IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

Chapter of Excellence Nomination 2016-2017

Iowa State University Material Advantage Chapter

> Elena Ewaldz ISU Material Advantage President

Chapter Overview

The Iowa State University Material Advantage Chapter (ISU MA) had yet another excellent year in many aspects. Career Development was chosen as the main focus for the year and that was well achieved. Seven professionals spoke at general meetings; workshops were held to advance career fair skills. Social events were held with professionals in order to facilitate networking opportunities. A main focus was put on attending conferences and allowing as many students as possible to attend, twelve attended MS&T and five attended CVD. Outreach also remained important to ISU MA, and the chapter's Outreach Chairs worked extra hard to grow and strengthen the outreach program, through which many lowa students, of all ages, were introduced to materials science and engineering. This year, ISU MA hosted or participated in 30 outreach events, many of them for students ranging in the k-12 age group. This increased from last year by nine events! Through the efforts of the Fundraising Chairs, we were able to increase funds by selling more pizza each week. With the work of the Fundraising Chairs and generous funding from Iowa State's Engineering Student Council, and the Department of Material Science and Engineering, 12 students were able to attend the Material Science and Technology 2016 conference, and 5 students were able to attend Congressional Visit Day in Washington D.C. at little cost to them. This was an amazing opportunity for our students, and one we were proud to be able to provide. Many students that attended MS&T were new to the conference and received valuable networking and educational opportunities. As part of the efforts to continue the strong connection between the ISU MA chapter and the MSE department at Iowa State, many events were hosted together. These events included a "Fall Rally" for all students, faculty, and staff, events with the learning community, and picnics. These events allowed incoming freshmen to not only get to know their peers and department, but also become introduced to Material Advantage, and the many opportunities it offered. The excellent support from the department has helped encourage students to become involved, and a close connection to the learning community has brought new students to meetings. Also through the close working with the department, ISU MA officers were able to work with professionals in the field. It is our belief that the support and encouragement of the department positively affected the ISU MA leadership, and through that leadership the sense of responsibility and pride within the organization has strengthened.

Throughout these past years' efforts, ISU MA saw stable meeting attendance, increased event participation, and excitingly increased outreach participation. The ISU MA chapter is very fortunate to have an amazing support system in our alumni, and hope to expand that relationship to the advantage of future students that go through the department. The department just implemented an alumni program called Graduates of the Last Decade (MSE

GoLD), which MA hopes to partner with to increase the vast network of MA alumna. Goals for this project are to increase donations from alumni to ensure that more students are able to attend conferences and trips at no cost to them. None of the accomplishments from this year would have been possible without the incredible executive board. The executive board put in many hours of effort, worked extensively with the MSE department, Ames Laboratory, lowa State University, and schools around lowa in order to provide the best experience to the students in the chapter and future students in the state. Their leadership, dedication and hard work gave students the opportunity to find and develop their passion for materials science and engineering, as well as act as inspiration to many to get involved and continue this chapter's tradition of excellence.

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Programming

lowa State University's (ISU) Material Advantage focused largely on various programing activities this year. The main focus was on General Meetings (GMs), where club business was discussed, food was served, and a guest speaker presented. GMs were a good time for students from all different grades to come together to socialize and learn about new ideas and fields within Material Science. Members were exposed to many opportunities to network and connect with various professionals, professors, and other students within the department.

General Meetings

Seven GMs were held this past year, which was about once a month. At some meetings, during especially busy weeks for students, fun materials related activities were held in lieu of a speaker. Speakers this year included: Kara Lind, a PhD. student in the department with Dr. Cademartiri who spoke about her research in plant behaviors and the use of Legos; MA members Carter Francis and Catherine Meis and their past research and internship experiences; new department faculty member Dr. Michael Bartlett who spoke about his research with geckos to create bioinspired adhesives; Dr. Dalal from the Electrical Engineering department who spoke about photovoltaics and semiconductors; Jake Auliff from Danfoss who showed some interesting failure analysis case studies and spoke on the importance of continuing in professional organizations after graduation; ISU alumni Greg Vetterick who spoke about his current company TerraPower and current nuclear advancements; and most excitingly Nobel Laureate Dr. Danny Schechtman who presented on "The Science and Beauty of Soap Bubbles." Students were very excited to learn from both peers and such highly respected scientists in the field. Listening to these talks about the different directions a degree in Materials Engineering can help students decide on what specialization to choose for their undergraduate degree.

Specialization Night

One of the annual traditions ISU MA hosts is Specialization Night. ISU Materials Engineering requires students to choose one specialization: metals, polymers, or ceramics. Specialization Night is meant to help students learn more about the individual specializations, classes required, possible job opportunities, or possible research opportunities within each specialization. This year Dr. Scott Chumbley, Michael Bartlett, and Steven Kmiec spoke on behalf of metals, polymers, and ceramics respectively. Freshman and sophomores attended this event and received valuable feedback to help them in selecting classes.

Fall Rally

ISU MA aided the MSE department in hosting the 2nd annual MSE Fall Rally. This year the rally was planned around the time that the department's External Advisory Council would be in town in order to have them participate as well. This was a great opportunity for students to interact with faculty, professionals, and peers in a very casual environment. At the picnic, MA was in charge of entertainment; therefore, we set up lawn games and music. The event was one of the most highly attended events of the year and participation and interaction of students was excellent.

Career Development

Career development is very important to ISU MA as a whole. This past year MA achieved a high level of career development opportunities by holding workshops, discussing specific practices at meetings, attending technical meetings and conferences, and contributing to networking events.

Workshops

One of the most highly attended workshop held was the resume review/career fair prep workshop. At this workshop, the department's advisors, a couple professors, and seniors helped everyone interested in having their resume looked at. They also gave advice on elevator speeches, how to approach companies at the career fair, and best practices when at the career fair.

Material Science and Technology Conference

At GMs, opportunities within the college and within the various societies associated with MA were discussed, such as scholarships, conferences, and technical meetings. Conferences enticed the students the most as the networking opportunities and learning experiences are priceless. With the gracious support of the MSE department, the College of Engineering, and travel grants, ISU MA was able to take 12 students to Salt Lake City, UT for the 2016 Material Science and Technology Conference. Students were only required to pay for the registration fee, food, and any other personal expenses. Because of the low cost, many students that many not have been able to attend before due to monetary constraints were able to this year. Many students were interested; therefore, an application process was required where the students were required to state why they wanted to attend the conference, how involved they would be at the conference, etc. At the conference, students had the opportunity to network with professionals in research and industry, as well as attend technical talks covering different areas of research and technology that may have interested them.

Congressional Visit Day

In the spring semester, ISU MA sent five students, four juniors and one sophomore, to Washington D.C. for Congressional Visit Day (CVD) with Dr. Iver Anderson of Ames Lab to continue the cause for science and education funding. This opportunity for students was in large part due to the travel grants provided by ACerS, money raised by the fundraising chairs, and ESC funding. Attendees were selected based on an application process to ensure good representation with a variety of technical experience backgrounds. Students contacted Senators Joni Ernst of Iowa, AI Franken of Minnesota, and attended casual coffee-breakfasts to talk to them about the need for continued science funding. They also met all of the Iowa Representatives, both at a casual coffee-meet and greet and in meetings with their staffers. This was a rather impressive feat for just one day on Capitol Hill. CVD was an amazing opportunity for students that allowed them to experience life at Capitol Hill as well as meet and network with Iowa's delegation in Washington D.C., and a valuable chance to learn and understand how government funding works and directly our careers.

Service

ISU MA had an exceptional year for outreach. During the 2016-2017 Academic year, our outreach team attended/hosted 30 separate events for K-12 outreach, with 17 events spring semester and 13 events in the fall. At each event, one to five MA members attended to present materials demos, including freezing marshmallows with liquid nitrogen to demonstrate glass transition temperature, melting pennies to demonstrate the physical properties of different metals, tempering steel to show the effects of heat treatments, bouncing a vulcanized rubber ball and an unvulcanized ball to show how to crosslinking polymer strands changes the way the polymer behaves, and shattering safety glass to show how changing the way force is applied changes the way a material will react.

At the beginning of both the fall and spring semesters, we hosted a Demo Team Training to train MA members on how to present the demos to a range of audiences. Our full team mailing list included about 20 names. These members could sign up for events via email and attend when they were available. Members were instructed to be passionate and excited when presenting the demos, which was not an issue for any team member. The demo team is comprised of members who truly love MA and getting kids excited about science.

The 30 events attended included presenting to the college level, at introductory 101 classes; to the high school level, with discover engineering days both at Iowa State and Des Moines Area Community College (DMACC); to middle school field trips to ISU and consultations with Des Moines area schools on projects; to elementary school field trips and science/STEM nights; and lastly, at the ISU Lab school, where kids ages 2-6 played with oobleck and saw liquid nitrogen. The largest event we attended was the Girls in Science Festival at the Science Center of Iowa in Des Moines, when a couple of thousand people attended. We also presented at the FiRST Lego League Championships at Iowa State, when a few thousand participants were on campus. Though we did not present to everyone who attended, between the students, teachers, parents and grandparents who saw our demos at these events and the other events throughout the year we managed to present to nearly every age group.

Of the 30 events attended, seven were specifically targeted towards getting girls interested in STEM fields. The majority of these seven were partnerships with the Women in Science and Engineering (WISE) or with the Society of Women Engineers (SWE), where we presented at their events. Many of the female members in MA attended these events to try to spark the girls' interest in science and Materials Engineering. Showing the kids that Materials Engineering, and science in general, is really cool is something we strive for as a demo team.

Also notable were partnerships with the Ames Laboratory for one event each semester, when MA members attended to assist and present at the Ames Lab Science Day in the fall and at a Science Bound event with Ames Lab employees at the Science Center of Iowa in the spring. Also, at the DMACC Discover Engineering Day, of all of the presenters, the MA demos were rated a 4.73 out of 5, higher than any other group present. Lastly, we partnered with the Indian Hills

and Stilwell Middle Schools to consult with their students via skype to discuss their designs for their satellite launch device project for NASA. All in all, a good year for our Outreach Program.

Fundraising for the Community

Part of our service for the community included collecting funds for the Youth & Shelter Services of Ames, IA. Every year they buy Christmas gifts for families in need, so we decided to try to sponsor as many families as possible. During pizza sales, we put out a jar to collect money from students then matched the students' donations. Overall \$120 was donated for children's Christmas gifts.

Social Activities

This year, ISU MA hosted 21 total events ranging from career building to sports to eating pizza. With the goal of maintaining departmental student participation and strengthening the excellent relationship between the student body and the faculty/staff, our events were all-inclusive to undergraduate students, graduate students, faculty, staff, and alumni. The many events hosted and co-hosted this year were:

- Fall Kickoff Rally: Co-hosted by the MSE Department and MA, who provided entertainment.
- Freshman Welcome Event: MA co-hosted with the freshman learning community a
 welcome event for the incoming freshman. Snacks and games were provided for all
 attendees.
- **Resume Review**: Upperclassmen with industry experience, professors, and advisors reviewed resumes of current students to provide feedback before career fairs.
- Friday After Class (FAC): All-you-can-eat pizza and drink social held on the last Friday of every month at Pizza Pit, a local pizza parlor. Aimed to give students a chance to unwind after a month of hard work. Free FAC (normally \$3 for member and \$5 nonmember) was offered to those who assisted in Outreach and Fundraising events.
- **Movie Nights**: Partnered with the learning community to encourage interaction between students.
- **Game Nights:** Board games, video games, and snacks were provided to students as they had a night of fun.
- End of Year Picnic: ISU MA provided burgers and hot dogs for students at the end of the spring semester to celebrate the end of another excellent year. Attendees also brought different games and activities. This year MA also bought shirts and tie-dye to "make your own MA shirt".
- MSE Trivia Night: This event was such a hit last year, students asked for it to be hosted
 again this year. It was co-hosted by the learning community and department. The event
 started out with walking tacos provided by the department, then featured trivia
 questions spanning many categories. This event especially encouraged interaction of
 older and younger students as the teams had to be mixed ages.
- Specialization Night: MA invited faculty members and upperclassmen to talk about the specialized fields in materials engineering, particularly their experience studying and researching in their respective fields. The upperclassmen talked about their experience in the courses.

- Intramurals: MA organized teams for intramurals hosted by Recreation Services; the sports participated in this year were Coed Soccer, Coed Volleyball, and Coed Broomball.
- **Kaleidoquiz and QuickyKwiz**: MA organized teams for the 6 hour and 26 hour long trivia (and crazy tasks) events hosted by KURE 88.5, the ISU student radio station.

Students were able to engage with peers outside of an academic setting and also be able to become more acquainted with faculty and staff. These faculty-student relationships are what makes ISU Materials Engineering outstanding. Students are more encouraged to attend office hours or find research opportunities when they know their professors. ISU MA has been the main connection between faculty and students, especially by hosting specific events to facilitate the interactions and improve the departmental sense of unity.

Chapter Management

This year's success, as always, is attributed to the amazing chapter management that ISU MA has. The faculty and staff members within the ISU MSE department have always gone out of their way to support ISU MA, including helping at events, speaking at meetings, and especially with financial donations. The Iowa State University Materials Advantage Chapter offers various areas for students to participate in, including outreach, fundraising, social activities, and programming activities. In order to maintain a high level of efficiency with planning and administrating these events, the ISU MA executive officers met twice a month, (off-weeks from GMs). At the meetings, officers were encouraged to discuss progress, concerns, or issues within their position. Events, activities, and meetings were also planned as a group. In addition to the mandatory Chair, Vice Chair, Treasurer, and Secretary positions, ISU MA has continued on the executive positions of two fundraising chairs, two outreach chairs, programming chair, events chair, webmaster, and historian. The outreach chairs have continued with creating and training an Outreach Team to assist in the many outreach opportunities that are presented. These positions have assisted in the expansion and growth of the ISU MA chapter. This year at MS&T, eight executive officers were able to travel for the conference. Both the Chair and Secretary attended the Chapter Leadership workshop that was hosted, and were able to gather valuable information to bring back to the club in order to advance the organization. The executive team was strong this year, but ISU MA always learns of ways to improve positions and the club.

Executive Officers

Through the changes made last year to the Chair and Vice Chair (referred to as President and Vice President) duties, work was more evenly distributed and the chapter was managed efficiently. The President worked as the liaison between all external bodies to the club, which included Iowa State University, Engineering Student Council, alumni, and any university, company, or National organization wanting to get in contact with ISU MA. The President conducted the general and executive meetings, made travel arrangements for MS&T, and worked closely with the Vice President.



PRESIDENT-ELENA EWALDZ

- The Vice President was responsible for overseeing the executive board and working more closely with the interworking's of the club. The Vice President would request updates every other week (off weeks from executive meetings) to make sure there are no issues or concerns with positions. The Vice President was able to have a better understanding of where each sector of ISU MA could improve. In the event of the President being unavailable, the Vice President would be required to run the general meetings, and activities.
- The Secretary had the responsibility of taking notes during meetings, advertising meetings, events, and activities, and was the main contact from the club to the student body. The secretary helped create and distributed fliers throughout the MSE building, and provided significant assistance to the President and Vice President. They also ran the ISU MA Gmail account and managed the emails that came in and out.
- The Treasurer was responsible for managing the ISU MA accounts through lowa State University. This position maintains the account sheets and balances the checking and credit card accounts. The treasurer also assisted the fundraising chairs in getting purchasing cards and solicits allocations from the Iowa State University Engineering Student Council. Once a month, the treasurer reported the balance of the account to the executive board.
- The two Fundraising Chairs were in charge of raising money for the club to spend on activities, outreach, and travel. This was done primarily through weekly pizza sales that they organized and oversaw. These sales were done in the Hoover Hall atrium, which is the Materials Science and Engineering department building on campus. This area is very busy around lunch time for many students. The chairs worked with Jeff's Pizza Shop, a local pizza parlor in Ames, to arrange a special deal on pricing to maximize the club profits. The chairs successfully made sure there were volunteers each week and that everyone serving was food safety certified. In addition to the pizza sales, the two officers were also responsible for purchasing food for the general meetings. This past year they also began searching out companies that might be interested in becoming sponsors/donors of the organization and building relationships with them. Without the amazing effort and dedication from the fundraising chairs, ISU MA would not be able to be as successful as it has been.
- The Outreach Chairs are responsible for organizing the large number of outreach demonstrations performed each year. The two officers coordinate with the hosts and find trained volunteers for the events. These are two of the busiest positions within the organization, and through the addition of the Outreach Team from the past years, the chairs were able to rely on a dedicated group of people to help out. Through the efforts made this year, we believe the outreach program will be able to excel and reach new growth for next year.
- The Programming Chair arranged speakers and activities for meetings as well as looked into the possibility of industry tours. Through the Programming Chair's hard work, eight speakers, an information session



VICE PRESIDENT-LEANDER MASCARENHA.



SECRETARY- JESSICA WETTSTEIN



TREASURER AND OUTREACH CO-CHAIR-DAVID PUHL





OUTREACH CO-CHAIRS- REBECCA WHITESELL AND SAM FER

- for ATI, two panels, and a variety of other activities were planned for the year. These opportunities were of great benefits to students, and helped provide insight to future careers and goals.
- The Events Chair organized social events for the chapter and had to work closely with the department and the freshman learning community mentors. This year there were 21 events hosted or co-hosted by ISU MA. These included the recurring "Friday After Class", intramural sports teams, and professional events planned with the Programming chair.
- The Historian and Webmaster positions are responsible for taking pictures and club events and maintaining the club website respectively. The Historian takes pictures at events and meetings to keep a record of the year via a "virtual scrapbook". Through lowa State Student Organizations, a new website was created that was much more user friendly and did not require coding knowledge to maintain. This allowed the Webmaster to be able to update it with information more frequently. With the new website, external entities were able to learn more about our society and know the correct people to contact.



PROGRAMMING CHAIR- CARTER FRANCIS



EVENTS CHAIR- TINA BERTHIAUME



HISTORIAN- MATTHEW KLOCKE AND WEBMASTER- AARON ROSZAK

Behind The Scenes

Each year, officers are elected through a majority vote at the April GM, which is the last meeting of the semester. Prior to the meeting, information is sent out to the department with descriptions of each officer position, and who is currently in the position. This allows students to have time to learn more about the positions, and prepare a short speech of why they would like to be elected. For those students not able to attend the meeting, an in absentia letter of intent can be submitted to be read at the general election. Following elections, a transitional meeting is scheduled so current officers can walk the new officers through their position. This meeting is crucial for a smooth handoff of responsibilities from year to year. Officers are tasked with preparing notes for the new students with details about what they did that year, any vital contact information, and any suggestions they have for the future. Every year, we hope to have a variety of lowerclassmen and upperclassmen on the executive board; therefore, new members are able to rely upon veteran students to assist with further questions. By maintaining excellent records of the year's activities, especially in the newly established GoogleDrive, the executive board is able to refer to previous year's notes for assistance. These include budget overviews, outreach schedules, fundraising records with food purchases and notes from general meetings, calendars, etc. Our chapter maintains a website at stuorgs.engineering.iastate.edu/material-advantage. The website is a great way for those interested in outreach to connect with the organization and those in charge of outreach, or someone that might be interested in becoming a sponsor knowing more about what we do. Through this website, students are also able to request to join the organization and become an "official member" at Iowa State.

Our general meetings and club events are typically very well-attended. General meetings had an average of 30-40 students this past year. Friday After Class events saw an average of 15 students, and the different events had anywhere between 10-50 students attend. The club was able to sponsor a few intramural teams throughout the year as well as many outreach events. ISU MA is a very close knit group of dedicated students and is very well supported by our department who recognize our passion. This past year was once again very strong year for ISU

MA, and we were proud to continue on the club's tradition of excellence within the department, university, and state.

IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

College of Engineering

Materials Science & Engineering 2220 Hoover Hall Ames, IA 50011-2300 Phone: 515 294-1214

FAX: 515 294-5444 mse@iastate.edu

http://www.mse.iastate.edu

May 31, 2017

To Whom it May Concern:

It is with great pleasure that I write this letter in support of the Iowa State University Materials Advantage (ISU-MA) Chapter. I am always proud of the student members and their accomplishments each year and this year is no different.

This year 12 students traveled to the Material Science and Technology conference in fall 2016 to attend the conference and take advantage of the opportunity to network with professionals and other students around the nation. In April, five students traveled to Washington D.C. for Congressional Visit Days. Due to their extensive planning and preparation, the students were able to meet with Iowa Senators and representatives and their staffs to speak on behalf of continued support for materials related research funding and industry support.

Monthly meetings and various activities, both professional and social kept the students busy the entire year. These included social activities to welcome new students, trips to nearby companies, and departmental related events. ISU MA's continued work to strengthen the relationship between the faculty and the student body has made the department stronger than ever.

The chapter has continued to provide outstanding outreach service to the community in Ames as well as communities around Iowa. In addition to educational outreach, students also expanded outreach to include community volunteering. The chapter performed an excellent 30 outreach demonstrations this year as well as volunteering for events such as FiRST Lego League and Ames Lab Science Day.

Through all of these projects, the ISU MA chapter continues to strive to provide students the foundation for excellent leadership and a model organization. I strongly endorse their application for the Chapter of Excellence award.

Sincerely,

Scott Chumbley, Professor, FASM

Scott Chumling