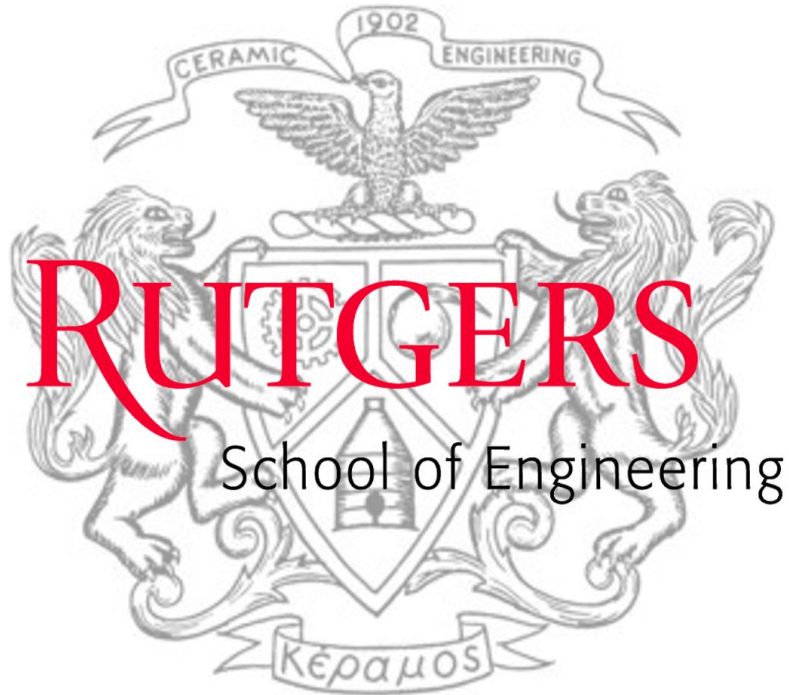


KERAMOS RUTGERS UNIVERSITY STUDENT CHAPTER 2019-2020 ANNUAL REPORT



Prepared By:

Katie Sun, Chapter President & Grant Kenny, Chapter Vice President
Rutgers University, New Brunswick Student Chapter

Prepared For:

General Secretary Dr. Jeff Smith
and
Members of the Keramos Executive Board

Date Submitted:

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Keragram Article

This past year has been another successful and lively period for The Rutgers University, New Brunswick Chapter. Our informal outreach events such as game, movie and study nights have served to further advertise our chapter and build relations between our own members and other students and faculty within the Materials Science and Engineering (MSE) department. The chapter has been an active partner by volunteering at recruitment events such as Major's Night and Honors Academy department showcases, as well as lab tours, and outreach events such as the return of our interactive glass slump molding event and in person meetings with students from a neighboring high school. Additionally, we have continued our efforts towards retaining engagement with alumni from the chapter, growing our LinkedIn group to 16 members over the past year and continuing to advertise and encourage graduating members to join and participate. (<https://www.linkedin.com/groups/12235300/>)

Being awarded the Ceramics and Glass Industry Foundation grant for the 2019-2020 academic year has allowed our chapter to continue hosting our well-received interactive open house for local prospective high school students. This event hosted by our chapter featured the ability for these students to shape and personalize panes of glass via slump molding, exposing them to both the artistic and scientific aspects of glass properties under the guidance of Keramos members and faculty. This was then followed by an opportunity



to speak with our department chair about aspects of study within materials science and engineering as well as potential career trajectories within the field. We then incorporated a new aspect this year to this event with touring other active laboratories within the department, such as the Additive Manufacturing Stereolithography labs to showcase the wide breadth of research areas within not only the department but materials science as a whole.

Some events were unfortunately canceled due to the COVID-19 outbreak. Yet, the chapter is excited for when they will be able to engage with local communities again to continue spreading awareness of glass and ceramics sciences!

Contact Information

List of Officers, Delegates, and Alternates for 2019-2020

Position	Last Name	First Name	Phone	Email	Delegate
President*	Frey	Caleb			X
Vice Pres	-	-	-	-	-
Treasurer	-	-	-	-	-
Secretary	-	-	-	-	-
Herald	-	-	-	-	-

*Material Advantage Chapter President temporarily listed due to COVID-19 impacting elections and inductions for the 2020-2021 cycle.

List of Active Members

Last Name	First Name	Status	Induction Date	New Initiate
Sukenik	Emily	Graduate	2019 Spring	
Deshkar	Ambar	Graduate	2016 Spring	
Tewatia	Arya	Graduate	2016 Spring	
MacDowall	Brian	Graduate	2017 Spring	
Rucker	Ross	Graduate	2017 Spring	
Schaefer	Mark	Graduate	2017 Spring	

Graduating Member Contact Information

Last Name	First Name	Phone	Email
Kenny	Grant		
Sun	Katie		
Bethur	Eshana		
Rizzie	Steven		
Tagliaferro	Gabrielle		
Ryan	Caillin		

Treasurer's Report*

Event	Description	Cost
Piscataway HS Glass Slump	Bullseye Slump Glass Plates 30 Pieces	\$376.62
Molding Workshop	Bus Transportation Cost	\$69.49
Piscataway HS Visit: NSHS	2x10 Pack of Polarizing Film	\$20.04
Study Sessions (Multiple)	Food (Donuts and Coffee)	\$67.21
Game Nights (Multiple)	Food (Pizza, Drinks)	\$100.00
Ornament Decorating	Supplies (Glass Ornaments, Markers)	\$75.00
Total Cost		\$708.36

* Only events with reimbursed expenses are reported.

Specific breakdown of Piscataway HS Glass Slump Molding Workshop Costs:

Item from Delphi Glass	Expense
Bullseye Slump Glass Plates 30 Pcs	\$299.95
Tax	\$23.40
Shipping and Handling	\$53.27
Total	\$376.62

Chapter Activities

Educational Outreach

Piscataway High School Glass Slump Molding Workshop

The Rutgers University Keramos Chapter received a Ceramics and Glass Industry Foundation (CGIF) grant for hosting glass slump molding workshops as a part of a day visit experience held in conjunction with the Rutgers Materials Science and Engineering department and local Piscataway High School. The event involved a visit of 25 Piscataway High School students to the Materials Science and Engineering department's labs at the Rutgers University New Brunswick campus. The students were able to design their glass slump precut pieces with colored frit into patterns onto a bowl mold (Figure 1). This event allowed for students to obtain both visual and hands-on ceramic and glass education and engaged them in the theoretical and practical applications of processing principles and practices while also allowing for artistic creativity.



Figure 1: Left: A Materials Science and Engineering professor provides guidance on cutting colored glass pieces to Piscataway High School students b) Right: Post-fired decorated pieces designed by high school student participants.

The day visit of the students to Rutgers also involved a demonstration of glass pouring prefaced by a short lecture of crucibles, glass composition, and glass phase transformation based on temperature. There was also a tour of Rutgers' ceramic research labs that engaged in direct write additive manufacturing of ceramic slurries. Lastly, the visit involved a presentation from the Materials Science Engineering department chair about ceramic and glass engineering, career and graduate school opportunities with the majors, and current research and advancement in the fields. These culminated in an opportunity for the students to have exposure to glass and ceramics engineering in both an educational and fun setting in order to establish an interest in

engineering to the students and in continuing the partnership with Piscataway High School and the Materials Science and Engineering department of Rutgers. This event is a continuation of the similarly modeled event of last year with Piscataway High School and slump molding. It was successful in increasing student interest in the fields of glass and ceramic engineering and initiated their introspection into the properties of materials and theories of processing past theory. Through the post-participation survey, 90% of participants stated they “learned something new about glass and ceramic sciences” and 35% stated they “were now considering futures in glass and ceramic sciences for higher education”.

Piscataway High School Visit: National Science Honors Society Meeting

A partnership with a Rutgers Materials Science alumna who is now a current teacher at the local Piscataway High School allowed for Keramos involvement with the high school's National Science Honor Society chapter. At this event, current Materials Science and Engineering Keramos members at Rutgers presented a brief presentation on: what Materials Science Engineering is in general and the Rutgers University Materials Science and Engineering program and degree, the career and graduate school opportunities possible with this major in general, and what the student presenters have accomplished so far in their Rutgers University careers (Figure 2). There were around 30 high school students in attendance. Additionally, glass samples and polarized plastic film were brought in order to present to the students examples of materials that are created and used. Various annealed and

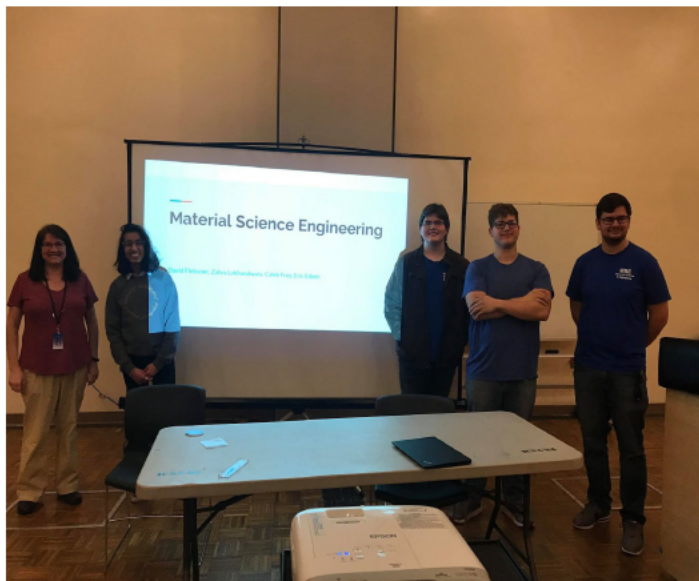


Figure 2: Keramos presents at the NSHS Piscataway HS meeting.

unannealed glass samples and variously shaped plastic samples were used to observe the coloration of internal stresses and strains. Physics optics topics were covered in order for students to understand the hands-on demos with the polarized plastic film samples and phone and laptop screens as a source of polarized light. They were able to keep the polarized plastic film samples after the demonstration.

Professional Development

Cancelled Event: Resume Critique Night

To aid students in improving their professional presence and their resume for applications, Keramos was going to hold a Resume Critique Night event during which more senior students and Materials Science and Engineering faculty and graduate students would cross-review

resumes. The event would begin with a brief presentation of ideal resume formats and contents, online application tips, and interview advice. Due to the COVID closure of Rutgers, this event was regrettably cancelled.

Service to the Ceramics Community

Study Sessions

Keramos hosted semesterly study sessions before the midterm periods in the fall and spring in order to support students in their academic careers while also allowing for camaraderie to be built between peers (Figure 3). This event is primarily hosted for sophomore and junior students who are new to the department's curriculum and professors to aid in their success.



Figure 3: Study Night attendees enjoy the pizza and refreshments provided while a junior year student reviews class material on a projector before one-on-one tutoring by Keramos members is offered.

MSE Night

Through a partnership with the Rutgers Materials Science and Engineering department, every semester Keramos engages with freshmen engineering students in order to promote Materials Science Engineering as a major for their consideration. Keramos works to promote the glass and ceramic engineering portions of the department offerings through informational sessions, lab tours, and social sessions involving professors, students, and prospective freshmen. This event is hosted before the freshmen declare their engineering majors and is a major recruiting event.

Cancelled Event: Majors Night

In April, the School of Engineering hosts a Majors Night during which all engineering departments table in order to encourage undecided engineering students to choose an engineering major. The Keramos members were planning to act as student volunteers to engage with these undecided students by sharing their personal experiences, the advantages of a major in glass and ceramics engineering, and promoting the department's program offerings. This event allows for

the major to be promoted to the prospective students, many of which had no exposure to the majors prior. Due to the COVID closure of Rutgers, this event was regrettably cancelled.

Cancelled Event: Open House & Rutgers Day

Every year Rutgers opens its doors to the general public in university-wide festivals. For Open House, prospective and admitted School of Engineering students are invited to the New Brunswick campus in order to learn more about the school and its program offerings. For Rutgers Day, it was estimated that about 94 thousand people attended Rutgers Day in 2019. Therefore both were a perfect opportunity for the Materials Science and Engineering department to showcase the various exciting opportunities a path in materials and ceramic science has to both prospective students, visitors, and alumni. The activities are usually interspersed by research laboratory tours, in which Keramos members play a key component by volunteering. Previous example activities demonstrate liquid-nitrogen-made ice cream, photovoltaic cells and batteries, and flameworking. This year we also planned to incorporate demonstrations with polarized light and other optical phenomena. Regrettably, due to COVID precautions these events were cancelled.

Alumni Engagement

This year, alumni engagement efforts have continued after the work conducted by the previous Keramos Rutgers chapter executive board of connecting through LinkedIn. The Rutgers Keramos chapter has a dedicated Keramos LinkedIn group in order to allow for continued connections and communications post-graduation

(<https://www.linkedin.com/groups/12235300/>). The roster of past Rutgers Keramos years has been referenced in order to add members into this group. The group asks as a platform to foster an online community representing our strong fraternal bonds, community engagement and scholarship, and to promote interest in the professional aspects of ceramic engineering, technology, and science.

Participation at the Annual Convocation and Business Meeting

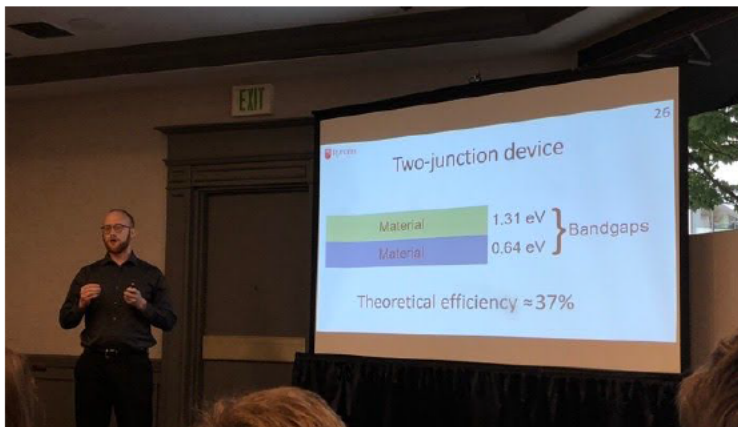
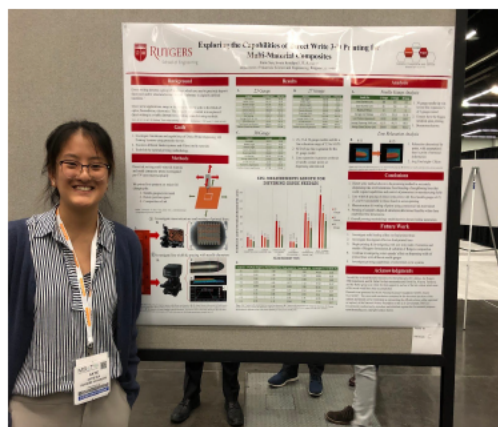


Figure 4: *Left:* The 2019-2020 President, Katie Sun, presenting her direct-write research at the MS&T 2019 Undergraduate Research Poster Competition. *Right:* The 2019-2020 Herald, Steven Rizzie, presenting the concept of two-junction dye sensitized solar cells at the MS&T 2019 student speaking competition.

This year, three Keramos representatives attended the annual Keramos national meeting at MS&T 2019 in Portland, Oregon. The president Katie Sun, treasurer Emily Sukenik, and herald Steven Rizzie represented the Rutgers chapter at the meeting to offer insight into the Mug Drop Competition rule changes, new member class year requirements, and also discussed ways of improving the outreach and scope of Keramos nationally. Outside of the meeting, Rutgers representatives participated in The American Ceramics Society's student poster competition and student speaking contest (Figure 4). Looking forward, the Rutgers chapter looks to send a greater delegation of student representatives to MS&T 2020 and hopes to develop a Mug Drop competition team.

Interorganizational Communications and Collaboration

Rutgers Materials Science and Engineering is significantly smaller than most engineering majors offered at Rutgers, which allows for the development of stronger social connections between students and professors. The collaboration between organizations within MSE helps to develop and maintain these connections and our departmental cohesion. Several social events were held in order to help establish and maintain these connections.

Game Nights

A staple destress event that Keramos and Material Advantage co-host once a semester is game night. During this event, students are encouraged to bring in board games and digital games in order to play with peers. This year, students opted to play Jack Box TV games and brought friends with differing majors! This event is one that is integral in establishing social relationships between peers in the same or different class years. Participation spanned all class years and included students with non-Materials Science Engineering majors.

Ornament Decorating

In the spirit of the holidays, Keramos hosted a social glass ornament decorating event. The event was preceded by a short presentation of how glass ornaments are created and how ornaments gained popularity. Afterwards, students decorated glass ornaments with chalk markers and proudly showed them off before hanging finished ornaments on the MSE tree in the lobby of our building (Figure 5).



Figure 5: *Left:* The attendees showcase their finished decorated ornament. *Right:* The students hang their finished ornaments on the MSE tree in the Center of Ceramics Research Building lobby.

Cancelled Event: MSE Game Day

Typically, the last event of the semester is the MSE BBQ and Game Day which is coordinated by Keramos, Material Advantage, and the Graduate Student Association and it is one of the biggest events of the year. It would have occurred during the reading period before final exams. The annual event is usually participated in by undergraduate and graduate students and professors and involves rivalries in the field games of volleyball, Kan Jam, Spikeball and more. This event is one that both celebrates the academic year's end and is one final time for students to say goodbyes before graduating. Unfortunately due to COVID-19, this event has been cancelled.

Annual Plan for Upcoming Academic Year

Membership

Due to the overall declining enrollment of students into the Materials Science and Engineering department and all current Keramos members graduating, an issue of the current Rutgers Keramos chapter has been maintaining membership numbers. This current year, the COVID-19 restrictions and Rutgers University closure occurred prior to Keramos publicity of inductions and before many of the planned Keramos events which were to increase awareness of the club to encourage membership. The move to digital interactions has made it difficult to both hold inductions and to identify enough interested members for the chapter to continue chapter activities.

Moving forward into the 2020-2021 academic year, the Rutgers Material Advantage chapter has agreed to temporarily oversee the completion of the CGIF grant and attempt to increase membership for the Keramos chapter. The contact information of Caleb Frey, president of the Rutgers Material Advantage chapter, is provided in the document beginning. The intended timeline is to begin planning for recruitment events for Keramos as part of regularly scheduled Material Advantage events starting as early as the first week of September to establish a new executive board by October's beginning. Then, the regularly occurring Keramos events will continue.

CGIF Grant Completion

The Rutgers Chapter had submitted an application for a CGIF grant for the 2019-2020 year. The proposed events were only half completed due to the COVID situation. The funding went to the Piscataway High School visit and Rutgers visit outreach. The other half of Keramos demonstrations during the Rutgers Engineering Open House and Rutgers Day events were not completed. Substitute events have been postponed until Fall 2020.

The proposed postponed events will be similar to the originally planned events, if COVID-19 precautions are lifted. The proposed events were a series of glass engineering demonstrations in the form of hands-on glass slump molding workshops and glass pouring demonstrations for older students and simpler sugar candy creation activities for elementary school students. The ceramics portion was to demonstrate ceramics additive manufacturing direct write capabilities and also simpler slip casting activities for younger students.

Tentative Schedule of Events

The Rutgers Keramos chapter's tentative schedule of events for the 2020-2021 academic year:

1. Summer:
 - a. Tentative planning of MS&T travel plans and trip logistics with executive board
2. Fall:
 - a. September:
 - i. Keramos executive board planning meetings of events to be held for the remainder of the fall semester & CGIF grant events
 - ii. First general interest meeting, mainly targeted at incoming Materials Science and Engineering sophomores
 - iii. Final logistical planning of MS&T 2020 travel
 - iv. Speaking competition in preparation of MS&T 2020
 - b. October:
 - i. Joint Keramos-Material Advantage Game Night
 - ii. Study Night
 - iii. Attendance to MS&T 2020
 - c. November:
 - i. MSE Night preparations and volunteering
 - ii. CGIF glass slump molding events
 - d. December:
 - i. Ornament decorating event
 - ii. Tentative meetings to discuss spring events and planning
3. Spring:
 - a. January:
 - i. Executive Board planning meetings of events to be held for the remainder of the spring semester
 - b. February:
 - i. Joint Keramos-Material Advantage Game Night
 - ii. Study Night
 - iii. Planning of our biggest events: Rutgers Engineering Open House, Rutgers Day, MSE Game Day, and Keramos inductions and recruitment
 - c. March
 - i. Initial induction preparations are made & Keramos advertised
 - ii. Materials ordered for Open House & Rutgers Day
 - d. April
 - i. Keramos inductions and executive board elections held
 - ii. Open House outreach event
 - iii. Rutgers Day outreach event
 - iv. Reports submitted