University of Delhi at ANDC SPIE Student Chapter

SPIE Annual Report 2022

Faculty Advisor: Prof. Amit Garg

SPIE Office Bearers (Total existing members: 33)
1. President- Ms Shruti Yadav, B.Sc. (H) Electronics
2. Vice-President- Mr Devesh Yadav, B.Sc. (Prog.) Physical Science (Computer Science)
3. Secretary- Mr Aditya Goyal, B.Sc. (Prog.) Physical Science (Computer Science)
4. Treasurer- Mr Shivansh Bhatnagar, B.Sc. (H) Electronics
5. Technical Officer- Mr Ankush Rana, B.Sc. (H) Electronics
6. Editorial Officer- Mr Kalpajit Roy, B.Sc. (H) Physics

International Day of Light 2021 Celebration
Date/Mode/Location: May 16, 2021, Online mode: Google Meet
Participants: Around 300 students from all over India
The SPIE student chapter at Acharya Narendra Dev College, University of Delhi organized thrilling events online on the occasion of International Day of Light on May 16, 2021 to cheer the students and participants. The official theme of SPIE, **"Let Your Light Shine"** was the name given to the event. The four major events organized in this celebration included Web based Treasure Hunt, Big Fact Meme Hunt, Advertizee Competition, and Sci-Fi Quiz Competition.

Workshop on Basics of Arduino Programming
Date/Mode/Location: June 01-02, 2021, Online mode: Google Meet
Participants: School students of classes 9 to 12
Speaker: Chapter members
The SPIE chapter organized a workshop in the online mode amid the second wave of Covid for the students of Lovely Public School, Delhi. The workshop titled 'Basics of Arduino Programming' was organized for two days (June 01-02, 2021), where the chapter members mentored a group of 100 students in learning and implementing Arduino Programming through an online platform named Tinkercad. Some basic experiments related to Arduino were displayed like the blinking of LEDs, measurement of distance using ultrasonic sensors, the beeping of buzzers etc, to provide a basic look into the working and programming of Arduino circuits. At the end of the workshop, the quiz conducted to test the understanding and learning of the students from the workshop showed a good performance overall.

Talk On 'Imaging Arithmetic: Physics U Maths> Physics + Maths'
Speaker: Prof. Gaurav Sharma
Date/Mode/Location: June 29, 2021, Online mode: Google Meet
Participants**:** Chapter members and PG and Ph.D. students from other colleges as well
An interactive and educational session was organized under the banner of the SPIE ANDC Research Programme (SARP). Around 75 undergraduate students from different colleges attended the session. Dr Gaurav Sharma, Professor of Electrical and Computer Engineering, University of Rochester, New York, delivered a talk on 'Imaging Arithmetic: Physics U Maths> Physics + Maths'.

Cloud Computing Workshop
Industry Partner: Brain Mentors Private Limited, Delhi

Date/Mode/Location: September 06-10, 2021, online mode, Google Meet.
Participants: Chapter members, ANDC students, and other college students.
Speaker:MrRavikant Tyagi from Brain Mentors
Cloud computing is the delivery of computing services including servers, storage, databases, networking, software, analytics, and intelligence over the internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale. Acknowledging the importance of these services in the current technological world, the SPIE chapter in collaboration with Brain Mentors Pvt. Ltd. (industry partner) organized an online workshop on 'Cloud Computing' from September 06-09, 2021 and September 11, 2021 on Google Meet. The key learning outcomes included: understanding the fundamentals of cloud computing, an introduction to core services of AWS (Amazon Web Services), billing and support services, and the security aspects of cloud computing. About 50 students participated with enthusiasm and the workshop was highly productive as per the feedback obtained.

Science Education Outreach Activity 2021
Topic: Sensor Interfacing using Arduino
Date/Mode/Location: October 18-31, 2021, online mode: Google Meet
To promote contemporary optics at the school level, the SPIE chapter performed an outreach activity with 9-12 standard students from two different schools. Five chapter members acted as mentors to students for this activity. Since students did not have any access to laboratory materials because of the Covid lockdown, all the activities were so designed that they could be easily performed their own homes. All the selected activities introduced the practical aspect of the concepts of Arduino Programming. Specifically, through the activity titled 'Sensor Interfacing using Arduino' students were given an insight into the different aspects of Arduino and its applications.

Ongoing Research Projects
1. *SPIE Mask Detector*
After the breakout of COVID-19, there arose a severe need to ensure the usage of air droplet protection mechanism, like face masks by the masses. Using Machine Learning Algorithms, we have come up with an idea to make a face mask detector that detects the presence of face masks on a human face. Integrated Data Science algorithms along with Electronic Science advances will be compiled together to detect whether a person is with or without a face mask and by giving an appropriate output using Buzzer or LED (i.e., red - without mask and green - with mask).
2. *Li-Fi (Light Fidelity) and Analysis*
Sound transmission using LED lights has already been demonstrated, so through this project, some of the chapter members will apply data analysis tools and techniques to check the relation between different wavelengths and the transmitted sound. The data will be collected from a working project using smartphone apps to demonstrate the use of handheld devices in doing projects.

Talk On Career Opportunities in Publishing
Date/Mode/Location: February 04, 2022, online mode: Google Meet
Participants: 50 (approx.) chapter members and college students
Speaker**:** Mr. Sahil Gupta, Founder at publishingconsultant.in

The world today is consuming media at a rate higher than ever before. Content creation is now a viable career option for aspiring students. Since it is such a new, different and rather diverse field, many aspirants are justifiably confused as to how they should go about to pursue this. The SPIE Student Chapter at Acharya Narendra Dev College, University of Delhi teamed up with Mr. Sahil Gupta, founder at pulbishingconsultant.in to shed some light on this largely underdiscussed field.

Quiz Competition on Telescope
Date/Mode/Location: February 20, 2022, online Google Meet.
Participants: Chapter members and students from various colleges and schools
The successful launch of the James Web Telescope is no less than a marvelous achievement for humanity. Hence, to celebrate this humungous accomplishment, SPIE Student Chapter decided to come up with a QUIZ COMPETITION ON TELESCOPES. This competition was held on February 20,2022via Google Meet and the Quizzes App. Students from various colleges, irrespective of their domains, participated wholeheartedly. The competition went off well, and in the end, the top three winners were awarded exciting prizes.

National Science Day-Museum of Illusions Visit
Date/Location**:** February 28, 2022, Museum of Illusions, New Delhi.
A visit to the Museum of Illusions, New Delhi is a unique experience for students as they have the opportunity not only to have fun but also to learn a lot about vision, perception, human brain and Science. One of the best things about this museum is the holograms and optical illusions. There are a number of images, portraits, and even engraved pieces of art that give it a 3D look. Some of the things to watch out for include images that disappear without reason, change their motif, or pop out of the picture. On February 28, 2022, we visited the Museum of Illusions, Connaught Place, New Delhi, Delhi 110001 on the occasion of National Science Day. Trips like these increase awareness and enthusiasm in young minds. Exposure to such knowledge, encourages students in the field of optics and mind storming.

Full Stack Web Development Using Mern
Industry Partner: Brain Mentors Pvt. Ltd., Delhi
Date/Mode/Location: March 05 - 09, 2022, online mode, Google Meet
Participants: 25 (approx.) chapter members and college students
Speaker: Mr Amit Srivastava, Founder-CEO Brain Mentors Pvt. Ltd.
With the advent and global accessibility of the internet, the world is now more interconnected than ever before. Everyday more and more websites are being added to the already seemingly-endless list. It wouldn't be wrong to say that digital innovations have ushered in a new age - the age of the internet. Recognizing the potential of this new and exciting career field, the SPIE Student Chapter at Acharya Narendra Dev College, University of Delhi partnered with Brain Mentors Pvt. Ltd to organize an online workshop focusing on Web Development using the latest industry-ready tools. On March 05, 2022 approximately 25 students attended the virtual workshop through the online conference portal, Google Meet. Mr. Amit Srivastava, Founder-CEO of Brain Mentors Pvt. Ltd. introduced the basics of the tools required and the essence and industry necessities for web development. The students learnt the basics of front-end and back-end web designing.

Learning Holography: A One-Day Offline Workshop
Date/Location: March 14, 2022, SPIE Lab, Acharya Narendra Dev College

Covid was no less than a nightmare for all of us, and the education system all over the world was heavily shaken by it. But "every sunset brings the promise of a new dawn." Hence, to rejuvenate offline learning after the catastrophe, the SPIE Student Chapter organized a one-day offline workshop on Holography, conducted by an esteemed faculty Dr Sanjay Kumar. Each session lasted around 1.5 hours, and a real hologram image was brought out at the end. The hologram was also cut into four pieces and distributed among the students as a token of learning and experience. The session was highly enriching and fruitful.

Arduino and Sensor Interfacing Workshop
Industry Partner: Touch Techno, Delhi
Date/Location: March 26, 2022, Electronics Lab at Acharya Narendra Dev College.
Participants: Around 30 students
Microcontrollers such as Arduino is a boiling topic in the field of Science. Together with sensors, Arduino can do wonders by simplifying our lives. Keeping in mind the need for students to learn modern technologies, the SPIE Student Chapter of Delhi at Acharya Narendra Dev College partnered with Touch Techno to bring a fun and informative physical hands-on one day workshop in the college. Students were first taught about the theoretical aspects of a microcontroller followed by hands on practical projects including blinking of LEDs to using IR sensors to make obstacle detectors. All the students were provided with individual Arduino Uno systems along with LEDs, sensors, wires and other required equipment to perform experiments.

Summer School on Optics and Photonics: Fundamentals and Applications Organized by IIT Delhi
Five members (Mr Naman Sirohi, B.Sc. (H) Electronics, I year; Ms Neha Khanra, B.Sc. (H) Physics, I year; Ms Nisha Khanra, B.Sc. (H) Physics, I year; Mr Aryan Kesarwani, B.Sc. (Prog.) Physical Science (Chemistry), II year; Ms Sakshi Garg, B.Sc. (Prog.) Physical Science (Computer Science), II year) of SPIE Student Chapter University of Delhi at Acharya Narendra Dev College, participated in the Summer School on 'OPTICS AND PHOTONICS: FUNDAMENTALS AND APPLICATIONS' organized by IIT Delhifrom June 06-24, 2022 in the online mode.