

CORNERSTONE

MESSAGE FROM DEAN ALLISON S. DANELL

Warm greetings to you from Harriot College at ECU! It is indeed a pleasure to share with you this Winter 2020 edition of our newsletter, Cornerstone. I am constantly impressed with all that my colleagues have been able to do while facing so many challenges. Even during a hiring freeze, so many folks are pitching in to ensure necessary work is still getting done. While the stress of the pandemic can feel quite significant, the pride I feel in holding this college leadership role is even greater.

In this issue, I am excited for you to read about the wonderful folks who call Harriot College and ECU home. You will learn how new directions in biochemical research can be sparked by young scientists who bring new insights into their courses. Their inquisitive natures have contributed to the success of the research agendas of our expert faculty.

You will also read about English professor Dr. Anna Froula, who has led the development of a unique and transformative

program to welcome military personnel to university studies through the Veterans to Scholars Program. As the daughter of a career Air Force officer, I am exceptionally moved by the service of our veterans and the care and support offered by Dr. Froula and her colleagues.

With a college as large as ours, our values can be illustrated with a variety of symbols: a microscope, the written word, the scales of justice. We choose the compass as our central image. As on our voyage of discovery, this timeless instrument helps us chart our course, and naturally, our compass always points east! No matter where your journey has taken you, please stay in touch, and take good care. ➤



Dr. Allison S. Danell

Leya Williams

Double Major in Anthropology and Political Science (minoring in International Studies)



"I love that both the anthropology and political science departments are close-knit communities. This allows me to get the one-on-one assistance I need, because I know the faculty, and they know me."

- ✘ Recipient of the fall 2019 Thomas W. Rivers Foreign Exchange Scholarship
- ✘ Made the most of her residential life experience by joining the Global Living Learning Community in 2019-2020
- ✘ Interned at the U.S. Embassy in Mozambique in southeastern Africa from February to April 2020, where she learned that the world is "a vast place full of beautifully different cultures and perspectives. It is our job as global citizens to listen and learn as much as we can from other people's world view...the only way we can ever truly get close to world harmony."
- ✘ Career goal is to work in international affairs for the U.S. Department of State or United Nations

Dr. Thomas Herron

Professor of English



"[Harriot College] gives you the time and space to be creative with interesting and talented colleagues from many different disciplines."

- ✘ Recently celebrated 15 years of working as a professor at ECU
- ✘ Area of teaching and research expertise is English Renaissance Literature
- ✘ Awarded a competitive National Endowment for the Humanities grant of \$93K that includes collaboration across campus and the Greenville teaching community to enhance student learning
- ✘ Creating virtual reality modules that will allow high school and college students to immerse themselves in the cultural and architectural wonders of Ireland's Kilcolman Castle, once home to poet Edmund Spenser

THE ROAD TO DISCOVERY

Course-based Undergraduate Research Leads to Publication, Grant

by Lacey L. Gray, University Communications

Harriot College students often carry out impactful work in the classroom, but it's not every day that it leads to an international publication and nearly \$300,000 in grant funding from the National Science Foundation (NSF). This is exactly what happened in the Department of Chemistry, where novel teaching methods, engaged faculty mentors and bright students provided the recipe for success.



Graduate student Kristin Tyson's research led to an international publication and the awarding of a National Science Foundation grant to ECU.

Kristin Tyson received undergraduate degrees in chemistry and biochemistry and a minor in mathematics from Harriot College in 2019. During her senior year, she took advantage of class time in her Instrumental Analysis course to carry out Course Based Undergraduate Research (CURE).

"Student research is an invaluable opportunity. It is a great way to learn what it will be like to do research in your major," Tyson said. "You are exposed to many different subject matters, and you are able to find and explore what interests you."

In 2013, associate professor of chemistry, Dr. Eli Hvastkovs, redesigned the Instrumental Analysis course to incorporate more inquiry-based learning, and in 2018, he won a faculty development award from ECU's Division of Research, Economic Development and Engagement for his CURE approach to teaching.

By 2019, when Tyson enrolled in the course, Hvastkovs knew how to inspire students to ask questions to which the answers were not yet known. Tyson and her team, Amanda Davis and Jessica Norris (who is now pursuing a Ph.D. in chemistry at Penn State University),

consulted with assistant professor of chemistry Dr. Adam Offenbacher and proposed to study a facet of how chemicals called proteins send messages in the body.

As is often the case when navigating a research project, the team did not reach a clear answer. But they tested a chemical reaction under a different solution condition (pH) and found an unexpected trend in the data.

In a specific protein called azurin, the students determined that a single tryptophan amino acid acted as a messenger, communicating between distinct regions of the protein.

"Fundamental discoveries like this help researchers understand how these proteins work so that they can design effective pharmaceuticals to treat a host of diseases," Hvastkovs said.

The team's discovery led to the writing and 2020 international publication of the paper, "Impact of Local Electrostatics

on the Redox Properties of Tryptophan Radicals in Azurin: Implications for Redox-Active Tryptophans in Proton-Coupled Electron Transfer," in the *Journal of Physical Chemistry Letters*. Tyson's paper was co-authored by students Davis and Norris, and ECU chemistry faculty Hvastkovs, Offenbacher and Dr. Libero Bartolotti.

"I was incredibly floored when my research was published," Tyson said. "It took a while for the disbelief to fade, but when it did, I was very happy and proud."

As a result of Tyson's and subsequent students' research, ECU is now the recipient of a 3-year, \$291,381 grant from the NSF for "Development of Unnatural Tryptophan Derivatives to Expand Tryptophan Function and to Study Biological Catalysis." Co-principal investigators include chemistry faculty Hvastkovs, Dr. William Allen and Dr. Andrew Sargent. Undergraduate students who conducted the preliminary research included Tyson, Davis, Norris, Hanna Kosnik, David Murray, Amanda Ohler and Chris Whittington.

"I'm proud that the CURE class has led to such an important finding, and that we were able to use this class as a catalysis to jumpstart multiple young researchers' careers as well as to secure a significant federally funded grant for the department," Hvastkovs said.

"Indeed, Kristin's paper helped to springboard the impact of the award," said Offenbacher, who is principal investigator on the grant. Through the grant, the team will address the challenge of developing a new set of chemical tools that allow tracking of the messengers, or electrons, within and between proteins based on the amino acid tryptophan.

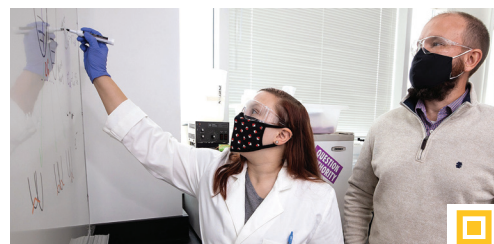
"While these unnatural amino acids have a similar appearance to their natural counterparts, they have unique functional properties that enable us to exploit them as chemical tools to track the movement

of electrons, much like a molecular GPS. Our goal is to apply these tools towards a set of magnetic-sensing proteins in nature that are responsible for seasonal bird migration towards

the development of new biosensors," Offenbacher said.

Tyson said her research experiences have shown her that she wants to work in the pharmaceutical industry in the future.

"Working with Dr. Offenbacher has been a great experience, and I feel so much more confident as a chemist," Tyson said. "I would not be as prepared to work in the field as a chemist without his guidance." ➤



Tyson works out a problem in the lab with assistant professor of chemistry Dr. Adam Offenbacher. (Photos by Rhett Butler, ECU Photographer)

ECU VETERAN TO SCHOLAR BOOTCAMP

Transitioning to Civilian Student

by Robert Spahr, ECU News Services

After a 17-year career in the U.S. Marine Corps that took him to 43 different countries and eight deployments, Jeremiah Caudill decided to pursue a degree from ECU.

Caudill, who retired from the Marines as a staff sergeant in 2012, had not been a student in nearly two decades, so he opted to earn an associate degree from Johnston Community College before transferring. But that classroom experience was not enough to prepare him for university life.

"I got here and I'm 20 years older than the average student," Caudill said. "I was no longer used to the fast pace that was required for a successful collegiate career."

Caudill was contemplating dropping out when he was invited to take part in the university's Veteran to Scholar Boot Camp – an intensive two-week program that helps integrate veterans to university life.



"It helped me survive," said Caudill, who graduated in May with a bachelor's degree in history and is now pursuing a master's degree.

"The boot camp helps you mentally prepare for adversity and build

a corps of people who can help you whenever you're having problems," he said.

Caudill's story is far too familiar.

"What we found is that the first semester of the first year can be particularly difficult for student veterans because they have families, they're prone to feeling isolated and they don't have someone telling them what to do," said Dr. Anna Froula, associate professor of English, specializing in film studies, who has been the director of the Veteran to Scholar program since its inception in 2017. "This program is meant to intervene in the difficulties of university life."

The Veteran to Scholar Boot Camp has successfully integrated dozens of veterans to university life, but this year marked a new era for the program, which is currently funded through a two-year grant from the National Endowment for the Humanities.

Not only was the typically in-person program held exclusively online due to the COVID-19 pandemic, non-veteran medical and pre-med students also were included for the first time.

To learn more about ECU programs for veterans, visit <https://studentveterans.ecu.edu>. ➤



CLIMATE, WATER, ENVIRONMENT

Voyages of Discovery Series Continues with Two Events in Spring 2021

by Lacey L. Gray, University Communications



The Voyages of Discovery Series launched its 14th season – focusing on climate, water and the environment – on September 17, 2020. Texas Tech University atmospheric scientist, **Dr. Katharine Hayhoe**, engaged her audience with real-time polling of ideas and emphasized the importance of talking about climate change, which she said affects all people. If you missed her talk, you may now view it online at <https://voyages.ecu.edu>.

Although it is disappointing the university cannot gather together during the coronavirus pandemic, Harriot College is pleased to continue the online format for the final two Voyages events. Each event will be free to all attendees.



On February 4, 2021, the series will feature environmental attorney **Mr. Robert Bilott**, whose successful lawsuit against DuPont – for its toxic pollution of West Virginia streams – is the basis for the film, "Dark Waters," starring Academy Award-winning actor Mark Ruffalo. Drawing from his book, Bilott will discuss "Dark Waters: The Story Behind the Environmental Legal Battle Exposing Corporate Coverup," which will include details of the unforgettable legal drama about malice, manipulation and perseverance against the failings of environmental regulation.



On March 25, the series will conclude with American meteorologist, professor and director of the atmospheric sciences program at the University of Georgia, **Dr. Marshall Shepherd**. Shepherd, a leading international expert in weather and climate, and former president of the American Meteorological Society, will discuss "Zombies, Sports, and Cola: Implications for Communicating Weather and Climate Science."

Given this season's thematic focus, the Voyages Series is reducing its carbon footprint and donating to organizations that put carbon back into the ground. For additional information, visit the Voyages website at <https://voyages.ecu.edu>. ➤



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ALUMNI SPOTLIGHT

Cynthia “Cindy” Crane, ECU 2011, M.S. Geology



Cynthia D. Crane is Executive Director of the Aurora Fossil Museum in Aurora, N.C. Her leadership has transformed the region by introducing the museum’s fossil collections to numerous children and students of all ages.

Crane is a paleontologist and geologist who specializes in the Coastal Plain of North Carolina. She has dedicated more than 20 years to research, outreach, and

education efforts of the state’s fossil record. She continues to be a strong advocate for paleontology in professional and amateur settings and dedicates her time mentoring young people who desire to pursue careers in STEM.

Advancement in her career was made possible in part by her graduate studies in the Department of Geological Sciences at ECU. As she pursued her degree, she worked as a graduate assistant and presented her research on the national stage, all while raising two sons as a single parent.

“I have a deep appreciation for the department and am very proud when I can boast about my education. Consisting of highly talented and accomplished professors and staff representing a diverse population, their leadership offered a nurturing and productive learning environment,” Crane said. Today, she gives back to the department by teaching classes on a part-time basis.

“Cindy was imaginative and hard working. She had strong opinions that she could back up with knowledge and logical argument,” said Dr. Steve Culver, professor and chair of the department. “Cindy challenged me. She knew more than I did about the fossils she was studying.”

As executive director, Crane’s reach extends well beyond the four walls of the museum. She developed a Teacher’s Kit Program to provide a hands-on learning experiences coupled with a virtual tour of the museum for classrooms across the United States. More than 42,000 students were served last year alone. ➤



The tooth of a C. megalodon, a lamnid shark that is related to both modern-day makos and great whites.

Consider supporting Thomas Harriot College of Arts and Sciences by making a donation online at www.ecu.edu/give. Stay in touch with Harriot College by phone at 252-328-6249 or email at thcas@ecu.edu.



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