2017

ANNUAL REPORT

INDIAN INSTITUTE OF TECHNOLOGY
GUWAHATI CHAPTER
INDIAN INSTITUTE OF TECHNOLOGY
GUWAHATI CHAPTER

STUDENT CHAPTER REPORT- 2017

Annual report submitted to SPIE as part of the reporting requirement as an SPIE student chapter

Prepared by

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Submitted to SPIE on 8th November 2017

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Message from Faculty Advisor

The term of the SPIE IITG student chapter office bearers for the year 2017 is coming to an end. I, as the faculty advisor of the chapter, am very happy at the achievement of the chapter in this year. The year started with a vigorous membership drive, as a result of which the total number of members have increased up to 50. The first visiting lecture of this year was delivered by renowned Physicist Prof K Thyagarajan from IIT Delhi, on 28 February 2017. Students and faculty members from the department as well as from outside departments attended the talk. This was followed by a one-day workshop on vacuum technology in August 2017. The workshop was attended by students not only from IITG but also from various other institutes in the near by region. So far there have been two outreach programmes one at Barhampur Nowgaon and the other at Nowgong College. The letter program also involved invited talks by IITG faculty members and a science demonstration by the technical officers and PhD students of Physics, IITG. There was also an optics teaching program at the North Guwahati Schools.

The chapter has further plans to organise a few more events such as invited talks in last two months of the year 2017. I take this opportunity to congratulate the office bearers and all the members of the SPIE IITG student chapter, for delivering yet another successful year of the chapter full of exciting and inspirational events. I feel honored to serve as the faculty advisor of the chapter for the year 2017. I am very much hopeful that the new office bearers in the year 2018 will continue the good work and take the chapter to newer heights in popularizing optics and optical science among the student community of the region.

Dr. Bosanta R Boruah
Faculty Advisor,
SPIE IIT Guwahati Student Chapter
Message from President

It was my immense pleasure to carry out the responsibility of the SPIE IIT Guwahati Student Chapter during the period of 2016-2017. The chapter, which was established on 30th of October, 2015 on the premises of IIT Guwahati with the primary objective of popularising the field of optics and photonics among undergraduate students of the north-eastern part of India, has built an active environment amongst the research scholars. The chapter helps to unite all the researchers working in field of optics and photonics by providing a unique platform to explore opportunities and share knowledge, not only amongst themselves, but also to the undergraduate students. The chapter has made a successful debut in the year 2015-2016 by conducting various events at regular intervals begetting a huge response. This led to an increased fascination for SPIE among the students, which resulted in an increase strength of 50 active members doing research in various frontier areas in optics and photonics, such as Laser-matter interaction, ultrafast optics, confocal microscopy, diffractive optics, terahertz plasmonics, fibre optics, quantum optics, laser cooling, trapping of atoms and so on.

Similar to the previous year, this year also our student chapter has inculcated its agenda by organizing several events such as visiting lectures, workshops, optics outreach programmes, optics teaching and optics awareness, etc. In this report, we will give the brief details of the events conducted during the year 2016-17, with a special recognition of all SPIE members and volunteers for their enthusiastic participation and continuous support.

I also wish to express my sincere thanks to the previous officers of our chapter, for their help and encouragements throughout the year. My special thanks to our treasurer Mr. S Jagan Mohan Rao for his substantial involvement in organizing each events and keeping all financial records of our chapter. My sincere thanks to Mr. Subhadeep Chakraborty, Ms. Koijam Monika Devi, Ms. Sasmita Behera, Mr. Darpan Mishra and Mr. Gobinda Pradhan for their valuable inputs and suggestions in each alternate Friday meetings, which was very helpful to plan each event appropriately.

Amongst all, my deepest gratitude goes to our Faculty advisor Dr. Bosanta R Boruah, who played the most crucial and central role of the chapter. His constant motivation and vision for the chapter helped to organize each event successfully despite of all the challenges. Also, I would like to thank Ms. Megan All and the entire SPIE student coordinators for their valuable suggestions and inputs. Finally, I would like to express our sincere gratitude to all SPIE members for their enthusiastic participation and support.

Every beginning has an end. But every end is a new beginning. Hence I extend my best wishes to the upcoming new officers of our student chapter and hope that the chapter continues to maintain the trend of improving itself as time passes by.

Mr. S S Goutam Buddha
President,
SPIE IIT Guwahati Student Chapter
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1. INTRODUCTION

The SPIE IIT Guwahati student chapter is the first of its kind in the north-eastern region of India. It came into existence on 30th of October, 2015 officially, at the premise of the Indian Institute of Technology Guwahati due to a proposal brought forward by some like-minded research scholars of the department of physics. With 21 student members at its inception, the chapter now stands strong with 50 members. At its core, the chapter functions with the motto “For the students, by the students” and the vision to popularize science and optics in the region. The chapter organize various events in schools, colleges and universities to provide educational awareness about optics and its related areas among students in the region.

1.1 Objective

The primary objective of the chapter is to promote the field of optics among the undergraduate students from the north-eastern region of India, who are quite unaware of the various scopes and advances in the field of optics. Unlike other fields of physics, there is no core course on optics at the undergraduate level in colleges and universities. Furthermore, the students of most of the Institutes in the region have very little opportunity to explore the field due to lack of proper facilities. With the help of the chapter, we actively organize many awareness programs and educational events in and around the region. The chapter aims:

- To introduce the various scopes, researches, developments, inventions, etc. In the field of optics to the students.
- To take the students beyond textbook optics and bring an understanding about the importance of optics.
- To inspire the students toward a career in optics through various outreach programs at schools, colleges and universities in the region.
- To organize a membership drive annually and enroll more UG/PG students into the chapter.

The officers and the members plan to work with definitive strategies toward the execution of these objectives to instill an interest in optics among the student community of the region.

1.2 Elected Officers (2016-2017)

![Faculty Advisor](image_url)

**Faculty Advisor**

Dr. Bosanta Ranjan Boruah (3096961)

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Mr. S S Goutam Buddha (3708748)
E-mail: satya.buddha@iitg.ernet.in

Vice-President
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E-mail: c.subhadeep@iitg.ernet.in

Secretary
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E-mail: koijam@iitg.ernet.in

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Outreach Coordinator
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Technical Secretary
Mr. Gobinda Pradhan (3709508)
E-mail: p.gobinda@iitg.ernet.in

Co-Secretary
Ms. Sasmita Behera (3709474)
E-mail: behera.s@iitg.ernet.in
### 1.3 SPIE Members

Currently, the chapter has 50 student members.

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</tbody>
</table>
2. ACTIVITIES CARRIED OUT DURING 2016-2017

2.1 Membership Drive II

We initiated a membership drive from 2nd of January, 2017 to 10th of January, 2017 within the institute.

Objectives:

- To enhance the strength of our chapter.
- To involve more and more emerging researchers in student activities.
- To enable the budding scientists to interact with a greater scientific community.

Official circular:

From: "Bosanta R Boruah" <brboruah@iitg.ernet.in>
Subject: SPIE IITG SC Membership Drive
Date: Mon, January 2, 2017 4:11 pm
To: rs@iitg.ernet.in, stud@iitg.ernet.in

Dear students and Research scholars,

Please see the appeal below sent by the president of SPIE IITG chapter. All those interested in more details or interested to join the chapter may please contact any of the office bearers whose contact details are in the below mail.

Regards
B R Boruah
Faculty adviser, SPIE-IITG student chapter

----------------------------- Original Message -----------------------------
Subject: SPIE IITG SC Membership Drive
From: satya.buddha@iitg.ernet.in
Date: Mon, January 2, 2017 3:24 pm
To: brboruah@iitg.ernet.in

----------------------------- Original Message -----------------------------
Dear All,

As we all know the Optics group of the Physics Department IITG is currently running an active Student Chapter under SPIE (International Society for Optics and Photonics) of Bellingham USA. The fundamental motive of the SPIE student chapter is to popularize science, mainly Optics and Photonics among the youth. A special feature of the SPIE student chapter is that they are specifically meant for students and executed mainly by them. There are currently about 322 chapters in 53 countries across the globe.

The SPIE members are eligible to get the benefits such as:

1. Travel grants for conferences.
2. Organize events such as workshops, science fair, visiting lecture program.
3. Promote the optics/photonics academic program within the college/university.
4. Journal subscription
5. Educational Scholarship

and so on.

We are now going to initiate a membership drive that includes renewal of old membership as well as creating new members. I invite all interested students to become a part of our student chapter. In this regard we request you all to contact us on or before 10/01/2017. For any query feel free to contact us.

Jagan mohan Rao: (+91) 7664938806
S S Goutam Buddha: (+91) 9085972183
Subhadeep Chakraborty: (+91) 908516046
Gobinda Pradhan: (+91) 9085982101
Darpan Mishra: (+91) 9954248180
Koljam Monika Devi: (+91) 7896888809
Sasmita Behera: (+91) 7663837726

For more details:
SPIE IITG Student Chapter: http://www.iitg.ernet.in/spie/

Related links:
SPIE Student Chapter: https://spie.org/membership/student-members/student-chapters
SPIE Student Members: https://spie.org/membership/student-members

Yours sincerely,
S S Goutam Buddha
Research Scholar, Dept. of Physics, IIT Guwahati
President, SPIE IITG Student Chapter

******************************************************************************

Bosanta R. Boruah
Assoc. Professor of Physics
Indian Institute of Technology Guwahati
Guwahati-781039, India
Phone: +91 (0) 361 2582725 (o)
FAX: +91 (0) 361 2582749
Alternate email id: boruahbr@hotmail.com
******************************************************************************
Outcome of the event:
The drive concluded with the inclusion of 21 new members as well as renewal of 20 old members to our chapter.

<table>
<thead>
<tr>
<th>Newly joined members</th>
<th>Renewal membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maidul Islam</td>
<td>1. Rahul Kesarwani</td>
</tr>
<tr>
<td>2. Ghana Shyam Mehar</td>
<td>2. Gyan Prakash Bharti</td>
</tr>
<tr>
<td>5. Pulak Taudkar</td>
<td>5. S S Goutam Buddha</td>
</tr>
<tr>
<td>7. Dangka Shylla</td>
<td>7. Indu Kalpa Dihingia</td>
</tr>
<tr>
<td>8. Abdelsalam hassan Muhammad abdelaziz</td>
<td>8. Bijita Sarma</td>
</tr>
<tr>
<td>11. Ashish Jain</td>
<td>11. Prahlad K Baruah</td>
</tr>
<tr>
<td>15. Jumal Das</td>
<td>15. Partha Pratim Dey</td>
</tr>
<tr>
<td>17. Upasana Deori</td>
<td>17. Khwairapkam Shantakumar Singh</td>
</tr>
<tr>
<td>21. Manoranjan Minz</td>
<td></td>
</tr>
</tbody>
</table>

2.2 Visiting Lecture II - Prof. K. Thyagarajan

A visiting lecture was organized at IIT Guwahati in association with dept. of physics, IIT Guwahati on 28th February, 2017. The lecture was delivered by one of the eminent personalities in the field of optics and photonics, Prof. K. Thyagarajan, department of physics, IIT Delhi.

Brief bio-sketch of the invited speaker:

Prof. K. Thyagarajan is currently a professor at the physics department, IIT Delhi. He has held visiting positions at Laboratoire Centrale de Recherches, Thomson-CSF France, Department of Electrical Engineering, University of Florida, USA, University of Waterloo, Canada, the City University of Hong Kong and Tokyo Institute of Technology, Japan. He has published more than 140 research papers in international journals, has filed five patent applications and is the co-author (with Professor A. K. Ghatak) of seven books, the latest being Fiber Optic Essentials, John Wiley, USA, 2007. In 1998 he was the co-recipient (with Prof B P Pal) of the “Fiber Optic Person of the Year 1997” award by Lucent Technologies-Finolux and Voice and Data, India. In 2003 he was decorated with the title of “Officier dans l’ordre des Palmes Académiques” by the French Government, in 2005 he was elected a Fellow of the Optical Society of America and in 2008 he was...
elected a Fellow of the Indian National Academy of Engineers. He has been a consultant to Tejas Networks India Pvt. Ltd., Bangalore looking into advanced issues related to high capacity communication through optical fibers. In 2011 he received the “Teaching Excellence Award” from IIT Delhi. His current research interests are in the fields of guided wave quantum optics, optical fiber amplifiers and nonlinear optical effects in waveguides.

**Title of the talk:**

Guided wave optical devices for the generation and manipulation of entangled photon pairs

**Abstract:**

Quantum properties of light are being exploited for various applications in the field of information and communication technologies. These applications require novel sources of non-classical states of light such as entangled states. Nonlinear optical effect involving spontaneous parametric down conversion (SPDC) in which a high frequency pump photon splits into a pair of lower frequency photons is one of the most important process used for the generation of entangled photon pairs and is expected to find applications in a wide variety of quantum optics based systems. In this context integrated optic waveguides that confine and guide the interacting light waves over long interaction lengths can be compact and efficient as well as provide the designer with new geometries for achieving specific interactions that may not be feasible in bulk. It is expected that in the future, integrated optic devices will form basic building blocks for complex quantum circuits for various applications. The talk will discuss the process of SPDC in optical waveguides and present some of our recent work in the design of waveguide devices for the generation and manipulation of entangled photon pairs.

**Outcome of the event:**

The event concluded successfully with more than 80 research scholars along with the faculty members of the department of physics attending the talk.

**Glimpses of the event:**

1. SPIE chapter president introducing the speaker
2. Prof. K. Thyagarajan during the talk
### 2.3 Vacuum Workshop

A students’ symposium entitled “**One-Day Workshop on Vacuum Technology and Its application In Optical Science**” was held on 19th of August, 2017. The workshop was jointly conducted by the SPIE IITG student chapter and Pfeiffer Vacuum (German manufacturer), one of the world's leading producers of vacuum products and services. The workshop comprised of introductory lecture on the fundamentals of vacuum technology and its relevance in optics followed by interaction-cum-demonstration sessions on vacuum generation through different pumps, vacuum measurements (several types of sensor and gauges), and vacuum analysis and hands-on training.

**Programme highlights**

- Lecture on relevance of vacuum technology in optical science by Prof. Alika Khare.
- Invited lecture on vacuum generation by industries personel.
- Hands–on demonstrations
- Question and answer/ Interaction session
Eligibility criteria

- UG/PG/Doctoral students who have keen interest and want to explore more on vacuum technology and optics to determine whether these fields might be their choice of career are encouraged to apply.
- Project staff/ Technical officers who have working on the field of vacuum technology.

Venue

Indian Institute of Technology Guwahati, Kamrup – 781039

Outcome of the event:

- A total of 126 participants attended the workshop.
- Prof. Alika Khare delivered a lecture on the “Relevance of vacuum technology in optical science”.
- Invited talk on “Vacuum generation” was delivered by delegates of Pfeiffer Vacuum Pvt. Ltd.
- The program was fruitful with mostly positive feedbacks and suggestions.
- Out of the total 126 participants, about 30 % thought that the first talk on the “Relevance of vacuum technology in optical science” was more useful.
- Roughly, more than 60% found that the session on “Vacuum generation” was the most useful.
- Most of the participants found that the “Hands–on demonstrations” were interesting and excellent.
- About 10 % of the participants wrote that they found all of the sessions useful.
- Most of the participants suggested that the chapter should organize such other events regarding optics and other field of sciences.

Feedback statements:

1. The course met its stated aims and objectives.
2. The event was scheduled at a suitable time.
3. The event was paced appropriately.
4. The event facilities and demonstrations were appropriate and satisfactory.
5. The event location was appropriate and satisfactory.
6. The trainer was well prepared.
7. The trainer responded to questions in an informative, appropriate and satisfactory manner.
8. Overall, the sessions were informative and valuable.
Feedback summary:

Figure: The data of the feedback collected from the participants in percentage (%).

Glimpses of the event:

1. Beautiful graffiti made by our volunteer
2. Registration desk
3. Inauguration by lighting lamps
4. Our faculty advisor addressing the gathering
5. Inaugural speech by our HOD
6. Tech. personel addressing the participants
7. SPIE introductory talk by president
8. Participants
9. Hands-on session

10. Hands-on session

11. During high tea session

12. During lunch session

13. A token of appreciation from SPIE

14. A token of appreciation from SPIE
2.4 Outreach Education Programme

An event named "Outreach Education Programme", was conducted as a part of the outreach activities of the SPIE IITG student chapter in association with Outreach Education Programme, IIT Guwahati. At the event, young and enthusiastic students are given the opportunity to gain a unique learning experience about the concepts of text books physics. In an attempt to develop the interest of the student community in science and its related areas, various science models and experiments were demonstrated. The programme was held in order to help the students in developing a deeper
understanding of simple classroom science concepts and its applications in our day-to-day life. The program aims to provide knowledge about different career opportunities in science and optics to the students.

**Programme highlights**

- Science teaching
- Tutorials on light
- Career oriented lectures
- Science model exhibitions

**Venue**

- S S A Girls’ H S school, Barhampur
- Shankar Dev Shishu Niketan, Barhampur
- S S A Boys HS school, Barhampur

**Outcome of the event:**

- The outreach event was successful with a participation of more than 250 students from 8th, 9th and 10th standard from the three schools.
- The event concluded with great remarks from the school staff and students.
- The staff members suggested that frequent outreach programs would be helpful for the students.
- The schools lauded the effort taken up by the SPIE IITG student chapter in promoting science and optics to the students.

**Glimpses of the event:**

1. Dr. Sidananda Sarma giving career opportunity talk
2. Mr. Rahul demonstrating models
3. Optics teaching

4. Group photo after teaching session

5. Mr Pulak teaching magnetism

6. Mr. Santanu explaining optical phenomena

7. Dr. Sidananda and Mr. Prahlad having an interaction with students

8. Group photo
9. Dr. Sidananda Sarma explaining models

10. Dr. Sidananda interacting with students

11. Mr. Aditya Kalita showing the models

12. Demonstrating the wave by a simple model

14. Group photo
2.5 Optics Teaching II - North Guwahati Schools

The event is conducted in the form of optics teaching in some of the schools nearby our campus, with an aim to ignite the young minds with the knowledge on optics and its related areas.

Programme highlights

- Optics teaching
- Tutorials on optics
- Model demonstrations in classrooms

Venue

- Changsari H S School, North Guwahati, Assam – 781039
- Changsari Valika Vidyalaya, North Guwahati, Assam – 781039

Outcome of the event:

- The event reached out to a total of 100 students from 8th, 9th and 10th standard from Changsari HS School, North Guwahati, Assam – 781039.
- The event reached out to a total of 80 students from 9th and 10th standard from Changsari Valika Vidyalaya, North Guwahati, Assam – 781039.
- The event was fruitful with the active participation of the students from both schools.
- The school staffs praised the effort of the chapter for motivating the students toward science and optics.

Glimpses of the event:

1. Ms. Jonmoni teaching reflection
2. Ms. Upasana teaching fundamentals of light
3. Dr. Biswajit teaching reflection  
4. Mr. Indu teaching wave phenomena

5. Mr. Pulak while teaching reflection  
6. Mr. Mrinmoy teaching human eye

7. Showing image formation due to two mirrors  
8. Mr. Ranjan showing electromagnetic effect
9. Mr. Santanu showing Bernoulli’s principle

10. Mr. Santanu showing Height Might expt.

11. Students enjoying the thermal expansion expt.

12. Mutual induction experiment

13. Students wearing diffraction glass

14. Rochester Cloak
14. Ranjan, Dipti and Santanu showing image formation

15. Rochester Cloak

16. Group photo at Changsari H S School

17. Group photo at Changsari Valika Vidyalaya
2.6 Optics Outreach Programme IV - OPTICS: Not an Illusion.

Optics - “Not an Illusion” (ONI-2017) is a platform for all budding physicists, in and around Nagaon, to gain a unique learning experience about light and optics. The symposium offered a myriad of opportunities in the form of lectures by eminent physicists, tutorials, optics quiz, science model exhibition, etc. to develop a deeper understanding about the use of light in optical technologies and its relevance in our day to day life. The symposium intends to help kindle the interest of the students toward a career in optics and its related areas.

Programme highlights

- Invited lectures on optics/photonics
- Tutorials on optics/photonics
- Quiz on optics/photonics
- Science model exhibitions

Eligibility criteria

- School/UG/PG students who have keen interest and want to explore more on optics and photonics to determine whether these fields might be their choice of career are encouraged to apply.
- The quiz competition is open to 10th, 11th, 12th, B.Sc/B.S., B. Tech/B. E. and M. Sc Students.
- The model exhibition is open for all.

Venue

Nowgong College, Nagaon

Outcome of the event:

- The event was successful with 250+ participants attending the outreach programme.
- Dr. Bosanta R. Boruah delivered a lecture on the “Shaping light beam using holography”.
- Dr. Ashwini Kumar Sharma delivered a talk on “Laser technology”.
- Interactive science model session entitled, “Physics as fun” was demonstrated by Dr. Sidananda Sarma, Mr. Lokesh Chakraborty and Mr. Aditya Kalita with the help of some research scholars.
- Two quiz competition held such as higher level (B. Sc, M. Sc, B. Tech students) and Lower level (10th, 11th, 12th students).
- The program was fruitful with mostly positive feedbacks and suggestions from the students.
- Most of the participants suggested that the chapter should frequently organize such outreach events regarding optics and other field of sciences.
Glimpses of the event:

1. Inaugurating the event by lighting the lamp

2. Felicitation to the principal

3. Inaugural speech by Dr. Sidananda Sarma

4. Inaugural speech by Dr. B R Boruah

5. Inaugural speech by Dr. A K Sharma
6. Inaugural speech by president

7. A token of appreciation to the principal

8. Participants

9. Principal addressing the participants

10. Students appearing quiz
11. Mr. Aditya demonstrating angular momentum

12. Mr. Lokesh Chakraborty and Dr. Sidananda explaining experiment based on laws of motion

13. Dr. Sidananda demonstrating moment of inertia

14. Mr. Aditya explaining double pendulum
15. Certificate distribution

16. Group photo

17. Group photo (Organizing committee)
2.7 Visiting Lecture III - Prof. David J. Hagan

Biography:

David J. Hagan received his PhD degree in Physics at Heriot-Watt University, Edinburgh, Scotland in 1985. After a brief spell as research scientist at the University of North Texas, he moved to UCF in 1987 as a founding member of the CREOL faculty. He is currently Pegasus Professor of Optics and Physics and also serves as Associate Dean for Academic Programs. He is currently executive Editor-in-Chief of Chinese Optics Letters and was the founding Editor-in-Chief of Optical Materials Express. His current research interests include nonlinear optical materials, especially semiconductors and organics, applications of extremely nondegenerate nonlinear optics, and techniques for nonlinear optical characterization and spectroscopy. Dr. Hagan is a Fellow of OSA and SPIE.

Title:

Making photons interact: an introduction to nonlinear refraction and absorption.

Abstract:

One reason why light we use electromagnetic waves (radio, light, etc.) for communication is that photons do not directly interact with each other. However this property presents obstacles for tasks such as light-by-light switching or optical computing. Nonlinear optics, where intense light may change the properties of a material, in turn affecting the propagation of other light waves, provides a method where all-optical switching and related effects may be realized. We will describe some of the basic mechanisms for these effects, and how we go about characterizing materials and resolving the various contributions to irradiance-dependent refractive index (nonlinear refraction) and absorption (nonlinear absorption). Our understanding of nonlinear optical materials characterization has progressed sufficiently over the years to allow a reliable picture of the physical processes leading to the nonlinear optical properties of a material. This is largely thanks to the development of reliable and complimentary methods for characterization of nonlinear optical properties. I will provide an overview of our techniques in nonlinear refraction and absorption characterization. Additionally, I will describe how nonlinear refraction and absorption can be strongly enhanced when two very different wavelengths interact in a material. In addition to the obvious applications of this effect, I will show how this can be applied to such diverse applications as infrared detection and tunable mid-IR sources.

Outcome of the event:

- The event was quite successful with 70+ number of students.
- 20+ number of faculties from different departments have also attended the talk.
Glimpses of the event:

1. Mr. Prahlad introducing the speaker
2. Mr. S S Goutam felicitating the speaker
3. Prof. David during the lecture
4. During the lecture
3. MEMBERS ACHIEVEMENT DURING 2016-2017

3.1 Achievements/Awards/Honours of SPIE Members:

Md. Gaffar (our chapter alumni) has been appointed as assistant professor in Muffakham Jah College of Engineering and Technology, Hyderabad.

Khwairakpam Shantakumar Singh (our chapter alumni) has been appointed as assistant professor in Assam University, Silchar.

Samit Kumar Gupta (our chapter alumni) has joined Nanjing University as a Post Doctorate fellow.

Indrajeet Kumar (our chapter alumni) has joined IIT Kanpur as a Post Doctorate fellow.

Biswajit Patthak received third best poster presentation award for the paper entitled “Zonal Wavefront Sensing with Enhanced Spatial Resolution and Improved Centroid Detection Accuracy”, in the International Topical Meeting on Applied and Adaptive Optics, 2017 (INTOPMAA), organized by IIST, Kerala, India.
Biswajit Patthak received Optical Society of India second best contributory paper award in the oral session for the paper entitled “Spatial Resolution Enhancement in a Grating Array Based Zonal Wavefront Sensor”, in the International Conference on Light and Light based Technology, 2016, held at Tezpur University, India.

Biswajit Patthak received Optical Society of India second best contributory paper award in the poster session for the paper entitled “Zonal Wavefront Sensing with Improved Accuracy”, in the International Conference on Light and Light based Technology, 2016, held at Tezpur University, India.

Biswajit Patthak has been an invited reviewer for a regular research article in one of the reputed international journal, Optics Express (OSA). The review was submitted successfully.

Biswajit Patthak, Sanatnu Konwar and Nagendra Kumar received Departmental (Physics) best paper award for the paper entitled “Liquid Crystal Spatial Light Modulator Based Wavefront Sensing and its Application”, in the Research Conclave, 2017, organized by IIT Guwahati, India.

Santanu Konwar presented a invited talk on "Wavefront sensing and computer generated holography: some basic concepts" at the UGC sponsored national workshop on Recent Trends in Physical Science Research, held on 21 & 22 October 2017, organized by Department of Physics, Silapathar Science College, Silapathar, Dhemaji, Assam.

Santanu Konwar received the OSA (Optical Society of America) best contributory paper award in the poster session for the paper entitled "Propagation of aberrated beam through atmospheric turbulence", at the International Conference on Light and Light based Technologies (ICLLT) held at Tezpur University from 26-28 Nov., 2016.

Joy P Das received best poster award by Springer in in the Research Conclave, 2017, organized by IIT Guwahati, India.

Deepak Kumar has joined in the Ph.D program at the Department of Physics, Punjab University, Punjab.

Jumal Das has joined in the Ph.D program at the Department of Physics, Tezpur University, Assam.

3.2 Patents/ Journal/Conference Publications of SPIE Members:


Sandeep Sharma and Tarak N. Dey, “Phase induced transparency mediated structured beam Generation in a closed-loop tripod configuration”, Phys. Rev A 96, 033811 (2017) (Figure is Selected for Kaleidoscopes: September 2017).


Maidul Islam, D. R. Chowdhury, and G. Kumar, "Terahertz guided mode propagation in a planar plasmonic waveguide and slow light properties," in 13th International Conference on Fiber Optics and Photonics, OSA Technical Digest (online) (Optical Society of America, 2016), paper P1A.21.


S Jagan Mohan Rao, D Kumar, G Kumar, DR Chowdhury, “Probing the Near-Field Inductive Coupling in Broadside Coupled Terahertz Metamaterials”, IEEE Journal of Selected Topics in Quantum Electronics 23 (4), 1-7


3.3 Conference/Workshop/School Visit of the SPIE Members

Biswa jit Pa thak presented two papers entitled "Comparison of Centroid Detection Algorithms in Different Atmospheric Turbulence Conditions" and "Zonal Wave front Sensing with Enhanced Spatial Resolution and Improved Centroid Detection Accuracy", at the International Topical Meeting on Applied and Adaptive Optics (INTOPMAA-17), held on 11-13 August, 2017, organized by Indian Institute of Space Science Technology (IIST) in association with OSI (Optical Society of India), OSA (Optical Society of America) and SPIE (USA).

Biswa jit Pa thak presented two papers entitled "Spatial Resolution Enhancement using Grating Array based Zonal Wave front Sensor" and "Zonal Wavefront Sensing with Improved Accuracy ", at the International Conference on Light and Light based Technologies (ICLLT) held from 26-28 November, 2016, organized by Optical Society of India and Tezpur University, at Tezpur University, Tezpur, Assam.

Biswa jit Pa thak attended the Workshop on Intellectual Property Right, held on 30 November and 1 December, 2016, at IIT Guwahati, organized by IPR Cell, R&D, IIT Guwahati.


Prahlad K. Baruah attended and presented his research work at The International Conference on Fiber Optics and Photonics, IIT Kanpur (2016) (Oral).
Santanu Konwar presented a paper entitled "Analysis of the Inter-modal Cross-talk in a Modal Wavefront Sensor", at the International Topical Meeting on Applied and Adaptive Optics (INTOPMAA-17), held on 11-13 August, 2017, organized by Indian Institute of Space Science Technology (IIST) in association with OSI (Optical Society of India), OSA (Optical Society of America) and SPIE (USA).

Santanu Konwar presented a paper entitled "Study of cross-talk in the detection of various Zernike modes by a Modal Wavefront Sensor", at the National Seminar on Advances in Electronics and Allied Science & Technology (NaSAEAST-2017), held on 27 & 28 June 2017, and organized by ESES and Gauhati University, Guwahati, Assam.

Santanu Konwar attended the Workshop on Intellectual Property Right, held on 30 November and 1 December, 2016, at IIT Guwahati, organized by IPR Cell, R&D, IIT Guwahati.

Santanu Konwar presented two papers entitled "Propagation of aberrated beam through atmospheric turbulence" and "Fluctuations in the orientation of the beam diffracted by a Liquid Crystal Spatial Light Modulator", at the International Conference on Light and Light based Technologies (ICLLT) held from 26-28 November, 2016, organized by Optical Society of India and Tezpur University, at Tezpur University, Tezpur, Assam.

Gyan Prakash Bharti and Alika Khare, "Efficient near band edge photoluminescence of PLD Zn1-xAlxO (0<x<0.10) thin films", Research Conclave, IIT Guwahati, March 2017.

Ranjan Kalita participated in the course on "Advanced microscopy and imaging techniques" jointly organized by DSS imagetech Pvt. Ltd., Olympus medical systems India Pvt. Ltd. and supported by Indian Institute of Technology Guwahati. (April, 2017)

Ranjan Kalita attended and presented his research work at International Conference on Light and Light based Technologies (ICLLT), Tezpur, India (November, 2016).

S S Goutam Buddha participated in the course on "Advanced microscopy and imaging techniques" jointly organized by DSS imagetech Pvt. Ltd., Olympus medical systems India Pvt. Ltd. and supported by Indian Institute of Technology Guwahati. (April, 2017).

S S Goutam Buddha attended and presented his research work at International Conference on Light and Light based Technologies (ICLLT), Tezpur, India (November, 2016).


Subhadeep attended ‘Open Quantum Systems' held in ICTS campus, Bangalore, India from 24 to 28 July, 2017.

Darpan Mishra participated in the "Visvesvaraya PhD Scheme for Electronics & IT/ITES Second Workshop for Presentation of Research Work" held at IISc, Bengaluru during 20-21 February, 2017.

Darpan Mishra attended GIAN course on "Silicon Photonics: Linear, Nonlinear, and Quantum Integrated optical Devices and Circuits" conducted at IIT Madras during 19th March to 1st April, 2017.
Manoranjan Minz participated in the "Visvesvaraya PhD Scheme for Electronics & IT/ITES Second Workshop for Presentation of Research Work" held at IISc, Bengaluru during 20-21 February, 2017.

Manoranjan Minz attended GIAN course on "Silicon Photonics: Linear, Nonlinear, and Quantum Integrated optical Devices and Circuits" conducted at IIT Madras during 19th March to 1st April, 2017.

Karuna S Malik participated in the “National Seminar on Advances in Electronics and Allied Science & Technology (NaSAEAST-2017)” held on 27th & 28th June 2017, organized by Electronic Scientists & Engineers Society (ESES) & Gauhati University, Guwahati, Assam.


Karuna S Malik participated in “IEEE Workshop on Advanced MATLAB Applications to Robotics and Signal Processing (RASPMAT 2017)” held on 7th & 8th October 2017, organized by IEEE Student Branch, Indian Institute of Technology Guwahati.

Nagendra Kumar participated in the “International conference on Sophisticated Instruments in Modern Research”, held on 30 June- 01 July, 2017 organized by Central Instrumental Facility, IIT Guwahati.

Nagendra Kumar participated in “IEEE Workshop on Advanced MATLAB Applications to Robotics and Signal Processing (RASPMAT 2017)” held on 7th & 8th October 2017, organized by IEEE Student Branch, Indian Institute of Technology Guwahati.

Sumit Goswami participated in 'Latex workshop' organised by Research Scholar Forum, EEE of IIT Guwahati held on September 9, 2017.

Sumit Goswami attended the symposium on "30 Years of Photonics Crystals - the Indian Research Scenario" sponsored by SERB, IIT Kanpur and IEEE-UP Section held during 21st September, 2017 to 23rd September, 2017 at IIT Kanpur.

Almost all the members participated the Research Conclave 2017, IIT Guwahati.

Almost all the members attended 13th International Conference on Fiber Optics and Photonics-2016, Dec 4-8, 2016, IIT Kanpur.

Almost all members attended SPIE Workshop on Vacuum Technology and its Application in Optical Science held on 19th August, 2017, organized by SPIE IIT Guwahati student chapter and Pfeiffer Vacuum Pvt. Ltd. In association with Dept. of Physics, IIT Guwahati, Guwahati, India.
4. FINANCIAL STATEMENT

Balance of activity grant from 2016= ₹ 7927.00 (USD 120.0151)
Total activity grant received in 2017= ₹ 99,075.00 (USD 1500)
(1 USD= ₹ 66.05, as on 06th March 2017)
Settlement of total activity grant= ₹ 1, 07,002.00 (USD 1620.01514)

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<tr>
<td>3.</td>
<td>Outreach Education Programme</td>
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<tr>
<td>a.</td>
<td>Publicity</td>
<td>₹ 1000.00</td>
<td>0</td>
<td>₹ 84,273.00</td>
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<td>b.</td>
<td>Refreshment</td>
<td>₹ 560.00</td>
<td>0</td>
<td>₹ 83,713.00</td>
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<td></td>
<td><strong>Total Expenditure:</strong> ₹ 1560.00</td>
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</table>
### 4. Optics Teaching II - North Guwahati Schools

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<tbody>
<tr>
<td>a.</td>
<td>Travel</td>
<td>₹ 496.00</td>
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<td>₹ 1854.00</td>
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<tr>
<td>b.</td>
<td>Refreshment</td>
<td>₹ 1065.00</td>
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<tr>
<td>c.</td>
<td>Miscellaneous + Lunch party</td>
<td>₹ 4540.00</td>
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**Total Expenditure: ₹ 7955.00**

### 5. Optics Outreach Programme IV – OPTICS: Not an Illusion

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<tbody>
<tr>
<td>a.</td>
<td>Travel, lodging and boarding.</td>
<td>₹ 9000.00</td>
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<td>b.</td>
<td>Funded by Outreach cell, IIT Guwahati</td>
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<td>₹ 7,000.00</td>
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<td>c.</td>
<td>Funded by Nowgong college</td>
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<td>₹ 12,000.00</td>
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<td>c.</td>
<td>Certificates + Prizes + Felicitation</td>
<td>₹ 21,800.00</td>
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<td>d.</td>
<td>Refreshment</td>
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<td>e.</td>
<td>Miscellaneous</td>
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**Total Expenditure: ₹ 62,439.00**

### 6. Visiting Lecture III – Prof. David J. Hagan

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<tbody>
<tr>
<td>a.</td>
<td>Publicity</td>
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<td>b.</td>
<td>Felicitation</td>
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<td>c.</td>
<td>Refreshment</td>
<td>₹ 246.00</td>
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**Total Expenditure: ₹ 3048.00**

**Total**

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<tr>
<td></td>
<td>₹ 1,22,181.00</td>
<td>₹ 44,450.00</td>
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5. MISCELLANEOUS INFORMATION

5.1 SPIE Lunch Party

The SPIE members had a small congratulatory lunch party for the successful ongoing year of the chapter.

Glimpses of the event.

1. During lunch party

2. During lunch party

5.2 SPIE IITG Student Chapter Foundation Day Celebration

The SPIE student chapter celebrated its 2\textsuperscript{nd} Foundation day on October 30, 2017. All the members along with the faculty advisor had a small get-together cum celebration in the department of physics, IIT Guwahati. A cake cutting ceremony was held as a part of the celebration. The faculty advisor of the chapter shared his experience and motivated the members to organize bigger and better events in the future. The event proceeded with the chapter officers taking the official leave from their respective positions. Also, a list of possible succeeding nominees for the officer’s position were
announced. The event concluded with a discussion of the future prospects of the chapter along with words of encouragement, motivation and determination among the members to take the chapter to greater heights in the future.

**Glimpses of the day:**

1. Celebration of second anniversary
2. Our faculty advisor congratulating all
3. Cake cutting
4. Group photo
5. Group photo
6. SPIE chapter’s officers
5.3 Future Events (Tentative)

1. We have planned a poster session on optics and its application on 9th December 2017 during the DST-SERB School on Frontiers in Quantum Optics.
2. Prof. Nirmal K Viswanathan has agreed to deliver a visiting lecture during the poster session.
3. We are planning for a workshop on laser and photonics in the next fall.
4. Optics outreach in nearby university/institution.
5. Optics teaching
6. SPIE membership drive
7. Optics awareness drive