

GaTech SPIE Student Chapter Report

Georgia Institute of Technology November 2017

1. Chapter Officers

President: Cody Fernandez (cody.fernandez@gatech.edu)

Vice President: Sean Rodrigues (srodrigues7@gatech.edu)

Secretary: Lakshmi Raju (Iraju@gatech.edu)

2. Current Members

The chapter currently has 18 members:

Name	Expires
<u>Susannah Doss</u>	6 December 2017
<u>Diego Dumani</u>	11 January 2018
<u>Cody Fernandez</u>	11 July 2018
<u>Ryan Freeman</u>	30 July 2018
<u>Larry Hartman</u>	31 January 2018
<u>Amir H. Hosseinnia</u>	11 April 2018
<u>Bharat Kathpalia</u>	7 March 2018
Andrew Kerr	18 February 2018
<u>Hesam Moradinejad</u>	25 April 2018

<u>Ashkan Ojaghi</u>	5 September 2018
<u>Seyyedeh Azar Oliaei Motlagh</u>	9 August 2018
<u>Lakshmi Raju</u>	24 August 2018
<u>Sean Rodrigues</u>	27 January 2018
<u>Victor Rodriguez Toro</u>	2 April 2018
<u>In-Cheol Sun</u>	11 January 2018
<u>Eric Tervo</u>	3 December 2018
<u>Ruihua Zhang</u>	19 July 2018
<u>Naiyun Zhou</u>	23 November 2017

3. Chapter Activities

During the 2016-2017 year, we hosted several events, participated in STEM volunteering, performed chapter recruitment, and elected the new cabinet for the 2016-2017 year.

3a. Volunteering Event 1: GTRI STEM Outreach

On October 4, the student chapter of SPIE participated in a STEM outreach volunteering event with GTRI STEM Outreach on the Georgia Tech campus. Cody Fernandez participated with Jack Wood, demonstrating physics exhibits to local middle school students. About 100 students saw audio wave, vacuum, rotational inertia, tesla coil, and virtual reality displays.

3b. Volunteer Event 2 : "A Day of Light"

An event titled "A Day of Light" was held by Sean Rodrigues, our standing Vice President. He applied for the funding through the SPIE cycle outreach grant. An article was written after the event was held and can be found here. "<https://www.cos.gatech.edu/hg/item/591331>"

"

Lights, Camera, and Action! Except this time it wasn't filming that was taking place March 18 on the Georgia Tech campus. A team of volunteers put together by Sean Rodrigues, a Ph.D. student in the School of Electrical and Computer Engineering (ECE) at Georgia Tech, held a mini workshop series titled "A Day of Light." The workshop, funded by an SPIE outreach cycle grant, aimed to both unify the concept of optics to K-12 students and to introduce them to career pathways in the field.

From lasers to sunglasses, students were immersed into a series of exercises that prompted them to question how conventional optical devices operated. Microscopes zoomed into cell phones to show how three colors in a single pixel can fill our screens with the breadth of color that we see around us. IR signals from remote controls were visualized by cellphone cameras, holographic displays were created using phones as backlights, and underlying principles of polarization described how 3D glasses give us the third dimension we experience in theaters.

The workshop hosted over 200 K-12 students from the broader Atlanta area, reaching as far out as Roswell and Norcross. The "Day of Light" was one of a series of science outreach events held in Atlanta including the 5th Annual Latino College and STEM Fair and the Atlanta Day of Science. CEISMC—the Center for Education Integrating Science, Mathematics, and Computing—organized the STEM fair, providing funding for school systems to attend from outside the metro Atlanta area and allowing for the workshop to have influenced a greater sphere of students, especially those from Hispanic and Latin American backgrounds.

Rodrigues, who submitted a proposal for the workshop and was awarded the grant by the Society of Optics and Photonics (SPIE), explained that "optics is a career field that is often overlooked by up and coming scientists, but is extremely prevalent in our day-to-day lives." He goes on to describe how a larger group of people who specialize in the field earlier on in their careers could promote faster advances in optical technologies from telecommunications in fiber optics to future display systems. Only a handful of schools in the United States offer optics degrees, one being Rodrigues' alma mater, the University of Rochester. Having joined the field himself later in life, he finds himself committed to educating students about the field earlier on in their careers.

"

3b. Officer Elections

In April 20, 2016, the officer elections were held. The results of the elections were as follows:

President: Cody Fernandez (cody.fernandez@gatech.edu)

Vice President: Sean Rodrigues (srodrigues7@gatech.edu)

Secretary: Lakshmi Raju (lraju@gatech.edu)

The new cabinet held its first meeting on September 19th, 2017. Recruitment, the Fall Interest/Welcome Meeting, and transferring fund management from Lakshmi to Sean and Cody was scheduled and discussed. Additionally, potential guest speakers were discussed. The date for the Fall Interest/Welcome Meeting was established as October 17th, 2017 and tasks for this meeting were delegated to the various officers. Additionally, we are currently considering several potential guest speakers and intend to have the speaker visit in March of 2017.

3c. Chapter Recruitment Activities

On several days during the fall semester, the officers of the cabinet spoke at 5 separate Optics & Photonics classes being offered during the semester. The cabinet emphasized the benefits of joining SPIE as a student member and promoted the Welcome/Interest Meeting on October 17th.

3d. Fall Welcome/Interest Meeting

On October 17th, 2017, the chapter hosted its 2017 Fall Welcome/Interest Meeting. The cabinet provided pizza and sodas for the event. During the meeting, a 30-minute presentation was made by the cabinet regarding planned activities for the semester and the benefits of joining SPIE as a student member. Afterwards a networking session was held to introduce new and old members.

3e. Guest Speaker

We invited Dr. Armani from AFRL to speak using the SPIE Invited Guest Lecturer funds. The event was scheduled to January 28, 2016. The agenda for this event was as follows:

Dr. Armani Schedule

10:00-11:00 Tour of EOSL

11:00-12:00 SPIE Lecture

12:00-01:30 Lunch at Ferst Place

01:30-02:30 SWE Meeting



Officer lunch with Dr. Armani

Nanomaterial-Enhanced Integrated Photonics

Abstract:

Integrated photonics offers a potential alternative to integrated electronics, with reduced heating and faster data rates. However, to achieve many of the desired performance metrics, it is necessary to combine disparate material systems which is extremely difficult due to a wide variety of reasons often including different lattice constants, thermal expansion coefficients, and refractive indices. Therefore, new materials and material systems are desired. One approach is to combine the optical materials conventionally used in telecommunications with nanomaterials. These hybrid systems offer optical and mechanical properties which are not attainable with conventional material systems. This talk will present an overview of the integrated hybrid photonic device research in the Armani Lab, including increasing the nonlinear coefficient of optical microresonators to improve the performance of cavity-based microlasers.

Bio:

Andrea Armani received her BA in physics from the University of Chicago and her PhD in applied physics with a minor in biology from the California Institute of Technology. She is

currently the Fluor Early Career Chair in Engineering and an Associate Professor of Chemical Engineering and Materials Science at the University of Southern California. She is a Topical Editor of Optics Letters, and a senior member of IEEE, OSA, AIChE, and SPIE. She has received several awards, including the ONR Young Investigator Award, the PECASE, and the NIH Director's New Innovator Award, and she was named a Young Global Leader by the World Economic Forum.

4. Chapter Infrastructure Improvements

4a. Officially recognized through Georgia Tech's SGA

Our student chapter is officially recognized as a chartered organization by the student government (SGA) of Georgia Tech. Currently, we are the only student chapter of an Optics & Photonics Professional Society recognized by the SGA. With this privilege, the chapter can reserve space on campus, create its own website on Georgia Tech's domain, and have its own official bank account.

4b. Wells Fargo Bank Account

On Aug. 15, 2015, our chapter was officially registered with Georgia Secretary of State Corporation Division. On Oct. 15, 2015, we obtained a letter on official Georgia Tech letterhead from the Office of Student Involvement authorizing our chapter to open an external bank account.

Our Wells Fargo account is currently active. The Wells Fargo Simple Business Checking account, which will provide us with a debit card to easily make purchases and checks to provide reimbursements to members who pay for SPIE expenses directly. The account features no monthly fee with a minimum balance of \$500 and online-only statements.

4c. Moved to OrgSync

Starting in the year 2016, Georgia Tech organizations moved to the new platform OrgSync. We set up a website through OrgSync where we can list our events, share documents, and communicate with one another.

Our OrgSync website is located at (<https://orgsync.com/136053/chapter>).

The exec board continues to maintain its website on Facebook to reach out to Chapter members and the GT Optics and Photonics community. (<https://www.facebook.com/SPIEStudentChapterGaTech>).

5. Planned Activities

5a. Invited Guest Lecture

We plan to invite a guest lecturer for this upcoming Spring. Specifics are still being discussed and an invitation is being prepared.

5b. Volunteering Event with The Laserfest

We plan to volunteer with the Laserfest that is hosted by GTRI. The details haven't been confirmed yet.

5c. Volunteering Event with The Laser Project

We plan to once again have student members volunteer with GTRI's The Laser Project during the Spring Semester at a local elementary school.

6. Financial Report

6a. 2016 Expenses and Current Balance

Starting Balance (Nov. 1, 2016): \$1,038.07 (Carried over from the previous year)

Expenses:

SPIE Invited Guest Lecture (May 2017) \$128.13(refreshments, gift, member lunch)

SPIE Interest Meeting (Oct. 2017) \$118.75 (food, drinks)

Current Balance (Nov. 1, 2017): \$791.19

Currently, we expect expenses for the following events:

- Spring 2018 – SPIE Invited Guest Lecture (food for SPIE attendees, gift for speaker)
- Fall 2018 - Welcome meeting

We did not request SPIE funding for 2018.