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Matthew Revitt <matthew.revitt@maine.edu>

## Celebrating four NSF CAREER awardees, studying marine microbiomes aboard a schooner, and more!

1 message

UMaine Research <research@maine.edu>  
Reply-To: UMaine Research <research@maine.edu>  
To: matthew.revitt@maine.edu

Tue, Jan 11, 2022 at 10:11 AM



## January 2022

[Office of the Vice President for Research and Dean of the Graduate School](#)

### Spotlight



### UMaine celebrates highest number of NSF CAREER Award Recipients

The year 2021 marked a first for UMaine, as four faculty members were selected in

the same year for the prestigious National Science Foundation (NSF) CAREER Award, a premier early career funding mechanism, which is intended to support enduring success in scholarship, teaching, and public service.

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### **ORC launches new Research Compliance Newsletter**

The ORC newsletter is designed to keep the research community up to date on compliance topics and make it easier for researchers to gain and maintain compliance.

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## **Featured Stories**



**First annual Statewide Research Symposium on Biomedical Science and Engineering for fall 2022**

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**ALI ABEDI, PH.D.**  
*Associate Vice President  
for Research*

**Abedi elected Vice President of IEEE's Council on Radio Frequency Identification**

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**UMaine professors complete another leg onboard Tara research schooner**

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**Where do the stories of Native Americans come from? Who tells them, and why?**

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## Announcements

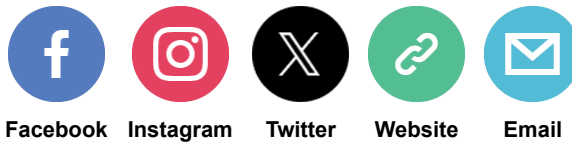
- [University of Maine Arts Initiative \(UMAI\) Economic Development Through the Arts RFP](#)
- [Collaborative Chats: Successful Research Partnerships in the Lobster Industry, January 12th](#)
- [Student Symposium accepting abstracts starting, January 19th](#)
- [The Microbes and Social Equity Speaker Series, January 19th](#)
- [Research and Creative Achievement award nominations due February 11th](#)

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## UMaine News: Research Stories and More

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## 2021 NSF CAREER Award Recipients

### UMaine celebrates highest number of NSF CAREER Award Recipients in 2021

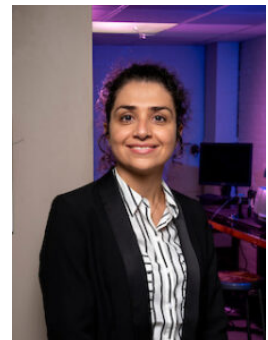
January 10, 2022 [Research News](#)

The year 2021 marked a first for UMaine, as four faculty members were selected in the same year for the prestigious National Science Foundation (NSF) CAREER Award, a premier early career funding mechanism, which is intended to support enduring success in scholarship, teaching, and public service.

This prominent award recognizes the exceptional potential of the faculty and their research. In 2021, UMaine's Sheila Edalatpour, Danielle Levesque, Lauren Ross, and Thomas Schwartz all received awards. These outstanding award recipients are highlighted below.

**Sheila Edalatpour**, an assistant professor of mechanical engineering at the University of Maine, is studying how the emission of heat changes when the materials involved are quantum-sized, or when they are separated by a gap of the same size as one or multiple atoms. The proposal earned her \$526,858 from a NSF CAREER Award. According to Edalatpour, optical and electronic properties can differ between bulk and quantum materials, and therefore, so can how they transfer radiated heat. Determining how material size affects thermal radiation, energy emitted from heated surfaces and transferred from one component to another in the form of electromagnetic waves, can help engineers design new materials to build more efficient, powerful and reliable devices for energy, computing, health care and other purposes. "Quantum size effects provide an excellent opportunity for engineering materials with novel thermal properties suitable for energy conservation and conversion technologies such as thermophotovoltaics, solar cells and smart windows," Edalatpour says.

**Danielle Levesque**, a University of Maine assistant professor of mammalogy and mammalian health, will use a National Science Foundation (NSF) CAREER Award of nearly \$920,000 to study temperature regulation in diurnal and nocturnal equatorial small mammals in an effort to describe the impacts of



Sheila Edalatpour, Assistant Professor of Mechanical Engineering.



Danielle Levesque, Assistant Professor of Mammology and Mammalian Health, School of Biology & Ecology.

climate change on species living in aseasonal tropical environments. "My research lies at the intersection of comparative physiology, ecology and evolutionary biology," Levesque says. "As an evolutionary and ecological physiologist, I am primarily interested in comparative energetics and evolution of mammalian temperature regulation." The proposed project will fill a void in the scientific knowledge of mammalian thermoregulation, as much of the previous work has been conducted with northern hemisphere species who live in latitudes with cold temperatures and a great degree of seasonality. Levesque's work, by contrast, takes place in the consistent equatorial conditions on Borneo.

**Lauren Ross**, a University of Maine assistant professor of hydraulics and water resources engineering, received a CAREER Award of more than \$600,000. This project will improve understanding of how estuary shape, river discharge and tides influence fresh and saltwater mixing. Previous studies into the dynamics of fresh and saltwater blending focus primarily on partially-mixed estuaries, meaning they experience moderate freshwater inflow from rivers, and estuaries with basic dimensions, Ross says. As a result, current research provides less insight into estuaries with complicated topographies like irregular and fluctuating depth and width,

headlands and constructions, and estuaries that have relatively large or small freshwater inputs from rivers, all of which can create more or less mixing. Ross, therefore, will use on-site data and numerical model simulations to quantify the mixing processes in more complex estuaries from across the world. Her research will encompass the Penobscot River Estuary, which experiences moderate river input and tides; the Reloncavi Fjord in the Chilean Patagonia, which has large river input and small tides, and the Gironde Estuary in southwest France, which has large river input and tides.



Lauren Ross, Assistant Professor of Hydraulics and Water Resources Engineering.



Thomas Schwartz, Professor of Chemical Engineering.

**Thomas Schwartz**, an assistant professor of chemical engineering at the University of Maine, received a \$513,995 NSF CAREER Award to advance his ongoing dissection of the Lebedev process. The well-known, multi-step chemical reaction is used to make butadiene from biomass-derived ethanol. However, little research has been conducted on the Lebedev process at the molecular level. Understanding the intricacies of the process would help researchers create new catalysts, which are necessary for the chemical reactions to make goods from both petroleum and biomass, that would increase butadiene yield. The emergence of improved catalysts could help grow the development of biobased, renewable chemicals. "Synthetic rubber is used in all sorts of consumer products, from car tires to paper coatings. Our goal is to enable production of synthetic rubber from renewable resources," Schwartz says. The new study builds on the previous research conducted by Schwartz and his UMaine Catalysis Group. He founded the group in 2015 to explore the intricacies of catalysts and the roles they play in chemical reactions used to make fuels and chemicals from carbon-based feedstocks.

These faculty accomplishments add to the [record setting year for research at UMaine](#), in which the university community set a historic high, generating \$133.6 million in external funding in support of research and

development activities.

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## ORC launches new Research Compliance Newsletter

January 10, 2022     [Announcements](#), [Program Highlight](#), [Research News](#)

The [Office of Research Compliance \(ORC\)](#) invites you to [subscribe to the new Research Compliance newsletter](#).

Compliance is a critical component of all research conducted at UMaine. The Office of Research Compliance provides the resources and support necessary to assist researchers with conducting ethical research and to ensure that all members of the university community are aware of and in compliance with federal regulations, state and local laws, and university policies pertaining to research.

This compliance is essential—without it, both the University and the involved individuals could be at risk for fines and penalties, and loss of trust in research. Ultimately, the University's ability to apply for and receive federal funding is contingent upon research compliance.

The mission of ORC is to promote a culture of ethics, integrity, and compliance with applicable laws, regulations, and policies governing research. ORC provides comprehensive regulatory guidance to the UMaine research community regarding specific components of research compliance, including animal care, biosafety, conflict of interest, controlled substances, export control, human subjects, research misconduct, research security, and responsible conduct of research.

The new ORC newsletter is designed to keep the research community up to date on compliance topics and make it easier for researchers to gain and maintain compliance. It will include information on the full range of compliance areas, plus helpful resources, tips, and updates within the field of research compliance. Published each fall and spring semester, the first edition is set to be issued early in the spring 2022 semester.

If you are a researcher, a research administrator, or want to learn more about research compliance at the University of Maine, please [subscribe to the Research Compliance Newsletter](#).

If you have any questions regarding research compliance at the University of Maine, please visit the [ORC contact us webpage](#).



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## UMaine News

# UMaine announces first annual Statewide Research Symposium on Biomedical Science and Engineering for fall 2022

January 6, 2022

The first annual Statewide Research Symposium on Biomedical Science and Engineering is planned for Oct. 13–14, sponsored by the University of Maine, University of New England, Mount Desert Island Biological Laboratory, Jackson Laboratory, Roux Institute, Northern Light Health and MaineHealth.

The symposium, to be held at the University of New England Innovation Hall in Portland, will highlight the diverse, state-of-the-art work in Maine's public and private academic institutions, healthcare systems and private industries as it relates to biological and physiological disciplines, medicine, biomedical engineering and data science.

The program will include plenary sessions with keynote speakers, poster sessions and breakout sessions on selected topics.

Registration materials, abstract deadlines and other details will be available in mid-January on the UMaine [Institute of Medicine website](#).

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## Abedi elected Vice President of IEEE's Council on Radio Frequency Identification

January 10, 2022 [Announcements](#), [Faculty Spotlight](#), [Research News](#)

Ali Abedi, Professor of Electrical & Computer Engineering and Associate Vice President for Research has been elected as the next Vice President of the Institute of Electrical and Electronics Engineers Council on Radio Frequency Identification (CRFID) for 2022-2023 term. The Institute of Electrical and Electronics Engineers or IEEE, is the largest technical professional organization in the world with over 400,000 members in more than 160 countries. The IEEE and its members come together as a global community through its robust publications, conferences, technology standards, and professional and educational activities.

The CRFID is one of IEEE's seven councils covering 14 technical societies including antenna and propagation, circuits and systems, communications, systems, man and cybernetics, ultrasonics, ferroelectric, and frequency control, Vehicular technologies, electronics packaging, engineering in medicine and biology, instrumentation and measurement, information theory, microwave theory and techniques, signal processing, social implications of technology, and solid state circuits societies.

Abedi is a senior member of IEEE and has previously served as Technical Committee Chair for CRFID on the topic of Wireless for Space and Extreme Environments which led to the establishment of an international conference in this area with its 10th edition coming up in 2022 in Canada. In his new role as VP of conferences for CRFID, Abedi will oversee expansion of worldwide conferences in the fields of interest for the council including RFID, IoT, WiSEE, Energy Harvesting, and Digital Twins events.

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## UMaine News



Courtesy of Lee Karp-Boss

# UMaine professors complete another leg onboard Tara research schooner

December 17, 2021

Lee Karp-Boss and Emmanuel Boss, professors at the University of Maine School of Marine Sciences, completed a month-long research cruise in the western South Atlantic Ocean as part of Tara Ocean Foundation's Mission Microbiomes project.

Tara, a French nonprofit that conducts ocean expeditions using its titular research schooner, [launched the project in December 2020](#) to learn more about how marine microbiomes, or assemblies of microorganisms in a given ocean environment, function. The organization also aims to understand how climate change and plastic pollution affect marine microbiomes.

Microbiomes make up two-thirds of marine biomass, support an extensive food chain and play important roles in biogeochemical cycles, yet little is known about their inner workings, according to Tara.

Boss and Karp-Boss joined the Tara schooner in early November for part of the two-year, 40,000-mile voyage along the African, South American and Antarctic coasts. Together with fellow researchers from Brazil, they designed and sampled diverse oceanographic regimes in undersampled regions in Brazilian waters.

Funded by a National Aeronautics and Space Administration (NASA) grant, Karp-Boss and Boss also installed the latest generation of ocean instruments on the research vessel to study plankton, tiny unicellular organisms that are the base of the aquatic food chain, and their associated optical properties.

The new instruments include two sensors recently developed at Sequoia Scientific Inc. by, among others, Wayne Slade and Thomas Leeuw, two former students with the UMaine School of Marine Sciences, to measure hyper-spectral backscattering and polarized angular scattering. These instruments provide information about the size and composition of oceanic particles, link it to Ocean Color remote sensing — an area of interest for NASA — and offer a unique view of the organisms comprising the plankton. The UMaine researchers also installed a plankton imaging sensor called an Imaging Flow Cytobot, which allows scientists to detect changes in plankton community composition “on the flight.”

In addition to conducting research, Boss and Karp-Boss participated in several outreach activities in multiple Brazilian towns, including Rio de Janeiro, Santos and Itajaí, and in Buenos Aires, Argentina, where their leg of the voyage ended. They met with school-aged children and members of the general public who visited the schooner and joined science meetings to develop new collaborations with Brazilian and Argentinian scientists. They also attended a ceremony in Santos, Brazil where town officials signed a law that mandated the inclusion of ocean literacy in public school curricula, the first of its kind worldwide.

Karp-Boss and Boss disembarked from the research vessel in Buenos Aires. Guillaume Bourdin, a Ph.D student with the UMaine School of Marine Sciences, replaced them for the next leg of Mission Microbiomes from Buenos Aires to Ushuaia, Argentina, which will focus on coccolithophore blooms in the Malvinas current. Coccolithophores are algae responsible for massive blooms culminating in geological features such as The White Cliffs of Dover, England. Other current and past UMaine students and affiliates are slated to board the vessel along its trajectory to South Africa and along the African coast back to its home port in Lorient, where it will arrive in October 2022. More information about the voyage can be found on the Tara Ocean Foundation [website](#).

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## UMaine News



C. Schmitt/Schoodic Institute

### Where do the stories of Native Americans come from? Who tells them, and why?

December 7, 2021

Much of what Americans learn about Indigenous people of the continent is communicated by people who are not Indigenous. Euro-American archaeologists in particular have influenced how people think about Native Americans past and present.

A team of Wabanaki researchers and students led by professor Bonnie Newsom of the University of Maine is creating a framework for retelling stories of the past.

“We hope to change not only public perception, but also to reconnect Wabanaki people to our ancestral past through an Indigenous archaeology lens,” said Newsom, assistant professor of anthropology and a faculty associate with the Climate Change Institute at UMaine.

In an article published this month in a special issue of the open-access journal *Genealogy*, the research team members describe their work in Acadia National Park, where Newsom and graduate students Natalie Dana-Lolar from UMaine and Isaac St. John from University of New Brunswick have been reanalyzing archaeological collections from Wabanaki cultural sites. The sites are associated with coastal shell mounds, which are eroding rapidly as global warming causes sea level rise to accelerate.

“For over a century, North American archaeologists have operated under a model that assumes the right to excavate, research, and interpret Indigenous archaeological sites and associated material culture with little to no consultation with the people whose heritage these places represent. Although archaeology has undergone a transformation in the past 30 years that has reformed some of these practices, narratives of Indigenous pasts that objectify past peoples and impose Eurocentric interpretations on Indigenous heritage are slow to change,” they write.

They present the example of the “Red Paint People” story portrayed by 20th-century archaeologists as a distinct and separate “lost” people who inhabited the landscape that became Maine. Despite the fact that this portrayal is not Indigenous and has been rejected by many in the archaeological community, the myth lives on in the public imagination and interferes with Wabanaki efforts to articulate their own history.

As Wabanaki archaeologists, Newsom, Dana-Lolar and St. John instead want to refocus the story on the relationship between past Indigenous peoples and Wabanaki communities today. Using Indigenous language and community voices to describe and interpret collections of stone, bone and ceramic materials, they tell a story of continuous Wabanaki presence in the Acadia region.

Through their own personal stories as well as Wabanaki languages and world views, the team wants to address the gaps in knowledge on past Indigenous use of the park lands, and to use information acquired through their research as a basis for knowledge exchange and communication with Wabanaki communities, so that they are fully informed to participate in stewardship decisions for Indigenous heritage spaces in Acadia National Park.

“This paper represents a sea change in the way knowledge about archeological science is created, managed and disseminated,” said Rebecca Cole-Will, program manager for Acadia National Park. “I began my career as an archeologist studying at the University of Maine and conducting fieldwork in Acadia National Park many years ago. It is tremendously rewarding to now be involved with research here at Acadia National Park that centers Wabanaki community engagement and Indigenous science.”

In the 1990s, Indigenous archaeology was defined in the academic literature by George Nicholas and Tom Andrews as archaeology “with, for, and by” Indigenous peoples, but as Wabanaki archaeologists, Newsom, Dana-Lolar, and St. John have always operated within this framework intuitively.

“Our commitment to the well-being of our people, both forward and back, shapes not only the archaeological questions we ask but also why we ask them,” they write.

The special issue, *Storying Indigenous (Life)Worlds*, is edited by UMaine professor Darren Ranco and Jamie Haverkamp, a former UMaine Ph.D. student, now an assistant professor at James Madison University.

Their work is supported by a Second Century Stewardship award from Schoodic Institute, the National Park Service, and National Park Foundation.

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