



# University of Arizona 2018-2019 Keramos Annual Report

Submitted 4/15/2019

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## 1. Summary Article

Over the last academic year, the Keramos student chapter has positively impacted the University of Arizona, the local community, and the Materials Science and Engineering department. We hope that increasing the involvement of faculty in our department and recruiting the incoming students will continue that positive impact. This Keramos chapter has so much to offer its members and the students in the MSE department. Although our last year was much more productive than the year before, we believe we can impact students and the community more.

The University of Arizona Chapter of Keramos has passed its rebirth phase this past year. Since in 2017 many of the former officers graduated in the year prior, there was much confusion from the new officers on how the society should be run. Despite the inexperience, the officers were able to rebuild Keramos and it is now a stable chapter at the U of A.

The chapter hosts bi-weekly meetings where discussion occurs about outreach, recruitment, future plans, and Keramos business. Usually, 10-15 students are in attendance at the meetings which doesn't sound like much, but the U of A MSE department is quite small, so many of the undergraduate students attend the meetings.

The U of A chapter has expanded its social and outreach events in the past year as compared to the year before. A department-wide barbeque was held during homecoming season where the faculty, staff, and students were all invited to eat and mingle with each other in a casual setting. This helps students become familiar with their professors and peers in a low-pressure, non-academic setting. The chapter also judged a science fair for The Southern Arizona Regional Science and Engineering Foundation, where a 3-D printed award and a cash prize was given to a high school student with a project involving creative interpretation of material science. Since January of 2019, the chapter has greatly increased its outreach to local high schools around Tucson where the chapter increases awareness that MSE exists and it is an interesting engineering and rewarding discipline to pursue. Tours to companies around the southern Arizona region have also been set up and executed as a way to show the students within the MSE department some options they may have when they graduate. Tours have been conducted at American Aerospace Technical Castings, Calportland Building Materials, and Carclo Technical Plastics. Several social events have also been conducted in the past year including student bowling, hiking, and arcade gaming. Finally, a resume review session was held for MSE students hoping to attend the career fair in order to polish their resume and improve their elevator pitches.

## 2. List of Officers, delegates, alternatives

First Name	Last Name	Email	Title	Phone Number
Daniel	Chavez	[REDACTED]	President	[REDACTED]
Michelle	Trinh	[REDACTED]	Vice President	[REDACTED]
Rachel	Gorelik	[REDACTED]	Treasurer	[REDACTED]
Max	Honebrink	[REDACTED]	Alternate for President	[REDACTED]
Allan	Chon	[REDACTED]	Alternate for Vice President	[REDACTED]
Lauren	Moghimi	[REDACTED]	Alternate for Secretary	[REDACTED]
Nicholas	Latham	[REDACTED]	Alternate for Herald	[REDACTED]
Jonathan	Langenbach	[REDACTED]	Delegate	[REDACTED]

### 3. List of Active Members

First Name	Last Name	Email	Title
Daniel	Chavez	[REDACTED]	President (Keramos) MA (VP)
Michelle	Trinh	[REDACTED]	President (MA) VP (Keramos)
Rachel	Gorelik	[REDACTED]	Treasurer
Morgan	Swanson	[REDACTED]	Member
Josh	Rohne	[REDACTED]	Member
Kathleen	Van Atta	[REDACTED]	Herald
Lindsay	Lutman	[REDACTED]	Member
Nick	Baumann	[REDACTED]	Member
Neale	Smith	[REDACTED]	Member
Lauren	Moghimi	[REDACTED]	Secretary
John	Langenbach	[REDACTED]	Member
Justin	Palacios	[REDACTED]	Member
Gabrielle	Lambert	[REDACTED]	Member
Johnathan	Goh	[REDACTED]	Member
Lucas	Stolberg	[REDACTED]	Member
Clare	Cronin	[REDACTED]	Member
James	Davia	[REDACTED]	Member
Allan	Chon	[REDACTED]	Member
Maxwell	Honebrink	[REDACTED]	Member
Nicholas	Latham	[REDACTED]	Member
Micheal	Gibson	[REDACTED]	Member
Nicholas	Thompson	[REDACTED]	Member

#### 4. List of Graduating Members

<b>First Name</b>	<b>Last Name</b>	<b>Personal Email</b>	<b>Phone Number</b>
Daniel	Chavez	[REDACTED]	[REDACTED]
Josh	Rohne	[REDACTED]	[REDACTED]
Neale	Smith	[REDACTED]	[REDACTED]
Lucas	Stolberg	[REDACTED]	[REDACTED]
Nicholas	Thompson	[REDACTED]	[REDACTED]

## 5. Honorary Member

Erin L. Ratcliff



Erin Ratcliff is an assistant professor in the Department of Materials Science and Engineering at the University of Arizona. Dr. Ratcliff received a Bachelors of Arts in Chemistry, Mathematics, and Statistics at St. Olaf College in 2003 and her Ph.D. in Physical Chemistry at Iowa State University in 2007. She went on to pursue a Postdoctoral Research Fellow with the Department of Chemistry and Biochemistry at the University of Arizona from 2007 to 2010.



Dr. Ratcliff's current research group is primarily working on materials synthesis, structural control, processing, and transport phenomena of low-cost semiconducting materials. Particularly looking at organic-based electronic devices, which has the potential for creating flexible devices for bioelectronics, thermoelectrics, energy harvesting and storage, and optoelectronics. Through all these devices being made out of organic materials, it would reduce manufacturing cost and lessened environmental impact, compared to inorganic semiconductors.

Dr. Ratcliff has not only contributed to the research community of organic electronics but in her classrooms. From teaching solid state chemistry (MSE 110) to Transport Phenomena and Kinetics in Materials Processing (MSE 415), regardless of the course level, she is always willing to support her students and provide as much assistance as she can. Dr. Ratcliff has also provided opportunities for undergraduate students to participate and gain experience working in her research lab. She is good-natured, inspires students about the field of organic electronics, and a congenial individual. These are the few reasons why Dr. Ratcliff deserves to be an honorary member of Keramos for the University of Arizona.

## **6. Treasurer's Report**

Over the past year, the club has spent its funds on various professional and academic activities, focused largely on outreach to high school students and participation in the materials science community. Supplies for demonstrations and travel expenses were financed by the club when visiting local high schools to raise awareness about the Materials Science major and the club. Money was also spent on creating a trophy and sponsoring an award for a winning project at the Southern Arizona Research, Science, and Engineering Foundation (SARSEF) fair. Club funds were also used to host a department-wide barbeque for University faculty and students as a club social event.

External funding by grants and school programs were able to fully cover the attendance of interested club members to the 2018 Materials Science and Technology conference, without needing to use current club funds. For next year, plans for fundraising include selling T-shirts and polos to club members, as well as selling snacks and baked goods to members of the department.

Current Balance: \$1,194.22



## 7. Chapter Activities

### 7.1 Department Barbeque

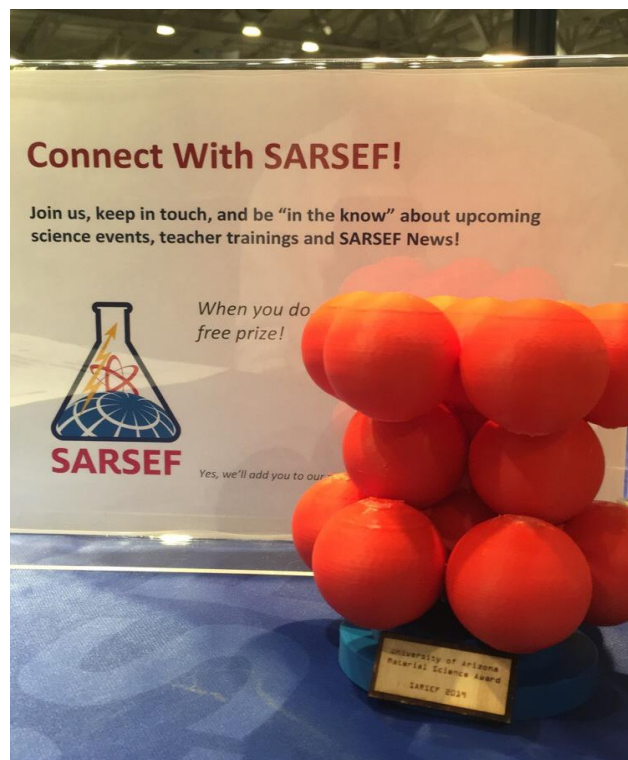
On October 27th, 2018, the Keramos chapter held a barbeque for the faculty, staff, students, and family members of the Material Science and Engineering Department at the Arizona Materials Laboratory. The chapter organized the event, rented the chairs, tables, and grills, and bought all the food needed for the event with a helpful donation from the department head, Dr. Deymier. This event is held every year during homecoming season and it serves as a low-pressure, casual gathering where students are able to get familiar with everyone in the department. It is a tradition that students and professors face off in a friendly game of bocce ball, where the score of wins on each side is kept and tallied through the years.



(Departmental BBQ hosted by Keramos and MA)

## 7.2 SARSEF Science Fair

On Thursday, March 7th, members of Keramos attended the Southern Arizona Research Science and Engineering Foundation (SARSEF) Science Fair at the Tucson Convention Center where a high school science project involving a materials science was chosen to be the winner of a sponsored award. The sponsored award was a 3-D printed HCP lattice on a stand and a \$50 cash prize. The award was given to a student who was researching several alloys that could be used in knee implants with considerations of biocompatibility and wear resistance. The chapter attended the science fair last year, and it is planned to establish this as a tradition as it helps inspire students to keep their pursuit of science.



(3-D Printed award)

**SARSEF: Southern Arizona Research, Science and Engineering Foundation**  
Every Child. Thinking Critically. Solving Problems. Since 1955



Board and Leaders  
John P. Schaefer-Honorary Chair  
UA President Emeritus  
**Betsy Bolding - Board Chair**  
Sabrina Deltchler  
Christopher Elsner  
Mary Foadick  
Daren Layton  
Larry Lebofsky  
Ravishankar Palanivelu  
Antonio Ramirez  
Rajendran Subramaniam  
Margaret Wilch  
Ashley Elaine York  
Kathleen Bethel - CEO  
Liz A. Baker -Deputy Director  
Brooke Meyer-Dir. Programs

March 13, 2019

Daniel Chavez  
1235 E James E Rogers Way  
Tucson, AZ 85719

Dear Daniel Chavez,

Thank you so much for changing children's lives with your gift of \$50.00 on 2/28/2019 to SARSEF.

Your gift helps more than 95,000 children and youth from pre-school to 12th grade each year, giving them the chance to explore, learn and succeed by honing their critical thinking and problem-solving skills.

Ryan became involved in SARSEF as a middle school student who liked science. But it was through SARSEF where he found his love of science. In his senior year, he won the science fair, was awarded a SARSEF scholarship, and soon found himself studying at Stanford.

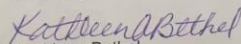
Arizona is one of the lowest ranked states for education; we can turn that tide - together. Our schools and teachers need programs like SARSEF to enhance and support their work, and our kids need it to learn the science, math, technology and critical thinking skills that today's economy demands. Parents from all walks of life search for programs like SARSEF.

And they find it... because of support from people like you.

For every dollar received, we help one more child become a future leader and innovator. The one life that is changed might be the very one that changes ours some day.

Thank you, again, for making that change possible.

Sincerely,

  
Kathleen Bethel  
CEO

P.S. SARSEF is a Qualified Charitable Organization (QCO) for the Arizona State Tax Credit, code #21048.

Qualified Charitable Organization (QCO) Code for Arizona Tax Credit: 21048  
4574 E Broadway Blvd. Tucson, AZ 85711 / (520) 621-8646  
Visit our website at: <http://sarsef.org>  
Arizona corporation organized exclusively for charitable & educational purposes Section 501(c)(3) of the Internal Revenue Service Code - IRS Tax ID 86-0946185

(Thank you letter from the CEO of SARSEF)

### 7.3 High School Outreach

This semester the Keramos and Materials Advantage chapters, as well as the Materials Research Society (MRS) chapter at the U of A, have greatly increased their efforts in local outreach to high schools. Several high schools around the Tucson area have been visited including the previous high schools of current Keramos students. The goal of this campaign is to make students in STEM-oriented high school classes more aware of materials science and engineering in order to encourage them to pursue a degree in MSE or any STEM field in general. Outreach visits include a powerpoint to showcase the U of A MSE department, an opportunity for students to handle pieces brought by chapter members such as 3-D printed pieces, aluminum castings, glass, ceramic pieces, and handbooks. The visit is concluded with demonstrations of materials properties such as shape memory alloys, pulling a piece of glass to simulate an optical fiber, and a Starlite thermal conductivity demo.



(Keramos President Daniel Chavez conducting outreach at Sahuaro High School)

## 7.4 Industry Tours

The chapter has been heavily pushing tours this semester to industries in the local Tucson area as well as to some locations in Phoenix. So far the chapter has conducted tours at American Aerospace Technical Castings, CalPortland Building Materials, Carco Technical Plastics, and a tour to Phoenix Analysis & Design Technologies (PADT) is set for April 19th.



(Keramos Vice President Michelle Trinh at American Aerospace Technical Castings)



(Keramos President Daniel Chavez at CalPortland Cement Plant Tour)

## 7.5 Social Events

Social events have been organized this year to facilitate an environment for students to get to know each other in a non-academic setting. Events include going to the local corn maze during Halloween, arcade night at an arcade establishment in downtown Tucson, Dinner and Bowling, and a hike on Mt. Lemmon.



(Keramos members after hiking Mt. Lemmon on a rainy day)

## 7.6 Resume Review

In order to help students prepare for the career fair at the U of A, a resume review session was held with a student worker from the Life Lab (the U of A career services) came and gave a powerpoint describe how to properly write a resume, how to write a cover letter, and how to talk to potential employers. The Life Lab worker also reviewed everyone's resume individually and gave them feedback. This was a very useful event as many students who attended the event were able to get interviews for internships and potential careers.

## **7.7 Staff Appreciation Breakfast**

The faculty and staff of the MSE department do a lot for the students from providing resources and connections for internships/careers to lending a listening ear, so the Keramos members thought it would be least we could do if we provided them with a free breakfast one morning to say thank you. This event is scheduled for Tuesday, April 16th at 8 am.

## **8. Conclusion**

Overall this year has been very successful for Keramos. Compared to last year, the U of A chapter has become more organized and prosperous as the amount of student involvement and activities has skyrocketed. The chapter is excited to begin the next year to continue and improve.

## University of Arizona Keragram



After passing through a period of revival last year, the University of Arizona Chapter of Keramos has spent the 2018-19 year focusing on raising membership and conducting outreach.

By participating in events such as the 2018 Southern Arizona Research, Science, and Engineering Foundation (SARSEF) Fair and the 2018 Materials Science and Technology (MS&T) Conference, Keramos has continued the traditions set by officers from the past year.



Several members received funding to fully cover their attendance of the 2018 MS&T conference, where they were able to attend presentations, network with companies, and later share their experience with the other members of the club. Through funding, the club was also able to sponsor an award for the SARSEF fair and judge the various high school projects submitted to the competition. The attending club members presented a trophy manufactured by the club to one of the winning high school students.

In keeping with past years, Keramos also hosted a barbeque on the grounds of the Arizona Materials Laboratory (AML), where students were able to spend time with department faculty in a less formal setting, and a friendly game of Bocce ball was played between professors and students.

In addition to continuing participation in annual events, this year Keramos has also begun a program of outreach to high school students. Visiting local high schools, club members taught high school students about the materials science and engineering major by giving presentations, showing demos, and inviting guest professor speakers.



In order to raise interest for the club, Keramos has also begun scheduling plant tours for members and students, with trips so far including companies such as American Aerospace Technical Castings and CalPortland Cement Company.

In addition to these activities, Keramos has also created T-shirts and polos for fundraising, and has hosted several social events, such as bowling and hiking trips, to foster a growing sense of club unity.