

Research

CUGR Newsletter



THE UNIVERSITY OF
MAINE

Fall 2019

Knowledge • Discovery • Innovation



CENTER FOR
UNDERGRADUATE RESEARCH

FALL 2019 Issue 14

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COVER PHOTO:

Benjamin Williams, Undergraduate Researcher
Photo: UMaine Marketing and Communications

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Academic Year 2019 – 2020 Research & Creative Activities Fellowship

The Center for Undergraduate Research is pleased to announce the Undergraduate Research and Creative Activities Academic Year Fellowship 'Call for Proposals'. This program supports undergraduate student engagement in faculty-mentored research. Several fellowships will be awarded for the 2019–20 academic year on a competitive basis; the competition is open to all UMaine undergraduate students from all majors. Each fellowship provides up to \$1100 support for one student to conduct faculty-mentored research. The CUGR Advisory Committee will review research and creative activities proposals for clarity of objectives, importance to the field, proposed approach, appropriateness of the budget, and indication of the project feasibility. Online application deadline is October 11, 2019. To apply visit <https://tinyurl.com/CUGR19AY>.

Eligibility Criteria:

Any undergraduate student currently enrolled in a degree program at the University of Maine may submit a proposal in consultation with a faculty mentor. Preference will be given to students graduating in or after May 2020.

Application Guidelines:

1. Applicants need to describe the research, placing it in the context of scholarly activities, while presenting in such a way that it is understandable to the reviewers from outside of the applicant's research field.
2. All proposals must be accompanied by a faculty mentor commitment letter submitted through the provided electronic link found in the application form.
3. Award Recipients must submit a report including technical and financial data by May 15, 2020. All recipients are required to submit an abstract and present the product of their research at the 5th Annual UMaine Student Symposium: Research and Creative Activity (UMSS20) on April 17, 2020.



CUGR allowed me to have a better understanding of the world of research, particularly on an international level, and a chance to tackle all the challenges that may come with it."

— Marissa Bovie, Earth Sciences and Anthropology major

New Open Lab Days!

New this year, the Center for Undergraduate Research is partnering with the Graduate School on an Open Lab Day project! This will serve as a way to introduce undergraduate students to the ongoing research happening on campus, and allow them to witness that research first-hand.

Open Lab Days will occur weekly throughout the fall 2019 semester. Check the CUGR website and Facebook page for date announcements, coming soon!



WiSe-Net lab students assembling a payload for the International Space Station.

New EPIC Course Announced

**Experiential Learning Innovation Central (EPIC)
FALL 2019**

INT 125: Experiential Program Innovation Central
Class meeting time: Friday 2:00–5:00pm
Credit hours: 3

This course is designed to provide an overview of experiential learning pathways for students at a 21st century land grant research institution. Students work in teams on a semester long project designed to enhance communication and problem-solving skills.

Students will get to learn more about the following centers: Advanced Manufacturing Center (AMC), Center for Undergraduate Research (CUGR), Center for Innovation in Teaching and Learning (CITL), Foster Center for Student Innovation, Honors College, and Innovative Media Research and Commercialization Center (IMRC).

This course is taught by various interdisciplinary faculty instructors, led by Ali Abedi (Coordinator), Assistant Vice President for Research and Center for Undergraduate Research Director.

Full course information such as schedule and meeting times, can be found on MaineStreet under the Fall 2019 course listing.

*For more information please contact Ali Abedi,
email: ali.abedi@maine.edu.*

EPIC
umaine.edu/research/epic

Easel & Poster Board Rentals

Hosting a symposium?

Are you presenting at a conference?

Co-Sponsored by CUGR and Honors College, every UMaine department or student group can now rent a poster board and easel at a very low cost. For availability, pricing, and other information please contact the CUGR office.

Poster Board Dimensions	Quantity
36" x 48"	120
24" x 36"	35
20" x 30"	18
Tri-fold	6

Combo Qty.	Price Per Combo
First 25 (1-25)	\$4.00
Next 25 (26-50)	\$3.00
Next 50 (51-100)	\$2.50
Combo = easel + foam poster board	
PRICE/COMBO EXAMPLES:	
Rental fee for qty. 20 combos equals \$80.00	
Rental fee for qty. 30 combos equals \$115.00	
Rental fee for qty. 100 combos equals \$300.00	

*These prices are for a maximum of 5 days, e.g. M-F or Th-M. Easel Dimensions: Adjustable telescoping legs allow variable heights from 36" to 66".

*A \$50.00 deposit is required at pick-up for loss & potential damages. Deposit will be refunded upon receipt in good condition or credited towards the final cost.

Morganne Robinson

Major: Kinesiology with Pre-Medical minor

Faculty Mentor: Kristy Townsend

How did you get started/interested in undergraduate research?

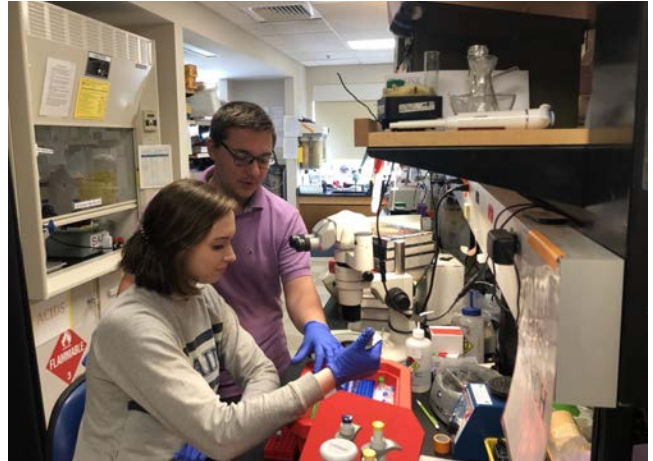
I initially wanted to become a part of undergraduate research on campus due to my interest in the medical field. I wanted to see what contributions to the research field I could make while obtaining my undergraduate degree. The variety of research being done on campus right now is fascinating, and I loved seeing the passion that these professors had for their respective fields. All of this combined made me want to enter research on campus, and I'm very glad I did.

What advice do you have for students pursuing research?

For those students on campus right now who want to get involved in undergraduate research but don't know how or are nervous about getting started, I have one piece of advice: email your professors! I came into contact with Dr. Kristy Townsend after emailing her about how I found her work incredibly interesting, and now I'm working in her lab on the same research I was amazed by. Most professors absolutely love to talk about the projects they're doing on campus, so don't be afraid to ask!

Where are you going from here?

In the future, I hope to go to medical school and to become a practicing physician in the state of Maine. I'm not sure what I want to specialize in yet, however I love the fields of internal



Morganna Robinson working in the laboratory.

medicine and surgery. I also hope to continue on with medical research, and hope to someday be working both with patients and in the lab.

How has CUGR affected your experience here at UMaine?

CUGR has had a large impact on my research during my time at UMaine, for it has not only allowed me to pursue research over the summer via my fellowship grant, but it has also allowed me to see other students' work via the student symposiums in the spring. There is nothing better than seeing my fellow classmates during the student symposiums and seeing how passionate they are about their research projects.

Kaj Overturf

Major: Biology & Wildlife Ecology, Honors

Faculty Mentor: Erik Blomberg

How did you get started/interested in undergraduate research?

I really became interested in undergraduate research during my sophomore year, when I started volunteering for a grouse project run by my advisor. This started my interest in gamebirds, and led to my interest in working on my own gamebird project.

What advice do you have for students pursuing research?

I would advise others who are considering undergraduate research to not worry about any doubts they might have going in. Conducting your own research can seem daunting, but there are plenty of resources to help you along the way.

Where are you going from here?

My intention, after I finish my research and graduate, is to attend graduate school, while ideally researching something involving birds and their management. This project has given me confidence that I can handle whatever comes next. My ultimate goal is to be a wildlife biologist for a state agency.



Kaj Overturf, undergraduate researcher, studies gamebirds.

How has CUGR affected your experience here at UMaine?

CUGR has allowed me to pursue the research I am currently conducting this summer. This is something that would have been much more difficult without CUGR. I have attended several CUGR showcases, and even presented in one. CUGR's presence and support has provided an avenue for me and many others to be able to present our work.

Jordan Miner

Major:

Biomedical
Engineering

Faculty Mentor:

Karissa Tilbury



Undergraduate researcher Jordan Miner.

How did you get started/interested in undergraduate research?

I have always been interested in pursuing a career in research. When I started my undergraduate years at UMaine I approached my advisor, Dr. Karissa Tilbury, about working in her lab and, to my delight, she agreed. My freshman year I worked with a few experienced graduates and undergraduates in her lab to gain experience and insight into being a researcher at UMaine. At the beginning of this year, my sophomore year, Dr. Tilbury approached me about working with Henry Lab in a collaborative research project involving DMD and zebrafish. I jumped at the opportunity and have been working on that project ever since.

What advice do you have for students pursuing research?

I have been conducting research under Dr. Tilbury since my Freshman year at UMaine. I have been involved in many

projects besides the one I am currently working on. This has allowed me to learn about new aspects of Biomedical Engineering that I might not have learned from my courses. Also, this opportunity has allowed me to network within the university and collaborate with other labs on campus. Overall, the advice I would give is to just go for it. I had no idea what I was getting into when I started my undergraduate research, however I couldn't be more thankful for the experiences and opportunities it has offered me in the short time I have been conducting research.

Where are you going from here?

I am continuing this research over the summer and into the next academic year. We are diving deeper into what SHG imaging can do for this project and are beginning to combine the data from SHG imaging and other types of imaging and analysis Henry Lab has been working on. We hope to get a publication out of this research. In the Spring of 2020, I will be doing a co-op at IDEXX Laboratories in Westbrook, Maine. I am very excited to have been offered this position and I plan to take full advantage of this opportunity.

How has CUGR affected your experience here at UMaine?

I have always been interested in research and CUGR has allowed me the opportunity to start an independent research project that I might have not been able to do without their assistance. I was also able to present at the annual UMSS in April, which I never would have even imagined of doing before beginning my CUGR sponsored research.

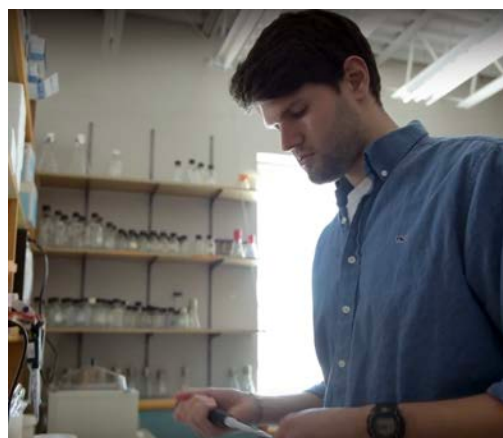
Benjamin Williams

Major: Biochemistry/Microbiology, Honors

Faculty Mentor: Sally Dixon-Molloy

Benjamin Williams, premed, is conducting research on understanding the manner in which bacteria gain tools for antibiotic resistance from the viruses that infect them. Benjamin presented at the UMSS19 on "The Impact of Prophage BPs on Antibiotic Resistance in Mycobacteria."

"The rise in antibiotic resistant bacteria is a critical issue in the clinical setting. So, as a pre-medical student this area of research is incredibly relevant to my personal interests and future professional goals," says Williams. "Gaining a better understanding of how bacteria acquire resistance to antibiotics is a necessary step in the drug discovery process. This is just one contribution to an incredibly diverse field of biomedical research."



Ben Williams researches antibiotic resistance in bacteria.

2019 UMAINE Student Symposium

More than 1,300 undergraduate and graduate students presented their work during the annual University of Maine Student Symposium held at the Cross Insurance Center in Bangor on April 10. The free public event, which was organized by UMaine Graduate Student Government (GSG) and the Center for Undergraduate Research (CUGR) as part of Maine Impact Week, provided an opportunity for community members to meet student researchers and scholars, see their posters and exhibits, hear their presentations, and view short performances and art. Awards and cash prizes were given to the symposium's top scholars and presentations in several categories.

Undergraduate Award Winners

Allied Health: Tessa Lindsley, Samantha King†, Kathleen Thibodeau and Taylor Durepo, *"What Strategies can be Implemented to Increase Workplace Satisfaction and Decrease Emotional Exhaustion thus Decrease Nurse Turnover Rates,"* advised by Patricia Poirier

Arts: Sarah Seitz, *"Data Queen,"* advised by Jon Ippolito

Biomedical Sciences: Anna-Maria Dagher, *"Exploring the Dynamic Relationship between Candida Albicans, Pseudomonas Aeruginosa and Fluconazole for Improved Candidiasis Treatment,"* advised by Robert Wheeler

Biomedical Sciences: Francesca Armstrong, *"Characterizing a Deadly Viral Infection in the Brain by Utilizing an Innovative and Unique Approach,"* advised by Melissa Maginnis

Education and Human Development: Hadley White, *"Addressing the World Language Teacher Shortage: How Can the Franco-American Centre Support French Programs Under Pressure in Maine,"* advised by Susan Pinette

Engineering and Information Sciences: Isabelle Grant, Chloe Lilly and Alex Danner, *"Fitness-based Optical Diagnostic Patch for the Observation of Cardiovascular Disease-risk Patients,"* advised by Karissa Tilbury

Interdisciplinary Collaboratives: Nicole McGrath† and Daniel Woodhouse, *"Examining Muscle Contraction and Angular Acceleration to Detect Balance Perturbation,"* advised by Vincent Caccese, Babak Hejrati, Marie Hayes, and Ali Abedi

Natural Sciences: Leala Machesney, *"Effects of Commercial Nutrient Solutions on Growth of Lemon Basil (Ocimum basilicum var. citriodora 'Mrs. Burns'),"* advised by Bryan Peterson and Stephanie Burnett

Physical Sciences: Gwyneth Roberts†, *"Quantifying Tidally Driven Transport in the Jordan River Estuary,"* advised by Lauren Ross

Social Sciences: Thilee Yost†, *"Hmong Americans and Mainstream Politics in St. Paul, MN,"* advised by Amy Fried

†Student in the Honors College.

2019 Summer Fellowship Recipients

The Center for Undergraduate Research (CUGR) announced the 2019 CUGR Summer Fellowship recipients. The center's advisory committee selected 13 proposals from 54 student submissions to be awarded \$3,300 each during the summer semester. Funding is provided by the UMaine Office of the Vice President for Research and NASA's Maine Space Grant Consortium. Each proposal was reviewed by three judges and discussed at a panel for clarity of the proposed project, research objectives, importance to the field, timeline, budget and faculty commitment letter.

Undergraduate Award Winners

Jacob Girgi Mechanical Engineering, *"Design and Fabrication of a Lower-limb Biofeedback Device,"* advised by Babak Hejrati

Mitchell Harling Biomedical Engineering, *"Optical Exploration of the Adipose Tissue Microenvironment using 2-Photon Microscopy,"* advised by Karissa Tilbury

Hua Lin Engineering Physics, *"Silicon-Carbide Nanowires and Thin Films for Sensing Strain and Pressure in Harsh Environments,"* advised by Sheila Edalatpour

Angel Loredó Mechanical Engineering, *"Determining the Mechanical Properties of Sintered Lunar Regolith from Concentrated Sunlight,"* advised by Justin Lapp

Benjamin Moore Biochemistry, *"In Planta Minichromosome Engineering using CRISPR-Cas9,"* advised by Ek Han Tan

Morganne Robinson Kinesiology and Physical Education, *"The Development of a Senescence-Associated Secretory Phenotype (SASP) Detection Panel,"* advised by Kristy Townsend

Joshua S. Stone Earth and Climate Sciences, *"Improving Methods for U/Pb Dating in Geological Materials,"* advised by Alicia Cruz-Urbe

Basel White Biomedical Engineering, *"The Computational Assessment of Breast Tissue Density Through the Use of the Continuous Density Score,"* advised by Andre Khalil

Rachel Bonney Marine Sciences, *"Bioaccumulation and Potential Impacts of Nanoplastics and Glyphosate in Developing Zebrafish (Danio rerio),"* advised by Nishad Jayasundara

Raegan Harrington Psychology, *"Adolescent Depression, Co-rumination and Friendship: A Longitudinal, Observational Study,"* advised by Rebecca Schwartz-Mette

Brittany Kucera Anthropology, *"Exploration of Rainwater Harvesting Potential at the Nadin-Gradina Archaeological Site, Northern Dalmatia, Croatia,"* advised by Gregory Zaro

Haley Nelson New Media, *"Growing Up Cuban,"* advised by Margo Lukens

Kaj Overturf Biology, *"The Effects of Winter Weather on Wild Turkey Roost Site Selection in Maine,"* advised by Erik Blomberg

CUGR Advisory Committee

Ali Abedi, Assistant VP Research, and CUGR Director, Professor of ECE, COE
Francois Amar, Dean of the Honors College, Professor of Chemistry, CLAS
Judith Andre-Rosenbaum, Associate Professor of Communication & Journalism, CLAS
Jim Artesani, Associate Dean of Graduate Education, Research, and Outreach, EDHD
Laura Artesani, Associate Professor, Music Education Coordinator, CLAS
George Criner, Associate Dean of Instruction, NFSA
Sally Dixon-Molloy, Honors Preceptor, Assistant Professor of Genomics, NFSA
Lee Karp-Boss, Associate Professor, Marine Sciences, NSFA
Jean MacRae, Associate Professor of Civil and Environmental Engineering, COE
Patricia Poirier, Graduate Program Coordinator, Professor of Nursing
Stefano Tijerina, Lecturer, Management, MBS
Deborah Eremita, Undergraduate Program Coordinator, Assistant Professor of Nursing
Timothy Cole, Associate Dean for Academics, CLAS

Academic Year 2019 – 2020

CUGR Program Dates and Deadlines

2019 - 2020 Academic Year Fellowship Awards

Online Application Deadline: October 11, 2019
Award Announcements: October 28, 2019
Performance Period: November 1, 2019 - May 1, 2020
Application Link: <https://tinyurl.com/CUGR19AY>

Undergraduate Student Travel Grant Program

Application Deadline: Open application from
September 1, 2019 to May 1, 2020
First come, first serve, contingent upon
funding availability

2020 Summer Fellowship Awards

Online application deadline: March 27, 2020
Award Announcement: April 17, 2020
Performance Period:
June 1, 2020 - August 31, 2020

2020 UMaine Student Symposium

Abstract Submission Deadline: March 13, 2020
Acceptance Notifications: March 23, 2020
UMSS20 April 17, 2020 at the
Cross Insurance Center



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Creating Knowledge. Promoting Scholarship. Inspiring Creative Activity.