

# **Missouri Chapter of Keramos**

## **2017 Annual Report**

*Excellence • Scholarship • Tradition*

MISSOURI  
**S&T**

University of  
Science & Technology

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## **I. Chapter Advisor Executive Summary**

Whether fueled by the first loss of the Most Outstanding Chapter award in more than a decade or by an unusually inept Material Advantage (MA) Chapter on the Rolla campus, this past year has been the most productive year I have witnessed in my nearly two decade run as faculty advisor. The Chapter and the officers set aggressive goals for the year and not only accomplished them, they completed most of the MA chapter's activities as well. This is a testament to the hard work and professionalism displayed by this particular Keramos executive board and the Keramos members at Missouri S&T. To indicate that I was pleased by their performance this past year would not do justice to what they have actually accomplished. Everyone leaned on them, MA, the department, the faculty, asking Keramos to run everything, organize everything, complete everything. Oh and by the way, go ahead and complete that huge list of things you had already planned for Keramos this year. Oh and do great in the classroom as well.

It has been amazing to watch this unfold. Elizabeth and John provided the strong leadership necessary to accomplish so much and I will very much miss having them in that role. The rest of the executive board elevated their participation as well, realizing that they needed to take the lead on many of the tasks so that all could be completed in a manner consistent with the ideals of this fraternity.

So many things were accomplished and are appropriately details in this report. So many of them make me proud to be a member of the Missouri S&T chapter of Keramos. As I read through them intending to highlight a few in this note, there were so many terrific examples of the Keramos chapter at its finest that I decided instead to close with the following statement.

This is the best the Missouri S&T chapter has ever been.

Jeffrey D. Smith

A handwritten signature in black ink that reads "Jeffrey D. Smith". The signature is written in a cursive style with a large, stylized initial 'J'.

Faculty Advisor of the Missouri S&T Chapter of Keramos  
April 13, 2017

## II. Annual Plan for Upcoming Year

Over the past year, Keramos has grown in membership and its role in the Materials Science and Engineering department here at the Missouri University of Science and Technology. Our department has been growing rapidly, and Keramos has done well to help ease the growing pains. The Missouri chapter has significantly increased its outreach efforts and has modified our Lunch and Learns to assist some course requirements by allowing students to discuss their industry experiences. The Keramos members organized the fall and spring etiquette dinners, convincing Nucor to sponsor the spring dinner much as Kohler sponsors the dinner in the fall. Looking forward to the future year, I would like to continue this spirit of achievement and the accomplishments that our chapter has made.

I look forward to a bright year for our chapter and the expansion of some of our programs. Overall, I would like to emphasize the professional aspects of our fraternity. Our Lunch and Learn program is a great opportunity to educate our members in lessons that cannot be gained within the typical curriculum. I would like to see us bring in more speakers who have had long and storied careers in industry, to not only give insight into to ceramic engineering, but also into the nature of business and economics. At our age, it is hard to understand the full impact of the history of the ceramic industries. A Lunch and Learn focused on the how and why of a particular ceramic technology in the context of history could prove useful in helping expand our members understanding of the industries that we will soon enter. These two particular ideas are just a couple of avenues that could be added to our already robust Lunch and Learn program.

Continuing with the theme of expanding professionalism, I would like to assist our members in the hiring process. We require initiates to attend the career fair, and almost all of our members go as well. To help prepare them for the hiring process, I would like to set up workshops geared towards technical content to help prepare our members for our particular industries. I would like to see a resume review workshop, a session of mock interviews, and even the basics of writing cover letters. These workshops would then be combined with the etiquette dinners to help train our members to be the choice candidates for the job.

Aside from the professional emphasis, I would like to better represent Missouri S&T in the contests held at the MS&T conference. Our process for the Speaking Contests is doing well, but I would like to help formalize the Ceramic Mug Drop and Disc Golf Contests. Creating teams consisting of Senior and Junior members that can pass on a history of our efforts as the Missouri Chapter in these competitions would be a good step in this direction. I would hope that these teams would eventually increase our success.

Altogether, I am very optimistic about the upcoming year. I believe that we have the work ethic as a chapter to continue our work from the past year, and the motivation to expand our professional emphasis into new events.

Evan Musterman



Keramos President - Missouri Chapter 2017-2018

**III. List of Officers for Upcoming Year**

Name: Evan Musterman <sup>1</sup> Office: President Address: [REDACTED] [REDACTED] Phone Number: [REDACTED] E-mail Address: [REDACTED]	Name: Jecce Jarman Office: Herald [REDACTED] [REDACTED] [REDACTED]
Name: Jacob Whanger <sup>1</sup> Office: Vice President [REDACTED] [REDACTED] [REDACTED]	Advisor: Dr. Jeff Smith [REDACTED] [REDACTED] [REDACTED] [REDACTED]
Name: Drew Jacobs <sup>1</sup> Office: Secretary [REDACTED] [REDACTED] [REDACTED] [REDACTED]	Historian: Tyler Grant [REDACTED] [REDACTED] [REDACTED] [REDACTED]
Name: Jon Scott Office: Treasurer [REDACTED] [REDACTED] [REDACTED] [REDACTED]	Nominations Chair: Sam Vomund [REDACTED] [REDACTED] [REDACTED] [REDACTED]

Officers attending convocation as delegates at MST 2017<sup>1</sup>

**IV. List of Active Members**

<b><u>Undergraduate Members</u></b>		
Anselmo, Nicholas	Heywood, Patrick <sup>2</sup>	Reynolds, Ethan
Baer, Matthew <sup>4</sup>	Jacobs, Andrew	Rodell, Olivia <sup>1</sup>
Blatt, Rebekah <sup>1</sup>	Jarman, Jecce	Robinson, Elizabeth <sup>4</sup>
Boillat, Rachel <sup>2</sup>	Jones, Matthew <sup>1</sup>	Sattman, Tyler <sup>4</sup>
Bueltmann, Alexandra	Jost, Michael <sup>3,4</sup>	Schneider, Teresa
Butler, Hannah <sup>3</sup>	Kent, Andrew	Schott, Andrew

Cahoon, Mary Ann <sup>1</sup>	Klafehn, Ethan <sup>3</sup>	Scott, Jon <sup>1</sup>
Carder, Nichole	Korklan, Nichole <sup>2</sup>	Scott, Margaret <sup>4</sup>
Chadbourne, Connor <sup>3</sup>	Latty, Blake	Shoaib, Noor <sup>4</sup>
Chernoff, Aleksander	Lawrence, Ben	Soendker, Stephanie
Cornish, Morgan	Lonergan, Jason	Stamps, Ransom
Courtney, Emily	Lunte, Ellie <sup>3</sup>	Steinbach, Derek
Croce, Dominic <sup>3</sup>	Martin, Austin <sup>4</sup>	Thompson, Lawrence <sup>3</sup>
Cunningham, Ryan	Martinez, Amelia <sup>3</sup>	Valadez, Christopher <sup>4</sup>
Dachroeden, Grant <sup>3</sup>	McCormack, Keith <sup>1</sup>	Vieth, Angela <sup>4</sup>
Dunn, William	McKinney, Jennifer <sup>3</sup>	Vietor, Hannah <sup>1</sup>
Eaves, Hannah <sup>3</sup>	Miller, Mary <sup>3</sup>	Vomund, Samantha
Ernst, Zachary <sup>3</sup>	Mitchell, Auben	Waldo, John <sup>4</sup>
Gilfoil, Katherine	Musterman, Evan	Wesley, Zoe <sup>4</sup>
Gordon, Joseph	Nulsen, Nicole <sup>1</sup>	Whanger, Jacob
Grant, Tyler	O'Neill, Erin <sup>3</sup>	Williams, Katrice <sup>4</sup>
Grieshaber, Doran <sup>3</sup>	Purnell, Mallory <sup>2</sup>	Zorn, Jacob <sup>4</sup>
Hahn, Michael	Read, Aaron <sup>1</sup>	
<b><u>Graduate Members</u></b>		
Brune, Paul	Lapeyre, Jon	Stanfield, Austin
Ferris, Myranda	Mattione, Anna	Wittmaier, Connor
Grohsmeier, Ryan	Murchie, Alec	Volz, Steven
Jarvis, Leiren	Nolte, Elizabeth	
<b><u>Postdoctoral Fellows</u></b>		
Dr. Jeremy Watts		
<b><u>Faculty</u></b>		
Dr. Laura Bartlett <sup>3</sup>	Dr. Wayne Huebner	Dr. Ron O'Malley
Dr. Richard Brow	Dr. Aditya Kumar <sup>3</sup>	Dr. Mary Reidmeyer

Dr. Fatih Dogan	Dr. Scott Miller	Dr. Von Richards
Dr. Bill Fahrenholtz	Dr. Mohsen Asle Zaeem	Dr. Mark Schlesinger
Dr. Greg Hilmas	Dr. Matt O'Keefe	Dr. Jeff Smith
<b><u>Emeritus Faculty</u></b>		
Dr. Darrell Ownby	Dr. Delbert Day	Dr. Harlan Anderson
<b><u>Honorary Members</u></b>		
1947 – John C. Hostetter	1985 – John Dial	2003 – Scott Miller
1948 – Frederick Norton	1986 – Chandra Ray	2004 – Chris Ramsey
1950 – Paul Smith	1987 – Mohamed Rahaman	2005 – Ted Day
1953 – Charles Smith	1988 – Lokeswarappa Dharani	2006 – Ron Kosher
1961 – William James	1989 – James Stoffer	2007 – Eric Bohannan
1970 – John Arthur	1990 – Daniel Armstrong	2008 – Matt O'Keefe
1970 – John Holt	1991 – Larry Heying	2009 – Ted Ruppert
1971 – Harlan Smith	1992 – Richard Hagni	2010 – Sam Stang
1973 – Hector McDonald	1994 – Daniel Stutts	2012 – Cindy Schwartz
1975 – Leroy Hart	1996 – Bill Hibler	2013 – S. Jill Glass
1977 – Manfred Wuttig	1997 – Kent Peaslee	2014 – Jaci Huebner
1978 – Paul Cash	1998 – Eric Schramm	2015 – Mike Carson
1980 – Edward Epstein	1999 – Ken Goretta	2016 – Glen H. Kirby
1981 – John Bartel	2000 – Terry Tiegs	2017 – Kathleen Shugart
1983 – Melvin Churovich	2001 – William Dawson	2017 – Mrityunjay Singh
1984 – Don Sparlin	2002 – Carl Moody	

Fall 2016 Initiate<sup>1</sup>  
 Fall 2016 Graduate<sup>2</sup>  
 Spring 2017 Initiate<sup>3</sup>  
 Spring 2017 Graduate<sup>4</sup>



## New Members

The Missouri University of Science and Technology Chapter of Keramos continued to expand this year through the recruitment of more ceramic and metallurgical engineering students. There were over 40 qualified applicants this year and the top students were admitted into our fraternity. Nine members were initiated November 16, 2016 and seventeen members April 6, 2017. Two metallurgical engineering students, two professors, and four freshman students were some of the new members to our chapter this year.

The initiation process this year was made to be a fun and relaxing experience for members entering our chapter. Each semester members grew close to one another during plaque making and initiate meetings. The application process was the same as the previous year, with information about the applicant's interests, campus involvement, and intention for pursuing a membership in Keramos. During the initiation process, initiates were required to attend the career fair, attend an etiquette dinner, make a glazed Keramos plaque, and pass an initiation test.



All initiates are required to attend the Missouri S&T Career Fair during the semester of their induction. Before attending the career fair, initiates were required to submit their resumes to the Herald for review and were each given feedback as needed. Attending the Career Fair builds professionalism and encourages networking with employers in the field. Over a third of the initiates who attended the Career Fair obtained internships or co-ops for this summer and upcoming semester.

During the etiquette dinners, initiates learned the ways of professional formal dining and what is appropriate to say and do. We discuss proper etiquette and review humorous pictures of professors and students displaying what not to do. Attending the etiquette dinner prepares initiates to act professional in a dining setting and make the best impression on those around them.

Initiates worked on making their Keramos plaques during the first few months of each semester. A stoneware clay body was rolled out and cut into the shape of the Keramos badge. The stars and moon shapes were cut and placed onto the main body and initiates hand carved "Keramos" in their plaque. All surfaces and edges were smoothed to make the plaques look professional. The plaques were bisque fired and then glazed with the two colors representing Keramos: blue and gold.

This year there was more attention to the plaque making process to produce plaques of higher quality. Finer details and smoother finishes helped the plaques truly stand out this year. The faculty Keramos members stated that this spring initiate class' plaques had been the best they had seen in many years. The above picture is of Hannah Eaves' plaque which received the best plaque award for the Spring 2017 initiation. She received a Keramos polo as a reward for making the best plaque. Our chapter hopes to pass this standard down to every following initiation class and also hopes continuous improvement in the process will lead to even more beautiful plaques in the future.

The final requirement before initiation was to pass a pledge test. Initiates were given a packet covering the history of Keramos and its role at Missouri S&T. They were then tested on these materials with additional questions including an assortment of practical knowledge pertaining to the materials field and our Materials Science and Engineering Department.

Upon completion of these tasks, initiates were inducted into our chapter through the Keramos initiation ceremony. Current members welcomed initiates in professional dress while professors wore their caps and gowns. After the initiation ceremony, the members were treated to a celebratory banquet where members signed new member's plaques. The picture to the right is a photo with the Spring 2017 Initiate Class.



**IV. Graduating Members**

<p>Matt Baer            Address: [REDACTED]            [REDACTED]            Phone: [REDACTED]            E-mail: [REDACTED]</p>	<p>Angela Vieth            [REDACTED]            [REDACTED]            [REDACTED]            [REDACTED]</p>
<p>Michael Jost            [REDACTED]            [REDACTED]            [REDACTED]            [REDACTED]</p>	<p>John Waldo            [REDACTED]            [REDACTED]            [REDACTED]            [REDACTED]</p>
<p>Austin Martin            [REDACTED]            [REDACTED]            [REDACTED]            [REDACTED]</p>	<p>Zoe Wesley            [REDACTED]            [REDACTED]            [REDACTED]            [REDACTED]</p>
<p>Mallory Purnell            [REDACTED]            [REDACTED]            [REDACTED]            [REDACTED]</p>	<p>Katrice Williams            [REDACTED]            [REDACTED]            [REDACTED]            [REDACTED]</p>

Elizabeth Robinson ████████████████████ ████████████████ ████████████████ ████████████████	Jacob Zorn ████████████████████ ████████████████ ████████████████ ████████████████
Margaret Scott ████████████████ ██████████████ ██████████████ ████████████████	

V. Missouri Chapter Honorary Keramos Nominations



**Kathleen N. Shugart, PhD**

The Missouri Chapter of Keramos would like to nominate Dr. Kathleen N. Shugart for honorary membership in Keramos for the 2016-2017 academic year. Dr. Shugart is a research scientist at UES, Inc. Dr. Shugart obtained her BS in Physics and Classical Civilizations from the University of Mary Washington. She went on to obtain her MS in Engineering Physics and also her PhD in Materials Science and Engineering from the University of Virginia, where she investigated high temperature corrosion mechanisms and microstructure of magnetic materials. Prior to becoming a research scientist for UES, Inc., Dr. Shugart acted as Interim Manager there and managed the Materials Characterization Facility (MCF) at the Air Force Research Laboratory at Wright-Patterson Air Force Base. Currently, Dr. Shugart is a contractor for MCF at the Air Force Research Laboratory at Wright-Patterson Air Force Base. Additionally, she advises researchers on best sample preparation practices, and also facilitates researchers in performing improved materials characterization especially in the areas of SEM, energy dispersive spectroscopy and wavelength dispersive spectroscopy. In total, Dr. Shugart has accumulated nine years of experience in ceramic materials technology development, with six publications to her name.



**Mrityunjay Singh, PhD.**

With great respect, the Missouri Chapter of Keramos would like to nominate Dr. Mrityunjay Singh for honorary membership in Keramos for the 2016-2017 academic year. Dr. Singh holds commanding positions for many organizations and companies: Chief Scientist at the Ohio Aerospace Institute in Cleveland, OH; President of the American Ceramic Society; Governor of Acta Materialia, Inc.; Academician of the World Academy of Ceramics, Italy; and Vice President of the International Board of the Academy.

Dr. Singh earned his PhD. in Metallurgical Engineering from Indian Institute of Technology-BHU, Varanasi, India in 1983 and went on to complete his post-doctoral work at Louisiana State University, Baton Rouge, LA and Rensselaer Polytechnic Institute, Troy, NY. His research has been involved in manufacturing, joining,

processing, and attachment technologies. Dr. Singh also has experience in characterization of advanced ceramics and composites, lightweight cellular ceramics and porous foams, high conductivity composites and porous materials for thermal management systems. He has additional in experience in ceramic matrix composites for turbomachinery and propulsion systems and a wide variety of materials for ultra-high temperature and extreme environment applications.

He remains a highly-involved individual in the materials field as a Fellow of the American Ceramic Society, ASM International, and American Association for the Advancement of Science (AAAS). Alpha Sigma Mu-Materials Engineering Honor Society awarded Dr. Singh with Distinguished Life Membership in 2014. Also, he is an Honorary Fellow of Indian Institute of Ceramics and received honorary membership from Materials Research Society of India. He



has been awarded Honorary Doctorate from Nagaoka University of Technology in Japan. As the recipient of over sixty-five national and international awards, Dr. Singh has set an exemplary precedent.

The Missouri Chapter believes that Dr. Singh is well-qualified for honorary membership into Keramos, and it was an honor to present him with his membership at the President's Meeting at MS&T this past October.

**VI. Treasurer's Report**

Two spreadsheets are included below to show our fiscal activity for the 2016 - 2017 academic year. The first describes the transaction in our bank account for both semesters as well as expected transactions that will occur after the writing of this report. The values given in the

expected revenue and expenditures section are estimated based off of previous amounts. The second spreadsheet described the transactions from our cash bag.

### Bank Account Records

Fall Semester, 2016				
Date	Description	Debit	Credit	Total
8/14/16	Beginning balance			\$482.32
9/1/16	Sale		\$25.00	\$507.32
9/8/16	Sale		\$10.00	\$517.32
9/15/16	Cords	(\$196.00)		\$321.32
9/22/16	Dues		\$10.00	\$331.32
9/22/16	Pizza for meeting	(\$40.16)		\$291.16
9/22/16	Sale		\$30.00	\$321.16
9/22/16	Sale		\$30.00	\$351.16
10/1/16	MJMC fundraising		\$300.00	\$651.16
10/1/16	Sale		\$40.00	\$691.16
10/6/16	Sale and dues		\$110.00	\$801.16
10/23/16	MS&T		\$324.00	\$1,125.16
10/21/16	Polo sales		\$40.00	\$1,165.16
11/3/16	Lunch and Learn	(\$222.31)		\$942.85
11/17/16	Initiation dinner	(\$397.51)		\$545.34
11/17/16	Speaking prize donation		\$200.00	\$745.34
11/17/16	Etiquette dinner payment		\$5.00	\$750.34
12/12/16	G.R.A.C.E. donation	(\$300.00)		\$450.34
Spring Semester, 2017				
Date	Description	Debit	Credit	Total
2/2/17	Pins	(\$300.00)		\$150.34

2/28/17	Deposit from cash bag		\$500.00	\$650.34
3/2/16	G.R.A.C.E. donation	(\$100.00)		\$550.34

**Cash Bag Records**

Fall Semester, 2016				
Date	Description	Debit	Credit	Total
8/14/16	Beginning balance			\$517.32
9/1/16	Sale		\$120.00	\$637.32
9/8/16	Sale		\$75.00	\$712.32
9/15/16	Padfolio sale		\$15.00	\$727.32
9/19/16	Deposit from previous year		\$45.00	\$772.32
9/22/16	Sale		\$47.00	\$819.32
11/3/16	Raffle tickets	(\$6.44)		\$812.88
11/15/16	Etiquette dinner payment		\$230.00	\$1,042.88
11/17/16	Initiation dinner payment		\$100.00	\$1,142.88
11/17/16	Polo sales		\$25.00	\$1,167.88
11/30/17	Cords	(\$30.00)		\$1,137.88
Spring Semester, 2017				
Date	Description	Debit	Credit	Total
2/4/17	MJMC fundraising		\$300.00	\$1,437.88
2/28/17	Etiquette dinner payment		\$100.00	\$1,537.88
2/28/17	Deposit into bank account	(\$500.00)		\$1,037.88
3/23/17	Sale		\$40.00	\$1,077.88
3/23/17	Cords		\$45.00	\$1,122.88
3/29/17	Frames for department awards	(\$50.59)		\$1072.29

## VII. Chapter Activities

### A. Fundraising

#### Item Sales

Approximately forty-five polos, ten t-shirts, five padfolios, and ten hats were sold to raise funds for Keramos. A new polo design, which was showcased at convocation, was created this year. There was not a new t-shirt design, but Keramos did work on this year's St Patrick's Day sweatshirt design. The design below went on the back of the sweatshirt and was available to everyone in the department. Over sixty people got sweatshirts with this back design. This was a service provided by Keramos and was not for profit. The design idea originated from the University of Illinois Centennial event where they used a similar design for t-shirts.



#### Miner Jobs for Major Cash

Starting in the fall of 2014, the Missouri Chapter began a program entitled “Miner Jobs for Major Cash” (MJMC), in which student members of the chapter would perform a service project for a faculty member in the department. In exchange for the help the faculty member would donate to the chapter. The program raised ~\$500 in the first year and continued to grow in its second year. During the 2015-2016 school year, members raised over \$850 for the chapter through this program. This year, the third year of the program, the chapter performed two “Miner Jobs for Major Cash” and raised \$600 for the chapter. The chapter already has some interest for the program from some of the newer faculty members and has plans to expand the program in the coming year.



*Students attempt to overcome friction*

### B. Educational Outreach

Keramos members have consistently engaged in several forms of educational outreach, such as open houses, volunteering at local science fairs, and others. This year was no exception, with involvement in several activities with a variety of age groups, and with guests from all over the country. Members perform technical demonstrations and answer material science questions for students 2nd grade through high school seniors.

#### Rolla Middle School Math and Science Family Fun Night

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 liquid nitrogen ice cream. Middle schooler and their families were present; this was a very engaging opportunity for the middle schoolers to learn.

## Rolla 7th Grade Science Fair

The university hosted a science fair in which various organizations demonstrated elements of different engineering majors to seventh graders. Keramos performed demonstrations and answered questions relating to materials science and engineering. These demonstrations focused on the relationship between chemistry and physical properties and included a silly putty exercise to illustrate the unique properties of polymers and a jolly rancher demonstration to simulate the properties of a glass melt. There was just over 100 students at the fair. The science fair was a fun and interactive way to introduce young students to the field of ceramic engineering and materials science.



## Engineering Week Expo in St. Louis

This year Keramos members participated at the Engineering Week Exposition at the St. Louis Science Center. Engineering Week Expo is an event hosted by the SLSC, to promote children's interest in STEM fields. Design teams and other organizations from Missouri S&T presented their work to inspire a new generation of engineers. Representatives from Keramos interacted with people of all ages, even as young toddlers, and educated them on material science. Demonstrations included Prince Rupert's drop, piezoelectronics, and other technical ceramics. The Jolly Rancher demonstration, in which melted Jolly Ranchers are used to simulate properties of glass and production of fiberglass, was particularly popular among children. The Engineering Week Expo was beneficial to not only children and their parents, but also the Keramos members. Over 9000 people came to the SLSC over the course of the event.

## Open Houses

Throughout the academic year, the Materials Science and Engineering Department hosts open houses to recruit potential students. Keramos helps host prospective students and their families by acting as tour guides, performing demonstrations, and by informing them about the



program. Keramos introduces prospective students to ceramic engineering by discussing the applications of ceramics in daily life and by demonstrating the extraordinary properties of such materials. Guests are shown a glass pour, how glass fibers are pulled, piezoelectrics, and the strength of tempered glass. These are just some of the many demonstrations. Open houses are also an opportunity for the potential students to ask questions about the material science program at Missouri S&T, and about the university in general.



## **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. Keramos students enrolled in ceramic and metallurgy engineering participated in this month long series of lectures. The Keramos students talked about their diverse range of co-op experience from Kohler to GE Aviation to Saint-Gobain as well as the experiences inside the department including research to leadership roles to lab experience.

## **WYSE Academic Challenge**

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. Keramos volunteers proctor and score the exams.

## **March for Science**

April 22nd, 2017 Keramos will run two tables with materials demos during the March for Science Festivities. Members will hand out mini demo kits and show the adults and the children who come to our table about the variety of ceramic applications in a wide range of industries.

## **HEROES Outreach Event**

At the end of April, Keramos is working with the Rolla Optimist Club and Helping Everyone Reach Out on Campus (HEROES) to expose local Boy Scout and Girl Scout Troops to the wonders of ceramics. Just under 100 kids will participate in this event ranging from K-12th graders.

## **C. Professional Development**

### **Etiquette Dinners**

Each academic year Keramos hosts two etiquette dinners. The purpose of the etiquette dinner is to mimic a dining interview and teach the *do's and don'ts* of a formal dinner outing. The dinner is typically hosted on campus at the Havener Center, but this year Keramos was excited to move the dinner to Just A Taste in St. James, MO. The fall dinner was hosted by Dr. F. Scott Miller and the spring dinner was hosted by Dr. Wayne Huebner. During the dinner, the host will educate the attendees with proper etiquette, which is accompanied by goofy pictures of professors acting out what should not be done.

In the fall semester, there was a lot of anticipation for the first etiquette dinner at Just A Taste. There was a total of 70 people at the event. The dinner was sponsored by Kohler Co. who graciously gave \$2500 and brought plenty of door prizes including shower heads, water bottles, and the prized toilet mugs. Three representatives from Kohler - Megan Hammon, Mike Carson, and Kaitlyn Deister - also



attended the dinner. Just A Taste came prepared to host with a wide arrange of delicious foods in large portions.

In the spring, we looked to improve even further and fine tune the dinner. There was a total of 81 people in attendance maxing out the capacity of Just A Taste at the time. Nucor was asked to sponsor the dinner and graciously agreed giving \$3000 in total. The dinner went on without a hitch. Wine was served for the time adding a new element to the dinner, the food was incredible, and everyone loved to listen to Dr. Huebner tell stories about his dining experiences across the world. After the dinner, Nucor agreed to sponsor the etiquette dinner in the future



adding reassurance that the etiquette dinner will continue to be a long-standing tradition of our Keramos Chapter increasing in grandeur each year. We would like to especially thank Gary Pennell and Tracy Frick from Nucor for attending and Eric Taylor and Casey Stuck from Just A Taste for giving us a new home for this event.

*Presenters and sponsors receive Keramos Greaves-Walker Plates*

## **Lunch and Learns**

Keramos sponsors monthly lunch and learns for the department. Topics for these talks range from students speaking on their co-op experiences, to professionals talking about industry, to professors talking about their career paths and life advice. Our Chapter provides food and reserves a room for the 30-40 students in attendance.

The fall semester series of Lunch and Learns consisted of a diverse group of talks. At the first lunch and learn in September, Keramos hosted the local student speaking competition for the MS&T 2016 conference. Three speakers presented their eight minute talks. Evan Musterman took 1<sup>st</sup> place at the local level and placed 2<sup>nd</sup> at MS&T 2016. In October Dr. Moats presented “Twists and Turns of a Career Path – How to Make Life Altering Decisions.” He gave an insight to his life and his career path. November was the last Lunch and Learn of the semester. Dr. Jay Singh who was the American Ceramic Society President at the time came and talked about ACerS, his work at NASA, and answered every question the audience could throw at him.

The spring semester series of Lunch and Learns mainly consisted of students fulfilling the requirements of earning technical elective credit hours for taking a co-op. Students presented on what technical and soft skills they acquired and what their experience outside of the job. Students presented on their experience at Kohler, GE Aviation, Owens-Illinois, PARC, Saint Gobain, Zimmer Biomet, and Sandia National Labs. These Lunch and Learns were mainly used to display the benefits, professional and social, of co-ops to entice students in considering taking a co-op and to display what different companies have to offer.

On April 3rd, we hosted yet another President of The American Ceramics Society, Dr. William Lee, where he shared outlined major points of his career and what habits he developed along the way. He also answered questions on engineering and professional development from the perspective of an international researcher.

## **PCSA**

Two students from our Keramos 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. Austin was part of the outreach committee and focused 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. John participated on the recruitment committee and focused on the advertising of PCSA to encourage participation from even more schools in upcoming years.

### **Next Top Demo**

Next Top Demo is an initiative from PCSA. Keramos students will submit a video of them conducting a ceramic/glass demonstration for outreach. In addition to the video a short explanation of the demo will also be added.

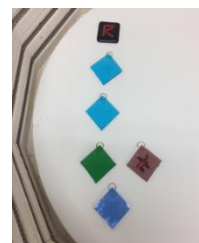
### **Graduating with Honors**

This is an honor bestowed upon the most dedicated members of Keramos. Graduating seniors are able to wear blue and gold honor cords at graduation and seniors who receive the graduating with honors distinction also get to wear a Keramos gold pin. The honor is given to seniors who have exceeded expectations in several different categories. The seniors fill out an application and write about the following criteria and how they went above and beyond: departmental activity, professional development, research, and other campus involvement.

## **D. Networking Events**

### **Keramos and Gaffers Guild Ornament Decorating**

Keramos worked with the Missouri S&T glassblowing organization, Gaffers Guild, to organize a day to make suncatchers. This event was held on November 11th and both Keramos and Gaffers Guild members seemed to enjoy the event and look forward to other socials creating glass pieces in the future. An event planned for next semester is Keramos members volunteering to help Gaffer's Guild create glass ornaments to sell at their winter glass sale.



### **Super Bowl Party**

On Super Bowl Sunday, February 5th, Keramos hosted a department get together at Dr Smith's house. Over thirty students and faculty came bringing food and fellowship as they cheered on the Patriots to victory.

### **BBQ with ASM and MA**

Alpha Sigma Mu, Materials Advantage, and Keramos cohosted a BBQ event that was kicked off with a park cleanup. Members met at Lions Club Park and cleaned up the pavilion area before starting friendly games of volleyball and ultimate Frisbee. BBQ, chips, and soda were then served and comradery was enjoyed by all.

## **E. Services to the Community**

### **Donations to G.R.A.C.E.**

Keramos made multiple donations to the Greater Rolla Area Charitable Enterprise (G.R.A.C.E.), a local charity that provides food and financial assistance to members of the community facing difficulties. The money for the donations, which totaled \$400 for the year, was raised through our etiquette dinners in which students and faculty were given the option of contributing to the charity.

### **Spring Banquet**

Keramos will organize and host the MSE department banquet on April 18th. The banquet will celebrate the accomplishments of the students and the faculty. Several awards will be presented including outstanding undergraduate students, graduate students, and faculty members. Students in each category are selected by the faculty and voted on by the students. Students and faculty are recognized for their hard work and dedication to the department. An award is also given to a professor who had the largest blunder that year. A student tells the story and presents them with the backside of a horse made out of clay, glazed, and fired.

## **F. Alumni Engagement**

### **Career Fair Fall Picnic**

The fall picnic was held before the fall career fair and potential employers for MSE students were invited. The picnic consisted of a softball game and a dinner catered by Lee's Chicken. Faculty and students had the opportunity to interact with potential employers in an informal environment. This helps students as they are more at ease the next day at the career fair since they had already met and talked with the employers.

## **G. Convocation and Conferences**

### **MS&T 2016**

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 wasn't going to stop us this year. 45 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 convocation.



## **Keramos Convocation**

Keramos National Convocation is held every year during the MS&T Conference. This meeting allows representatives from every chapter of Keramos to meet each other, discuss best practices, and discuss new ideas. The meeting this year began with the student portion ran by the student representative John Waldo. Students discussed new initiatives and gave advice for developing Chapters. Short presentations were given by each chapter to give insight to chapter activities of the previous year. Missouri S&T alumni Robert Swartz was the Career Speaker. At the end of the meeting awards were given. The Missouri Chapter was honored and humbled to accept the Diamond Award. Next semester our chapter intends to send at least two delegates to convocation. Evan Musterman and Jacob Whanger have volunteered to represent Missouri S&T.



## **Glass Problems**

Keramos 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.

## **American Ceramic Society RCD**

Keramos 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, Keramos 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. RCD gave a rich insight to the refractory community and all that it can offer.

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

Three Keramos 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.

### **Ceramic Expo**

For the first time ever, members from the Missouri S&T Chapter will be attending the 3rd Ceramic Expo. With its networking reception, the Ceramics Expo is an exciting opportunity, as there will be a great number of representatives from all parts of the materials industries, from raw materials to testing equipment. Keramos members plan to attend several technical sessions, covering a wide range of topics, from aerospace, energy, refractories and much more. Missouri S&T hopes that attending the Ceramic Expo will continue as a tradition to benefit the members of the chapter.

### **Congressional Visit Day**

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 which 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 thing I've done was the REU (Research Experience for Undergrads) workshop on additive manufacturing sponsored by NSF. This is what really propelled me to look into and eventually become a graduate school and showing to the people who make these choices on the benefits of these programs and departments 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.

## **H. External Chapter Communications**

### **Initiation of Colorado School of Mines**

This year Keramos was happy to welcome a new chapter to our great organization at Colorado School of Mines. The Missouri Chapter was presented with the opportunity to help install this new chapter, an opportunity they instantly jumped on board for. While the two chapters were unable to finalize a timeframe to travel to Golden, Colorado for the installation, they devised a new method for the installation. With the help of two former Missouri Chapter Keramos members that are currently attending Colorado School of Mines for graduate school, and video conferencing technology, these two forward thinking institutions held the first virtual Chapter Chartering ceremony in the history of Keramos. Though there were a few hiccups getting the process set up, the initiation of new members went off without a hitch. The Missouri Chapter is very proud of this accomplishment and hopes for the opportunity to one day charter more chapters through the help of this technology.

## **Keramos Logo**

An initiative in our Chapter was to improve the branding of Keramos within the school and department. A wordmark was created to be used as a secondary logo to the Keramos Crest, shown below. The wordmark fill matches the American Ceramic Society blue and retains important aspects of the Keramos Crest including “Ceramic Engineering” and “since 1902”. Our Chapter would like to share this wordmark with other chapters to use in the future.



## **National Student Representative**

The Keramos National student representative is elected every year during the student portion of the Keramos Convocation. The student representative is in charge of organizing the student portion of National conference calls, being a liaison between the student chapters and the National Board, and communicate best practices to chapters.

For the 2015-16 school year John Waldo was the National student representative. To speed up communication between Chapters a President’s GroupMe was created. The GroupMe was used to share ideas, answer questions, and tighten the relationship between chapters.



## **VIII. Keragram Article**

Greetings from the Missouri Chapter of Keramos! This has been a very busy year for us with a large focus in outreach. We have also worked with industry to sponsor our etiquette dinners and worked on increasing our membership through new socials and activities.

The Missouri Keramos members have consistently engaged in several forms of educational outreach, such as open houses, volunteering at local science fairs, Engineering Expo Week in St. Louis, and others. This year was no exception, with involvement in several activities with a variety of age groups, and with guests from all over the country. Members perform technical demonstrations and answer material science questions for students 2nd grade through high school seniors. This year over 1600 students participated in our material demos, not counting open houses or department tours.



This was another successful year for Lunch and Learns. At the first lunch and learn in September, Keramos hosted the local student speaking competition for the MS&T 2016 conference. In October Dr. Moats presented “Twists and Turns of a Career Path – How to Make Life Altering Decisions” and gave students an insight to his life and his career path. November was the last Lunch and Learn of the semester. Dr. Jay Singh who was the American Ceramic Society President at the time came and talked about ACerS, his work at NASA, and answered

every question the audience could throw at him. The spring semester series of Lunch and Learns mainly consisted of students fulfilling the requirements of earning technical elective credit hours for taking a co-op. Students presented on what technical and soft skills they acquired and what their experience outside of the job. Students presented on their experience at Kohler, GE Aviation, Owens-Illinois, PARC, Saint Gobain, Zimmer Biomet, and Sandia National Labs. The April Lunch and Learn continued with the tradition of having the current ACerS president have an informal talk with the Missouri students when Dr. William Lee came to Rolla and shared his advice on careers, life, and his perspective on academia and industry.

Each academic year Keramos hosts two etiquette dinners. The purpose of the etiquette dinner is to mimic a dining interview and teach the *do's and don'ts* of a formal dinner outing. The dinner is typically hosted on campus at the Havener Center, but this year Keramos was excited to move the dinner to Just A Taste in St. James, MO. The fall dinner was sponsored by



Kohler and hosted by Dr. F. Scott Miller and the spring dinner was sponsored by Nucor and hosted by Dr. Wayne Huebner. During the dinner, the host will educate the attendees with proper etiquette, which is accompanied by goofy pictures of professors acting out what should not be done.

Nine new members were initiated November 16, 2016 and seventeen new members April 6, 2017. Two metallurgical engineering students, two professors, and four freshman students were some of the new members to our chapter this year. This year the Missouri Chapter was happy to initiate a new chapter as well as twenty-six new members to our own organization. We were happy to help welcome Colorado School of Mines to Keramos. Our chapter helped install the new chapter via video conference. With the help of two former Missouri Chapter Keramos members that are currently attending Colorado School of Mines for graduate school, and video



conferencing technology, these two forward thinking institutions held the first virtual Chapter Chartering ceremony in the history of Keramos. The Missouri Chapter is very proud of this accomplishment and hopes for the opportunity to one day charter more chapters through the help of this technology. We also had the pleasure of initiating Jay Singh as one of our Honorary Members this year. We presented him with his membership certificate at the MS&T conference in Salt Lake City this past October.

## **IX. Executive Summary**

The Missouri chapter of Keramos exceeded the expectations for this year. With twenty-six new members, including two new faculty members, two metallurgy undergraduates, and four freshmen, in a fall and spring initiation ceremony our chapter continues to grow. Our increase in numbers allowed the chapter to grow in outreach activities as well as conference participation.



The Material Science and Engineering department also grew this past year. Between new faculty members, two of which are now members of Keramos, and an increase in underclassmen, the department leaned on Keramos and the other student groups to step up. Keramos met the call by facilitating co-op students who take their co-op for credit to present about their experience in front of their peers. Over the course of five Lunch and Learns, students had the opportunity to not only talk about their experience in industry, but to work on their presentation and communication skills. Nothing had been set up in over five semesters so over the spring semester Keramos hosted three students every other week to earn their credit.

Keramos students also stepped up to the plate volunteering for outreach activities. The increase in outreach events came about as both the reputation of the quality of demos given by MSE students spread and this year's exec board and active members willingness to contact members in the both the local and extended community. Over the course of the 2016-2017 academic year, Keramos students worked outreach events that reached over 1600 students. And that is not counting open houses and tours that occur inside of the materials building. The response from the demos is overwhelmingly positive and several of the activities that we did this year were the result of the event coordinator reaching out to us and asking if we could do materials demos for their kids because they heard such good things about them. I'm very proud of how much our outreach program has developed and with the increase in members, I have no doubt that this chapter will continue expanding outreach events across different venues.

The chapter also worked with industry to sponsor students going to MST as well as both the fall and spring etiquette dinners. Asking for funding is a hard thing to do especially as an undergraduate, and is a good skill to develop. Keramos worked with Materials Advantage and raised \$8000 to help send forty-five students to MST in Salt Lake City this past October. Kohler sponsored the fall etiquette dinner for the second year and Nucor sponsored the spring dinner. Having sponsors for the etiquette dinner also us to open up the dinner to the department and have a wider range of students exposed to the correct etiquette for business or interview dinners.

Keramos had a fantastic year of all around growth. A healthy increase in members, a greater community exposure, and an increase in services to the department shows the strength of this Keramos chapter and the promise of a great and successful future. Keramos will continue to serve the community and offer professional events and development to its members and looks to next year's executive board to continue on with the outstanding traditions of Keramos.

Elizabeth Robinson

A handwritten signature in black ink, appearing to read 'Elizabeth Robinson', with a long, sweeping horizontal line extending to the right.

Keramos President - Missouri Chapter 2016-2017