USCB
UNIVERSITY OF SOUTH CAROLINA BEAUFORT

USCB SCHOOL OF
SCIENCE & MATHEMATICS
NEWSLETTER

Vol. 2 • No.2 — *The Official Newsletter of the USCB School of Science and Mathematics.* — FALL 2019

What's New in STEM@USCB

USCB is gearing up for the 2019-2020 academic year. We hosted more than 140 new students declaring a STEM major and another 120+ declaring pre-nursing or public health majors during USCB's summer orientations as of this July, and orientation sessions are not yet complete. Students in Biology and professional programs will enroll in at least three biology courses during their time at USCB, and one or more math courses. For Math and Computational Science majors, three to five mathematics courses will mark the lower range of enrollments during their undergraduate careers. We continue to build STEM majors and serve multiple strong programs. The Biology Honors degree program will be full in this, its second year, as will the second cohort for Honors Nursing, for the second consecutive year. Two new dorms in Beaufort have been completed, making a total of four. That gives us space to grow the current residential honors and arts campus majors and expand new Beaufort Honors programs in the future.

As of this writing, Biology is now the largest major at USCB. We work hard to support the faculty's needs so they, in turn, can deliver a strong and meaningful undergraduate experience for this growing major. Computational Science welcomes its first five graduate students this fall, and the undergraduate degree is thriving. Also, Mathematics is growing well, nearly doubling its number of majors since the fall of 2016. We hope for even better recruitment for the fall of 2020 with the release of our new university web presence. That should make finding the right USCB degree even more straightforward for high-school students interested in Science and Mathematics in the Lowcountry.

USCB students honored for receiving prestigious internships

This spring, Chancellor Al Panu, Provost Eric Skipper and several Science and Math faculty hosted a small party to celebrate several of this year's recipients of prestigious summer research internships across the country. The students receiving these positions were: Ms. Christina Adams (Biology), NSF Research Experience for Undergraduates (REU) internship at MUSC in Cancer Research; Ms. Brook Gantt (Computational Science), internship at AvidXchange, Inc. in Charlotte, N.C.; Ms. Shae Gantt (Math/Computational Science), REU in the Harvard Epidemiology Summer Program at the T.H. Chan School of Public Health; Ms. Alexis Miller (Computational Science), internship working on software engineering at Vanguard in Malvern, Pa.; and Mr. Alex Rendon Longuitud (Biology), NSF REU internship at University of Iowa investigating rates of mutation and geographic variation in viruses. We have had students engaged previously in summer research programs spread all across the country. Shae Gantt is the second undergraduate from the Math and Computational Science Program mentored by Dr. Swati DebRoy to attend the prestigious Harvard Epidemiology Summer Program. Other internships for Computational Science have resulted in permanent job offers, some even prior to the student's senior year. We are proud of this group and look forward to many more of their classmates following their lead in receiving similar internships in the future.

Pictured left to right: Alex Rendon Longuitud, Shae Gantt, Dr. Al Panu, Alexis Miller, and Christina Adams (not pictured, Brook Gantt)

Dr. Al Panu congratulates the summer internship awardees on their achievements.

New faculty in Marine Biology:
Dr. Daniel T. Pettay

Dr. Daniel "Tye" Pettay comes to Beaufort this fall to be our newest faculty member in the Natural Sciences Department. Dr. Pettay is a specialist on coastal phytoplankton and eutrophication (the occurrence of elevated productivity) and the problems that can arise from these conditions, including harmful algal blooms. He is a native of South Carolina, having spent part of his childhood in Bluffton, and graduating with an undergraduate degree from Clemson and a master's from the College of Charleston. His Ph.D. research, at Penn State, focused on the shifting relationship between corals and their algal symbionts under the impact of changing environmental stress. Dr. Pettay hails most recently from the University of Delaware, where he was active in their Citizen Monitoring Program, training volunteers to monitor water-quality indicators at permanent sampling stations in and around Delaware Bay.

New faculty member in Computer Science attends NSF workshop:
Dr. Kishwar Ahmed

Dr. Kishwar Ahmed joined the USCB faculty in Computer Science this summer to get a head start on teaching and research for the fall semester. Dr. Ahmed's Ph.D. research, completed at Florida International University, ranges from high-performance computing to quantum computing and cyber-physical systems. More specifically, his research includes modeling and simulation, parallel computing, interconnection network and energy-efficiency in computing.

Rather quickly, Dr. Ahmed was invited to participate in a National Science Foundation program: Midscale Experimental Research Infrastructure Forum (MERIF) Education Workshop held at George Washington University, from May 29-30, 2019. He received an NSF travel grant to attend. The workshop's goal was to teach university and college faculty how to use various NSF-funded midscale experimental testbeds (virtual developmental training computer programs) in their classes. The testbeds include well-known cloud experiment platforms (Chameleon, CloudLab), network research platforms (GENI), and wireless network experiment platforms (ORBIT, COSMOS) that Dr. Ahmed will be incorporating into some of the new courses he is developing at USCB.

New Chair of Department of Computer Science:
Dr. Brian A. Canada

Dr. Brian Canada steps up as the new Chair of the Computer Science department. Brian has been with the Computational Science degree program virtually since its inception. Now, he takes over to lead this strong degree program and help build the new Master's in Computational Science program. He is also developing the burgeoning Information Systems and Technology degree, now nearing final approval. The Computer Science department recently hired a new faculty member, Dr. Kishwar Ahmed (see above), through a statewide STEM initiative funded by National Science Foundation entitled **M**aterials **A**ssembly and **D**esign **E**xcellence in **S**outh **C**arolina (MADE in SC). Dr. Canada is guiding the department in actively in searching for two additional faculty lines to support these degree programs in the coming academic year.

Bluffton Middle Students gain "insight" into the workings of the vertebrate eye

Dr. Jena Chojnowski (foreground on right) works with one group while Kathryn Madden assists another group in the background).

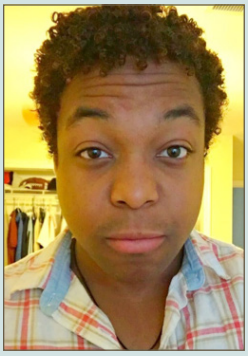
On May 22nd, 2019, some of Bluffton Middle School's rising scientists got to experience what it means to be the eye of the beholder, or rather the holders of the eyes. They got to observe the anatomy of a cow eye and learn about its inner workings through dissection, with the help and direction of some of USCB's students and faculty. Dr. Jena Chojnowski lead a small team of USCB's professors—Dr. Holli Lancaster and Kathryn Madden—and USCB students Kathryn O'Neill (2019 grad) and Biology student Illyasha Omar-Price in assisting 7th- and 8th-grade students through a cow-eye dissection and vision tutorial. The middle school students included those with English as a second language and some from special education.

In addition to gaining "insight" into the vertebrate eye, former USCB Biology student O'Neill and current USCB Biology student Omar-Price (an alumna of Beaufort Middle School) were able to gain valuable experience in teaching, mentoring and presenting. Along with helping to direct the eye dissection, they gave a 20-minute presentation on "Who and What It Means to Be a Scientist." Learning and debunking science stereotypes in our community at this age in academic development is critical to overcoming the limitations of those stereotypes. "Anybody can be a scientist. You can be a scientist." These are important words to hear, especially coming from underrepresented scientists themselves. Dr. Chojnowski and the Bluffton Middle School will continue their scientific relationship with more interactions, notably bringing college students to the middle school for the continued pursuit of scientific advancement for all.

Kathryn O'Neill (right) works one-on-one with a middle school scientist.

Illyasha Omar-Price (left) works with group of middle school scientists.

Alumni Highlights



Demetrius Rhodes, Computational Science, Class of 2017, was hired recently by the South Carolina Department of Mental Health as a Systems Programmer and Developer. Prior to accepting his new position, Demetrius was a dedicated and valued member of USCB's team of information technology specialists. We'll miss you, Demetrius—best of luck in your new career!

Michelle Fernandez, Computational Science, Class of 2017, was promoted to Software Engineer Developer at Fidelity Investments in Durham, N.C., in December 2018. Her job responsibilities include providing business solutions by developing, testing and supporting software applications, meeting frequently with Fidelity business stakeholders and external vendors to analyze application requirements, and participating in team project-planning efforts. In addition, Michelle is part of a group of USCB alumni at Fidelity (including her sister, Ashley, mentioned above) who organized a donation-based scholarship program for our Computational Science students.

Will Eckrich, Computational Science, Class of 2019, was employed immediately after graduation as an Associate Programmer Analyst with AECOM in support of the U.S. Department of Energy at the Savannah River National Laboratory in Jackson, S.C. In supporting the Savannah River Site's overall mission of safely removing radioactive waste, Will's job entails developing new web applications and maintaining current applications, all in support of business systems, including property and chemical management, information technology, and accounting and finance.

Recent publications from the **SCHOOL of SCIENCE and MATHEMATICS:**

Ahmed, K, J Bull, J Liu. (in press) Contract-based demand response model for high performance computing systems. Proceedings of the 16th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA 2018), Melbourne, Australia, December 2018.

Ahmed, K, J Liu, and K Yoshii. (2018) Enabling demand response for HPC systems through power capping and node scaling. Proceedings of the 20th IEEE International Conference on High Performance Computing and Communications (HPCC 2018), Exeter, UK, June 2018.

Ahmed, K, J Liu. Energy demand response modeling for high performance computing systems. Workshop on Modeling & Simulation of Systems and Applications (ModSim 2018), Seattle, WA, August 2018.

Andres, AS, CR Main, **DT Pettay**, W.J. Ullman. (2019) Hydrophysical and hydrochemical controls of cyanobacterial blooms in Coursey Pond, Delaware (USA). Journal of Environmental Quality 48: 73-82.

Bannister, M, M Schwarz, E Muller, M Fine, **K Ritchie** (in prep) Seagrass and sediment microbial community shifts along a natural CO2 gradient in Vulcano, Italy.

Beatty, DS, JM Valayil, CS Clements, **KB Ritchie**, FJ Stewart and ME Hay (in press) Local management enhances Acropora defense against a thermally regulated bleaching pathogen. Science Advances.

Canada, BA, D Slate, B Slate. (2019) A Data-Driven Exploration of Arbitration as a Settlement Tool: Are Case Outcomes Affected by the Size of the Claim?, Kluwer Arbitration Blog, May 2019. [Invited; available online at http://arbitrationblog.kluwerarbitration.com/2019/05/05/a-data-driven-exploration-of-arbitration-as-a-settlement-tool-are-case-outcomes-affected-by-the-size-of-the-claim/]

Luo, S, Z Wen, **X Zhang**, W Xu, AY Zomaya, R Ranjan. (2019) GoSharing: An intelligent incentive framework based on users' association for cooperative content sharing in mobile edge networks." Future Generation Computer Systems 95: 601-614.

Main, CR, DI Greenfield, C Doll, Y Wang, EB Whereat, R Mortensen, **DT Pettay**, KJ Coyne. (2018) Critical comparison of molecular methods for detection and enumeration of the harmful algal species, *Heterosigma akashiwo*, in environmental water samples. Journal of Applied Phycology 30: 2425-2434.

Gonski, SF, W Cai, WJ Ullman, A Joesoef, CR Main, **DT Pettay**, TR Martz. (2018) Assessment of suitability of ISFET sensors for pH measurements in dynamic estuarine environments. Estuarine, Coastal and Shelf Science 200: 152-168.

Grottoli, AG, PD Martins, MJ Wilkins, MD Johnston, ME Warner, WJ Cai, TF Melman, KD Hoadley, **DT Pettay**, S Levas, V Schoepf. (2018) Coral physiology and microbiome dynamics under combined warming and ocean acidification. PLoS ONE 13: e0191156.

Goulet, TL, E Muller, ER Hall, **KR Ritchie**, J Bellworthy, M Fine (in prep) Light leads over ocean acidification in influencing the coral *Sylophora pistillata - Symbiodinium* symbiosis from shallow and deep water in the Red Sea.

Ritchie, KB, D Gil-Agudelo, D Conrad, M Elliott, A Jonguitud, C Fischer (in prep) Antibiotic-producing symbionts of the white shark, *Carcharodon carcharias*.

Zhang, X, G Cao. (2019) Proactively Placing Static Relays With Social-Link Awareness in Mobile Social Networks. in IEEE Transactions on Vehicular Technology, vol. 68, no. 2, pp. 1903-1915, Feb.

(**bold** indicates USCB author)