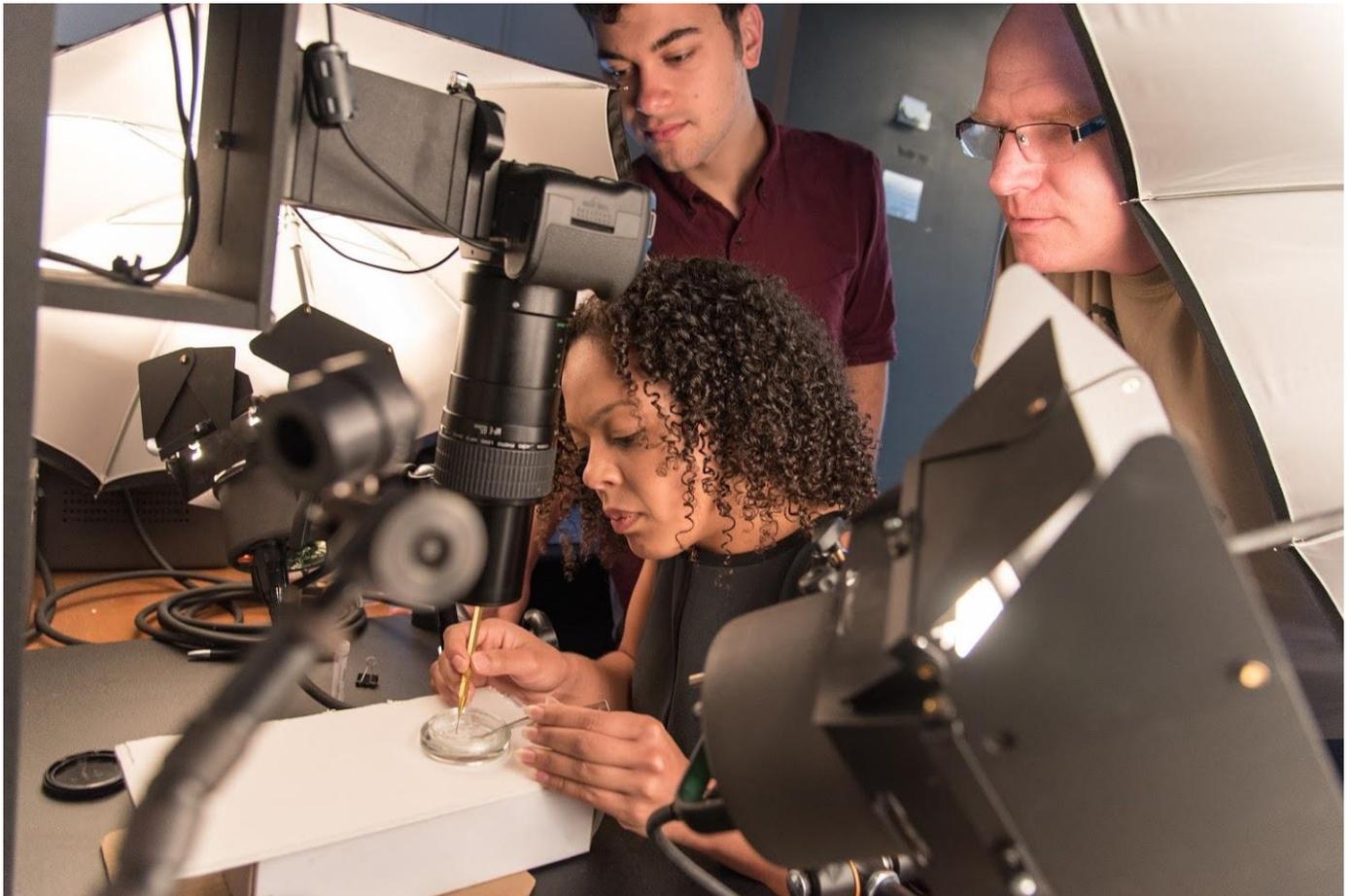




University of Vermont, College of Arts and Sciences
Department of Biology Newsletter
Fall 2017

FACULTY NEWS



Meet the "Bernie Sanders" Spider

[A UVM student team found 15 new spiders and named them after some of their heroes of human rights and conservation—including Vermont's own Bernie Sanders.](#)

Dr Ingi Agnarrson and four of his undergraduate students have discovered 15 new species of “smiley-faced” spiders—and named them after, among others, David Attenborough, Barack Obama, Michelle Obama, Leonardo DiCaprio, and Vermont Senator Bernie Sanders.

You won’t find them in Washington, DC, Hollywood, or Vermont—but on Caribbean islands and other southern spots you might now get a glimpse of *Spintharus davidattenboroughi*, *S. barackobamai*, *S. michelleobamae*, and *S. berniesandersi* as well as *S. davidbowiei* and *S. leonardodicaprio*



This was an undergraduate research project,” says [Ingi Agnarsson](#), a spider expert and professor of biology at UVM who led the new study. “In naming these spiders, the students and I wanted to honor people who stood up for both human rights and warned about climate change—leaders and artists who promoted sensible approaches for a better world.”

The study was published September 26 in the *Zoological Journal of the Linnean Society*.

Why Bernie?

Until now, the beautiful yellow “smiley-faced spiders” in the genus *Spintharus*—named for a smiley face pattern on their abdomens—has been thought to have one widespread species “from northern North America down to northern Brazil,” Agnarsson says.

However, when a research team from the [Caribbean Biogeography Project](#) (“CarBio”)—spearheaded by Agnarsson in [UVM's Biology Department](#) and Greta Binford at Lewis & Clark College—examined spiders from Jamaica, Cuba, the Dominican Republic, Puerto Rico, the Lesser Antilles, Florida, South Carolina, Costa Rica, Mexico, and Colombia—they discovered that one widespread species was actually many endemic species. Using CarBio genetic work, and the Vermont students’ painstaking photography and lab work, the team—with support from the National Science Foundation—was able to identify and formally describe fifteen new species. “And if we keep looking, we’re sure there are more,” Agnarsson said.

Each student who helped describe the spiders also got to name a few of them—and some were named for beloved family members, “but we all named the Bernie Sanders spider,” says Lily Sargeant, one of the students who worked on the project, and who graduated from UVM last year. “We all have tremendous respect for Bernie. He presents a feeling of hope.”



The Quantitative and Evolutionary STEM Training (QuEST) Program for Doctoral Students provides doctoral students with the skills, knowledge, and competencies needed to solve environmental and global health problems in an ever changing workforce and research environment. QuEST is a five-year PhD degree program that builds upon the existing strengths more than eight academic units on the University of Vermont campus.

The UVM NSF Research Traineeship (NRT) program is an innovative and evidence-based model for transforming STEM graduate education training. Emerging infectious diseases, antibiotic and pesticide resistance, reduced crop yields caused by climate extremes and shifts, and the loss of biodiversity affect environmental and global health and food security. In each case, identification of successful solutions to these global challenges requires fundamental knowledge of evolutionary principles. QuEST trains these problem-solvers.

Research activities will center around three topical areas and their intersection: evolutionary and ecological impacts of rapid environmental change, global change and disease dynamics, and modeling for prediction. Study systems will reflect the research expertise of over 30 faculty across eight academic units at the University of Vermont and will span diseases, pests, and species invasions in plant, insect, marine, amphibian, and human systems.

The QuEST program is unique among other interdisciplinary, big-data programs across the country in our emphasis on evolutionary training, modeling for prediction, and culturally sensitive teamwork.

Meaningful internships drive career connections. QuEST internships are designed to develop continued partnership with industry and non-academic institutes and centers. Students will identify possible internship partners by end of the first year and during second year include the internship as part of dissertation research proposal including deliverables resulting from work.



Welcome Dr. Kristin Bishop

Kristin Bishop, Lecturer in Biology, grew up in Washington State and received her B.S. in Zoology from the University of Washington in Seattle. She then pursued her Ph.D. at Brown University as an NSF Graduate Research Fellow specializing in vertebrate functional morphology and biomechanics, with a focus on understanding the evolutionary history of flight in bats. After earning her Ph.D., she was a postdoctoral teaching fellow at Duke University, where she taught Comparative Vertebrate Anatomy and studied the mechanics and energetics of walking in cats and primates. Later, as an NSF Postdoctoral Fellow in Biological Informatics at the University of California at Davis, she created computational models of the fluid mechanics of suction feeding in fish.

Before coming to UVM, Kristin was an instructor of Biological Sciences at Florida International University. Her areas of teaching expertise include Comparative Vertebrate Anatomy, Vertebrate Zoology, Evolution, and General Biology. While at FIU, Kristin pioneered methods of adapting active learning techniques, such as writing to learn, peer teaching, and flipped classroom, to large enrollment classes with as many as 400 students in a section. As an active participant in FIU's Center for the Advancement of Teaching, she participated in and led many faculty reading groups on innovative pedagogy and served for two semesters as a faculty fellow at the center.

In her spare time, Kristin enjoys being outside hiking and kayaking, reading for pleasure, and spending time with her husband, two kids, and dog. Kristin is very much looking forward to introducing her California and Florida-born kids to the wonders of snow here in Vermont.



Welcome Dr. Nathan Jebbett

Professor Jebbett received his B.A. in Cellular Neuroscience from Colgate University in 2006 and received his Ph.D. in Neuroscience from UVM in 2013. His dissertation research involved modeling the toxic effects of methylmercury on neural- and glial- progenitor cells during late gestation, the purported period of heightened susceptibility to later cognitive impairment. His other research interests include the role of neural stem cells in the development of the neocortex and cell transplantation therapies for nervous system disorders.

Professor Jebbett's academic interests span all things neuroscience; he teaches a variety of courses for the Undergraduate Neuroscience Program including NSCI 096 First-Year Neuroscience Seminar, NSCI 111 Exploring Neuroscience, NSCI 255 Neuroregeneration, NSCI 270 Diseases of the Nervous System, and BIOL 261 Neurobiology. Additionally, he serves on the planning committee for the Vermont Brain Bee and as faculty advisor for the UVM Neuroscience Club.

Historic artifacts escape Torrey Hall flames



On August 3 repairmen soldering the copper roof during the renovation of the historical building that housed the Zadoc Thompson Natural History Collections and the Pringle Herbarium caused a multiple alarm fire. While this fire did considerable damage to the building, the natural history collections and herbarium escaped with minimal damage in part to new cabinets housing the collections that had been obtained from a recent grant from the National Science Foundation. In addition, firefighters entering the building aware of the value of its contents from recent inspections covered the cases with tarps on the upper floor to protect them from water damage. Over the next 8 days the 4-story building containing hundreds of thousands of animal and plant specimens, some dating back to the early 1800's, were moved to new temporary housing.

The Zadoc Thompson Natural History Collection of animals were relocated to Blundell House on the Red Stone Campus. Space in Blundell currently houses the mammal collection (\approx 10,000 specimen) bird collection (\approx 1,000 specimens), and insect collection (\approx 60,000 specimens) as well as a rapidly constructed teaching lab for some of the field oriented courses being taught by the Biology Department. Work continues on unpacking and reorganizing specimens following the rapid relocation following the fire as well as digitization of specimens as part of the National Science Foundation grant.

Blundell Teaching Lab



HAUNTED HALLOWEEN



SPOOKY SCIENCE



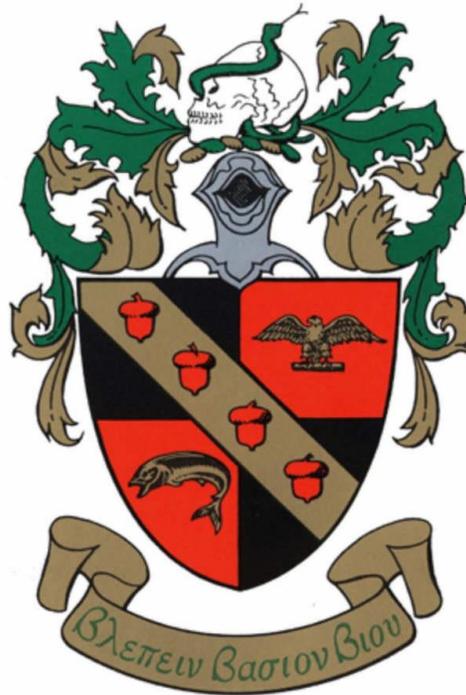


GRADUATE STUDENTS

Tri Beta Supports Puerto Rico Scientists

In the wake of the devastating Hurricane Maria on Puerto Rico, UVM's chapter of Tri Beta Biology Honor's Society decided to take action. They organized a bake sale with all proceeds going to help scientists whose research labs were impacted by the storm. In less than four hours, the group made \$200! The money was donated through Ciencia Puerto Rico. If you would like to donate additional funds, the link is provided below. Job well done Tri Beta!

www.cienciapr.org



**BETA BETA BETA NATIONAL
BIOLOGICAL HONOR SOCIETY**



The Ebert Lab studies various aspects of eye development using the powerful little zebrafish as a model. In just the last year, members of the lab have published a number of papers and been awarded departmental prizes for their work. 4th year PhD student extraordinaire, Sarah Emerson, who specializes in exploring the function of Sema/Plexin signaling in zebrafish eye development, was lead author on two papers on the topic this year and second author on a third. Ashley Waldron, another 4th year PhD student who is investigating aminoacyl-tRNA synthetases in zebrafish development in hopes of gaining insight into roles they play in disease, published a paper on histidyl-tRNA synthetase and was awarded the John Wheeler Graduate Student Research and Development Award, which she used to attend and present her work at the Aminoacyl-tRNA Synthetase Meeting in October. Helaina Stergas, an outstanding Accelerated Masters student was recently awarded the Ronald Suiter Prize, which she will use to present her thesis work characterizing the role of orphan receptors DCBLD1 and 2 in eye development at the Northeast Society for Developmental Biology Conference this upcoming April. Overall, 2017 has been an incredible year for the Ebert Lab and they are excited to keep up the momentum going into 2018!

2017 Awards and Conferences

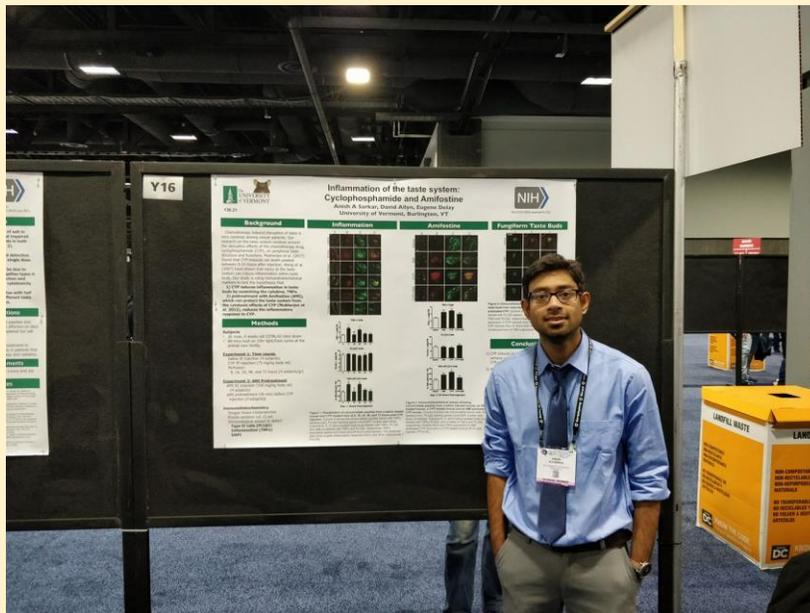
Academic Programs for Learning and Engagement (APLE) Awardees

Haya Alshaabi, Addie Cotter, Cassandra Smith and Haley Moll

2017 RONALD SUITER PRIZE RECIPIENT

Helaina Stergas

Congratulations!



Anish Ali Sarkar

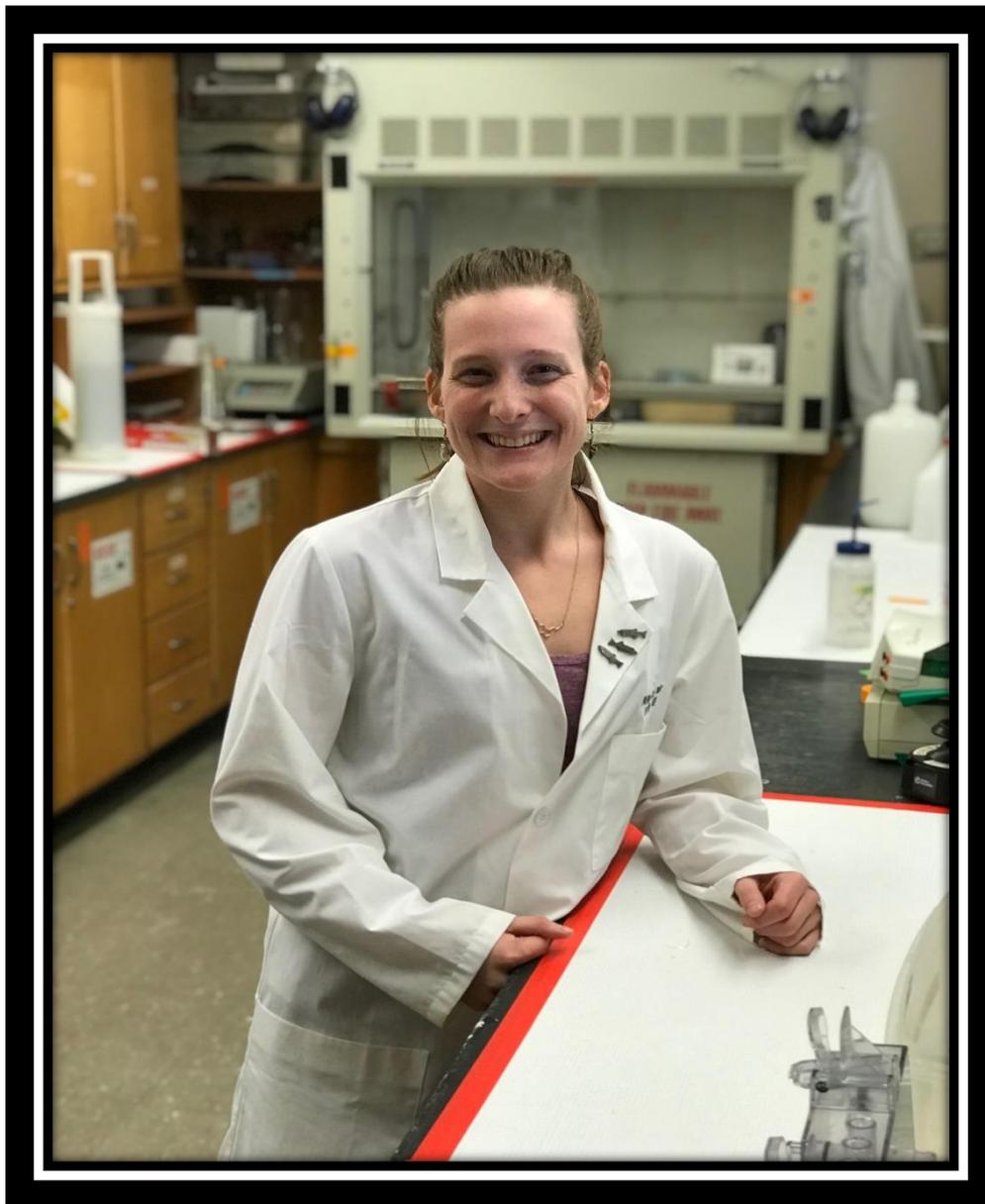
Received 'Graduate Summer Research Fellowship 2017' – Awarded from the graduate college towards research expenses during summer.

Attended the conference 'Neuroscience 2017', Washington DC, hosted by Society for Neuroscience.

I presented a poster on taste sensory systems, speaking about the research I am conducting. Titled 'Inflammation of the taste system- Cyclophosphamide and Amifostine'.

Received a travel grant for the Neuroscience 2017 conference from Graduate college 'GSS Travel Mini-grant'

Riley St. Clair awarded Rodney L. Parsons Anatomy and Neurobiology Award



Riley St. Clair, a graduate student in Bryan Ballif's lab is the 2017 recipient of the University of Vermont Graduate College Parsons Award. This award is given to one doctoral candidate per year who demonstrates excellence in neuroscience research as well as a commitment to teaching students in an anatomical discipline. Riley plans on using the award to travel to a conference to present her research. Congrats Riley!

The Art of Biology 2017

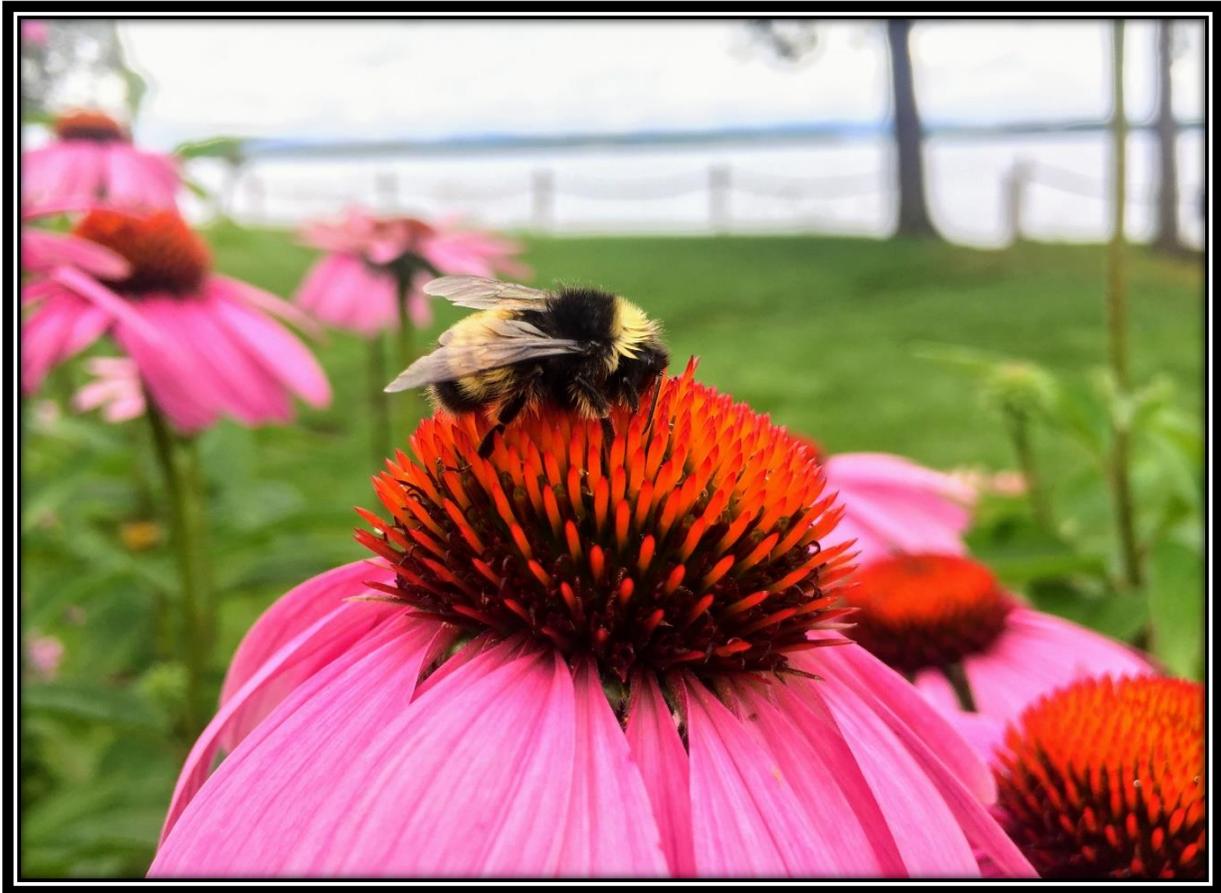
1st Place Winner – Peter Euclide



Fish out of water: Getting high school science teachers out of the classroom and into the field is the goal of the Champlain Research Experience for Secondary Teachers (CREST). Here ten teachers stepped outside their comfort zone and sorted through a large catch of invasive alewife (pictured) for rainbow smelt. The fish collected that day went on to be genotyped for my dissertation assessing the impact of lake causeways on the population structure of three different species of fish in Lake Champlain.

The Art of Biology 2017

2nd Place Winner – Samantha Alger



Over half of Vermont's bumblebee species are in decline. This photo captures an encouraging sighting: one of Vermont's threatened species, the yellow-banded bumblebee (*Bombus terricola*), feeding from an Echinacea flower along the banks of Shelburne Bay, Lake Champlain.

My research examines the threats to bumblebees. As part of this work, I conducted species surveys throughout Vermont and found that while *B. terricola* are in decline on a regional scale, the species is locally abundant in some places. These data are critical for understanding species distributions and the environmental pressures affecting them.

UNDERGRADUATE STUDENTS



SUMMER NEUROSCIENCE UNDERGRADUATE RESEARCH FELLOWSHIPS (SNURF)

Exciting opportunity to join state-of-the-art laboratories and discover the world of neuroscience research!

We are offering two fellowship programs (sponsored by either NINDS or NSF) that run from May 29 – August 3, 2018 and offer a substantial stipend, as well as on-campus housing and a supplement for lab supplies.

- **Participate in investigations of how the nervous system develops, functions and repairs itself after injury.**
- **Get hands-on training in molecular, cellular, anatomical, physiological approaches.**
- **Gain valuable experience before you enter graduate school.**

The program supported by **NSF** is focused on training you to investigate the basic science of neural function and behavior and provides a stipend of \$5000. All faculty members participating in our Neuroscience Graduate Program are eligible to serve as your mentors. This program supports up to eight fellows per year and is for undergraduates planning to go to graduate school.

The program supported by **NINDS** is focused on training you to investigate the neuroscience of neurological disorders and stroke and provides a stipend of \$4000. You will be trained by a team of mentors that includes both basic scientists and clinicians. This program is for undergraduates planning to pursue a biomedically focused graduate research program, or a medical scientist (M.D., Ph.D.). Students will also shadow clinicians 1-2 times and engage in a simulation activity.



ALUMNI NEWS



TAKING FLIGHT

Why do so many astronauts return to Earth with blurred vision? That's the question Karina Marshall-Goebel '10 aims to answer with her research on how long-term space travel impacts the human body, specifically our eyes.

While much has been done to understand other spaceflight side effects, the causes of vision issues have been elusive.

Marshall-Goebel is on a mission to change that. She's focused on testing a hypothesis that microgravity, which enables us to float during spaceflight, may cause an increase in pressure around the brain. That pressure impacts eyes' arteries, causing them to deform and vision to change.

“In high school, I found I enjoyed my science classes the most,” says Marshall-Goebel, who grew up in a suburb of Milwaukee, Wisconsin. “I didn’t know what I wanted to do after college. All I knew was that I loved science.”

The other thing she knew: “Being from the Midwest, I was craving an adventure, to experience a new part of the country.” A guidance counselor recommended UVM, which turned out to be a perfect fit. “The proximity to great skiing didn’t hurt either,” Marshall-Goebel laughs.

She entered college with a commitment to get involved and dove in—orientation leader; orchestra (cello); crew team; TriBeta, the biological honors society; and, of course, hitting the slopes with the Ski & Snowboard Club.

A bio major/chem minor, Marshall-Goebel was on a pre-med path until things took a turn with a senior year comparative physiology class. “Studying the human body and how it functions was absolutely fascinating to me, and I knew immediately that I was hooked,” she says. “The freedom to take a variety of biology courses, from forensic biology to marine ecology, allowed me to discover what spoke to me the most and where my passion was.”

NEXT STOP: MARS

Marshall-Goebel discovered space physiology as her “true calling” during her master’s work. “Understanding how the body works is one thing. Figuring out how the body adapts when you take away gravity is a whole different ballgame.” During an internship at NASA’s Johnson Space Center in Houston, Texas, she found her niche in eyesight.

Knowing why vision changes in space, and how we can prevent it, is not just key for a handful of astronauts on the International Space Station; it has huge implications for larger-scale human space travel, and, perhaps someday, the colonization of other planets. “I want to be part of the generation that pushes us to go to Mars, and makes it a reality,” Marshall-Goebel says.

Her work could also benefit Earthlings. In order to test her vision change hypothesis, Marshall-Goebel is using new, non-invasive technology that accurately measures pressure around the brain. If proven effective, this device could be useful for treating traumatic brain injury or glaucoma patients.

STAFF NEWS



Welcome to our new Life Sciences Stockroom Manager!

I graduated in Botany and started my career as a Research Assistant at the Biotechnology Institute in India. Based on my husband's job used to travel a lot to different countries in Europe. Finally settled in Vermont for the past 16 years. I love Vermont, enjoy going on ferry trips to Newyork.

For the past 10 years worked as Research Technician at UVM College of Medicine. Now I am excited to work at Life Sciences Stockroom. My favorite hobby is gardening during summer and enjoy caring indoor plants year round. Our furry Friend (Chance) wonderful buddy crazy to go on walks and hikes. My two boys are juniors in high school and College.



Welcome to our new Administrative Assistant Martha Allen

Martha Allen has 20 years of experience as a staff member at UVM. For the last 12 years I have worked for the Center for Health and Wellbeing, most recently as the office manager in Living Well where I managed a yoga studio and a very busy office. Prior to that I worked 8 years for Telecommunications and Network Services as an Administrative Assistant. I have an Associate's degree in Business Management from Champlain College.

An avid outdoor enthusiast, I enjoy hiking with my husband James and our Tennessee walker named Rosie. In the summer we like to spend time on our boat on Lake Champlain.

My eldest son Alex will graduate with his Master's Degree in Dietetics from the University of Utah in May. My daughter Mikayla is a sophomore at UVM majoring in Psychological Sciences. My youngest son Isaac is a First Year at UVM majoring Biological Sciences.

Donations Made to the Department of Biology in 2017

The Department of Biology would like to thank the generous contributions made by the following. Your donations are very much appreciated!



**Mr. David & Mrs. Renee Berteau
Mrs. Florence M. Glass
Mrs. Jennifer Hollister-Lock
Dr. Barbara Clark Kay
Ms. Patricia Donze Larrabee
Mr. Michael Damian Lock
Dr. Norine Noonan
Ms. Patricia Anne Payne
Mrs. Florence M. Glass
Ms. Wendy Sara Rosenblum
Mr. Robert Rothstein
Joe and Renee Schall
Dr. and Mrs. Andrew Fitzgerald**

Thank you all very much!

**Yes! I am pleased to support the UVM Department of Biology and its
commitment to excellence in education and research!**

We are grateful for your contribution to the Biology Department of any amount

Please click [HERE](#) to make your donation

Or send a check in the amount of \$___ made payable to the University of Vermont Foundation.
On the memo line of the check write "Department of Biology"

**Please send to:
UVM Foundation
Grasse Mount
411 Main Street
Burlington, VT 05401**

Thank you for your support!