

Missouri University of Science and Technology Material Advantage Chapter

Chapter of Excellence Nomination and End of
Year Report

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Chapter Overview

Chapter Overview

The Missouri University of Science and Technology (Missouri S&T) chapter of Material Advantage (MA) is one of six student organization listed under the Materials Science and Engineering Department at Missouri S&T. The MA student chapter's goal is to increase student interest and involvement in the Material Science field and in the Materials Science department. The chapter provides its members with professional development opportunities to help students get involved in the scientific community, and develop relationships with current professionals within materials research fields and the materials industry. Developing these relationships between students and industry is extremely important for the success of the students and any future involvement in the field of materials. To achieve the goal of increasing interest in Materials Science, the chapter is active in introducing STEM, (science, technology, engineering, and mathematics) subjects with a focus in material science, to younger students including K-12 students and underclassmen at the university. Fostering interest in science and technology in the younger generation is important for continued scientific advancement as well as for the future of material science and engineering in the U.S. and abroad. The chapter also serves to educate current students about the materials industries through industry speakers, tours of Materials Science facilities, how to network with industry at professional conferences, and more. Finally, MA is simply a group where material science students can find friends, enjoy the company of their department, and form connections that will be valuable later on in their careers.

Chapter Overview

Chapter Officers

Jacob Belke
Chair



Elizabeth Robinson
Vice Chair - Ceramic



Jacob Belke
Vice Chair - Metallurgy



Micca Nevins
Treasurer



Halle Bischoff
Secretary



John Waldo
Historian



Jennifer McKinney
Programming Chair



Sami Garnier
Webmaster



Dr's. Greg Hilmas & Ron
O'Malley Faculty Advisors



Committee Heads

Stephanie Soendker
Outreach



Drew Jacobs
Social



Aleks Chernoff
Professional Development



Chapter Overview

Highlight

Conference Attendance

- 45 Students attend MS&T
- 8 students attend AIST
- 2 students attend CVD

Student Speaker

Evan Musterman – 2nd Place Overall

Scholarships

- AIST Ronald E. Lincoln Memorial Scholarship – Joseph Goedeke
- Steel Intern Scholars (formerly FeMET and StEEL Scholarships) - Henry Dul & Logan Bader

Programming

Fall Picnic

The annual Materials Department Fall Picnic was sponsored this year by Nucor. The fall picnic is held every fall the day before the Missouri University of Science and Technology Fall Career Fair. At the picnic, students, faculty, and potential employers who are staffing the career fair are invited to participate in a softball game and BBQ. The picnic gives an opportunity for students to interact and network with employers in an informal environment before the career fair.

Joint Meeting

Material Advantage, Keramos, and American Foundry Society had bi-weekly joint meetings with the Materials Science and Engineering Department to keep all of the undergraduate and graduate students informed of what was going around the department. The meetings were held after the MSE seminar every Thursday afternoon. Outreach events, professional events, and social events were discussed, planned, and had many volunteers during these weekly meetings. Pizza was provided during the gathering.

Career Development

Technical Meeting Attendance

Materials Science and Technology (MS&T) 2016 Conference

MS&T 2016 took place in Salt Lake City, UT this past year. Missouri S&T always sends a large delegation of students and the location was not going to stop us this year. Forty-Five students attended because of generous donations from Nucor and Dr. Ronald O'Malley. Missouri S&T came home with many MS&T awards. Evan Musterman came in second in the Student Speaking Competition and Stephanie Soendker won the Aesthetic Mug Competition. Ashley McClain won the PCSA Creativity Competition with her fused glass jellyfish. The Missouri Chapter of Keramos won the Diamond Award at Keramos convocation.



The 77th Glass Problems Conference

Material Advantage members attended the 77th Conference on Glass Problems (GPC) in Columbus, OH. This was an extremely informative conference for undergraduate students. The GPC exposed members to the specialized niche of the glass industry. The GPC was a wonderful blend of technical talks and meeting people from industry. The technical sessions covered a broad range of glass related topics, such as melting, energy, modeling and refractories. These talks implemented topics covered in MS&T ceramic engineering program, as well expanded the members knowledge on glass. It also showed the extensive technical aspects of glass production. There were several representatives from industries, giving members a chance to network. This tour was very beneficial for members, as it gave members an up-close look of the glass making process. Overall, the 77th Conference on Glass Problems was a great experience for members, showcasing the vast field of glass science and technology.

The 53rd Annual Symposium on Refractories

Material Advantage members attended the 53rd Annual Symposium on Refractories in St. Louis, MO sponsored by the St. Louis Section and the Refractory Ceramics Division of the American Ceramic Society (ACerS). This year's topic was the "Real World Applications of Refractory Testing." Talks covered a wide variety of common issues in the refractory community including thermal conductivity determination, slag corrosion testing methods, monolithic refractory properties, and castables. Attendees came from countries all over the world. During the exposition, Material Advantage members networked with suppliers and companies. Also at the symposium were some alumni of the Missouri S&T Keramos chapter that shared their experiences of working in the refractories field. Overall, the symposium provided a rich insight in to the refractory ceramics community and all that it can offer.

41st Annual USACA Conference on Composites, Materials, and Structures

Three Material Advantage students were selected to be student pages for the 41st Annual USACA Conference on Composites, Materials, and Structures in Cocoa Beach, FL. Due to ITAR restriction, USACA selected student pages from three universities to check in all participants and work security at the doors of the sessions. This conference was an invaluable networking opportunity for the students. The pages got the opportunity to spend a week alongside leaders in the composites industry creating contacts for the future. Pages also spent a lot of time with each other going to the beach, playing volleyball, and surviving a tornado storm.

Congressional Visits Day 2017

Aleks Chernoff and Jonathan Lapeyre were a part of Material Advantage's Congressional Visit Day to advocate for federal support and funding for science and engineering disciplines. Both students have had experiences where federal funding has made a difference in their educational career. When Jon was asked why he wanted to apply, he said, "In my college career, I have had awesome opportunities to attend conferences and to work as an intern at Dal-Tile but my favorite activity was the REU (Research Experience for Undergrads) workshop on additive manufacturing sponsored by NSF. This is what really propelled me to look into furthering my education and eventually becoming a graduate student. Pass along the lessons I've learned regarding these choices, and the benefits of these programs, is very important to me." Aleks similarly works in the electron microscopy lab which would not be possible without grants from the federal government. They met with staffers of several congressional offices showing samples from research in ultra-high temperature ceramics and ceramic foams and overall had a productive visit, with a little sight-seeing too.

The Iron & Steel technology (AIST) Conference and Exposition 2017

This year's AISTech Conference was held in Nashville Tennessee. Eight undergraduate and graduate students were in attendance along with several professors from Missouri S&T including Dr. Ron O'Malley who will be the 2019 AIST president. Tim Adams, a graduating senior, was chosen to present his groups' MSE senior design project on ductile iron sponsored by Kohler.



Service

G.R.A.C.E. Food Drive

In October, MA sponsored a "Metallurgy Students & Ceramic Faculty vs. Ceramic Students & Metallurgy Faculty" canned food drive with the proceeds being donated to GRACE (Greater Rolla Area Charitable Enterprise). To motivate both teams, it was decided that the winning team would choose a student and a faculty member from the "losing" team to be pied. Points were assigned to donated items, and this year's winner was the metallurgy students & ceramic faculty. The metallurgy faculty member that was chosen to be pie'd this year was the department chair, Dr. O'Keefe (pictured).



Park Clean-up

On April 9th, the MA student chapter teamed up with the ASM student chapter to do a joint park cleanup of the Rolla Lions Club Park. Eight student volunteers spent about an hour walking around the park and picking up any trash from the pavilions, around the lake, and on the bike trails. Afterwards, there was a large BBQ at one of the pavilions.

World Wide Youth in Science & Engineering (WYSE)

Material Advantage and Keramos members assisted Dr. Bill Fahrenholtz with the state finals of the Worldwide Youth in Science and Engineering (WYSE) competition. This event is a major academic competition for high school students in the state of Missouri. Students take exams in a range of subjects from math to biology to engineering graphics. The student volunteers proctor and score the exams.

Outreach-Demos

Outreach for the department has always been incredibly important and one of the most active portions of our Material Advantage Chapter. There are a wide variety of demonstrations performed for an even wider variety of audiences. In the past year, it is estimated that through around 20 organized events, approximately 5,500 students and their families were reached. Our Outreach team strives to educate our audiences on the science and career opportunities in Metallurgical Engineering and Ceramic Engineering through interactive and engaging demonstrations and by providing home experiments for younger students to do at home or in their classes with their families and peers.

Open Houses

This year we participated in four open houses with the Missouri S&T Admissions Office. Each open house included a group of students who talked with prospective students about the different degree programs offered and guided them on tours through the labs and building. Other students gave demonstrations of glass forming and applications, technical ceramics and metal applications. Our MA Chapter also partnered with the Missouri S&T American Foundry Society (AFS) Chapter to provide Foundry tours and a pour for students and their families to watch.

Discovery Fair



The Missouri S&T Admissions Office invited our Chapter to participate in the St. Louis' Engineers' Club first annual Discovery Fair where area companies and universities with opportunities in STEM came and presented to high school students and their families after the school day. The St. Louis Science Center, St. Louis Zoo, several Civil Engineering firms, and four other universities also presented at the event. Our Chapter had a booth with interactive glass, technical ceramic, and metals demos that

was presented to students as a video display from the Missouri S&T College of Engineering and Computing Science showing the research opportunities within the Material Science and Engineering department. Around 50 students and their families were reached and given mini demo kits to do at home.



Rolla Middle School Math & Science Family Fun Night

Our Chapter also participated in the annual Rolla Middle School Math and Science Family Fun Night. Our team did interactive glass, technical ceramics, and metals demos as well as filled in for the Physics Department by making liquid nitrogen ice cream, marshmallows, and demonstrations with balloons and ping pong balls. Around 200 students and their families attended the event and were given mini demo kits to take home and do.



Rolla Science Day

Material Advantage and Keramos members frequently present demonstrations to middle schoolers from Rolla Middle School. This year, volunteers went to Rolla Middle School Math and Science Family Fun Night, and presented many demonstrations, such as liquid nitrogen ice cream. Middle schoolers and their families were present; this was a very engaging opportunity for the middle schoolers to learn.

Engineers' Week SciFest

This semester we were invited again to join the Missouri S&T Student Design and Experiential Learning Center (SDELC) teams to participate in the St. Louis Science Center Engineers' Week SciFest event. Our Chapter and the design teams used interactive displays and demonstrations to educate students and their families on the wide range of STEM opportunities and to promote Missouri S&T. Big Dream at the science center approximated that over 9,800 people attended SciFest over the two-day period. Each student and their families participated in our interactive glass, technical ceramic, and metals demos and were given one or two mini demo kits to take home.



HERO on Campus Science Day

Helping Everyone Reach Out (HERO) on Campus invited us to join their event in partnership with the Rolla Optimist Club to do glass, technical ceramics, and metals demonstrations for area boy and girl scout troops.

Introduce a Girl to Engineering Day

Our Chapter also participated in the campus-wide Introduce a Girl to Engineering Day. Our team guided groups of girls who are interested in STEM careers on a tour of the labs and building as well as demonstrations of glass formations and applications of technical ceramics. Our Chapter partnered with the AFS chapter and the Blacksmithing club to also give the girls tours of the Foundry and some blacksmithing demonstrations.

March for Science

April 22nd, 2017, members assist by running two tables with materials demos during the March for Science Festivities. Members handed out mini demo kits and showed the adults and the children who came to our table about the variety of ceramic applications in a wide range of industries.



Campus Visitors

Throughout the school year there were several groups from the Rolla area that visited the department including a group of students from Waynesville High School, East Central Community College, and several others. Each group was walked through a ceramics lab, the Foundry and saw demonstrations put on by the Blacksmithing and the Gaffer's Guild. All of the students

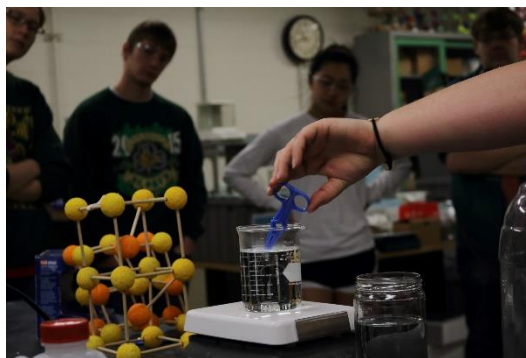
were given admission and degree program information and their teachers received mini demo kits to take back to their classrooms to do for other students.

Over the Break Demos

Five MA members checked out demo kits over the break to do demos for students in their old schools in their home towns. Demos were performed in Kansas City, St. Louis, Springfield, and for several schools in the Rolla area.

Demo Days

This semester two Demo Days were organized to continue training new MA members how to do demos and to put together various kits. Over 100 hours were volunteered by MA members to teach new students how to give demos, to construct new kits of display materials to be used from traveling events, to assemble packs of materials to be given out to students and to teachers for use in their classrooms, and to help maintain the equipment used for presentations.



Social Activities

Welcome Barbeque

On September 1st, MA held a recruitment barbecue after the first department technical seminar of the semester which was aimed at recruiting new freshmen. There were almost 100 students in attendance as well as faculty. Burgers and hot dogs were served.

Trivia Nights

On the first Tuesday of every month, a local bar and grill called The Locker Room would host a trivia night, which Material Advantage members would attend. Some nights the team would be a large conglomerate of metallurgists and ceramics, other nights it would be a humble gathering of a few department friends, but every night was an intense battle for first place. (It should be known that the team considered “not last” to be close enough to first place).

Paintball Outing

On March 12th, Material Advantage sponsored a paintball event at a local venue called Paintball Preserve, where 30 department members were able to play free paintball. The event was a 3-hour session of pure fun, excitement and vengeance, as alliances were made, friendships were shattered, and department rivalries were hashed out on the field. One of the rounds was a fierce standoff between metallurgists and ceramists, where the mets claimed the title as paintball champions.



Dodgeball

On March 9th, Material Advantage sponsored a fun dodgeball tournament at the campus rec center. This was an opportunity for members to let loose a bit during the stressful times of the semester, and it was a chance for members to get to know one another better as well.

Chapter Management

Organization and Procedures

General Meetings

Meetings were held every Thursday on a bimonthly basis following a Materials Science and Engineering Department technical seminar. These meeting were used to inform members of upcoming events. Meeting attendance ranged between 15 and 20 members with attendance being required for meetings regarding upcoming professional conferences. Agendas and minutes were emailed out and saved to a community Google Drive for reference and archiving.

Officer Meetings

Officer meetings were held every Wednesday on a weekly basis to allow officers, committee chairs, and the chapter advisor to stay up to date on planning events and organizing chapter. Chapter business included finances, social events, outreach, industrial plant visits, as well as business from other student organizations such as Keramos and the American Foundry Society. These meetings were essential for organizing upcoming activities and to ensure the executive members were well informed.

Trip Planning Meetings

Special meetings were held prior to professional conferences to help plan logistics for these trips. Logistics included lodging, transportation, and student events during the conferences. Students were given contact information of other attendees, conference itineraries, and room and van assignments (if needed).

Elections

Officer elections were held during a general meeting on April 20, 2017. The entire officer board was elected in a trickle-down style using Roberts Rules of Order. Nominated students were asked to give a short speech outlining their credentials for the position and reason for running. Any students not in attendance were asked to create a short video speech to be played during elections.

Communication

Communication amongst the Material Advantage chapter members is primarily through OrgSync, department wide e-mails and through bi-weekly meeting updates.

Member Development

MS&T Leadership Workshop

Several MA officers attended the MA leadership workshop at the MS&T 2016 conference. This meeting was an opportunity for every MA Chapter to meet each other, discuss best practices, and explore new ideas. Student involvement was a major topic in this year's workshop. Topics were discussed over breakfast with the chapters, separated by position.

PCSA

Two students from our Chapter were chosen to be PCSA delegates. President's Council of Student Advisors (PCSA) to ACerS is a student run organization that focuses on outreach, programming, and building professionalism. PCSA expanded to 50 members from 35 different Universities and 10 countries. Austin Martin and John Waldo represented Missouri S&T. The current focus is on developing demo kits. These kits allow teachers to purchase small materials science based demos for their students and include detailed procedures and explanations of the properties demonstrated.

Officer Duties

Chair

The Chair is responsible for the overall guidance of the chapter. He/she sets the agenda for the general and executive meetings and is also in charge of contacting faculty and other organizations outside of the department. The Chair is also responsible for delegating tasks throughout their term as well as coordinating and completing the end of year report.

Vice Chairs

The Vice Chairs (Ceramic and Metallurgy) are responsible for setting up lab tours and demos, and also serve as a liaison between the other MSE groups. Additionally, they serve as the chair's primary assistant while also organizing the fall picnic and overseeing preparations for the different conferences.

Secretary

The Secretary is responsible for keeping minutes for executive and general meetings. He/she is also responsible for publicizing events and obtaining rooms for events. The secretary also creates a calendar for the month that is passed out at seminar so that students in the department know what events are going on.

Treasurer

The Treasurer is responsible for maintaining financial records, purchasing items, and obtaining reimbursements and grants from Material Advantage. He/she also provides financial updates at executive meetings.

Historian

The Historian is responsible for cataloging, collecting pictures, compiling articles, and cataloging events of the chapter.

Programming Chair

The Programming Chair is responsible for managing all social events during the year, as well as establishing new social events for the chapter.

Webmaster

The Webmaster is responsible for maintenance and upkeep of the MA website and OrgSync page, as well as the e-mail distribution group.

Committee Chairs

Social Committee Chair

The social committee chair is in charge of working with the programming chair to plan social events for the chapter.

Network Committee Chair

The networking chair is in charge of scheduling and planning events with industry contacts such as plant tours and industry dinners.

Outreach Committee Chair

The outreach committee chair is responsible for planning and scheduling volunteers for outreach events such as Materials Day and Open House demos.

Outgoing Continuity

Documentation Storage

To ensure that all documents are accessible to future officers, all important chapter documents, pictures, and forms are stored on a community Google Drive. This enables officers to create and share documents with ease among other officers and members.

Officer Transitions

A meeting was held between the outgoing and incoming officers to discuss roles and responsibilities of each of the positions. Outgoing officers were asked to outline the basic tasks that their position requires, and incoming officers were given the opportunity to ask any questions regarding the position. New ideas or suggestions were also exchanged among officers to help further grow the chapter. Additionally, incoming officers were asked to attend the last month of executive meetings to understand how meetings are run.

Recruitment Activities

The Missouri S&T Chapter of MA always has an active recruitment process and encourages undergraduates and graduates to join Material Advantage. Officers are sent every semester to talk to students in the introduction material science classes.

Freshman Engineering

Freshmen enrolled in an engineering discipline at Missouri S&T have to take a freshmen engineering course. The course exposes students to every engineering discipline on campus. As part of this exposure, a student from each major was asked to talk about their intern, co-op, and class experience. MA members enrolled in ceramic and metallurgy engineering participated in this month-long series of lectures.

Minerama

Minerama is an event put on by the university for incoming freshman. Every organization recognized by the university is invited to attend. MA created a board with pictures representing the events that are put on throughout the school year. This event helps with recruitment for the organization and the department.

Treasury

Thomas O’Keefe Professional Development Fund

The Thomas O’Keefe Professional Development Fund is an account that is shared among the six department student organizations, Alpha Sigma Mu, Keramos, the American Foundry Society, Gaffer’s Guild, Blacksmithing Club and Material Advantage. The account unfortunately was misappropriated and no funds were given to the student organizations from this particular account. However, funds were provided through various departmental accounts as well as significant donations from Dr. Ron O’Malley and Gary Pennell from Nucor Yamato. These funds were used for student events including travel to the MS&T conference in Salt Lake City, UT.

MA Student Chapter Funds

Other events that the student chapter funded and attended were professional events such as AIST and Congressional Visits Day. As well as social events including chapter picnic’s, paintball social, senior sendoff dinners, and finals week study breakfasts. These events are a great way to bring the chapter together as a group and help with our professional development.

Advisor Letter



MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

May 31, 2017

To Whom It May Concern:

We are writing this letter in strong support of the Missouri Univ. of Science and Technology (Missouri S&T) Material Advantage Student Chapter in their pursuit of being recognized as the Most Outstanding Chapter of MA for 2017.

The Missouri S&T Chapter of MA had a great year, and it has been our honor to be the faculty co-advisors for the chapter. The executive board of officers, led by President Jacob Belke, accomplished a substantial amount of student programming, career development, and service activities for the chapter. In brief, the 2016-17 year saw the MA Chapter actively participate in the summer 2016 ASM Materials Camp, Preview Registration and Orientation (PRO) days for the campus, the Worldwide Youth in Science and Engineering (WYSE) state finals, F.I.R.S.T. robotics competition, St. Patricks' School science fair, the Rolla Lions Club park cleanup and the MA Chapter annual canned food drive to benefit a local Rolla, MO food pantry (GRACE). Other chapter outreach activities included Missouri S&T open houses to promote materials science, the St. Louis Engineers' Club first annual Discovery Fair, the Rolla Middle School Math and Science Family Fun Night, the St. Louis Science Center Engineers' Week SciFest event, the HERO on Campus Science Day and the Rolla Middle School Math and Science Family Fun Night. We are extremely proud of the MA chapter's involvement in these service activities.

The MA Chapter was also very active in traveling to conferences and other events this year. They sent 45 students to MS&T'15 in Salt Lake City, UT, by bus from Rolla, with several students participating in the MA leadership workshop, one student taking 2nd place in the speaking contest, 1st place, aesthetic, in the mug drop competition and winning the PCSA creative competition and receiving the Keramos Diamond award at the conference. Two students attended the MA Congressional Visit Day to advocate for federal support, and several students attended the 77th Conference on Glass Problems (GPC) in Columbus, the 53rd Annual Symposium on Refractories in St. Louis, and the 41st Annual USACA Conference on Composites, Materials and Structures in Cocoa Beach. Eleven MA students also went to the AIST conference in Nashville, TN, in the spring *during finals week*, and participated in events such as the undergraduate speaking contest and in the graduate poster competition (second place). It takes an incredible amount of work by the executive officers to organize these trips, get the students to the events, and make sure that everyone has a successful meeting while making it safely back home.

In summary, we firmly believe that the Missouri S&T MA Student Chapter has done a great job of enhancing the professional development and education of the students pursuing degrees in the MSE department. They deserve to be recognized for their many outstanding accomplishments in 2016-17.

Sincerely,

Gregory E. Hilmas
Curators' Professor of Ceramic Engineering
Missouri S&T MA Chapter Co-Advisor

Ronald J. O'Malley
Iverson Chair Professor & Director PSMRC
Missouri S&T MA Chapter Co-Advisor

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