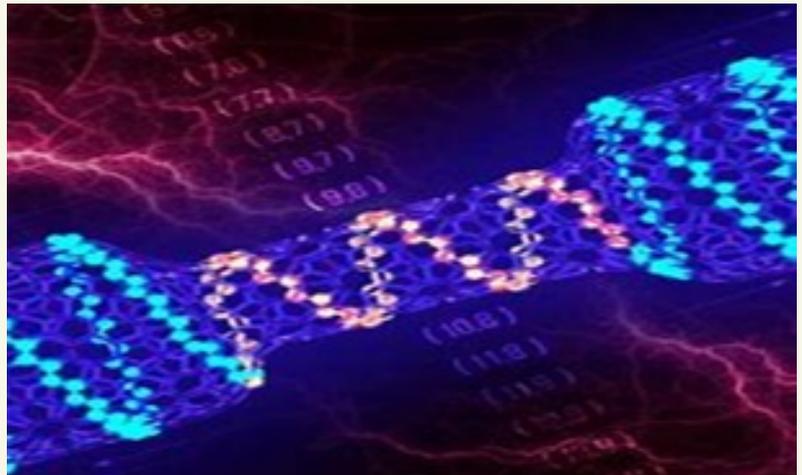
A DECISIVE STEP IN TINY TRANSISTORS - TURNING NANOTUBE INTO TINY TRANSISTOR - QUEENSLAND UNIVERSITY OF TECHNOLOGY



Author: Ms.Remya Ramesh, Assistant Professor, Department of ECE

An international team of researchers has used a unique tool inserted into an electron microscope to create a transistor that's 25,000 times smaller than the width of a human hair

The research, published in the journal Science, involves researchers from Japan, China, Russia, and Australia who have worked on the project that began five years ago. QUT Center for Materials Science co-director Professor Dmitri Golberg, who led the research project, said the result was a "very interesting fundamental discovery" which could lead a way for the future development of tiny transistors for future generations of advanced computing devices.



A designer view of a single-wall carbon nanotube intramolecular junction with metallic portions on left and right ends and a semiconductor ultrashort $\sim 3,0\text{nm}$ channel in between. Credit: National University of Science and Technology, Moscow.

The researchers created the tiny transistor by simultaneously applying a force and low voltage which heated a carbon nanotube made up of a few layers until outer tube shells separate, leaving just a single-layer nanotube. The heat and strain then changed the "chirality" of the nanotube, meaning the pattern in which the carbon atoms joined together to form the single-atomic layer of the nanotube wall was rearranged. The result of the new structure connecting the carbon atoms was that the nanotube was transformed into a transistor. Professor Golberg's team members from the National University of Science and Technology in Moscow created a theory explaining the changes in the atomic structure and properties observed in the transistor.

Professor Golberg says that in this work, they have shown it possible to control the electronic properties of an individual carbon nanotube. Lead author

Dr. Dai-Ming Tang, from the International Center for Materials Nano architectonics in Japan, said the research had demonstrated the ability to manipulate the molecular properties of the nanotube to fabricate nanoscale electrical devices.



Professor Dmitri Golberg led a team that used a unique tool inserted into an electron microscope to create a transistor that's 25,000 smaller than the width of a human hair. Credit: QUT

Dr. Tang began working on the project five years ago when Professor Golberg headed up the research group at this center. Dr. Tang says, "Semiconducting carbon nanotubes are promising for fabricating energy-efficient nanotransistors to build beyond-silicon microprocessors. However, it remains a great challenge to control the chirality of individual carbon nanotubes, which uniquely determines the atomic geometry and electronic structure. In this work, we designed and fabricated carbon nanotube intramolecular transistors by altering the local chirality of a metallic nanotube segment by heating and mechanical strain."

Professor Golberg said the research in demonstrating the fundamental science in creating the tiny transistor was a promising step towards building beyond-silicon microprocessors. Transistors, which are used to switch and amplify electronic signals, are often called the "building blocks" of all electronic devices, including computers. For example, Apple says the chip which powers the future iPhones contains 15 billion transistors



The computer industry has been focused on developing smaller and smaller transistors for decades but faces the limitations of silicon. In recent years, researchers have made significant steps in developing nano transistors, which are so small that millions of them could fit onto the head of a pin.

“Miniaturization of transistors down to nanometer scale is a great challenge of the modern semiconducting industry and nanotechnology,” Professor Golberg said. “The present discovery, although not practical for a mass-production of tiny transistors, shows a novel fabrication principle and opens up a new horizon of using thermomechanical treatments of nanotubes for obtaining the smallest transistors with desired characteristics.

Reference:

1. Queensland University of Technology. "Researchers use electron microscope to turn nanotube into tiny transistor." ScienceDaily.

www.sciencedaily.com/releases/2021/12/211223141924.htm (accessed December 29, 2021).

2. “Semiconductor nanochannels in metallic carbon nanotubes by thermomechanical chirality alteration” by Dai-Ming Tang, Sergey V. Erohin, Dmitry G. Kvashnin, Victor A. Demin, Ovidiu Cretu, Song Jiang, Lili Zhang, Peng-Xiang Hou, Guohai Chen, Don N. Futaba, Yongjia Zheng, Rong Xiang, Xin Zhou, Feng-Chun Hsia, Naoyuki Kawamoto, Masanori Mitome, Yoshihiro Nemoto, Fumihiko Uesugi, Masaki Takeguchi, Shigeo Maruyama, Hui-Ming Cheng, Yoshio Bando, Chang Liu, Pavel B. Sorokin and Dmitri Golberg, 23 December-2021, Science.

DOI: 10.1126/science.abi8884

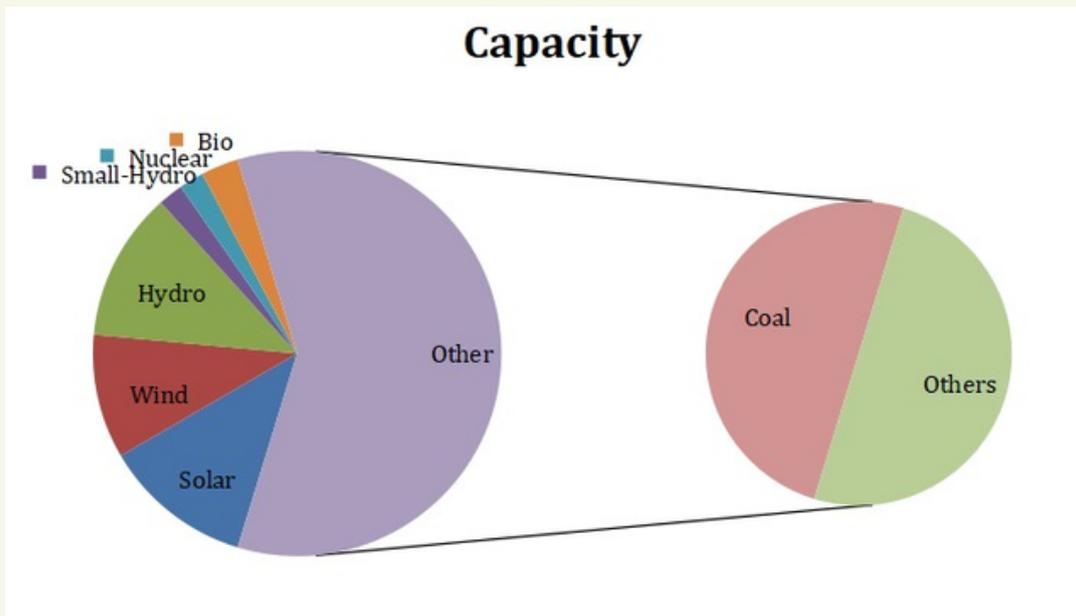
STUDENT'S ZONE

INDIA'S POWER CHALLENGE

By Vysakh Pradeep, S3 ECE B



It is said that “Coal is King” in India and it is expected to be so unless we achieve our goal of 450 GW of renewable energy by the year 2030. 60% of the energy produced is derived from thermal power plants, with 50% from coal alone. That means 234 GW from an installed capacity of 388.1 GW. India has great ambitions for increasing its solar power capacity, aiming to achieve 280 GW..



Source: Central Electricity Authority

The Solar Problem

India must understand that in order to have an economically feasible solar solution, it must possess the required infrastructure in terms of local manufacturers, raw materials supply, etc. India must be able to navigate geopolitical realities and establish a truly indigenous industry at home. Currently, the solar industry is heavily reliant on imports. India has no wafer production capacity as of now. Shifting to solar would require heavy investments, not only set up capacity but also the cost of duties if imports were to be reduced. With the new excitement from the public for electric vehicles, rooftop panels, etc., India would be turning into a huge market for solar power with no manufacturing capacity. The solar constant is 1.361 kWm^{-2} and the efficiency of current-generation commercial cells is only 14- 19%. Even then they have a lifespan of 25 to 30 years. Massive numbers of solar panels are bound to be retired, on top of the fact that the Silicon used for making them is in short supply. We all have seen how the Silicon shortage of 2021 caused disruption in the global supply chains of several industries. As the popular saying goes, the only person who wins from a gold rush is the one who sells shovels!

The Much-Maligned

Nuclear Energy A very tiny 3.1% of our energy comes from nuclear power plants. We must remember that India predicted the presence of nuclear deposits as early as 1901. The first mine was operational in 1967. It is however saddening that a wave of uncertainty, fear, and opposition cropped up among the general public against nuclear energy. Nuclear power was associated with Weapons of Mass Destruction (WMDs). Chernobyl and Fukushima hardly did any help to its image among the public. All of the Indian nuclear projects have been realized with the help of western nations that supplied expertise, transfer of technology, initial investment, etc. Kudankulam faced massive public protests in 2011. The proposed Jaitapur plant also faces similar opposition from the public and interest groups



The surprising fact about nuclear energy is that the fuel U-235 has an energy density of 79,390,000 MJ/kg¹

. Nuclear fuel has around 2×10^7 times the higher energy density than any other kind of fuel!

What India missed out on was switching to nuclear power long ago, to be at par with the United States and China in terms of generation. Uranium-based plants produce comparatively small amounts of waste that can be disposed of safely, or be used in thorium breeder reactors. It gives higher energy per kilogram of fuel and only need to be refuelled in plants in about 1.5 to 2 years. It is therefore, wise that we include nuclear energy when we speak of sustainability, in order to achieve our environmental conservation goals as well as address the growing needs of the population

STAFF ACHIEVEMENTS • Prameela B, Associate professor, Presented a paper titled "A feed-forward gain enhancement technique in a narrow-band low noise amplifier using active inductor" in AVES '21 ON 19.12.2021 AT S. V National Institute of Technology, Surat.

STUDENT ACHIEVEMENTS • ASHNA BIJU of 2018-22 batch completed an Online Internship on "Internet of Things" at Enfono Technologies on 12/20/2021

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