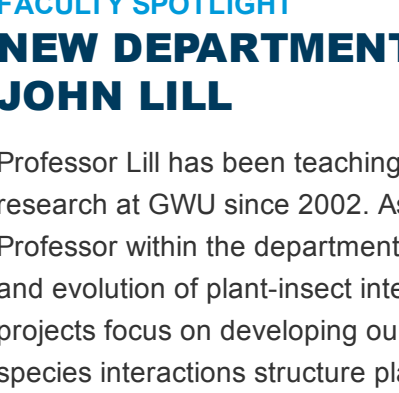
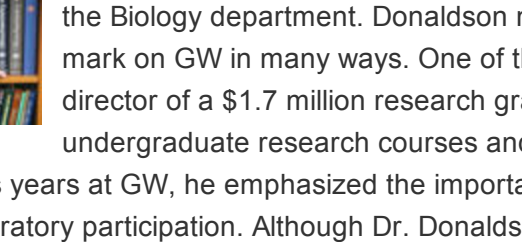




BIOLOGICAL SCIENCES NEWSLETTER **FALL 2018**



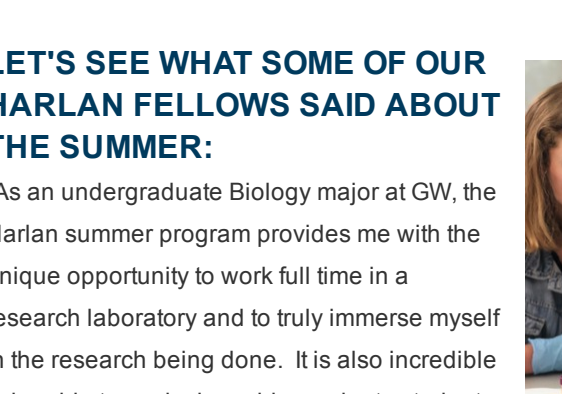
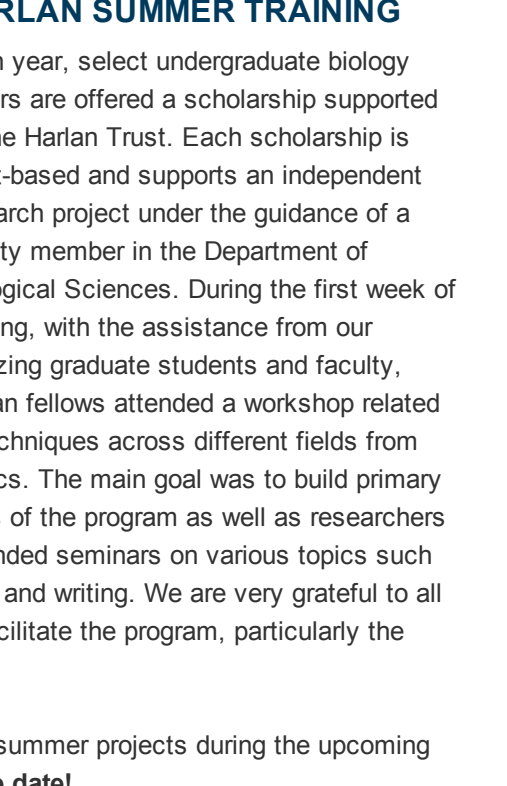
DEPARTMENT CHAIR RETIRES **ROB DONALDSON RETIRES**

Dr. Robert Donaldson has retired after 41 years as a professor in the Biology department. Donaldson made an impact and left his mark on GW in many ways. One of those being his position as co-director of a \$1.7 million research grant used to develop undergraduate research courses and a molecular biology concentration. Throughout his years at GW, he emphasized the importance of research and facilitated undergraduate laboratory participation. Although Dr. Donaldson has retired from GW, his impact is permanent. The department thanks him for his multiple terms as Department Chair and wishes him all the best in his future endeavors in Colorado!

FACULTY SPOTLIGHT

NEW DEPARTMENT CHAIR: **JOHN LILL**

Professor Lill has been teaching and conducting research at GWU since 2002. As a newly promoted Full Professor within the department, he studies the ecology and evolution of plant-insect interactions. His research projects focus on developing our understanding of how species interactions structure plant-based arthropod communities and influence herbivore diet breadth. We are very excited to have Dr. Lill as our new Department Chair.



HARLAN SUMMER TRAINING

Each year, select undergraduate biology majors are offered a scholarship supported by the Harlan Trust. Each scholarship is merit-based and supports an independent research project under the guidance of a faculty member in the Department of Biological Sciences. During the first week of training, with the assistance from our amazing graduate students and faculty, Harlan fellows attended a workshop related to techniques across different fields from molecular biology, ecology, microscopy and bioinformatics. The main goal was to build primary research skills and get acquainted with other participants of the program as well as researchers in the department. Throughout the summer, student attended seminars on various topics such as effective science communication, presentation skills, and writing. We are very grateful to all of the graduate students, staff and faculty that helped facilitate the program, particularly the coordinator Dr. Jelena Patmotic!

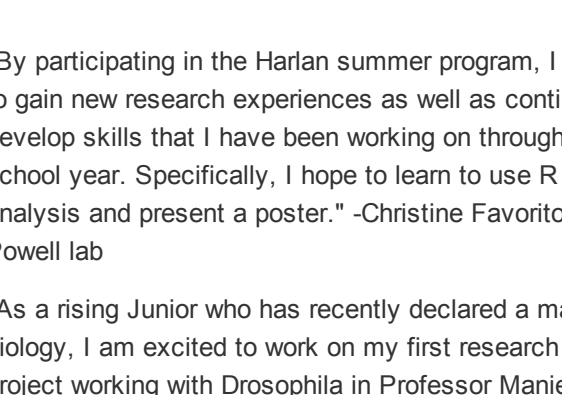
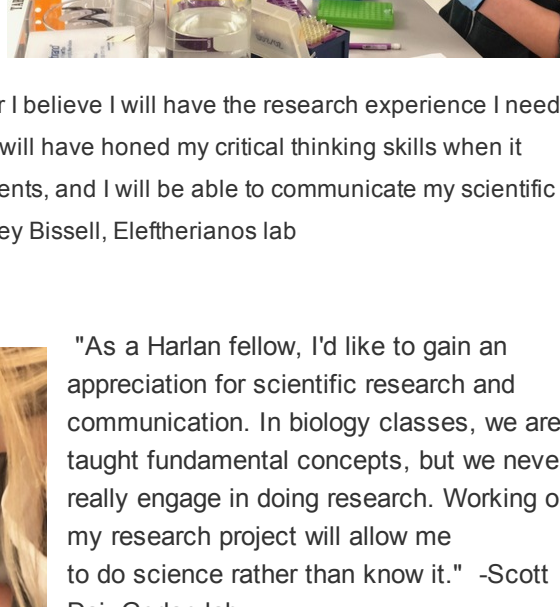
At the end of their fellowship, students will present their summer projects during the upcoming **poster session scheduled for September 28. Save the date!**

-Dr. Jelena

Patmotic

LET'S SEE WHAT SOME OF OUR HARLAN FELLOWS SAID ABOUT THE SUMMER:

"As an undergraduate Biology major at GW, the Harlan summer program provides me with the unique opportunity to work full time in a research laboratory and to truly immerse myself in the research being done. It is also incredible to be able to work alongside graduate students and postdocs at such an early stage of my research career as they have an endless wealth of knowledge to share. By the end of this summer I believe I will have the research experience I need to set me up for my future professional endeavors, I will have honed my critical thinking skills when it comes to designing and troubleshooting experiments, and I will be able to communicate my scientific findings clearly to a range of audiences." -Whidbey Bissell, Eleftherianos lab



"As a Harlan fellow, I'd like to gain an appreciation for scientific research and communication. In biology classes, we are taught fundamental concepts, but we never really engage in doing research. Working on my research project will allow me to do science rather than know it." -Scott Dai, Gedan lab

"I am excited to participate in a supportive and collaborative environment that provides real, hands-on research experience. I know that this experience will push me to apply the knowledge and skills I have gained in a real-world context, mimicking the professional environment that we all will soon be entering. It is incredibly unique and valuable to have a guided and structured undergraduate research experience and I am excited to see the end result!" -Phoebe Shaw, Gedan lab

"By participating in the Harlan summer program, I hope to gain new research experiences as well as continue to develop skills that I have been working on throughout the school year. Specifically, I hope to learn to use R for analysis and present a poster." -Christine Favorito, Powell lab

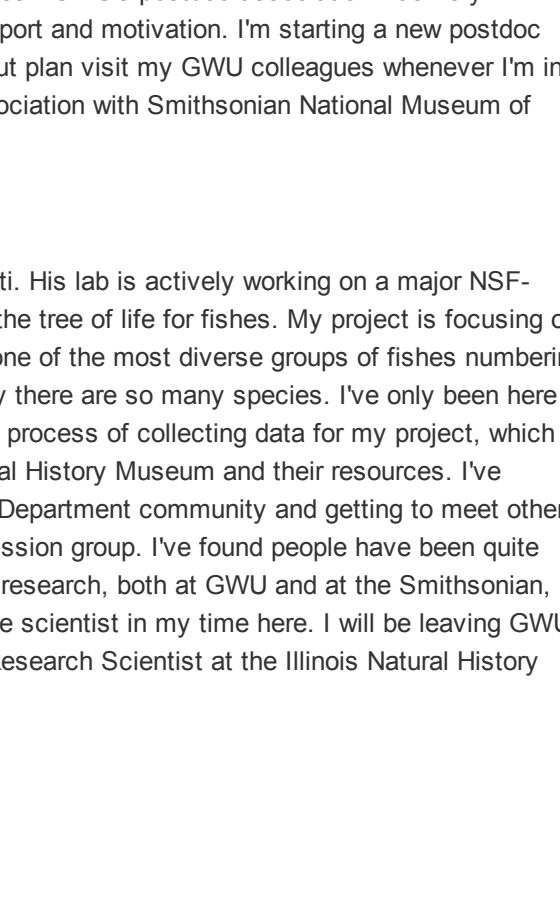


"As a rising Junior who has recently declared a major in biology, I am excited to work on my first research project working with *Drosophila* in Professor Manier's lab. By the end of this program, I plan on learning the aspects of biology research that are not usually covered in a typical introductory biology class such as effective scientific communication, creating a compelling poster, and reading and understanding research literature." -Mohammad Rahman, Manier lab

POSTDOC SPOTLIGHT

An important section of our newsletter is dedicated to postdocs because they play such an important research role within the department. We currently have 14 postdocs employed in the department. We reached out to some of our postdocs leaving the department to tell us about their experience at GW and to reflect on their accomplishments.

"Overall my time as a postdoc at GWU has been fantastic! The faculty and staff were extremely welcoming and I found the transition to postdoc less stressful due to the helpfulness of the Biology staff (special thanks to Madison and Nonnie!). A one year postdoc can be very challenging but the easy transition allowed me to hit the ground running on my projects as soon as I arrived and I have several manuscripts in preparation based on the data I was able to generate in my short time at GWU. I'm particularly thankful to my PI Alex Pyron for his support, and to Amy Zanne and Leon Grayfer for their helpful advice in navigating the obstacles facing early career researchers. I thoroughly enjoyed Amy's weekly discussion group and plan to continue to participate remotely from my new position. Not only was it beneficial to my professional development it was also a valuable venue to pitch new research ideas and get feedback from a diversity of researchers at various career stages. GWU's postdoc association was very welcoming and provided a great source of support and motivation. I'm starting a new postdoc position at Florida State University this July but plan visit my GWU colleagues whenever I'm in town as I will be maintaining my research association with Smithsonian National Museum of Natural History." -Tim Colston



"I came to GWU to work with Dr. Guillermo Orti. His lab is actively working on a major NSF-funded project with the goal of reconstructing the tree of life for fishes. My project is focusing on reconstructing the relationships of catfishes, one of the most diverse groups of fishes numbering over 3,400 species, to help us understand why there are so many species. I've only been here since January 2018, but so far I've started the process of collecting data for my project, which I do in collaboration with the Smithsonian Natural History Museum and their resources. I've enjoyed becoming a part of the GWU Biology Department community and getting to meet others at seminar socials and the Systematics Discussion group. I've found people have been quite helpful so that I can get what I need to do my research, both at GWU and at the Smithsonian, and I feel like I've become a more collaborative scientist in my time here. I will be leaving GWU soon and starting in August as an Assistant Research Scientist at the Illinois Natural History Survey." -Milton Tan

CONGRATULATIONS CLASS OF 2018

We would like to congratulate our recent graduates and spotlight some of their achievements. The recipients of the Biology Seniors Award include:

1. SCHOLARS IN QUANTITATIVE AND NATURAL SCIENCES (SQNS) AWARDS

- Kathryn Cavanna
- Sarah Chachula (Chemistry Major)
- Pravin Fonseka (Chemistry Major)
- Isvita Marfatia
- Tanya Mehdiadeh

2. HARLAN GRADUATES

- Acacia Lee Ackles
- Michelle Jungsun Ahn
- Christine Mary Favorito
- Jose Juan Hermina
- Elna Kapoor
- Meghana H Keswani
- Carolina Queiroz Cardoso
- Alexander Altieri Ruebenstahl
- Zahra Shokati
- Emily Susan Wendel

3. GRADUATING WITH DEPARTMENTAL HONORS

- Acacia Lee Ackles
- Ranjith K Bhangu
- Yana Kropotova
- Alexa Lindsey Lowe
- Tanya Mehdiadeh
- Sarah Murad
- Alexander Altieri Ruebenstahl
- Liam Finn Spurr
- Sean Michael Wespe

4. ATKINS PRIZE FOR BEST UNDERGRADUATE RESEARCH

- Liam Spurr

3. MASTERS STUDENTS

- Tiffini Smith
- Kathryn Norman
- Dustin Cooper

4. PhD STUDENTS

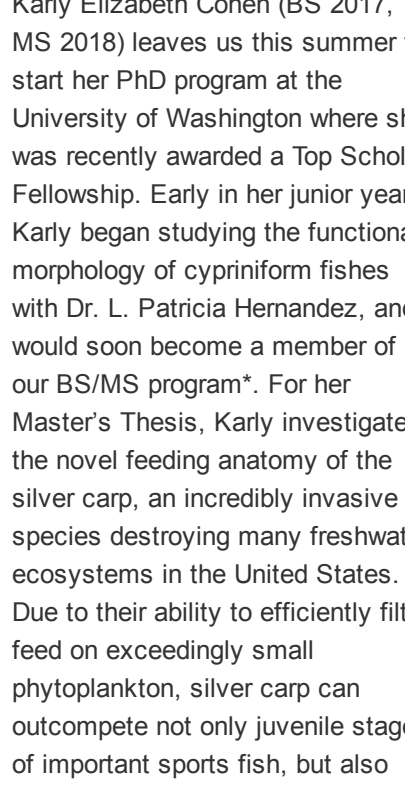
- Shruti Yadav
- Diti Chatterjee Bhowick
- Amy Mito
- Matthew Haynsen

RESEARCH SPOTLIGHTS

This section of our newsletter is devoted to highlighting some of the amazing work being done in our labs!

GW RESEARCHERS PUBLISH UPDATED FISH TREE OF LIFE

Half of all living vertebrate species are fishes, and Dr. Guillermo Orti and his former PhD student, Dr. Lily Hughes, recently reconstructed their family tree using genomic data. As part of an international research effort involving GW, the Smithsonian Institution, and the Beijing Genomics Institute, the group sequenced 131 new fish transcriptomes that were combined with published fish genome data. The study, among the largest of its kind for fishes, was recently published in the *Proceedings of the National Academy of Sciences*, supporting many previously proposed groups of fishes with genomic data. The team found a surprising close relationship between tunas and seahorses, and a close relationship between flat, bottom-dwelling flounders and fast-swimming jacks, which have only come to light recently based on genetic data. Fossil evidence combined with this new Tree of Life suggests that most modern groups of highly diverse "percomorph" fishes evolved during the Mesozoic Era, surviving the extinction event that wiped out most dinosaurs on land.



For more information see: REFERENCES

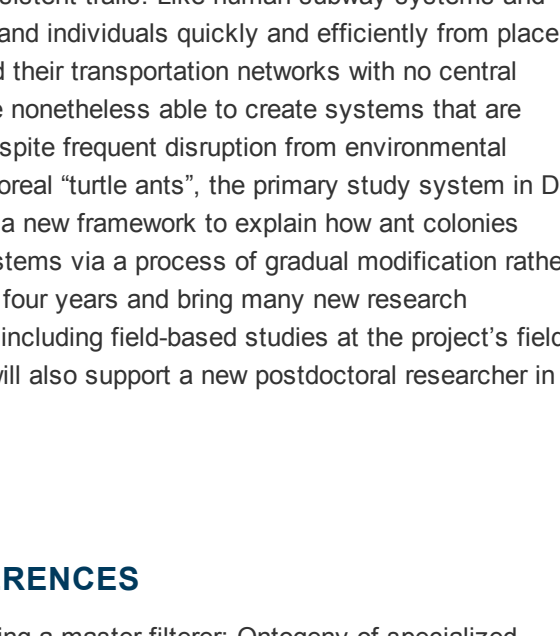
time at GW, Karly presented 8 posters and presentations at scientific conferences including the Society for Integrative and Comparative Biology, the International Congress of Vertebrate Morphology, and the Joint Meeting of Ichthyologists and Herpetologists. Having just defended her thesis, Karly has already published a cover article and has a second paper in revision for the *Journal of Morphology*. She is also revising a third paper for the *Journal of Experimental Biology* and will author or co-author 4 additional papers from her work in the Hernandez lab. During her time at GW, Karly was supported by both a Harlan Fellowship and a Shenkman Career Services Award, won an Honorable Mention for the NSF Graduate Research Fellowship, and took first prize at the annual GWU Research Day. Karly's extraordinary level of scholarship exemplifies the enormous research potential of our talented undergraduates who blossom when nurtured by dedicated mentors like Dr. Hernandez. This accomplishment is all the more noteworthy because Karly suffers from dyslexia, which initially presented an obstacle to her dream of becoming a research scientist. Her hard work and dedication, along with a supporting mentor, enabled her to overcome this challenge and succeed beyond her advisor's wildest dreams. While we are sad to see her go, we look forward to following Karly's career as she continues her graduate studies at the University of Washington.

*The BS/MS program in the Department of Biological Sciences is an accelerated program that enables academically gifted undergraduates to complete both their BS and MS degrees in 5 years. For more information visit the [Biology website](#).

For more information see: REFERENCES

DR. POWELL'S NEW NSF-FUNDED PROJECT

In natural systems and human society, transport networks dictate the flow of resources from suppliers to consumers. Yet despite the ubiquity of transport networks, there is no unifying framework for predicting how such systems respond dynamically to external pressures in a way that balances infrastructure cost and transport efficiency. In a new NSF-funded project, Dr. Scott Powell and collaborators from Harvey Mudd College and University of York will use ants to build new insights into this general problem. Many ants distribute their colony members and resources across multiple nests, with movement between nests maintained by a network of persistent trails. Like human subway systems and road networks, the goal is to move resources and individuals quickly and efficiently from place to place. Yet unlike humans, ant colonies build their transportation networks with no central vision or overarching plan. Certain species are nonetheless able to create systems that are remarkably reliable, efficient, and low-cost, despite frequent disruption from environmental conditions and natural enemies. Using the arboreal "turtle ants", the primary study system in Dr. Powell's laboratory, this research will develop a new framework to explain how ant colonies create such well-functioning transportation systems via a process of gradual modification rather than design. The project will run over the next four years and bring many new research opportunities for GW undergraduate students, including field-based studies at the project's field sites in the Florida Keys [picture]. The grant will also support a new postdoctoral researcher in Dr. Powell's laboratory.

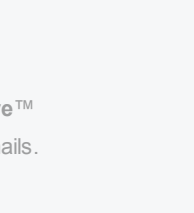


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