



## **ANNUAL REPORT 2011**

The year 2011 had been very productive for the ISP – CELOS SPIE Student Chapter as the chapter saw full participation from the chapter members who took the chapter to a new height. The Social outreach program, Industrial tours, Saturday labs and Special seminars were organised through the year. Eminent speakers related to field of Optics and Photonics delivered lectures on various topics. The annual event of International School of Photonics “Annual Photonics Workshop” had been a great success. The success of Optics Talent Search Exam has motivated us to conduct more such events in the coming future. The chapter president Upkar Kumar represented the chapter at SPIE Optics + Photonics conference held at San Diego. The chapter won silver medal in the Annual Outreach Olympics 2011.

The session started with the GBM on 1<sup>st</sup> December 2010. The new office bearers for the year 2011 were elected in the meeting. They are:

<b>President</b>	: Upkar Kumar
<b>Vice President</b>	: Kumar Saurav
<b>Secretary</b>	: Deepak Kumar Singh
<b>Treasurer</b>	: Pradeep
<b>Staff Advisor</b>	: Prof. V.P.N. Nampoori

## **FINANCIAL DETAILS**

Chapter Bank Account	: A/c no. - SB684 at Union Bank of India, Kalamassery, Ernakulam.
Balance brought forward	: 16060 INR
Annual grant from SPIE	: 73577 INR
Contribution from outreach program	: 13950 INR
<b>Total</b>	<b>: 103587 INR</b>

### **Expenditures**

Seminars	: 6013 INR
GBM and other meetings	: 2555 INR
Invited Talks	: 12586 INR
Optics Kit Version 5	: 10079 INR
Optics Fair 2010	: 16000 INR
Optics Fair 2011	: 22000 INR
Annual Photonics Workshop	: 10000 INR
Optics to School	: 4061 INR
Industrial visit	: 5037 INR
Concession given to the members for taking part in academic activities	: 9021 INR
Stationary/Printout/ Xerox	: 981 INR
<b>Total</b>	<b>: 98333 INR</b>
<b>Balance</b>	<b>: 5254 INR</b>

## **CHAPTER ACTIVITIES**

- Annual Photonics Workshop 2011** – The chapter in association with ISP – OSA student chapter and Photonics Society of India conducted the two day national workshop at the International School of Photonics premises on 27<sup>th</sup> and 28<sup>th</sup> February 2011. The workshop has its focal theme as “Recent Trends in Fiber Optics and its application”. The workshop witnessed around 50 participants from different parts of India. The annual magazine of the International School of Photonics was also released during the two days event. Optics and Photonics related companies from all over the country displayed their products during the workshop. The Nalanda Endowment award for the highest marks in first semester for the Integrated MSc. Degree course in Photonics was presented to Mr. Vikas R.



**Prof. P. Radhakrishnan delivering lecture during APW 2011**

- **Optics Fair 2010** – The year 2010 ended on a high note with chapter members organising the annual outreach program of the chapter, Optics Fair on 18<sup>th</sup> and 19<sup>th</sup> December 2010. Around 650 students participated in the two days event. The Optics Kit version 4 was inaugurated during the fair. The chapter members were divided into four sections: Kids Section, High School Section, Higher Secondary Section and General Section. The chapter members demonstrated different interesting experiments related to the field of Optics and Photonics to the school students.



**A demonstration from the general section**

- **Optics to School:** A team of selected chapter members went to a school in rural area near Ernakulam district and threw some light on the importance of Optics and Photonics as career. They also demonstrated various simpler yet interesting experiments to the school children for whom these all was like a dream. The chapter also gave the school a free Optics demonstration kit. The chapter is looking out for ways to bring these students to our Optics Fair program so that they can learn more about optics and can also see some more optics related experiments.



**Students and teachers at Optics to School 2011**

- **Industrial Visit:** The chapter members visited “Nest Photonics” and got a hand on experience several equipments at the centre. The main idea behind organising this tour was to get the feel of various experiences in various R&D going on, in the field of Optics and Photonics. The members were enlightened by the lectures and demonstration by the engineers of the Nest Photonics.



#### **Industrial Tour to Nest Photonics**

- **Erudite Program:** The erudite program is a new initiative by the chapter members in association with the Cochin University of Science and Technology. In this program we invite various eminent professors from the field of Optics and Photonics. This year we were lucky enough to hear it from one of the Nobel Laureate in Physics, Prof. Anthony James Leggett. He delivered a lecture series on ‘Quantum Entanglement and the time paradox’. The chapter members also organised a lecture series by Prof. Derrick T. Reid from St. Herriot Watt University, Scotland. The lecture series was focussed on the Ultrafast Lasers and related phenomenon. The event lasted for 5 days with various talks and



interaction sessions by the guest. The chapter is also planning to utilize SPIE visiting lecture grant to arrange some more lecture series like this in coming future.



**Prof. Leggett during his talk**

- **Optics Fair 2011:** This fair was organised on 8<sup>th</sup> and 9<sup>th</sup> December 2011. This was the second Optics fair in less than one year. The event was attended by around 1400 students from various schools and colleges around the Ernakulam district. To effectively handle the crowd, the students were categorized into four sections namely kids section, high school section, higher secondary section and general section and accordingly the experiments were set up.

The schools participating in the event were introduced with the latest version of the optics kit with much more activities than the previous kits. The kits were warmly received by them. The biggest hit of the Optics fair was the video section in which chapter members filmed movie “Cosmic Voyage”. The chapter members also conducted Optics talent search

examination and Optics Quiz during the two day event. This has proved to be the best Optics fair so far for the chapter. The feedbacks received from the students and the teachers have been phenomenal. Some of them have even requesting to conduct it twice a year. For more details on Optics Fair 2011, please visit [www.facebook.com/opticsfair](http://www.facebook.com/opticsfair) .



**School students at Optics Fair 2011**



## Chapter members demonstrating experiments in the Higher secondary section

- **Tuesday Seminars:** The research scholars at International School of Photonics are encouraged to take seminars related to their research to make sure that their work is going on smoothly. List of the seminars taken by research scholars and master students is as follows:

- ❖ "*Optical properties of certain nanomaterials*" by Mr. Mathew. S, Research Scholar.
- ❖ "*Structure and Dynamics of DNA: A brief introduction*" by Mr. Bejoy Varghese, Research Scholar.
- ❖ "*Spectral and optical characterization of photonic materials*" by Ms. Misha Hari, Emeritus Scientist, International School of Photonics.
- ❖ "*Tellurite Glasses for optical limiting applications*" by Ms. Roseleena Toms, Research Scholar, International School of Photonics.
- ❖ "*Intelligent Microbes and their socialization*" by Dr. V. P. N Nampoori, Emeritus Scientist, ISP, CUSAT.
- ❖ "*Study on Optical Interferometric techniques for Industrial/ Engineering Applications*" by Mr. Ratheesh Raj, Research Scholar, International School of Photonics.
- ❖ "*Study on TiN-SiO<sub>2</sub> nanostructures*" by Ms. Divya. S, Research Scholar, International School of Photonics.
- ❖ "*Optical Biosensors - An Introduction*" by Mr. Bobby Mathews, Research Scholar, International School of Photonics.
- ❖ "*Super continuum emission from tightly focused femto second pulses - beyond intensity clamping*" by Ms. Sreeja. S, Research Scholar, International School of Photonics.
- ❖ "*Fabrication and Characterisation of Chalcogenide Nano Composite based materials for Photonic device application*" by Ms. Tintu. R, Research Scholar, International School of Photonics.



- ❖ *"Chemical Sensors based on Long Period Gratings"* by Mr. Libish. T. M, Research Scholar, International School of Photonics.
  - ❖ *"Optical Nonlinearity in Lead Iodide"* by Ms. Rajeena Naufal, Research Scholar, International School of Photonics.
  - ❖ *"Multiple Nonlinearity with the theory of Z Scan"* by Dr. VPN Nampoori, Emeritus Scientist from International School of Photonics.
  - ❖ *"Photonic Crystals"* by Misha Hari, Research Scholar, International School of Photonics.
  - ❖ *"Unidirectional Micro disk lasers"* by Mr. Siddharth Joshi, M. Sc (Integrated), Centre of Excellence in Lasers and Optoelectronic Sciences, CUSAT.
  - ❖ *"Preparation and Characterization of Chalcogenide glasses"* by Ms. Indu Sebastian, Research Scholar, International School of Photonics.
  - ❖ *"Linear and Nonlinear studies on Chalcopyrite semiconductors"* by Ms. Vijeta Jha, Research Scholar, International School of Photonics.
- **Invited talks:** The chapter members have also arranged a number of "Invited talks" by eminent professors from different universities across the globe. The details of the talks organised in the year 2010-11 are listed below:
    - ❖ *"Fluorescence Life Time Microscopy - Theory, Experiment and Applications"* by Mr. Manu Vaishakh, NTU, Singapore.
    - ❖ *"Ultra intense laser driven new generation electron accelerators and applications"* by Dr. Riju Issac, Asst. Professor, M.A College, Kothamangalam.
    - ❖ *"X- ray image enhancement- some new approaches"* by Mr.V.A Menon, Retired X-ray engineer, National institute of Health, Bangalore.

- ❖ *"Imaging stimulus induced neuronal activity in the visual cortex"* by Dr. Manu Punnen John, Post Doc. Fellow, Frankfurt Institute for Advanced Studies, Johann Wolfgang Goethe University.
- ❖ *"Advanced polymers for 3D for Telepresence and Energy conversion"* by Dr. Jayan Thomas, Associate Research Professor, University of Arizona.
- ❖ *"Century of Photons and Half century of Lasers"* by Dr. C. P. Girijavallabhan, Emeritus Professor, ISP, CUSAT.
- ❖ *"Frequency, Sruthy and Raga"* by Dr. K. N. James, Principal, K. V. M from College of Engineering and Information Technology.
- ❖ *"Light Emitting Liquid Crystals"* by Dr. Somanathan Narayana Sastri, Scientist from Central Leather Research Institute, Chennai.
- ❖ *"Studies on Photonic Crystals"* by Mr. Hareesh Natarajan from Queens College, City University of New York.
- ❖ *"Introduction to MEMS"* by Dr. V. Natarajan, Scientist, NPOL.

## FUTURE ACTIVITIES

- **Annual Photonics Workshop 2012:** The chapter is determined to host another national photonics workshop in the year 2012 at International School of Photonics in the month of February. The GBM for APW 2012 will be held on 6<sup>th</sup> January 2012. The chapter members are working out plans to make the workshop more participants friendly to ensure maximum participation.
- **Optics Fair 2012:** The annual outreach program of the ISP-CELOS SPIE student chapter optics fair has been a huge success in year 2011. The chapter in association with ISP-CELOS chapter is looking forward to organise two Optics Fairs a year so that more and more students can get opportunity to have a feel on the Optics related experiments.

- **Visiting Lecturer Program:** The chapter is in talk with Professor Raul J Martin Palma for utilising its visiting lecturer grant. Both parties are working out for a suitable date when Prof. Raul can deliver his lecture at International School of Photonics.
- **Invited Talks:** The chapter is constantly in talk with other eminent personalities around the world for their talk on Photonics and Optics related topics so that graduate and research students can get to know about the research going on in different parts of the world.
- **Optics to School:** The chapter members from northern part of the country are planning to go through various schools in northern part of India during their summer vacation demonstrate students various basic optics experiments. The chapter members will also be presenting the Optics Kit to the government schools in rural areas.
- **Industrial visit:** The chapter members will be taken to Indian Space Research Organisation (ISRO), Trivandrum as a part of the industrial visit in the year 2012. This tour will be very helpful for students in getting a feel of research activities in the Space related sector.
- **Saturday labs:** The chapter is planning for the Saturday labs for the school students. The idea is to select students from a school every week and to give them opportunity to try their hands in using various optical set ups so that they can observe optics from a much closer distance.
- **Seminar:** The chapter members are always encouraged to take seminars on their research related topics. The chapter will be conducting various Thursday seminars and special seminars in future to keep the trend going.

## **Word of Thanks**

The year 2011 has witnessed various optics outreach activities throughout the year. This would not have been possible without the effort and determination from all SPIE members. I, on the behalf of the ISP – CELOS SPIE student, would like to pass a warm vote of thanks to all chapter members for their support. Thanks to Prof. V.P.N. Nampoore for his valuable suggestions. I would also like to take this opportunity to thanks SPIE community for the all the helps and encouragements. Special thanks to Mr. Ben Lockwood and Mr. Dirk Fabian for all the help and support.

Upkar Kumar