

INQUIRIES

NEWSLETTER FROM THE UMKC OFFICE OF UNDERGRADUATE RESEARCH & CREATIVE SCHOLARSHIP

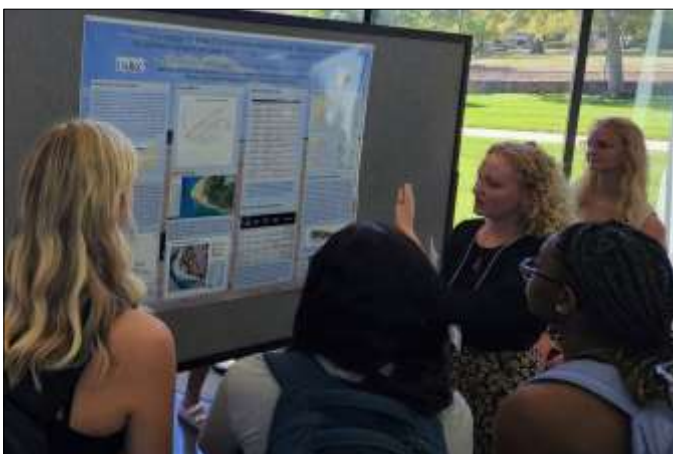
SUROP and Eureka Symposia Bookend the Fall Semester

SUROP Symposium

At the SUROP Poster Symposium on August 21, 2023, 21 students presented projects that they undertook with support from UMKC's Summer Undergraduate Research Opportunity (SUROP) Grants. From work in graphic design to biomedical engineering, from rhetoric to genetics, SUROP projects represented a broad range of cutting-edge research, scholarly, and artistic work.

Presenters shared their experiences traveling to Iceland, Argentina, and the Bahamas for research. They presented findings from the archives at Howard University, the University of Pennsylvania, and the University of California Los Angeles. And from research conducted right here in Kansas City, students discussed the urban heat island effect, LGBTQ+ artists and business owners, and rooftop tallgrass prairies.

An impressive crowd of more than 200 visitors circulated through the symposium, where they learned about the important work students accomplished with support from SUROP Grants. These student-led, faculty-mentored projects served as models for aspiring undergraduate researchers.



Eureka Symposium

Eureka classes bring “aha moments” when students employ research methods to pursue answers to important questions in an academic discipline. This fall, 173 students enrolled in three different Eureka classes worked diligently throughout the semester and presented their work at the Eureka Symposium on December 5, 2023.

Dr. Alison Graettinger's Critical Thinking in the Sciences students presented their research on how natural disasters intersect with mental health, public health, disability, the economy, and the climate.

From Frida Kahlo's diary to Barbie movie reviews, students from Dr. Jane Greer's English II class shared research on a wide range of topics in writing studies.

Dr. Jeff Rydberg-Cox's Myth & Literature students' essays explored themes of hospitality, homecoming, cunning, and blame in episodes from Homer's *The Odyssey*.

Eureka students expressed enthusiasm about their projects. Through their research, they were able to see connections between the course material and their broader academic interests, and between their academic studies and real-world problems.





Undergraduate Research and Creative Scholarship

umkc.edu/undergraduate-research

The Office of Undergraduate Research and Creative Scholarship supports high-impact learning opportunities by funding the work of undergraduate researchers, scholars, and artists; linking students with research opportunities; providing opportunities to enhance intellectual and career-building skills; and supporting quality faculty mentorship.

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Faculty Advisory Board

Shuhao Cao, Mathematics

Travis Fields, Mechanical Engineering

Alison Graettinger, Earth & Environmental Science

Jane Greer, English

Amanda Grimes, Health Sciences

R. Scott Hawley, Stowers Institute

Saul Honigberg, Biological Sciences

Kimberly Johnson, Multicultural Student Affairs

School of Education, Social Work, & Psychological Sciences

Seung Lark Lim, Psychology

Debra Leiter, Political Science

Ryan Mohan, Biological Sciences

Paul Rulis, Physics

Jeff Rydberg-Cox, Classical Studies

Student Ambassadors

Asayiel Alhajeri, Biology, '24

Aleigha Dollens, Earth & Environmental Science, '24

Layla Liwaru, Biology, '24

Alijah Smith, English, '24

Olivia Sours, Health Sciences, '24

Lindsay Todd, Biology, '24

Plan Ahead for Spring Opportunities

Roo Ready for Research Lightning Talks

For this new and exciting event, we invite students to give a 3-minute oral presentation on their research as we welcome new Roos to campus for the spring semester.

Presenter Registration Deadline: Jan. 26

Event Date: Feb. 2

Undergraduate Research Fellows

Students who have been deeply involved in research or creative scholarship can apply for the Undergraduate Research Fellow transcript designation.

Application Deadline: Mar. 1

Mentor Award Nomination Deadline

This award honors faculty who have achieved excellence in mentoring undergrad researchers, scholars, and artists.

Nomination Deadline: Mar. 1

SUROP Grant Funding

Students who wish to conduct scholarly, research, or creative projects under the direction of a faculty mentor may apply for a competitive grant to fund a maximum of \$1,250 in research or creative expenses. Students who are awarded a SUROP grant also receive a \$2,000 tuition grant.

Application Deadline: Mar. 1

Annual Symposium of Undergraduate Research & Creative Scholarship

The 24th Annual Symposium will be held on Thursday, April 18, 2024, in Pierson Auditorium. Undergraduate students conducting research, taking part in creative scholarship, or preparing scholarly papers are invited to share their work with the UMKC community during the symposium.

Priority Registration: Mar. 15

Final Registration Deadline: Apr. 8

Applications and registration forms for all programs can be found on the website:

umkc.edu/undergraduate-research

Undergraduate Research Advisory Board Welcomes New Member Shuhao Cao



Shuhao Cao is a computational mathematician interested in solving partial differential equations. More recently, Shuhao has been dedicated to bringing together the design of neural network architectures and the theory of partial differential equations to help the PDE solver become faster and more accurate. Shuhao came to UMKC in 2022 and began serving on the Undergraduate Research Advisory Board in 2023.

What were some of your early experiences with research?

I started working on hard math problems as brain teasers in high school to participate in the qualifying tests for the International Math Olympiad back in China. Working on these problems, I discovered the huge repository of unsolved mathematical problems and was amazed by the beauty of those. During undergrad, I participated in Mathematical Contest in Modeling (MCM), and I found that mathematics, especially differential equations, are a

gift to humans to describe the universe around us.

How do you incorporate undergraduate students into your research?

I often give undergraduate students examples of how materials featured in Calculus I are used in the most advanced mathematical research in differential equations, machine learning, etc. Many students learned Calculus in high school or during their freshman year taught by someone who has not done a lot of mathematical research, and thus did not have the chance to realize many beautiful things in nature and mathematics, such as symmetry and minimalism, are hidden in the simple formulae they learned even in the first Calculus class. I also like to recommend to my student some great visual demonstration of mathematics, that inspires my own research, such as 3Blue1Brown's video on neural networks and differential equations.

What do you enjoy about teaching students at UMKC?

I found many students were adult learners who came back to school, and they are hard-working and humble.

Student Earns National Recognition for Her Research Accomplishments

This fall brought national recognition for UMKC Senior **Aleigha Dollens's** research on earthquakes on the Motagua Fault in Guatemala. Aleigha began this research when she traveled with **Dr. Tina Neimi's** Guatemala GeoHazards International Research Experiences for Students program, and has continued work under Dr. Neimi's mentorship with support from SUROP and SEARCH grants.

At the Association of Environmental and Engineering Geologists' Annual Meeting in Portland, OR, Aleigha won first prize for her poster, "Electrical Resistivity Tomography Mapping of the Motagua Fault along the 1976 Guatemala Earthquake Rupture at La Laguna and Gualán."



The Geoarchaeology Division of the Geological Society of America recognized Aleigha with the Richard Hay Award for her abstract, "Evidence of earthquakes buried at the Mayan site of Quirigua in Guatemala: An evaluation of archaeological excavation archives." The award supported her travel to the GSA Annual Meeting in Pittsburgh, PA. Thirty-four years ago, Dr. Niemi was the recipient of the very first Richard Hay Award.

Meet McLain Hymer



Would you begin by sharing a little bit about yourself and your role at UMKC?

I grew up in Overland Park, Kansas and graduated from Kansas State University in 2019 with a dual degree in Psychology and Human Development and Family Sciences and a minor in Conflict Analysis and Trauma Studies. During my time at K-State, I participated in

undergraduate research with Dr. Melinda Markham, studying communication methods and strategies used within post-divorce military families. Although I am not involved in research directly in my current professional role, I am still thankful for the skills I gained from the experience.

This is my first role in higher education, after working with high school students as a college advisor for the past four years. Some of my favorite things to do outside of work are reading, playing with my dog Cleo, and trying out new restaurants in Kansas City.

As the Manager of Nationally Competitive Awards here at UMKC, I aim to encourage students of all backgrounds and academic disciplines to apply for prestigious national scholarships and fellowships. These competitive awards can fund undergraduate and graduate study, research, summer programs, and various experiences abroad. My goal is to create a positive application experience for students by supporting them every step of the way. I can help students explore their options and identify what award best matches their interests and goals, connect students with other campus resources, and assist with all application components.

Your prior role was as a college advisor to high school students. What has it been like to transition to working with college students at UMKC?

While I was working with high school seniors on their college plans, I always struggled to say goodbye at the end of the year. After all of the hard work they had put in to make sure their college dreams come true, I could only hope that things would work out for them once they arrived on campus. This is what led me to pursue a new position within higher education. I wanted to work with students after they had already arrived at college and help them reach their full potential while they're here.

I have absolutely loved working with college students so far. I get to meet these students at such a pivotal time in their lives and help them shape their goals for

the future. In my role specifically, I get to help students step out of their comfort zone and try out experiences that they may never have the chance to do outside of college. I know that college can be an overwhelming time for many students, so I hope to provide resources in a digestible way and empower them throughout their college journey.

What is one thing you wish all UMKC students knew about nationally competitive scholarships and awards?

I want all UMKC students to know that there is no single type of student that should consider applying for nationally competitive awards. Students of all backgrounds, identities, and majors can be great candidates for these awards, and I encourage them to consider applying if they find an award that matches their interests and goals. While a strong academic record is helpful when applying for any competitive opportunity, applications are reviewed holistically, and selection criteria do not focus solely on a student's GPA.

What can faculty do to help students become competitive for national scholarships and awards?

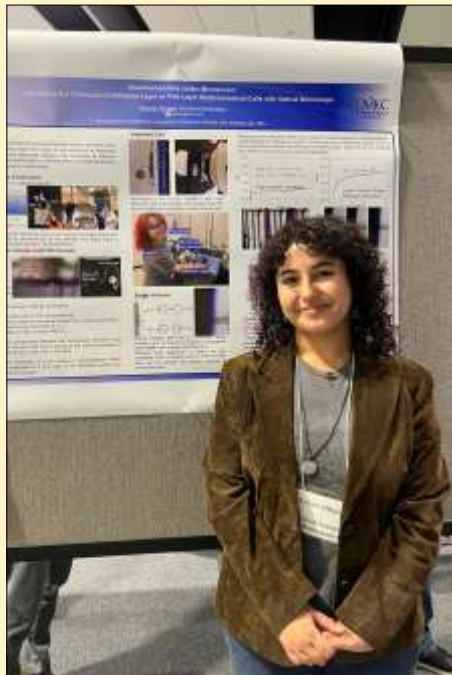
Faculty can help by encouraging students to step out of their comfort zone and participate in experiences that will set them apart, whether that is studying abroad, participating in undergraduate research, or becoming active in their community. Participating in unique experiences, especially if they involve leadership, will help a student become a better candidate for nationally competitive awards. Additionally, faculty can help encourage students to consider these opportunities earlier rather than later. The longer a student has to prepare for their application the better, especially if they are hoping to travel abroad.

Is there anything else you'd like to share?

I am happy to collaborate with any faculty members and/or student groups that faculty members advise for if they would like me to visit their classrooms/ meetings and present to their students. I can customize the presentation to match the academic and professional interests of a specific group of students or give a general presentation about the awards I work with. My biggest goal is to get the word out about these opportunities so that our students are aware of them, so I am open to any ideas that faculty members may have about how to best accomplish that goal.

To learn more about the work I am doing, you can visit my website [here](#). If you have a student in mind that you think would make a great candidate for one of these awards, feel free to refer them over email (mhymer@umkc.edu) or by filling out [this form](#).

Early Involvement in Research Leads to Student Authorship



As a sophomore at UMKC, **Asayiel Alhajeri** began her research experience in **Dr. Mohammad Rafiee's** electrochemistry lab. As a senior, she published her first co-authored article in the *Journal of Chemical Education* in September 2023. In the years between, Asayiel has been awarded a SEARCH Grant and has served as an Undergraduate Research Ambassador. She loves talking to other students about how to get involved in research since her own experience gave her the opportunity to practice problem-solving skills and build confidence in an academic setting. The paper, "Electrochemistry under Microscope: Observing the Diffusion Layer and Measuring Diffusion Coefficient," describes a technique that can be employed in classrooms without sophisticated equipment to visualize the electrode reaction in the diffusion layer. Co-authors include her mentor, Dr. Rafiee, a UMKC graduate student, and collaborators at Avila University.

Undergraduate Research Fellows

Students who have been deeply involved in research or creative scholarship may be recognized as Undergraduate Research Fellows, a designation that appears on their official transcripts. To be recognized, students must demonstrate that they have developed a research question, identified appropriate methods to pursue that question, carried out the project, and circulated the work to a wide audience. The following students were awarded the Undergraduate Research Fellow transcript designation in Fall 2023.

Asayiel Alhajeri, '24

Biology Major

Victor Arellano, '23

Public Health Major

Trevor Bell, '24

Biology Major

Juan Calderon, '24

Mechanical Engineering Major

Grace Dang, '24

Biology Major

Sheyda Dehghani, '25

Biology Major

Hannah P. Edwards, '24

Music Therapy Major

Liz Langford, '23

Earth & Environmental Science Major

Jonah Petitjean, '23

Economics Major

Alijah Smith, '24

English Major

Emma Stauffer, '24

English Major

Mya Thomas, '25

Earth & Environmental Science Major

Lindsay Todd, '24

Biology Major

Benjamin Vandenburg, '23

Biology Major

2023-2024 SEARCH Grant Awards

Andi Basalo, '24

Political Science Major

“State Legislative Term Limits and Representational Loss”

Mentor: Greg W. Vonnahme

Sophia Baugher, '24

Earth & Environmental Science Major

“Urban Heat Island Mini City: A Real-Time Interactive Model”

Mentor: Fengpeng Sun

Trevor Bell, '24

Biology Major

“The Role of rRNA Post-Transcriptional Modifications in Escherichia coli Ribosome Biogenesis”

Mentor: Michael OConnor

Juan Calderon, '24

Mechanical Engineering Major

“Thermophysical Analysis of a Nanofluid Mixture under Constant Heat Flux for the Application in High Temperature Solar Collector”

Mentor: Sarvenaz Sobhansarbandi

Sheyda Dehghani, '25

Biology Major

“Utilizing Self-assembly for Liquid-in-Liquid 3D Printing of Biomaterials”

Mentor: Zahra Niroobakhsh

Johnny Diep, '26

Physics Major

“Setting the Stage for Machine Learned Potential Functions in Electronic Structure Calculations”

Mentor: Paul Rulis

Aleigha Dollens, '24

Earth & Environmental Science Major

“Radiocarbon and Thermoluminescence dating of the Terminal Mayan Earthquake at the Quirigua Archaeological Site in Guatemala”

Mentor: Tina Niemi

Yasmeen Hanon, '25

Political Science Major

“Oil and Orientalism: Rethinking the Political Resource Curse in the Middle East and North Africa”

Mentor: Rebecca H. Best

Z Kemp, '25

Civil Engineering Major

“How Wildfires Affect Soil Sediment Concentration: Impact on Human Life and Infrastructure”

Mentor: Megan L Hart

Mary Klene, '25

Earth & Environmental Science Major

“Stratigraphic, Petrographic, and Geochemical Study of Interbedded Gypsum and Cu-ore Deposits in the Boleo Formation in Baja California Sur, Mexico”

Mentor: Tina Niemi

Laylah Liwaru, '24

Biology Major

“Observing mutation of the foxg1a gene and its effect on muscle development in the zebrafish jaw”

Mentor: Hillary McGraw

Rahma Mohamed, '24

Health Sciences Major

Mattea Brooks, '24

Health Sciences Major

“What is the Extent of Medical Translation Service Policy in the Kansas City Metro Area and How Do Health Providers Deliver this Service to Underserved Populations?”

Mentor: Kelsey Gardiner

Josie Newman, '24

Media, Art, & Design Major

“A Dive Into the Archives: Womontown Zine”

Mentor: Zachary Frazier

Nathan Nguyen, '24

Business Administration Major

“Physical Activities Status Within The Asian-American Community in Kansas City”

Mentor: Joseph Lightner

Jonah Petitjean, '23

Economics Major

“The Attention Economy and Temporal Expropriation: Alienation and Technological Enclosure”

Mentor: Sirisha Naidu

Robert-Abel Faustino Porras, '25

Computer Science Major

“Data Mapping of Latinx Community of Greater Kansas City Metropolitan Area”

Mentor: Theresa Torres & Jesse Lowe

Theo Raitzer, '25

Economics Major

“Another Latin American Debt Crisis? Analysing the Effects of Recent US Interest Rate Increases on Latin American Countries”

Mentor: Zhongjin Li

Continued on next page...

“The effects of visual and circadian proteins on

SEARCH Grant Awards (continued)

Nikhith Rao, '27

Six-Year Med Program

“The effects of visual and circadian proteins on BDBT and of BDBT on DBT”

Mentor: Jeffrey L. Price

Nikitha Sheth, '29

Six-Year Med Program

“Osteoderm Geometry and Crocodylian Taxonomy”

Mentor: Rachael C. Allen

Olivia Sours, '24

Health Sciences Major

“Harvesters Food+Health Program Evaluation”

Mentor: Kelsey Gardiner

Quynh Tran, '28

Six-Year Med Program

“Characterization of Bullera alba and an Evaluation of its Mycotoxin”

Mentor: Brooke Esquivel

Tabitha Tyler-Post, '25

Earth & Environmental Science Major

“Physical Characteristic Changes in Sediment Due to Exposure to High Heat”

Mentor: Alison Graettinger

Jay Vanderslice, '24

Physics Major

“Impact of Thermally Induced Variation in Electronic Band Structures on Semiconductors used in Functional Energy Devices”

Mentor: Paul Rulis

Ellery Vaughn, '24

Psychology Major

“Examining the Relationship Between Conflict Resolution Style and Self Control in Couples”

Mentor: Seung Lark Lim

Brady Wolff, '24

Music Composition / Music Theory Major

“New Methods of Analysis for Microtonal Music of the 20th and 21st Centuries”

Mentor: David Thurmaier

Jayden Hunter, '25

Biology Major

SUROP Grant Leads to Publication

In summer 2022, UMKC undergraduate student **Vagmi Kantheti** was awarded a SUROP Grant to develop a corpus of full-text journal articles related to the 1918 influenza pandemic with her mentor, **Dr. Billie Anderson**. A year later their co-authored article was published in the *Journal of Information Science* in July of 2023.

The article focuses on methodology that researchers in any discipline could employ to develop a full-text corpus for text-mining to meet their specialized research objectives. The 1918 influenza pandemic corpus developed by Vagmi, Dr. Anderson, and their collaborators will be used to draw connections between the historical event and the more recent COVID-19 pandemic.

Thank you, UR Ambassadors!

These students help us run programs and spread the word about undergrad research all year long.



Fall 2023 UR Ambassadors:

Asayiel Alhajeri, Biology, '24

Aleigha Dollens, Earth & Environmental Science, '24

Layla Liwaru, Biology, '24

Alijah Smith, English, '24

Olivia Sours, Health Sciences, '24

Lindsay Todd, Biology, '24