

➤ **Soceties: DEPTH**

• **Cosmology Club**

DEPTH (DelTech Engineering Physics Technical Hub) is a one of its kind society in DTU which has incredible excellence in Physics.

Research studies these days are gaining an unprecedented focus and attention. A researchable area in any academic discipline is an area that has ample scope to be explored. The very path one traverses in search of authentic solutions to a specific academic problem constitutes of what we call 'research'. This research question posed by the researcher and the methodology that he adopts to get solutions is the most crucial part of the research work.

Advances in technology are often based on discoveries in physics and inventions based on a new interpretation of existing scientific knowledge. Astrophysics, quantum mechanics and investigations into atomic structure and energy have been able to explain much of the way the world works, even down to the original birth of the universe. Also, Physics is not a standalone field. Its tenets actually apply to a wide variety of fields. Specific aspects of physics that many people find daunting include the need to understand different mathematical equations and graphs and then be able to translate those concepts into real life. While there may be easier subjects out there, one of the values of studying physics is that it is intrinsically challenging and therefore also extremely rewarding when a student finally understands it.

Electrical and Electronics engineering is at the forefront of developing new technologies for a number of industries including transport, healthcare, construction, and robotic. The programs in electronics are rigorous with an emphasis in math and science. Students study topics such as wireless, digital, data and fibre optic communications, which prove to be extremely engaging topics for research.

Along with the need to acquire a first-hand knowledge of the subject time, money and patience could also prove to be some constraints for a researcher. The research work itself demands attention to finer details and accuracy. When these things are put to stake in a bid to hurry up there could be massive flaws in the work. A research enthusiast hence must overcome these barriers and get heads on involved in the work.

Pursuing a research project is a challenging and rewarding experience, and this opportunity enables one to pursue an in-depth original study about a topic of interest.

Vision

The Department of Applied Physics aims to act as a centre of excellence for creating an environment of technological innovation and solving problems using scientific approach. To provide facilities to delve into educational research in various fields of physics such as nanotechnology, nuclear technology, microwave and optical communications, etc.

OBJECTIVES:

1. To teach students basic indispensable concepts of physics which form the foundation of the subject. These concepts include Classical Mechanics, Quantum Mechanics, Special Relativity and Electromagnetics.
2. To help develop an inclination for research among the students.

A research begins with a potential idea or a question. One of the most important of the research problems is the 'validity' of the research question itself. This however can be overcome by attaining a deep insight into the subject which allows one to raise questions, which will be promoted among the students by the society.

3. Formation and presentation of research papers.

Once a project is completed, Student should be able to present it to the professors in the form of research paper and society provides a platform for such works to be accomplished by the involved students.

4. Guiding the students for further higher studies. The society considers it a goal to guide those aspiring to pursue a career in R&D, or secure admissions in higher institutions, by providing them with the pre-requisites, academically or otherwise, in terms of guidance.

WHAT MAKES US DIFFERENT?

The fact that our college has not seen many such societies as ours, which focuses considerably on regular lecture classes given by the society member themselves, with the help of recognized unequalled resources, renders the reason that DEPTH should be associated with DTU. Good knowledge should be always be put to good use. This is the purpose of the society; the society members attempt to combine learning with ideas to help grasp the practical know-how for future study and more importantly, carry out research under concerned professors, not only for their own benefit but also for the fellow students.

If not for research purposes, students who find physics anything but problematical would be greatly benefited.

OUR ACHIEVEMENTS

1. Former Member, Vaibhav Sharma, EP BTech'15

- 1) GSoC 2017 - Proposal selected by Australian Open Source Software Innovations and Education for the Carbon footprint project.
- 2) IIIT Hyderabad Hackathon Winner - Digital Masala Hackathon 2017 sponsored by Facebook. Received a funding of 5000\$ to further develop his project.
- 3) GSoC 2018 Mentor - Served as a mentor at AOSSIE for a carbon footprint project on Crowdalert web.
- 4) Placement - Is successfully placed in Zomato with a CTC of 24 lacs.

2. Former Member, Alankrit Tomar EP BTech'15

- 1) Research Paper Published:

- “*Design and Analysis of a graded Rectangular-Core Photonic Crystal Fibre for Low-Loss Terahertz Communication*”, Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications XII, SPIE Optical Engineering + Applications, San Diego, California, US (Link: <https://doi.org/10.1117/12.2320912>).
 - “*Rectangular-Core Photonic Crystal Fibre for Low-Loss Terahertz Communication*”, International Conference on Advances in Optics and Photonics, Optical Society of India (OSI), Hisar, India.
 - “*Triangular-Core Photonic Crystal Fiber for Terahertz Communication*”, Photonics 2018, Indian Institute of Technology, New Delhi.
- 2) Was selected to undertake a 12-week fully-funded project at Universite Laval, Quebec, Canada under the MITACS Globalink Research Internship Program.
3. Our former member **Debadri Das EP DTU'14** got selected for M.S. in Quantum Computing at Stanford University.
4. **Chirag Arora EP DTU'15**
- 1) Only person to crack GSoC 2016 in first year from DTU
 - 2) GSoC Student Mentor for two years.
 - 3) Represented my GSoC org (AOSSIE) at Mentor summit that took place in Sunnyvale, California
 - 4) Got selected in CERN OpenLab summer student programme in 2018 and henceforth, interned at CERN in Geneva during the summer.
5. **Rishi Aneja EP DTU'15**
- 1) Selected for Mitacs Globalink research internship at University of Ontario Institute of Technology.
 - 2) Selected for the Harvard project for Asian and international relations 2016 in Hong Kong.
 - 3) Prize Winner: Jaipuria Quiz League 2018 National Finals 2nd position and Jaipuria Quiz League 2019 regional finals 1st position.
6. Current team member **Aryan Jogia and Pranav Kairon** interned at SSPL (SOLID STATE PHYSICS LAB) a laboratory of the Defence Research & Development Organization (DRDO). Located in Delhi, it is the main DRDO lab involved in the development of Semiconductors and related technologies in India.
7. Our current team members namely **Ishan Goel, Aditya Prasad, Tariq Naseem and Pranav Kairon** interned at LASTEC (Laser Science and Technology Centre) a laboratory of the Defence Research & Development Organization (DRDO). It is the main DRDO lab involved in the development of Lasers and related technologies. LASTEC functions under the DRDO Directorate of Electronics & Computer Science.

DEPTH EVENTS 2017-2018

Special Interest Group (SIGs)

Our society has always been involved in infusing knowledge in students. Special Interest group were formed to infuse basic aptitude of fundamental topics of physics. These topics include Classical Mechanics, Special Relativity, Quantum Mechanics, Astrophysics and Electromagnetic theory (EMT). SIGs were also formed specifically before exams (in the last week) to clarify doubts related to specific topics of physics.



Industrial Visit

An industrial lab visit was organized for the B.Tech (Engineering Physics) students 2k15 batch to the Solid State Physics Laboratory (SSPL), Defense Research and Development Organization (DRDO), Timarpur, New Delhi was held on 22nd October, 2018. Its aim was to sensitize them about the practical challenges that organizations face in the chip designing against the course they are studying in 7th semester: VLSI and FPGA design. It was aimed to make them well acquainted with the professional working environment and to give practical hands on experience. During the visit students were given a brief lecture by the scientist working there on an introductory lecture on chip designing

Intra departmental cricket tournament

Event: Date: 31 Oct and 2nd Nov, 2018

On the mentioned dates, Depth, the only physics society of DTU conducted intra departmental cricket tournament under the supervision of our faculty advisor Mr Deshraj Meena, in which 6 teams participated (EP first year i.e A8 & B8, EP second year, EP third Year, DEPTH non EP and a team comprising of faculties).

As it happened

31st October: The proceeding began with EP 2nd year and EP 3rd year locking horns at Aryabhata ground. The match started at 8 AM sharp. EP second year won the toss and chose to bowl first. EP third year scored a total of 40 batting first in its batting quota of 6 overs, which the second years chased with 5 balls to spare.

The second match was played between EP 1st years (A8 vs B8). The match began at 11, with B8 winning the toss and electing to bat first. B8 annihilated A8's bowling attack, scoring a massive 83 runs total in 6 overs. In reply, A8 bundled up for a mere 50 run total.

The third match witnessed the clash between B8 and Depth non EP team. The latter won the toss and chose to bowl. B8 did what they know the best, hammering DEPTH non EP's bowlers all around the park, scoring 80 runs of 6 overs. In reply, the other team bundled up for just 42 runs.

The last match of the day was the decider, as it would decide that who will face the faculties in the ultimate showdown. The B8 won the toss and invited the second year to bat first. The second year, even after a collapse, managed to score 53 runs in their 6 overs. B8 in reply scored only 36 runs, failing to achieve the set target.

2nd November

Faculties and the second years locked their horns at the DTU sports complex. The proceedings began at 9, with faculties winning the toss and electing to bat first. The faculties showed a lot of character and showed the second years that **who's the boss**. The faculties tamed the second year's bowling line-up, hitting them all around the park, scoring 97 of their quota of 15 overs. In the innings break, refreshments were served, in order to refill the energy bar of players. In the second innings, the faculties again tamed the 2nd years, just making it impossible for them to score. Somehow, the second years managed to achieve the target in the last ball of the match, but it was evident that even though 2nd years won the match, the faculties won everyone's heart and respect.



Lansdowne Astronomical Trip

We have organized successfully a night sky observation trip to Lansdowne, Uttarakhand on 17th March, 2018.

Following were the aims of this trip:

- 1) To equip the students with the basic abilities of handling and operating Telescopes for extra-terrestrial observation.
- 2) To overcome the common misconceptions related to the physics of planetary motion, star life cycle, and nebula formation and to develop in depth understanding of the above topics.
- 3) To teach student the art of astrophotography and software used to process data.
- 4) To motivate students to pursue research and higher education in astronomy & astrophysics.



List of the events going to be held in “INVICTUS”, Tech Fest DTU-2019

- 1) Ideathon
- 2) Tricky Circuit Competition
- 3) Image processing competition
- 4) Virtual Planetarium
- 5) Physics Quiz
- 6) GRE, GATE and CAT informative session
- 7) Hovercraft Workshop
- 8) CANSAT Workshop