

Research

CUGR Newsletter

Spring 2020



CUGR
CENTER FOR
UNDERGRADUATE RESEARCH

**SPRING 2020
Issue 15**

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Photo by UMaine Marketing and Communications

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We've moved!

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2020 Student Symposium

Research and Creative Activity

UMaine Student Symposium
Friday, April 17, 2020
Alfond Arena
University of Maine
Orono, ME

Submission Deadline: Friday, March 13, 2020

Acceptance Notifications: Week of March 23, 2020

Poster Information:

Poster printing at UM Printing Services, Keyo Building

5% discount for students until April 10, 2020

Exhibit Poster 24" x 36"

Before April 10: \$19.95

Presentation Poster 36" x 48"

Before April 10: \$37.95

umaine.edu/umss

Summer 2020 Research & Creative Activities Fellowship

The Center for Undergraduate Research is pleased to announce the Undergraduate and Research and Creative Activities Summer 2020 Fellowship 'Call for Proposals.' This program supports undergraduate student engagement in faculty-mentored research. Several fellowships will be awarded for Summer 2020 on a competitive basis; the competition is open to all UMaine and University of Maine Machias undergraduate and graduate students from all majors.

Each fellowship provides up to \$3300.00 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.

Eligibility Criteria:

Any undergraduate student currently enrolled in a degree program at the University of Maine or the University of Maine Machias may submit a proposal in consultation with a faculty mentor. Preference will be given to students graduating in or after May 2021.

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 Friday, September 18, 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 (UMSS21) in April 2021.
4. Apply now here: <https://tinyurl.com/FellowshipSummer2020>

EPIC

Experiential Programs Innovation Central

umaine.edu/research/epic



What is EPIC?

Vision

To provide the best high-impact student-centered undergraduate education in the nation and beyond.

Mission

To enable comprehensive development and systematic integration of innovative high-impact experiential learning in undergraduate programs. Where learning goes beyond the classroom, as students methodically gain invaluable experiential education during their years at UMaine, preparing them as successful professionals and lifelong learners.

Stay tuned for upcoming opportunities!

For more information contact Ali Abedi at
ali.abedi@maine.edu.



We've Moved!

The Center for Undergraduate Research (CUGR) has moved to Stewart Commons to co-locate with the Innovative Media Research and Commercialization Center.

Co-located with IMRC, our vision is to provide the best high-impact student-centered ungraduated education in the nation and beyond.

Easel & Poster Board Rentals

Having a Symposium?
Are you presenting at a conference?

Co-sponsored by CUGR and the Honors College, every UMaine department or student group can rent poster boards and easels at a low cost.

These prices are for a maximum of five days, e.g. Monday– Friday or Thursday– Monday.

Easel Dimensions: Adjustable telescoping legs allow variable heights from 36" to 66".

For availability, pricing and other information, contact the CUGR office at cugr@maine.edu.

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

Combo Qty.	Price Per Combo
1–25	\$4
26–50	\$3
51–100	\$2.50
Combo = easel + foam poster board	
PRICE/COMBO EXAMPLES: Rental fee for qty. 20 combos equals \$80 Rental fee for qty. 30 combos equals \$90 Rental fee for qty. 100 combos equals \$250	

Student Spotlight

Olivia Bradstreet

Major: Studio Art

Faculty Mentor: Ed Nadeau

Class of 2020



Olivia Bradstreet

How did you get started in undergraduate research?

In the arts research often means dedicated “making” time. Throughout college I have met artists while on residency and talked to professors during their sabbaticals, and all emphasize the need for time and funds to create outside of a daily academic regiment. As I began to pursue planning for my Honors Creative Thesis, I knew I wanted to achieve this dedicated making time in undergrad so that I could apply my studies of paper, print, fiber, and art history all into a long-term project and continue to explore the themes of the body and intergenerational memory in process art. The Honors College and the Art department were instrumental in always encouraging me to make larger connections in my studies, which is something that undergrad research has allowed me to do.

Brief description of your research project

My research project is about small scale studio art practice and papermaking. With handmade paper I can explore process art and the connections made through fiber, setting, and time. In process art, where the focus is the making of the work itself, not the final product, the meaning of materials becomes very important. Because the relationship the artist has to the materials is embedded in the work, I chose fiber because it serves as great material connector for exploring personal narratives. My research involves setting up a small paper making studio with limited means to make archival quality materials and exploring the forms and aesthetic qualities of handmade paper as a medium for 2D and 3D works.

What are you looking forward to about your research and the Student Symposium?

I'm excited to bring this research to the UMaine community and share what I've learned during this making period. I'm happy to be part of this curiosity-fueled group of students, and I'm ready to be inspired, as I always am, by their efforts across multiple disciplines. I hope that by presenting from an arts perspective I can be part of the bridge between fields and investigate the connections between the traditional research and aesthetic experiences.

What benefit did working with a faculty mentor on your research have on your overall experience?

Being able to work one with one of my longtime art professors, Ed Nadeau, has been so useful, as direct mentor feedback is really essential as a student artist new to arts-based research. Working with a faculty mentor has meant I could bounce creative ideas back and forth with someone I can trust on the subject and it has allowed me to see what communication between working, professional artists inside and outside of academics can look like.

Any other interesting information or advice?

My education path has been less than traditional; as someone who was homeschooled under a radical education philosophy, I never attended any formal schooling before applying for state college at 18 years old. I mention this because I want other students from nontraditional education backgrounds to know that if they apply themselves with confidence, they can succeed in these environments. It isn't easy, in fact it can be really hard, but after time you'll learn that your unique background is a source of strength and resiliency.

Student Spotlight

Raegan Harrington

Major: Psychology

Faculty Mentor: Rebecca Schwartz-Mette

Class of 2020

How did you get interested in Undergraduate Research?

I started my undergraduate research experience during the second semester of my freshman year. My developmental psychology instructor noticed my enthusiasm for the topics we discussed and asked if I would join The Peer Relations Lab. At the time, I did not know what I was getting into, but soon realized I had a passion for research. A combination between the topics and methods within the lab sparked my interest and have propelled me into my own research projects and endeavors.

Brief description of your research project:

My research project is about co-rumination, an interpersonal processes typical of adolescent friendships that has socioemotional tradeoffs. Co-rumination (Rose, 2002), the extensive rehashing of problems and concerns with friends brings friends closer together via emotional support but also exacerbates depressive symptoms both concurrently and over time (e.g., Rose et al., 2007, 2014).



Raegan Harrington

The present study will fill two important gaps within the co-rumination literature. First, despite repeated calls for researchers to collect observational data on co-rumination (e.g., Calmes & Roberts 2008; Rose 2002; Rose et al 2007), studies have relied nearly exclusively on adolescents' self-reports. Second, longitudinal studies have included only two time points (e.g., Rose et al., 2007; 2014; Starr & Davila, 2009; Stone et al., 2011), and the longer-term implications of co-rumination for friendships and emotional adjustment are purely speculative.

The current study directly addresses these gaps by investigating the concurrent, short-, and longer-term correlates of adolescent co-rumination with friends using a multimethod, longitudinal design and advanced dyadic data analysis (multilevel modeling; Raudenbush & Bryk, 2002). Data for the current study comes from the Maine Adolescent Peer Project (PI: Rebecca Schwartz-Mette), a large study of adolescents and their closest friends conducted from 2016–2018 (N = 186 participants in 93 dyads).

What are you looking forward to about your research and the Student Symposium?

In my experience, the most enjoyable part of research is seeing everything come full circle. This is the part where you get to view the results of your project and begin to tell others about the influential knowledge you have discovered. It is the part where you can make a difference. Contributing to empirical literature that others will expand on is very exciting and the most rewarding part for me. I look forward to sharing what I have discovered with my peers at the Student Symposium and also learning more about their projects.

What benefit did working with a faculty mentor on your research have on your overall experience?

My faculty mentor was one of the best resources throughout my project. My mentor helped guide me in the right direction with my ideas and questions. She continues to help refine my work and better my research skill set.

Any advice to other undergraduates?

If you are an undergraduate with research ideas and questions, I encourage you to reach out to a faculty member that analyzes similar topics. It is a great first step that can lead to many other steps.

Student Spotlight

Deven Teisl

Major: Ecology and Environmental Sciences

Faculty Mentor: Jessica Leahy

Class of 2020

How did you get started in undergraduate research?

I became interested in undergraduate research during my Sophomore year at the University of Maine. I was taking a class centered about global sustainability issues and a common theme presented throughout the class was how research produced through a collaboration of academic institutions and local communities can be our best bet at solving complex problems. I have always had desire to contribute to the communities that I grew up in, and I believe that producing research that benefits and solves issues within your community, no matter how big or small the problem is, can be one of the best ways to give back to those around you.

Brief Description of your Research Project

Through conversations with Dr. Sara Velardi, a postdoctoral research associate who has been doing research on maple producers' scale management decisions in Maine, most current owners and operators in the maple syrup industry have the common interest of expanding their current operations, but they are unsure of how to approach that problem. Due to this issue, my research will focus on creating a sugarbush assessment tool. This assessment tool will consist of a set of guidelines which can be utilized by current or future producers and can be used to easily assess woodlots without having to hire a consulting forester to do the assessment for them. Through a meta-analysis of the available research and conducting interviews, I intend to create the most up-to-date and succinct resource that can be utilized by maple syrup producers. This will allow them to expand their current operations, while saving them time, energy, and money. This tool will also be made available to the public, allowing those who are interested in joining the maple syrup industry to get a jump start on their own operations.

The assessment tool will be created as a guidebook, with the different characteristics I have identified along with the optimal ranges for each of the characteristics that indicate the productiveness of the woodlot.

Included along with this guidebook will be an equation created through both interviews and surveys of both maple producers and foresters that will provide the user with a suitability rating of the woodlots potential to transition into a sugarbush.



Deven Teisl

What are you looking forward to about your research and the Student Symposium?

I look forward to the opportunity to share and present the culmination of my, and my mentors, hard work over the past six months. Research is meant to be shared among the community and the Student Symposium is the best way to complete such an important part to the research process.

What benefit did working with a faculty mentor on your research have on your overall experience?

Research cannot come to fruition without the support and collaboration of others. If I did not have the support of Dr. Jessica Leahy, Dr. Sara Velardi, and all the other faculty and stakeholder mentors that have guided me along the way, I would not be where I was today with my research project. It is extremely beneficial to be working with mentors who have so much research experience in this field, and I am extremely thankful for their help. As someone who has never had to design, conduct, and produce a research project of this magnitude before, it was extremely overwhelming in the beginning. But since I had aligned myself with the right people and listened to the advice that they provided myself and my fellow students, I was able to forge ahead. I am extremely thankful for the expert guidance they have provided over the past six months and I look forward to continuing my work with them.

Any advice to other undergraduates?

Study what you are passionate about, and take part in research when the opportunity presents itself.

Student Spotlight

Abigayl Novak

Major: Ecology and Environmental Sciences

Faculty Mentor: Yongjiang Zhang

Class of 2020

How did you get started in undergraduate research?

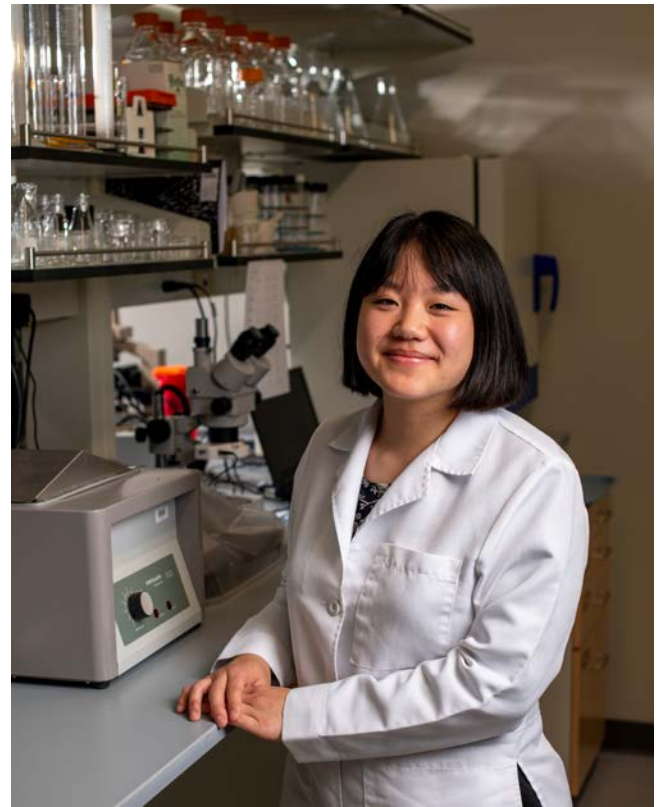
Ever since I was a freshman in college, I wanted to conduct my own research. It wasn't until I was given the opportunity to combine my capstone research as my own independent research that I took it and ran. I am lucky that I have been able to connect my interest in plants and the environment in my research that will help me hopefully excel in my future education.

Brief description of your research project:

My research looks at soybeans in drought response by looking at the plant hormone, Abscisic Acid (ABA). ABA has been known to be one of the primary hormones involved in drought conditions and could tell us a lot about what is going on during a drought. By looking at these plants in this type of condition, we will be better prepared for unknown outcomes. In addition, because plants are essential for people to live, it is important to recognize that research should be a part of new discoveries involving plants. Lastly, plants make up the structure, aesthetic, and zest of our earth. Learning about plants in their natural or native environment can help us understand them in a different perspective. For example, usually in agriculture a crop is planted in several rows which is known as monoculture. But scientists and farmers tend to overlook the basic nature of that crop. If we scale down and look at plants in their natural environments, we could improve crop yields or resistance to extreme weather conditions like drought or intense freezing.

What are you looking forward to about your research and the Student Symposium?

I am excited to see my research come together and tell a story that I will be able to understand and communicate. I think that the Student Symposium is an important way for people from academia and people from the community to come together and understand new research. In many instances, scientists conduct research but forget to communicate it to the public. It is also a great networking event, where we can communicate our research but we can also learn about what others are doing and find similarities in our research projects finding commonalities to reminisce about.



Abigayl Novak

What benefit did working with a faculty mentor on your research have on your overall experience?

I wouldn't be able to do the research I've done without my faculty mentor. I have had the opportunity to gain a lot of experience that will be useful for me as I move on to graduate school. Basic concepts of how equipment works, the behaviors and expectations of working in an academic setting but also a lab setting, and having access to resources that will aid research goals.

Any advice to other undergraduates?

Research is not an easy thing to do. I have learned that flexibility is very important to recognize. When your plants die you must change your plans, adjust and start over. When something doesn't go as planned, as a researcher, you must change to adjust to what has happened.

CUGR Fellowship

Academic Year 2019–2020

Award Recipients

Academic Year Fellowships are established to help provide financial support for undergraduate students in hopes of creating an environment where students can become involved in meaningful faculty-supervised research. Students' proposals are reviewed and scored by the CUGR Advisory Committee. Awarded projects are selected based on the scores from the reviews and panel discussions. Each proposal must include: Abstract, project description, timeline, budget table, budget justification, and a faculty commitment letter.

Brianna Ballard, History, *"The Presence of Black Sea Bass within the Archaeological Record and its Effects on Land Settlement Patterns,"* advised by Bonnie Newscom

Jessica Beneski, Zoology, *"A Comparative and Genomic Analysis of Mammalian Bladder Phenotypes,"* advised by Danielle Levesque

Cole Butler, Mathematics, *"Nodal Network Model of Zika and Chikungunya in Colombia,"* advised by Brandon Lieberthal

Olivia Bradstreet, Studio Fine Arts, *"Paper, Pulp, and Practice: Investigating Connection Through Process Art,"* advised by Ed Nadeau

Jacob Cote, Microbiology, *"The Role of Prophage in Mycobacterial Antibiotics Resistance,"* advised by Sally Molloy

Dominique DiSpirito, Political Science, *"Testing the Waters of Natural Resource Management: A study on the Management Values of Acadia National Park's Key Stakeholders,"* advised by Katharine Ruskin

Maddie Eberly, Forestry, *"Feedbacks Between Wood Structure and Function Driving Forest Tree Responses to Extreme Drought,"* advised by Jay Wason

Natalie Harmon, Earth and Climate Sciences, *"First Row Transition Element Analysis of Eclogites,"* advised by Alicia Cruz-Urbe

Aldous Hofmann, Botany, *"Quantifying Leaf Structural and Morphological Variation in Wild Blueberries for Precise Management,"* advised by Yongjiang Zhang

Patrick Hurley, Ecology & Environmental Sciences, *"Mites, Camera, Action: Assessing Current Varroa Mite Treatment Trends for Beekeepers in Maine,"* advised by Julia McGuire

Miranda Jacques, Biomedical Engineering, *“An Array of Synthetically Produced Fluorescent Biomarkers for Monitoring Neutrophil Behavior in the Non-Specific Immune Response,”* advised by Matthew Brichacek

Marissa Kinney, Microbiology, *“Investigating the Potential Relationship Between Black Soldier Fly Larvae Reared on Potato Scrap Substrate and the Suppression of Gram-Positive Bacteria,”* advised by Edward Bernard

Noah Moring, Business, *“The Effective Marketing of Products, Services, and Events towards College Students,”* advised by Stefano Tijerina

Jordan Miner, Biomedical Engineering, *“Imaging Zebrafish with Duchenne Muscular Dystrophy using Second-Harmonic Generation to Evaluate Myosin Structure,”* advised by Karissa Tilbury

Leigh Neptune, Food Science & Human Nutrition, *“Nonverbal Displays of Pride and Shame in LGBT Populations,”* advised by Mollie Ruben

Abigayl Novak, Ecology & Environmental Sciences, *“Investigating the Environmental Impacts of Abscisic Acid Levels in Soybean Drought Response,”* advised by Yongjiang Zhang

Shannon O’Grady, Animal and Veterinary Sciences, *“Predictors and Impacts of Haemosporidian Parasite Infections in Barn Owls,”* advised by Pauline Kamath

Sophia Palangas, Communication Sciences & Disorders, *“Assessing Health Related Quality of Life, Language Impairment, and Psychosocial Factors in Post-Stroke Aphasia,”* advised by Christopher Grindrod

Olivia Reese, Media Studies, *“Speak Softly and Carry a Selfie-Stick: Understanding Risk in Selfie-Behaviors in National Parks,”* Advised by Judith Rosenbaum-Andre

Anna Schumann, Molecular and Cellular Biology, *“The Role of BPs’ gp33 Immunity Repressor in the Downregulation of M. Chelonae Genes,”* advised by Sally Dixon

Samuel Varga, Finance, *“How Speculative are Different Sectors of the Stock Market?”* advised by Grant Miles

Michelle Ward, Psychology, *“Influence of Personality Differences on Dementia Caregiver Burden,”* advised by Fayeza Ahmed

Ben Williams, Biochemistry, *“Enteric Microflora Dysbiosis: Impact on Sleep Fragmentation, and Mild Cognitive Impairment in Aging Adults,”* advised by Marie Hayes

Maine Space Grant Consortium

Award Recipients

The Maine Space Grant Consortium is an affiliate of NASA's National Space Grant College and Fellowship Program. The mission of the Maine Space Grant Consortium is to support NASA's mission and four strategic enterprises by strengthening Maine's aerospace related research and education assets, which are critical to the Agency.

Oisin Biswas, Biomedical Engineering, *"Surface Contamination Detection Method Using Structural Color Analysis,"* advised by Caitlin Howell

Benjamin Chasse, Biomedical Engineering, *"A Nature-Inspired Non-Invasive Compound Detection System,"* advised by Caitlin Howell

Sean Detwiler, Mechanical Engineering, *"Humanoid Robot Simulator of Torso and Arms for the Testing of Wearable Robotics,"* advised by Babak Hejrati

Chris DeMarchi, Mechanical Engineering, *"Stimulating Varying Hydrogen Flow Patterns in Solar Powered Lunar Oxygen Production,"* advised by Justin Lapp

David Fitzpatrick, Engineering Physics, *"A Hybrid Thermochemical and PSA Process of Air Separation,"* advised by Justin Lapp

Rosamond Hickey, Chemical Engineering, *"Using Patterned Release Paper as Low-Cost, Portable Microdroplet Generators for Advanced Diagnostics,"* advised by Caitlin Howell

Abram Karam, Civil Engineering, *"Second-Order Derivatives of Nonsmooth Functions with Applications in Engineering,"* advised by Peter Stechlinski

Li Mackenzie Ladd, Mechanical Engineering, *"Integrating Electrical Components in Compliant Mechanics,"* advised by Aaron Joy

Henry Laurita, Zoology, *“Path, Pattern and Preference- the Power of Shape to Modify Honeybee Foraging Behavior,”* advised by Julia McGuire

Lindsey Lagerstrom, Psychology, *“Practicing Telemental Health Care in Maine,”* advised by Fayeza Ahmed

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

Jacob Marchio, Engineering Physics, *“Design and Construction of a Computer Controlled Astronomical Spectropolarimeter,”* advised by Sam Hess

Sahvannah Michaud, Psychology, *“Emerging Neuroimaging Technology in Category Learning Research,”* advised by Shawn Ell

Nicholas Soucy, Physics, *“THED: Thermal Hand Experience Device,”* advised by Nimesha Ranasinghe

Amelia St. John, Microbiology, *“Investigating the Role of Group B Streptococcus Prophages on Bacterial Fitness and Virulence,”* advised by Melody Neely

Tom Szewczyk, Biology, *“Lymphatic System as a Conduit for Immune Cells and Lipid Communication in Fat,”* advised by Kristy Townsend

Dylan Taplin, Biology, *“The Role of Bone Morphogenetic Proteins on Lipid and Glucose Sensing in Tanycytes,”* advised by Kristy Townsend

Deven Teisl, Ecology & Environmental Science, *“Tapping the Sweet Spot- Predicting the Suitability of a Woodlot’s Potential to Transition into a Productive Sugarbush in Maine,”* advised by Jessica Leahy

Basel White, Biomedical Engineering, *“The Application of Machine Learning to the Tissue Segmentation of Grayscale Mammograms,”* advised by Andre Khalil

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 and Journalism, CLAS
Jim Artesani, Associate Dean Accreditation and Graduate Affairs, EDHD
Laura Artesani, Associate Professor, Music Education Coordinator, CLAS
George Criner, Associate Dean of Instruction, NSFA
Sally Dixon-Molloy, Honors Preceptor, Assistant Professor of Genomics, NSFA
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, NSFA
Sara Imam, Undergraduate Student Representative
Stefano Tijerina, Lecturer, Management, MBS
Deborah Eremita, Undergraduate Program Coordinator, Assistant Professor of Nursing, NSFA
Timothy Cole, Associate Dean, CLAS
Catherine Biddle, Assistant Professor of Educational Leadership, EDHD

CUGR Program Dates and Deadlines

2020 Summer Fellowship Awards

Online Application Deadline: March 27

Award Announcement: April 17

Performance Period:

May 11 – August 28

Apply at:

tinyurl.com/FellowshipSummer2020

2020 UMaine Student Symposium

Abstract Submission Deadline: March 13

Acceptance Notifications: March 23

UMSS20 April 17

Alfond Arena

University of Maine, Orono, ME

Submit at: tinyurl.com/UMSS20



Creating Knowledge. Promoting Scholarship. Inspiring Creative Activity.

The University of Maine is an EEO/AA employer, and does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender expression, national origin, citizenship status, age, disability, genetic information or veteran's status in employment, education, and all other programs and activities. The following person has been designated to handle inquiries regarding non-discrimination policies: Director of Equal Opportunity, 101 North Stevens Hall, University of Maine, Orono, ME 04469-5754, 207.581.1226, TTY 711 (Maine Relay System).