
I. Officers

President: Lisa Richards (lisa.richards@utexas.edu), Member #: 3310305
Vice-President: Bin Yang (bin.yang@utexas.edu), Member #: 3384396
Treasurer: Colin Sullender (csullender@utexas.edu), Member #: 3443603
Outreach Coordinator: Robin Hartman (robin.hartman@utexas.edu), Member #: 3519040

II. Introduction

The 2013-2014 was a year of good activity for the SPIE student chapter at the University of Texas at Austin. We have had regular seminar meetings throughout the year and social events to kick-off each semester. In February and March, we participated in University of Texas wide outreach events “Introduce a Girl to Engineering Day” and Explore UT, which was rewarding for both the young children who attended it and the chapter members who organized it. We plan on continuing the work we have done this past year. The following is a report of our chapter activities.

III. Chapter Activities

a. Seminar Series

The Biomedical Optics Graduate Organization student seminar series is the primary activity of our chapter. Since its inception, the seminars have been well received, well attended, and have provided an excellent place and opportunity for graduate students to meet and interact on a regular basis. This year, we have had seminars from graduate students, post-doctoral fellows, industry professionals, and an invited speaker from outside of the University of Texas at Austin. This helps all graduate students learn about research efforts that go on around campus and at other universities. The talks are also a great way for graduate students to gain experience in giving seminars and to practice for upcoming talks at conferences. We have also included some tutorial sessions as part of the seminar series. The following is a list of the seminars with the presenters and topics:

<table>
<thead>
<tr>
<th>Date</th>
<th>Presenter</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/4/13</td>
<td>Dr. Manu Sharma, Post Doctoral Fellow, Biomedical Engineering</td>
<td>Helping UT BME students get an industry job via a professional development initiative</td>
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<tr>
<td>Date</td>
<td>Speaker</td>
<td>Topic</td>
</tr>
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</tr>
<tr>
<td>9/12/13</td>
<td>Dr. Manu Sharma, Post Doctoral Fellow, Biomedical Engineering</td>
<td>Helping UT BME students get an industry job via a professional development initiative, Part II: Resumes</td>
</tr>
<tr>
<td>9/20/13</td>
<td>Robin Hartman, Graduate Student, Biomedical Engineering</td>
<td>Delivery of an oxygen-sensitive two-photon contrast agent to the mouse brain via blood brain barrier disruption using ultrasound and microbubbles</td>
</tr>
<tr>
<td>10/18/13</td>
<td>Evan Perillo, Graduate Student, Biomedical Engineering</td>
<td>Studying Gene Expression with Single Molecule Fluorescence in situ Hybridization (smFISH) Microscopy</td>
</tr>
<tr>
<td>10/25/13</td>
<td>Subhamoy Das, Graduate Student, Biomedical Engineering</td>
<td>Engineering Syndecan-4 Proteoliposome Particles to Overcome Disease-Induced Growth Factor Resistance</td>
</tr>
<tr>
<td>11/1/13</td>
<td>Nicholas Dana, Graduate Student, Biomedical Engineering</td>
<td>Photoacoustic Characterization of Myocardial Ablation Lesions</td>
</tr>
<tr>
<td>11/15/13</td>
<td>Bharadwaj Muralidharan, Graduate Student, Electrical and Computer Engineering</td>
<td>Trends in Prototyping of Electronics</td>
</tr>
<tr>
<td>2/11/14</td>
<td>BOGO Officers</td>
<td>Girl Day Planning and Preparation</td>
</tr>
<tr>
<td>2/14/14</td>
<td>BOGO Officers</td>
<td>Girl Day Planning and Preparation (continued)</td>
</tr>
<tr>
<td>2/21/14</td>
<td>Dr. Jörg Enderlein, Professor, Georg August University Göttingen</td>
<td>The Physics of Superresolution Fluorescence Microscopy</td>
</tr>
<tr>
<td>2/24/14</td>
<td>BOGO Officers</td>
<td>Explore UT Planning and Preparation</td>
</tr>
<tr>
<td>2/28/14</td>
<td>BOGO Officers</td>
<td>Explore UT Final Run-Through</td>
</tr>
<tr>
<td>3/29/13</td>
<td>Dr. Swapnajit Chakravarty, Senior Research Scientist, Omega Optics, Inc.</td>
<td>Label free early cancer detection with on-chip silicon nanophotonic devices</td>
</tr>
<tr>
<td>4/11/14</td>
<td>Geraldine Tunnell, M.B.A. Executive Director of Portfolio Planning, Dell, Inc.</td>
<td>Industry Hiring Perspectives from the Inside</td>
</tr>
<tr>
<td>4/25/14</td>
<td>Dr. Brian Wilson, Professor, University of Toronto</td>
<td>OSA Invited Lecturer, Title TBA</td>
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</table>

Some highlights of this year’s seminar series are the professional development seminars given by Dr. Manu Sharma and the forthcoming seminar by Geraldine Tunnell from Dell, Inc. These seminars have
kicked off a new professional development initiative started by our chapter dedicated to helping our student members better prepare for their career after graduation.

Other highlights are many of the invited speakers that we have hosted this spring. We were delighted to host Dr. Jörg Enderlein from Georg August University Göttingen in Germany together with Dr. Tim Yeh, an Assistant Professor in the Biomedical Engineering Department. This seminar was our largest this year, attracting around 65 students across Biomedical Engineering, Chemical Engineering, Chemistry, Physics, and Institute for Molecular Biology Departments.

We were also pleased to host Dr. Swapnajit Chakravarty from a local company that originated from the Electrical Engineering Department. We also look forward to hosting Dr. Brian Wilson later this month as an OSA invited speaker. We plan to invite another speaker later this year through SPIE.

b. Social Events

To help welcome new students to the group, we organized an ice cream social with catering from a local favorite creamery on August 30, 2013 as our fall kick-off event. This was a great way for people associated with the organization to get to know each other, and interact in an informal atmosphere. The kick-off party was also a good networking opportunity for current students, and an opportunity for us to recruit new students to the chapter. We also hosted a bowling bash at the on-campus bowling alley on January 15, 2014 as our spring semester kick-off event. This was a great opportunity for current students to catch up with each other while engaging in a fun activity at the same time. This event helped encourage current members to get excited about our upcoming events in the spring semester.

Enclosed below are some photographs of the social events from the past year:
c. Outreach – Girl Day

“Introduce a Girl to Engineering” Day is a University of Texas at Austin Cockrell School of Engineering wide outreach event organized by the Women in Engineering Program every year during Engineer’s Week. This year, “Girl Day” took place from 2 to 5 pm on February 22, 2014. Each year, “Girl Day” attracts close to 2,000 1st – 8th grade students to the university campus to experience various hands-on engineering activities and see what it’s like to be an engineer. More information about the event can be found at: https://www.engr.utexas.edu/wep/k12/girlday

Our part in this event was to organize an optics program for kids to learn about properties of light with some demonstrations and hands-on activities. Titled ‘Fun with Optics’, our optics demonstrations included “light has color” using a prism to make a rainbow, “light is a polarized” using a polarizer to show how we can block light traveling in certain directions, and “light has energy” with UV-activated beads that the kids got to take home. We demonstrated how refractive index matching can make objects seem to disappear (“Disappearing glass”) as well as how refractive index mismatches cause light to bend, leading to either magnification of the object or an apparent bending of the object. A Fresnel lens was also used to show how light bends in the presence of a lens, and telescopes were used to demonstrate light bending in a lens system and magnification of distant objects. In addition, we demonstrated the power of reflection using a 3D hologram to display a movie played from an iPad using a technique similar to Pepper’s ghost, which made the movie appear to be in 3D. Almost all the demonstrations were interactive and the kids got to try everything out on their own, giving them a true hands-on experience. Our optics program was a big hit, and we had approximately 250 young female students come to the table throughout the afternoon.

Enclosed below are some photographs of the event:
d. Outreach – Explore UT

Explore UT is a University of Texas at Austin wide outreach event organized by the university every year. Billed as the ‘Largest open house in Texas’, this year’s Explore UT took place from 11 am to 5 pm on March 1, 2014. Each year, Explore UT attracts close to 50,000 children of different age groups to the university campus to learn and participate in various activities. More information about the event can be found at: http://www.utexas.edu/events/exploreut/

Our part in this event was to organize an optics program for kids to learn and do some hands on activities. Titled ‘Fun with Optics’, our program was a presentation where we explained some interesting properties of light to the children and practically demonstrated them. For example, to illustrate the concept that light has energy, a household light bulb was illuminated using microwave technology. We also demonstrated polarization properties using a polarizer and an analyzer, and demonstrated the light spectrum using a prism and filters. This year, we introduced new demonstrations to improve the event, including how to “pour light” using water as a waveguide and how to re-direct light using mirrors with the Khet Laser Game supplied by SPIE. To go along with the demonstrations, we had small handouts that the kids could take home with them which included diffraction gratings, polarizers, and fluorescent beaded bracelets/lanyards. As a climax to the presentation, we demonstrated how the children could make their own pinhole camera. This was followed by a period of hands-on activity where the participants built their own camera and used them to look visualize an image. Throughout the day, we had approximately 100 participants over 3 sessions.

Since we are unable to accommodate every student in our sessions, we included multiple ongoing demonstrations outside of the main room where the presentation was taking place: “Laser Graffiti”, a light-to-sound demonstration, “Disappearing Glass” using refractive index matching, and a 3D hologram.
using a technique similar to Pepper’s Ghost to display a movie from an iPad in 3D. Throughout the day, students were able to come by and use a laser pointer to “draw” on the board from across the hall, and were able to modulate sound going to a speaker using a laser pointer. They also got see a glass tube disappear in oil up close, and see a movie playing in 3D from a 2D display. This was a huge success, and really helped to engage the students who were unable to attend the main session. We also hope these events encourage the students to come back for our “Fun with Optics!” event next year. Throughout the day, we had over 50 students come visit our optics demonstrations outside the main presentation room.

Organizing and participating in this outreach activity was extremely rewarding for the members of our chapter. It was extremely interesting to teach young children and expose them to the hidden world and properties of optics. The participants came out excited and were amazed by the interesting properties of light, like bending a spoon or that we can make our own little rainbow with a prism. Every year, we have tried to add an activity to the mix along with increasing the number of sessions we have with participants. We have been contacted both from our university and local schools to hold similar events throughout the year. Overall, it continues to be a thoroughly enjoyable outreach focus for our student chapter, and has seen significant involvement by our members.

Enclosed below are some photographs of the event:
III. Future Activities

a. Seminars

We plan on continuing our primary activity, which is the seminar series through the next year. The seminar series has been well attended in the past and we are looking to increase our target audience in the future by providing an opportunity for graduate students from different backgrounds to give talks. We hope to do this both by invited students from a variety of different research labs as well as across different Departments. This year, we increased our professional development programming to help students better prepare for careers in industry after graduation. We plan to continue this into the next year after high attendance indicated great interest from students. We also plan to host seminars given by University of Texas at Austin faculty members and industry professionals. Finally, we will be utilizing the SPIE traveling lecturer program to invite an external speaker in the coming year. The speaker, date, and time of the presentation is yet to be decided.

b. Social Events

We would like to have a kick-off event at the beginning of each semester to encourage graduate student participation and attendance at our seminars and outreach events. These will continue to be excellent networking opportunities and team-building events. We plan on using these events to identify future BOGO officers as well.

c. Outreach Activities

We plan on participating in “Introduce a Girl to Engineering” Day again this upcoming year, which will be on February 28, 2015. The success of the event we organized this year was greatly appreciated by the Women in Engineering Program, and our chapter members greatly enjoyed volunteering for the event. This motivates us to host another event in 2015, and we hope to improve the program to include a wider range of demonstrations. One of the difficulties we had this past year was working outside rather than in a classroom, which made some of the demonstrations difficult to see in bright sunlight. We should be able to improve upon this next year and include more optical illusions that work well outdoors. We hope to inspire more young female students to get interested in optics and engineering.

We also plan on participating in Explore UT 2015, which will be March 7, 2015. The success of the event we organized this year has already been greatly appreciated by the BME department here, who are eager to see us put on a bigger show to reach more young students next year. This coupled with our enriching experience in organizing this year’s event motivates us to do it again in 2015. We will start planning for the event towards the end of 2014. Similar to this past year, we will continue to provide hand-on activities outside of the demonstration room that will be accessible throughout the day for children who are turned away from the event due to size limits. We aim to plan well for the event to make it a successful activity.

IV. Member Roster

Total Student Members (as of April 1, 2014): 29

<table>
<thead>
<tr>
<th>Name</th>
<th>Expires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashvin Bashyam</td>
<td>10 February 2015</td>
</tr>
<tr>
<td>Taylor Chonis</td>
<td>20 March 2015</td>
</tr>
<tr>
<td>Nicholas Dana</td>
<td>24 November 2014</td>
</tr>
<tr>
<td>Nan Du</td>
<td>6 January 2015</td>
</tr>
</tbody>
</table>
Will Goth
Alexander Hannah
Ricky Hennessy
Peter Hill
Maria Jimenez
Syed Kazmi
Ki Hyun Kim
Cong Liu
Geoffrey Luke
Andrew Mark
David Miller
Bharadwaj Muralidharan
Zeyu Pan
Evan Perillo
Lisa Richards
Kaushik Subramanian
Colin Sullivan
Karun Vijayraghavan
Gezheng Wen
Bin Yang
Douglas Yeager
Biwei Yin
Soon Joon Yoon
Bei Yu
Xingyu Zhang

7 January 2015
18 November 2014
15 January 2015
4 September 2014
10 November 2014
29 November 2014
10 March 2015
30 December 2014
5 December 2014
6 January 2015
8 December 2014
29 August 2014
12 February 2015
12 October 2014
5 November 2014
15 January 2015
14 December 2014
20 June 2014
17 January 2015
6 December 2014
13 January 2015
19 December 2014
8 January 2015
4 February 2015
10 January 2015

Total Alumni Members (as of April 1, 2014): 17

Name
Kristen Maitland
Nicholas Durr
Lenore McMackin
Yaroslav Urzhumov
Ashwin Parthasarathy
Badr Elmaanaoui
Chris Mack
Amit Paranjape
Jinze Qiu
Hakki Refai
Richard Naething
Richard Naething
Casey Deen
Erica Towle
Katheryne Wilson
Varun Pattani
Henry Sebesta

Graduation Date
May 2006
Dec 2010
(not available)
Dec 2007
Apr 2010
May 2010
Dec 1998
May 2011
Dec 2010
Aug 2005
Sep 2010
Sep 2010
Dec 2011
Aug 2012
May 2012
Dec 2013
Aug 1966
V. Finances

Ending Balance (Spring 2013): $3,331.27

Summer Deposit:
OSA Activity Grant (July 2013): $1,400.00

Starting Balance (Fall 2013): $4,731.27

Deposits:
SPIE Activity Grant (Feb. 2014): $1,300.00
OSA Chapter Prize (Nov. 2013): $100.00

Seminars:
Dr. Manu Sharma Seminar (I): -$71.92
Dr. Manu Sharma Seminar (II): -$59.92
Robin Hartman Seminar: -$59.92
Evan Perillo Seminar: -$51.94
Subhamoy Das Seminar: -$57.92
Nicholas Dana Seminar: -$51.98
Bharadwaj Muralidharan Seminar: -$57.92
Outreach Planning Meetings (3): -$208.38
Dr. Jörg Enderlein Seminar: -$91.27

Outreach Events:
OSA outreach student competition: -$82.56
General Demo supplies: (not posted yet)

Social Events:
Ice Cream Social: -$340.25
Bowling Bash: -$60.57

Travel (OSA Student Leadership Conference):
Hotel: -$320.96
Transportation: -$42.48
Food: -$36.57

Net Deposits: $1,400.00
Net Expenses: -$1,594.56
Ending Balance: $4,536.71