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Introduction

SPIE-DCE Chapter at DELHI TECHNOLOGICAL UNIVERSITY is an active group in the university and being associated with it has been a very memorable learning experience during my PhD program and it is not only for me but for every other members of this chapter. Through this student chapter, SPIE has provided all the students of our chapter who are interested in Optics and Photonics, a gateway to connect to the outside world involved in this area. The student chapter has rendered the much needed platform to bring all the students of the college together who share the same zeal and interests.

There is a uniqueness in our chapter for most of our members are undergraduates studying engineering in various fields such as Engineering Physics, Information and Communication Technologies, Electrical, Mechanical and Polymer technology, to mention a few among many. So what SPIE-DCE chapter does for the undergraduates is that it induces interest in Optics and Photonics and encourages the student to think beyond the traditional fields in their respective branches.

I had received the SPIE Officer Travel grant-2011 from SPIE which was a wonderful opportunity to attend and present technical papers and also represented the chapter at the exhibition in the conference SPIE Optics & Photonics, 2011 at San Diego. To meet and interact with the most eminent researchers in the field, some of those from whose books we learn back home was very motivating and a humbling experience. The icing on the cake was to meet and become friends with students from all over the world working in the same field, sharing same passion. At the chapter leadership workshops we discussed and shared inputs about how to manage our chapter better and how to popularize our chapters among the new students in our colleges.

During my role as the chapter President I have always had support from my senior and the new chapter members, their enthusiasm and eagerness in organizing activities is very commendable. I would particularly like to extend my thanks to other PhD researchers associated with our chapters: Sahil Bhatia, Himanshu Chauhan, Kamal Kishor and Shruti. But the most important and beneficial role has been played by our faculty advisor Prof. R.K. Sinha. Despite his busy schedule as a teacher, researcher, he has always found time and energy to help and motivate us in chapter related activities. Finally I would like to thank Dirk, Ben, Tasha and Alison from SPIE for their constant support in smooth running of our chapter.

Venus Dillu

President 2011-2012

SPIE DCE Chapter
Officers

Faculty Advisor

Prof. Ravindra Sinha – Fiber optics & optical communication
Head, Applied Physics Department
dr_rk_sinha@yahoo.com

Research Scholars Associated with the Chapter

President Ms. Venus Dillu

Vice President Mr. Sahil Bhatia

Secretary Mr. Kamal Kishor

Treasurer Ms. Shruti Singh
Collaboration

**TIFAC-CORE in Fiber Optics and Optical Communication @ DCE**

*SPIE DCE CHAPTER*

SPIE DCE CHAPTER has collaborated with TIFAC-CORE@DCE for research and development activities in the field of Optical Communication and Optical Engineering. TIFAC-CORE@DCE will provide student members with the latest facilities available in its labs & the students will undertake and help in industrial projects assigned to TIFAC-CORE@DCE.

**SPIE DCE in collaboration with TIFAC-CORE@DTU (DCE)**
Chapter Activities

24th January 2011

Lecture Series Organized By SPIE DCE Chapter with DEPTH (Deltech Engg Phy Technological Hub)

LECTURE 1 - Eminent Prof. M S Sodha delivered a lecture on “A Physicist Encounters Engineering” by Padamshree M.S Sodha
Prof. M S Sodha with Prof R K Sinha and Prof P B Sharma
28-30th January 2011

Department of Applied Physics in Association with SPIE DCE Chapter & DEPTH organized a workshop on ROBOTICS by ROBOSAPIENS, India.

B Tech students actively participated and interacted in the workshop.

3rd February 2011

Lecture Series Organized By SPIE DCE Chapter with DEPTH (Deltech Engg Phy Technological Hub)

LECTURE 2 - Eminent Prof. Ajoy K Ghatak delivered a lecture on “Measurement in Quantum Theory”
March 2011, Visit by Prof K Shenai

LECTURE 3: Prof Krishna Shenai, of International fame from University of Toledo delivered a talk on “Rugged electrical power switching in semiconductors.”
SPIE Summer Training

SPIE DCE Chapter organized three weeks Summer Internship for undergraduate students and educated them about basics of optics, photonics, PCF, metamaterials, plasmonics and they also learnt various related experiments, during 11th -29th July, 2011.

<table>
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<tr>
<th>Serial No.</th>
<th>Faculty/Scholar</th>
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<tbody>
<tr>
<td>1</td>
<td>Dr. Ajeet Kumar</td>
<td>Basics of optical fiber &amp; optical communication</td>
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<tr>
<td>2</td>
<td>Ms. Monika Rajput</td>
<td>Dispersion characteristics &amp; properties of optical fiber</td>
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<tr>
<td>3</td>
<td>Ms. Bhavna Dabas</td>
<td>Introduction of photonic crystal fiber (PCF): Theory</td>
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<td>4</td>
<td>Mr. Kamal Kishor</td>
<td>Characterization of PCF : OVERVIEW</td>
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<td>5</td>
<td>Ms. Swati Rawal</td>
<td>Optical Network</td>
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<td>6</td>
<td>Ms. Shruti</td>
<td>Planar Optical Waveguides and their Application</td>
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<tr>
<td>7</td>
<td>Ms. Venus Dillu</td>
<td>LASER</td>
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List of Experiments done during SPIE Summer Training

1. LASER characteristics: P-I & V-I graphs for LED and LD.
2. Detector characteristics: P-I & V-I graphs for LED and LD.
3. Analog Communication
4. Digital Communication
5. Modulation technique: PP, PW and PAM.
6. Frequency Division Multiplexing & Demultiplexing.
7. OFT Communication Technique
8. OTDR
9. EDFA Demo
Asst. Prof Dr Ajeet Kumar delivering a lecture on Basics of optical fiber & optical communication
Ms Monika Rajput delivering a lecture on “Dispersion characteristics & properties of optical fiber”

Ms Bhawana Dabas giving a talk on "Introduction of photonic crystal fiber (PCF): Theory"
Ms Venus Dillu giving a talk on “LASER”

Ms Swati Rawal delivering a lecture on "Optical Network"
Ms Shruti delivering a talk on “Planar Optical Waveguides and their Application”

Mr Kamal Kishor sharing an overview on “Characterization of PCF”
23rd July-1st August, 2011

SPIE DCE Chapter won Education Outreach Award of 3000$ and thus organized workshop on Optics for Teachers.
20th-25th August 2011

Ms Venus Dillu received Officer Tracel grant to attend: Student Leadership Chapter Workshop on 20th August 2011 in San Diego, California and also presented her paper at the international conference SPIE –Optics & Photonics at San Diego, CA, USA.

Ms Venus Dillu, President SPIE DCE Chapter @ DTU, representing the chapter at the workshop. Ms Dillu interacting with Prof E L Dereniak, President SPIE 2012.
Ms Dillu with Prof Naomi J Halas

Ms Dillu with Prof Vengu and other chapter leaders

Ms Dillu with Prof K Bajaj

Ms Dillu with Prof A Lakhtakia

Ms Dillu at SPIE DCE Chapter @ DTU booth during the Chapter Exhibition with Mr. Dirk Fabien and Mr Ben Lockwood.
Ms. Venus Dillu, presenting her paper “Infiltrated plasmonic photonic crystal cavity for sensing,” at SPIE Optics & Photonics 2011, Proc. SPIE 8120, 81201F dx.doi.org/10.1117/12.893754

October 2011

SPIE and OSA chapters of Delhi Technological University held a competition DESIGN PRO 1.0 (Smart Lighting Challenge 2011) for undergraduates in the month of October and also kept a promotional event.
Undergraduate students getting prizes and certificates for Design Pro 1.0
Visitors @ SPIE DCE Chapter

7th Nov. 2011

Dr Ishwar D Aggarwal from Naval Research Laboratory, USA and Research Professor @ Dept of Physics and Optical Science, University of North Carolina at Charlotte gave a lecture on Optical material and devices used in military equipments.

Prof Partha Banerjee from University of Dayton, Ohio, USA delivered a talk on Metamaterials.
5th Dec 2011
Prof Somnath Sarkar from Calcutta University, Calcutta, & Prof S I Hosain, Deputy Director of Vocational Education & Consultant, Cuttack visited TIFAC CORE lab in Applied Physics Dept.
Awards

- **Swati Rawal** has been awarded a fellowship of 1050 GBP by the Department of Physics and Astronomy, St. Andrews University, Scotland, UK to appreciate the fabrication facilities of NanoPhotonic Devices going on in the department as well as to attend the Summer School of Silicon Photonics from 28th June 2011 to 13th July 2011. During her stay in UK, she has initiated interaction with Prof. T. F. Krauss and his research group for joint research activity in the field of Photonic Crystals.

- **Venus Dillu** has been awarded Officer Travel Grant worth 2250$ from SPIE for attending and presenting her research paper in SPIE Optics & Photonics 2011, held at San Diego, CA, USA during 20th-25th Aug 2011.

- **Kamal Kishor** received a travel grant of USD 1500 from Optical Society of America to attend the workshop on Laser in China, Changchun from 30thJuly-6th Aug 2011-09-23.

- **Kamal Kishor** received a travel support to attend the OSA meeting at University of Southampton, UK from 9th Aug-14Aug 2011.

- **Shruti** received a full travel grant from Department Of Science & Technology(DST), Govt. of India to attend SPIE Optics & Photonics 2011, held at San Diego, CA, USA.

- **SPIE DCE Chapter won Education Outreach award from SPIE worth 3000$ to educate and organize a workshop for school teachers about Optics and Photonics.**

Journal Publications


Papers in Conferences

4. "Performance Characterization of High Speed point to point Dual Broadcast service PON system without using any source at ONUs", Ambrish Kumar, Jiten Boruaah and R.K.Sinha, Presented and appeared in the proceedings (page number 171) of XXXVI OSI Symposium, Frontiers in Optics and Photonics, IIT Delhi during December 03-05, 2011
11. "Second Harmonic Generation for UV emission from left handed material ", Monika Rajput, R.K. Sinha, Swati Rawal, Bhawana Dabas and Shailendra Varshney, presented in Frontier in Optics-OSA, held in SanJose, California, USA during October 16-20, 2011, Paper Number: FThP4
## Financial Information

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## Resources at SPIE DCE Chapter

### Experimental Setups:

1. High Dc Voltage Measurement Using Electro-Optic Effect
2. High Dc Current Measurement Using Magneto-Optic Effect
3. Fusion Splicing Machine
4. Measurement of Dielectric Constant
5. Characterization of Optical Fibers
6. Optical Time Domain Reflectometer
7. WDM Network Analyzer
8. Analysis of Modal Propagation in Waveguides
9. CCD Based Imaging Systems
10. Laser Diffraction
11. Measurement of Speed of Light
12. Fiber Optic Voice and Video Links
13. BER Experimental Setup
14. Eye Diagram Analyzer for Optical Fiber Communication System
15. Fiber Fault Detection System
16. Newport Optical Fiber Setup
17. Newport Vibration free table
18. Newport Projects
19. EDFA Setup
20. Optical Spectrum Analyzer

Computational and Scientific Softwares:

1. Optiwave Fiber Laser Cad (Optiamplifier 4.0)
2. COMSOL
3. Intelli Suite
4. Matlab release 14
5. Rsoft Bpm Beam Propogation Method (Design Of Integrated Optical Components)
6. Opti_Hs (Semiconductor Hetrostructure Modelling)
7. Optiwave Fiber_Cad (Fiber Cad Suite)
8. Femlab
9. VPI Transmission Maker (Under Evaluation)
10. Opti-Amplifier
11. RSOFT Band Solver
12. OptiFDTD
13. IE3D (Trial Version)