

Rensselaer Polytechnic Institute Material Advantage Chapter

Chapter of Excellence Nomination

2017-2018 Academic Year



Table of Contents

1. Chapter Overview.....	2
2017-2018 CHAPTER OFFICERS	2
2017-2018 CHAPTER HIGHLIGHTS	3
2. Programming	4
2.1 GENERAL BODY MEETINGS (GBMs)	5
3. Career Development	6
3.1 MATERIAL SCIENCE & TECHNOLOGY CONFERENCE (MS&T) 2016	6
3.3 DEVELOPMENT ACTIVITIES	6
3.4 EASTERN NEW YORK ASM DINNERS.....	7
4. Service.....	8
4.1 CAMPUS OUTREACH	8
4.2 K-12 OUTREACH (MATERIAL OUTREACH)	9
5. Social Activities.....	10
6. Chapter Management	12
6.1 OFFICER DUTIES	12
6.2 ORGANIZATION AND PROCEDURES.....	13
6.3 CONTINUATION OF EXCELLENCE	14

1. Chapter Overview

2017-2018 CHAPTER OFFICERS



Dan Lewis
(Faculty Advisor)



Justin Weinstein
(Chair)



Brendon Kondrat
(Vice Chair)



Tenzin Tashi
(Secretary)



Yue Zhai
(Treasurer)



Livinia Williams
(Outreach Co-Chair)



Brianna McDonough
(Outreach Co-Chair)

2017-2018

CHAPTER HIGHLIGHTS

Career Development

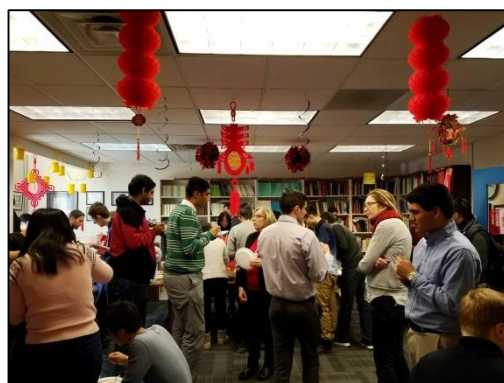
- ❖ MS&T 2017
- ❖ Undergraduate Research Fair
- ❖ Professional Development Workshops
- ❖ Professor Seminar Series

Outreach

- ❖ Material Outreach Program
- ❖ 16 Outreach Events
- ❖ Approximately 450 K-12 students reached
- ❖ Approximately 500 Freshman students reached

Social Activities

- ❖ Ice Cream Social
- ❖ Gingerbread House Making
- ❖ Holiday Celebrations
- ❖ Games and Mac & Cheese



Chinese New Year Celebration hosted in junction with Materials Science & Engineering department.

Statistics

<u>2017-2018</u>	<u>2016-2017</u>	<u>2015-2016</u>	<u>2014-2015</u>
<ul style="list-style-type: none">❖ 16 Outreach Events❖ 4 ASM Dinners❖ 3 MS&T Student Attendees❖ 12 Networking Events❖ 917 Member Attendances	<ul style="list-style-type: none">❖ 13 Outreach Events❖ 4 ASM Dinners❖ 5 MS&T Student Attendees❖ 11 Networking Events❖ 792 Member Attendances	<ul style="list-style-type: none">❖ 10 Outreach Events❖ 4 ASM Dinners❖ 2 Industry Tours❖ 12 MS&T Student Attendees❖ 10 Networking Events❖ 829 Member Attendances	<ul style="list-style-type: none">❖ 9 Outreach Events❖ 6 ASM Dinners❖ 2 Industry Tours❖ 15 MS&T Student Attendees❖ 12 Networking Events❖ 641 Member Attendances

2. Programming

Rensselaer Polytechnic Institute (RPI) Material Advantage programming can be broken down into three distinct categories: career development, service and outreach, and social activities. These topics are strongly chapter themed, and will be discussed in greater detail in the following pages, while the main programs that originated from the chapter are described in detail here.

Over the 2017-2018 academic year, RPI Material Advantage chapter hosted 8 traditional General Body Meetings (GBMs) to inform members of upcoming events, opportunities available and ways that they could get involved in the chapter. These GBMs were designed to meet students' different needs. Some GBMs were tailored towards professional development, such as GBMs offering members consultation for the upcoming career fair each semester. Others hosted speakers to provide networking opportunities.

The RPI Material Advantage chapter also hosted 4 social events. Some social programs include 2 holiday themed socials, and 2 games nights to help students de-stress. These events served as great opportunities to promote interactions between students and faculty as well as between students of different class years.

RPI Material Advantage continued the tradition of cultivating professional and academic development with the annual Undergraduate Research Fair (URF), a Professional Development GBM before each career fair, and extra help sessions for core courses in the Materials Engineering curriculum. The objective of the URF is to provide students with an opportunity to meet professors and graduate students from various research groups in order to find undergraduate research opportunities. Professional Development GBMs are held before career fairs to prepare our members for this important event by resume critiquing.

The last major branch that makes up this chapter of Material Advantage is the outreach program which provides services and outreach to both the RPI community and K-12 school in the surrounding districts. This outreach program is focused on introducing students to materials science and STEM topics as a whole. Material Outreach is a program that we developed to focus on teaching and unifying our volunteers. Volunteers choose a topic in materials science and develop a 10-15 minute presentation paired with interactive demonstrations to teach a specific concept of material science in an engaging way. To further introduce students to the engineering design process, the volunteers also develop open ended engineering design challenge prompts. Some specifically covered include shape memory alloys, ferromagnetic materials, material structure construction, and fiber optic technology. The Material Buddies demonstrate primarily in local elementary, middle, and high schools, as well as local science fairs and STEM events. Material Buddies has been made possible this year through generous funding from our MSE Department as well as grants from ASM.

2.1 GENERAL BODY MEETINGS (GBMs)

The following subsections detail our 4 special themed GBMs that had specific goals and activities. The other 4 GBMs that made up our 8 total GBMs were regular meetings, as detailed in section 2.

Ice Cream Social

This year RPI Material Advantage continued the tradition of holding an Ice Cream Social as its first event of the year. This is a major recruiting event for the chapter by encouraging new first year students to socialize with upperclassmen while making ice cream sundaes. The Material Advantage officers gave an overview of the chapter and invited anyone interested to be involved.



Halloween GBM

The RPI Material Advantage chapter hosts a professional development program every semester before the career fair hosted by RPI. This year it happened to coincide with Halloween. The meetings open with a PowerPoint discussing general career fair information, a list of companies hiring Materials Engineers and advice on talking to recruiters. Freshman and sophomores are encouraged to attend for professional tips, resume critiques, cover letter help, and other advice from upperclassmen and graduate students. After the presentation, students are encouraged to mingle among class years and discuss previous internship, co-op and research experience.

Class Registration GBM

The chapter hosted a meeting before class registration opened up to assist freshmen and sophomores in scheduling courses for the upcoming semester. Upperclassmen also aided students in creating “four-year plans” to ensure all graduation requirements would be met. Topics such as dual majoring, minoring, studying abroad, co-ops and the co-terminal program were discussed in depth. This GBM served as a way to enhance the chapter’s ability to informally mentor students and reinforce bonds between class years.

Holiday GBM

Right before the closing of the fall semester, the chapter hosted an end-of-year holiday GBM. This meeting served as both a distress and relaxation GBM, as well as a look into the events coming up in the following spring semester.

3. Career Development

RPI Material Advantage provides its members with various professional development opportunities. These opportunities include the Undergraduate Research Fair, MS&T Conference, local ASM dinners, and industrial GBMs. The chapter works closely with the Materials Science and Engineering Department, the School of Engineering, and the Eastern New York ASM chapter to prepare students for the future.

3.1 MATERIAL SCIENCE & TECHNOLOGY CONFERENCE (MS&T) 2017

RPI Material Advantage organized and funded three undergraduates to attend MS&T in Pittsburgh, PA. This trip was funded by the RPI Materials Science and Engineering department and the Eastern New York ASM chapter. Students attended lectures, plant tours, and networking events.

Professional and Technical Lectures

Students attended professional development talks at MS&T'17 on topics such as career management and Professional Development Training in graduate school. Students also attended various technical talks, including ones given by fellow RPI faculty.

Networking

RPI Material Advantage members attended events and met students and professionals from across the globe. Events included the Chapter Leadership Workshop and a student networking mixer. Students had the chance to share their resumes, talk to people in their field of study, and discuss current research in many areas of material science.

ASM “DomesDay” Competition

A team of RPI Material Advantage members entered as one of twelve teams part of the ASM “DomesDay” Competition at the MS&T conference. The team’s project was scored based on mechanical strength when compressed using two parallel plates until failure, the aesthetics of the project, and an ‘elevator pitch’ given to the judges followed by questions from the judges and audience. This year the team constructed their dome using PVC.

3.3 DEVELOPMENT ACTIVITIES

Chapter Leadership Workshop at MS&T 2017

At MS&T, the current RPI MA board members attended the chapter leadership workshop and successfully collaborated on strategies to improve attendances, and fundraise while gain an understanding of the events hosted by other chapters. Officers also discussed the possibilities of establishing an officer network to connect Material Advantage chapters.

Undergraduate Research Fair (URF)

Professors and graduate students of the Materials Science and Engineering Department were invited to display research posters and inform interested students of possible research opportunities within the department. Almost all the labs in the Materials Research Center were present and able to answer any questions that undergraduate students had. This proved to be a good way to introduce graduate students to undergraduate students. Every year, this event allows students to find research opportunities.



ENGR 1600 – Material Science for Engineers Study Sessions

Study sessions for the materials science focused course for freshmen and sophomores was hosted before the class's first and second cumulative exams for both the fall and spring semesters. One graduate liaison, as well as other volunteer graduate students were available to answer students' questions on the material to be covered. Since ENGR 1600 is a required course for several engineering majors outside of materials engineering at RPI, this event attracted many students from different engineering disciplines across campus.

Business Cards

Early in the fall semester, the RPI Material Advantage chapter offered its members the opportunity to order MA business cards to further help with professional networking. The order was placed early enough in the semester so that students could use them at the on-campus career fair. The business cards contained information such as the student's name, major, class year, email address and LinkedIn profile link.

Mat Chat Professor Seminar Series

This year the officer board introduced a series of professor seminars focused on career and professional development. As a trial, 3 seminars were held featuring professors from the MSE department. These seminars went well and allowed students to both receive insight on potential career paths as well as become familiar with their professors.

3.4 EASTERN NEW YORK ASM DINNERS

ASM Poster & Micrograph Contest and Exhibition – November 2017

The Materials Poster & Micrograph Contest and Exhibition is an event held every year by ASM. Often held in various locations within the area, this year it was held in RPI. Although the contests and dinner are not organized by Material Advantage, we are responsible for advertising the event and supplying poster stands/boards for the contestants. The Materials Poster & Micrograph Contest and Exhibition is held to encourage both graduate and undergraduate students to showcase their research. An award is offered for the winners in the graduate, undergraduate, and micrograph categories for outstanding poster research and micrograph display. In addition, the dinner offers students the opportunity to network with professors and individuals from the industry.



Eastern New York ASM Scholarship and Award Banquet – May 2017

Students were able to network with industry professionals and professors before the dinner and award ceremony. These awards included inductions into the Materials Honor Society, Alpha Sigma Mu. The 2017 Geisler Award winner was announced, recognizing an outstanding young materials engineer from the Eastern NY ASM Chapter who has made significant contributions to the materials engineering field before the age of 40. Two undergraduate students and one graduate student from RPI were also awarded the Eastern NY ASM chapter scholarships. The 2016 Geisler Award winner gave a presentation on their current work in materials science.

4. Service

RPI Material Advantage provides service and outreach to both local K-12 students and the RPI campus. Our educational outreach program, Material Buddies, has been successfully growing and developing over the past couple of years. The goal of the program is to spark future scientists' and engineers' interests in materials and expose undergraduate students to community service and outreach opportunities. We place a heavy emphasis on cultivating the understanding of materials concepts on multiple levels from the elementary school children we teach to the undergraduate students who volunteer with Material Buddies. This approach has created both a fun experience and sustainability in our program.

4.1 CAMPUS OUTREACH

Navigating Rensselaer and Beyond, Materials Gastronomy – August 2017

This event was held in partnership with the First Year Experience office and Navigating Rensselaer & Beyond. MA hosted a short information session on the basics of materials engineering, a lab tour, and demonstrations. The demonstration included making ice cream with liquid nitrogen and tempered chocolate. A short social with current students took place after the demos.

Activities Fair – September 2017

RPI Material Advantage held a table at the annual activities fair to showcase the chapter's highlights and materials science concepts. The members demonstrated one of the outreach activities, freezing marshmallows with liquid Nitrogen, to draw interest from students. Material Advantage and material science pun stickers were also distributed. This event serves as the incoming class's introduction and first impression to the RPI Material Advantage Chapter.

Medalist Open House – September 2017

This Open House is held annually to award and congratulate high school students who have won the RPI Medalist Scholarship. RPI Material Advantage helped introduce Medalists to the RPI Materials Science and Engineering (MSE) Department by showcasing the Materials Research Center (MRC) and the materials major to these students. Prospective RPI students were able to tour the Electron Microscopy lab as well as the nanoscale characterization lab, and ask questions to a group of current undergraduate Materials Engineering students. A group of volunteers also performed materials demonstrations outside of the MRC.

Fall Open House – October 2017

This Open House is an annual event for high school students interested in attending RPI. RPI Material Advantage chapter recruited volunteers who helped the RPI MSE department showcase the MRC and the materials engineering major to these students. A group of students volunteered at a demonstration table, while others answered questions posed by prospective students and their parents in the student lounge. Other students led short lab tours of various labs in the MRC.



RPI students and faculty (left) speaking to prospective RPI students (right).

Accepted Students' Day – April 2018

This is an event where RPI Material Advantage helps the RPI MSE Department promote the department and the materials science and engineering major to prospective freshmen. Some RPI MA members held a demonstration table in the Polymer Center, answered questions and gave lab tours to the prospective students and their families. Others hosted a materials engineering major information table in the Darrin Communication Center. There, they showcased computer simulations and simple demonstrations. The students were also able to talk to the visitors about co-ops, internships, and research experiences.

4.2 K-12 OUTREACH (MATERIAL OUTREACH)

In an effort to continually improve the outreach events organized by RPI Material Advantage, the Material Outreach program was developed in 2012. Material Outreach is a program focused on the development of the volunteers who interact with students in the Albany area through teaching demonstrations. The goal of this program is to create sustainability by training knowledgeable and enthusiastic volunteers to effectively communicate the scientific concepts behind the demonstrations. In order to achieve the overall goals of the program, volunteers need to acquire a strong understanding of the scientific concepts being demonstrated, develop a well-organized 10 minute presentation, and provide real life problems and solutions to help students better understand the connections between science and everyday life. Since the implementation of this program, new learning and hands on activities have been developed, and more K-12 students are reach every year. Material Outreach is also many students' first experience with combining event planning, leadership, and public speaking. The practice of these skills and involvement in the chapter through Material Outreach also serves as a stepping stone for the majority of Material Advantage officers before they are elected into their positions.

Mythbuster Day – December 2018

In partnership with the Society of Women Engineers, Material Advantage hosted a group of 130 middle school students at RPI. These students had the opportunity to tour several labs and experience cutting edge tools such as Scanning electron microscopes.

Exploring Engineering Day – February 2018

Exploring Engineering Day is an annual event held by the RPI School of Engineering as a celebration of National Engineers Week. RPI Material Advantage exhibited a hands on activity called “Material Selection” which demonstrated the differences between ductile and brittle materials with playdoh and popsicle sticks. Students learned, that often, using multiple materials can be best.



Exploring Engineering Day “Material Selection” lecture.

Nanotechnology Family Engineering Days – March 2017

With the help of Professor Ullal from the Material Science Department and his NSF grant for outreach, Nanotechnology Family Engineering Days was started this year. These days focused on teaching students and family about complex nanotechnology concepts through hands on demos. Examples of these concepts included nano-fluidics, quantum dots, and DNA structures. Two of these events were hosted, each at a different middle school. It was a very successful series that will be continued in future years.



5. Social Activities

While RPI Material Advantage chapter dedicates most of its time to outreach and professional development, social activities are also viewed as a crucial tool to build a successful network between students and alumni, as well as within our department. This year, to highlight the diversity within the Materials Science and Engineering Department, the RPI Material Advantage chapter held several cultural social activities, such as the End of Year Potluck Celebration, a pumpkin decorating event, and a Chinese New Year Celebration. A featured social activity that was offered this year was the installation of several games nights. These activities were developed to bring the community together and to build a causal atmosphere within the department. Recruitment is done simultaneously at many of our social activities if there are students who have never been involved in Material Advantage before.

Activities Fair

RPI Material Advantage held a table at the annual activities fair to showcase the chapter’s highlights and introduce materials science. RPI Material Advantage demonstrated one of the Material Buddies outreach activities, freezing marshmallows with liquid Nitrogen, to draw interest from students.

Gingerbread House Making

The Gingerbread house making event acted as a good bonding experience before the holiday break for the new freshman liaisons and other club members. It was greatly enjoyed by all that attended as it turned into a material selection event with the different foods available to make the houses. Students strived to create sturdy yet elegant houses with limited time and materials.



Holiday Potluck Celebration

The Holiday Potluck celebration is now an annual event put on by the RPI Material Advantage chapter and the Materials Engineering Department. For the third year in a row, students and faculty were encouraged to bring a dish to pass around at the end of the fall semester, right before finals week started. This event has become the chapter's most successful event with high attendance from faculty, graduate and undergraduate students. This event provides a more relaxed environment for the undergraduate students to interact with their professors and teacher's assistants while also experiencing food from around the world. A group of students even gathered to perform classical renditions of holiday music.

Games Night

Hosting games nights last year proved to be a big success, so the event was carried into this year. Three games nights were held, typically after weeks where there had been many midterms given throughout the department. One night, in particular, featured a mac and cheese platter.

Chinese New Year Celebration

To promote the cultural diversity in the Materials Science and Engineering department, the RPI Material Advantage chapter celebrated Chinese New Year for the second year in a row. The lounge in the Materials Research Center (MRC) was decorated with dragons and paper cutouts, and faculties and students were encouraged to dress in red. Attendees learned about Chinese culture and customs and were able to enjoy cultural dishes to celebrate the New Year.

End of Year Celebration

Each year, the RPI MA chapter hosts an end of the year BBQ in May in collaboration with the MSE Department. This event takes place during the study days before finals week to reduce stress and celebrate the completion of another year with friends and colleagues. Due to poor weather, the Material Advantage E-board decided to host the event indoors with a Mac and Cheese Bar accessible to all guests. The added personalization with toppings and sides was enjoyed by all students who attended.

6. Chapter Management

RPI Material Advantage Chapter is run by an executive board of seven officers including chair, vice chair, secretary, treasure, publicity chair, outreach chair, social chair and associate liaisons that meet weekly for one hour. Associate liaisons, including one freshman and two graduate students, attend weekly meetings to represent their respective groups, particularly when events are planned. The meetings are directed by the chair with each executive board member providing input related to their role. Officers are encouraged to take on events that arise throughout the semester, which provides them with multiple professional development opportunities.

6.1 OFFICER DUTIES

Chair

The chair conducts all meetings of the chapter, sets the weekly agenda, delegates committee responsibilities, and makes committee appointments. The chair is the point of contact to the Material Advantage advisor, National Material Advantage, the Eastern NY chapter of ASM, the RPI School of Engineering, and the RPI Materials Science and Engineering Department. The chair also organizes the annual trip to MS&T.

Vice Chair

The vice chair organizes, plans, and runs all general body meetings. This includes setting the semester schedule, reserving rooms, and acquiring resources needed such as projectors. The vice chair also plans and organizes social activities.

Secretary

The secretary maintains all chapter records and keeps meeting minutes at all Executive Board meetings. This person acts as a correspondent for the chapter and fulfills all reporting requirements, such as annual reports. The secretary submits information to society headquarters to highlight chapter activities. The secretary also oversees the bulletin board in the Materials Research Center and advertises general body meetings and social events with emails and posters. This person also maintains the chapter website and oversees activity on the chapter's Facebook page. The secretary also takes on any other organizational duties assigned by the chair.

Treasurer

The treasurer receives, records, and deposits all funds paid to the chapter. This person disburses the funds as authorized by the Executive Board and prepares financial reports for the chapter and society headquarters, while also keeping track of available scholarships and grants. Further, the treasurer helps generate new fundraising ideas and oversees bake sales.

Outreach Chair

The outreach chair coordinates all school visits and is the point of contact for the schools, teachers, and students going on each outreach event. The outreach chair organizes bi-weekly meetings for Material Buddies and keeps track of supplies for outreach events, while training volunteers and compiling the Outreach Grant.

Freshman Liaison

The Freshman Liaison acts as the interface between freshmen members, potential freshmen members, and the chapter. This person represents the interests of freshmen and thinks of ways to involve and recruit more first year students.

Graduate Student Liaisons

Graduate Student Liaisons act as the primary interface between graduate members and the chapter. In addition, they represent the interests of graduate members and their availability when planning events.

Faculty Advisor

Professor Daniel Lewis is the primary contact with Material Advantage headquarters and receives chapter materials for distribution to officers. He advises chapter officers on forming and implementing goals, objectives, and programs.

6.2 ORGANIZATION AND PROCEDURES

Recruiting Activities

At the beginning of each fall semester, Material Advantage recruits heavily for new members. Material Advantage participates in several events, including Navigating Rensselaer & Beyond, an Ice Cream Social and the on campus Activity Fairs aimed towards the incoming freshman. This exposes students to the Materials Science and Engineering department and the benefit of being a member of Material Advantage. Previously, the chapter relied on posters and in-class verbal advertising to promote events. This year, RPI Material Advantage actively used the Facebook page and kept the website updated to display relevant information to members. In addition, a bulletin board outside the lounge area in the Materials Research Center was renovated with a calendar and recent images.

Executive Board Elections

Elections are held every spring semester in March or April. Advertising is initiated at least a month in advance with email notifications and announcements at general body meetings. Candidates are required to fill out a survey and send a platform describing their qualifications, involvement, and reasons for running for the current position. The chapter then holds a General Body Meeting to vote for all positions.

Training

Shortly after elections, elected officers begin attending Executive Board meetings, and current officers spend a month helping elected members transition into their new roles. The old officers provide a summary of their work for the past year and discuss it with the new officers. The officers are expected to be the most involved in the chapter, attending nearly every event. At the end of the semester, the Executive Board also holds a spring planning meeting where officers set their personal goals for the next academic year.

Finances

The treasurer oversees the finances of the chapter. The RPI Student Union offers a bank account service for student organizations. The treasurer keeps records and makes deposits and withdrawals for reimbursements. In order to keep track of finances, a budget is constructed based on interest and past attendance of events from the chapter's curated activity reports.

Record Keeping

RPI Material Advantage keeps meticulous records of events and chapter information. The officers maintain a shared folder on Google Drive to share files for the current year and up to 3 years previous. Records from years before are stored on a hard drive in the office of our faculty advisor as well as on a CD. The files can be broken down into Agendas, Activity Reports, Events, and other important information. The record keeping ensures that the knowledge acquired by officers can be shared from year to year, and when planning an event, officers can use these resources as a guide. The chapter also maintains a Google Calendar to keep track of events and meeting times. There is one calendar for board members, and another for all Material Advantage members.

Storage

Material Advantage gained additional storage, with the help of the Materials Science & Engineering Department. As new Material Outreach demonstrations were developed and, as a result, new materials ordered, there was limited storage space available. However, an office was gained through conversation with the department. This allowed for the chapter to properly and safely store supplies and increase organization for events.

Communication

The chapter's website is maintained by the Publicity Chair. This site features information about upcoming events through a link to the organization's Google Calendar, membership, officer contacts, academic references, previous job records, and scholarship information. The publicity chair also sends a weekly email to the RPI Material Advantage list with event information and updates. The Executive Board also maintains a bulletin board outside of the student lounge and a RPI Material Advantage Facebook page which utilizes Facebook Events to invite students.

6.3 CONTINUATION OF EXCELLENCE

RPI Material Advantage chapter's continuation of success is built on succession planning, meticulous record keeping, and an active chapter membership base. Succession planning has involved creating opportunities for general members to gain exposure to officer positions through shadowing Executive Board meetings. The RPI Material Advantage general body has made the organization successful by taking advantage of the resources provided and by being involved in networking opportunities and events. The chapter offers its members events that cover a wide spectrum of interests from industry speakers and plant tours to professional and academic meetings and social events like holiday celebrations and potlucks.

RPI Material Advantage is proud to be one of the most active and successful professional societies on campus through a balance of these social and professional development programs, as well as outreach events. Professor and industrial talks and plant tours have increased technical knowledge while conference trips for MS&T, ASM dinners, and general body meetings have increased our networking skills. Overall, our chapter upholds its distinguished program by continuously recruiting active members, developing new programs, and continuing to receive support from our advisor and our department.