School of Mathematics and Sciences

Newsletter for Academic Year 2024-2025

Welcome to the 2025 Newsletter of the School of Mathematics and Sciences at North Carolina Wesleyan University. As you read along, we hope you will join us in celebrating our school's student and faculty accomplishments over the past academic year.

Our school consists of a wide array of scientific fields — biology, biomedical science, chemistry, earth science, environmental science, mathematics, and physics. We currently have ten full-time teaching faculty in our school, and we are dedicated to delivering quality instruction, academic advice, and pathways for the future success of our students, whether in academic or non-academic settings.

Our newsletter begins with a word from our school chair, followed by a mention of awardees from Honors Convocation, an awards ceremony held each spring. Next, we highlight a few excellent student accomplishments and move into a recap of our annual Student Symposium winners. Continuing, we recall all the students who completed their projects in the Taylor-Crocker Honors Program. Finally, we take a moment to showcase some of our faculty talent in their teaching, development, and research endeavors, and we finish with some Pi Day fun.

An Invitation to Study with Us

If you were asked "What first interested you in science," you might say it was the fascinating creatures in nature or the beauty and complexity seen through a microscope or the way various plants and animals seem to flourish together in a specific location. Perhaps you saw images from the Hubble telescope that awed you at the vast enormity and elegance of our universe. Maybe you just have a knack for logical mathematical thinking and enjoy the process of solving equations and puzzles and recognizing structures and patterns. We all come to these scientific frontiers from many paths. No matter your starting point, NC Wesleyan University offers you the opportunity to slow life down and engage with questions of the physical and the abstract. Yes, university life can seem fast-paced, especially when you have two exams on the same day plus a sick roommate to care for plus soccer practice. You can expect to be busy— very busy. What I mean by "slow life down" is that you have the opportunity to devote a significant portion of time to sitting under the teaching of a few professionals as they train you how to think scientifically and mathematically. The journey on which they will take you is not about quick, cheap "likes" on social media or shallow sound-bites from a news segment. True intellectual thinking takes time. It is not a knee-jerk, fast-paced, emotion-driven endeavor. Your studies will teach you how to properly peel back the layers of the physical world and gain a view and understanding that transcends boundaries and forces you into a state of humble tension. Yes, you gain skills and improve your intellectual arsenal, but as you learn, you begin to understand just how unimaginably complicated the world is. You will have tools of investigation and a mind trained for processing data, but you will also be convinced of your own finitude in the midst of such an extravagantly full world.

We, the faculty of the School of Mathematics and Sciences at North Carolina Wesleyan University, invite you to come study with us as we stretch ourselves and bend down low into the hard work of exploring the physical and mathematical universe— discovering, questioning, and flourishing together.

Brent Dozier, PhD
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Associate Professor of Mathematics
Chair of the School of Mathematics and Sciences

Honors Convocation

At this year's Honors Convocation on April 3, 2025, our school was proud to present its awards and recognize our excellent students formally.

- KME (Kappa Mu Epsilon) Mathematics Honor Society - Danny Mayorida-Alvarez, Ben Sellers, Makena Meyer
- Biology Awards - Cameron Baker, Victoria Seggiaro Parma
- Chemistry Award - Julian Pfefferman
- Environmental Science Award - Jazmin Ramirez Vieytez
- Mathematics Awards - Candela Conde Latini, Julian Pfefferman

Here are some photos from the ceremony. Congratulations to everyone!



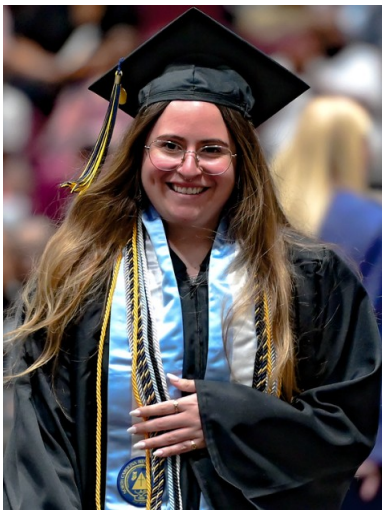


Student Accomplishments

- Yamila Ordoñez received a GlaxoSmithKline Women in Science Scholar award, reflecting excellent academic performance. In addition to a scholarship, Yamila will be paired with a female scientist for a mentoring experience at GlaxoSmithKline in the Research Triangle Park as well as an invitation to attend a bi-annual conference at GlaxoSmithKline.

- Mary Bentley (BS Chemistry) was accepted into multiple REU programs for this upcoming summer. The NSF-sponsored programs included the SIMCODES computational chemistry program at Iowa State, UNC-Charlotte's NanoSURE, UT Knoxville's Molecular Signaling program, and the University of Pittsburgh's chemistry department. Mary has committed to the REU at the University of Pittsburgh where she will be working with the Rankin-Turner bioanalytical group. Mary has designed her own project and will be analyzing natural terpenes that are present in a variety of skincare products (namely, bug spray and cosmetics) via gas chromatography-mass spectrometry.

- Andy Rizzo was accepted to a PhD program in Marine Biology at Texas A&M Corpus Christi.



- Andy Rizzo was the 2025 recipient of the Algernon Sydney-Sullivan Award.

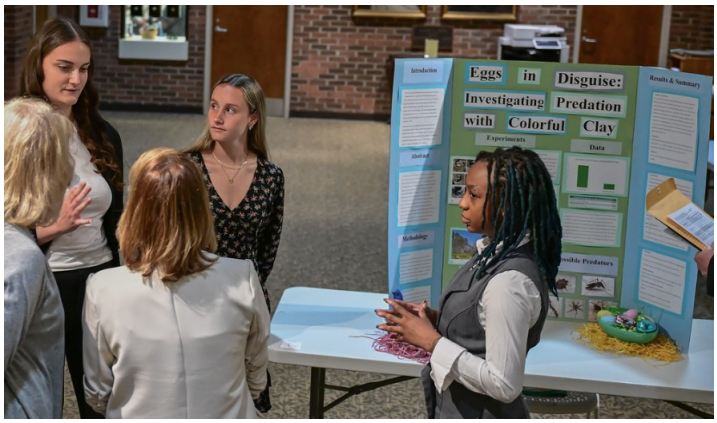
Student Symposium

The winners of this year's Student Symposium poster competition, held on Wednesday, April 16th at the Dunn Center are:

1st Place Lower-Level Category:

Cosima Geywitz, Makena Meyer, Serenity Barnes

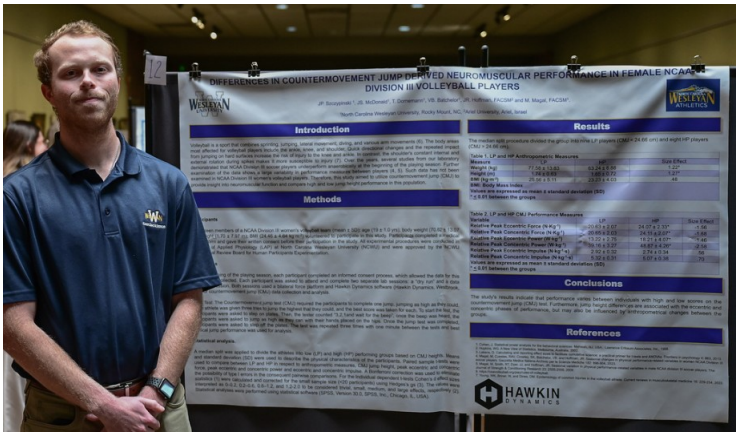
Eggs in Disguise: Investigating Predation with Colorful Clay



1st Place Upper-Level Category:

Justin P. Szczypinski

Differences in Countermovement Jump Derived Neuromuscular Performance in Female NCAA III Volleyball Players



Taylor-Crocker Honors Program

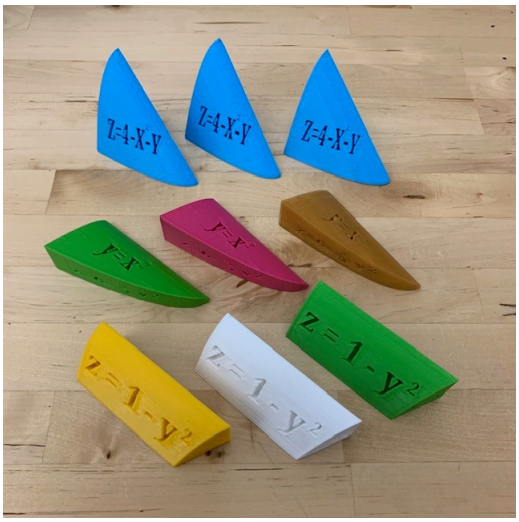
The following students completed their honors projects this academic year.

- Candela Conde Latini - *The Leslie Matrix Model and Its Applications in Actuarial Science*
- Delfina Conde Latini - *Simulating the World War II Cipher Machine, "Lorenz"*
- Victoria Seggiaro Parma - *Metabolic Consequences of Sleep Disorders: A Comprehensive Analysis of Their Role in Diabetes*
- Conner Thomas - *Opioid Administration in the Prehospital Setting*
- Roberta Vulcano - *Frustration Responses in Domestic Cats (Felis catus): Behavioral Analysis in a Food Obstruction Experiment*

Faculty Highlights and Activities

Aaron Allen, PhD - Mathematics

- In May 2024, Dr. Aaron Allen participated in the 24th Biennial Conference of the Association of Christians in the Mathematical Sciences (ACMS), where he delivered a presentation titled "My Experience Implementing UDL in College Algebra." During his talk, he shared insights into his application of Universal Design for Learning (UDL) strategies and highlighted the positive effects these methods had on student learning.
- Last fall, students in Dr. Allen's Multivariable Calculus (MAT 221) course brought mathematical theory into the tangible world using the library's 3D printer. Divided into three teams of three, each group selected a mathematically defined solid to model. In particular, these were shapes bounded by intersecting surfaces studied in class. The project unfolded in three stages. First, students used GeoGebra, a 3D graphing calculator, to visualize the surfaces and determine the curves of intersection between them. This required deriving parametric equations for the edges where the surfaces met. Once the mathematical models were complete, the teams exported their solids from GeoGebra into Tinkercad, where they annotated each face with the equation of the surface defining it. Finally, the teams exported their resulting 3D print file from Tinkercad to the 3D printer. Each of the nine students selected a filament color for printing, resulting in a vibrant display of mathematical craftsmanship. The final solids, pictured below, are a testament to the creative intersection of calculus and technology.



Brittany Al-Attabi, MS - Chemistry, Biology

- Ms. Al Attabi was accepted to Western Michigan University to pursue a PhD in Science Education with a concentration in Chemistry.

- Ms. Al Attabi, along with business professor Dr. Paul Ewell, attended the two-day Gateway Course Experience Workshop in Asheville, NC. The workshop, put on by the John N. Gardner Institute, addressed college gateway course experience in terms of student success and retention. Attendees were challenged to shift away from the mindset of so-called "weed-out" courses and toward actionable steps that could improve the student experience.

Daniel Elías, PhD - Biology, Environmental Science

- Dr. Elías returned from a sabbatical at Universidad Científica del Sur in Peru, where he taught ecotoxicology and led a research project on the effects of methomyl and salinity on Physella acuta. This work was done in collaboration with Dr. José Iannacone. The resulting article can be viewed at the link: https://ejournal.usm.my/tlsr/article/view/5095
- Dr. Elías received a $251,000 NSF grant to support the Environmental Science program at NC Wesleyan. The grant is focused on outreach to local high schools and on supporting underrepresented students through research, fieldwork, and travel opportunities.
- At one of our Fourth Monday Colloquiums, Dr. Elías presented a talk comparing his research on pollutants, salinity, and freshwater snails conducted in Peru with similar research conducted in the United States, including work on PFAS, salinity, acetaminophen, and microplastics.
- Publications

  ⋆ *Effects of ibuprofen and microplastics on movement, growth and reproduction in the freshwater snail Physella acuta.* D. Elías, J. Ramirez Vieytez, M. Funoy Sayar, J. Loaisiga, A. Harper, J. Doll Frontiers in Environmental Science, 12, 1514062

  ⋆ *Impact of acetaminophen and microplastic exposure on Physa acuta movement, growth, and reproduction.* D. Elías, C. Lynch, K. Minchew, C. Van Norden, J. Doll. Biologia https://doi.org/10.1007/s11756-025-01893-9

- In Review:

  ⋆ *Effects of salinity and acetaminophen on egestion rate and movement of Poecilia reticulata*

  ⋆ *Effects of Perfluorooctanoic Acid (PFOA) and Elevated Salinity on Growth, Reproduction, and Movement of Physa acuta*

- Dr. Elías has also signed a book contract with Elsevier to serve as lead editor and author of a new academic book tentatively titled *Microplastics in Freshwater: Understanding Contamination and Solutions.*
- At the NCWU Faculty and Staff Awards Ceremony, Dr. Elías was a co-recipient (with Leah Hill) of the Inspiration Award, honoring employees who exemplify a positive attitude and demeanor that is inspirational to students, faculty, staff, and the greater campus community.

Brent Dozier, PhD - Mathematics

- Dr. Dozier's article *Sums of Powers of Integers* was published in August 2024 in *Mathematics Magazine*, (Volume 97, Issue 4), a journal of the Mathematical Association of America (MAA). The article may be viewed temporarily at the link below.

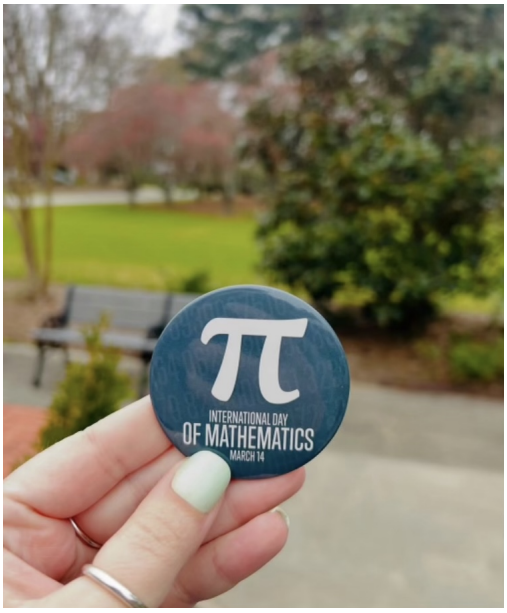
https://www.tandfonline.com/eprint/PMDKCSWQXJ3IEJI7F2BM/full?target=10.1080/0025570X.2024.2378661

Emily Weber, PhD - Biology, Biomedical Science

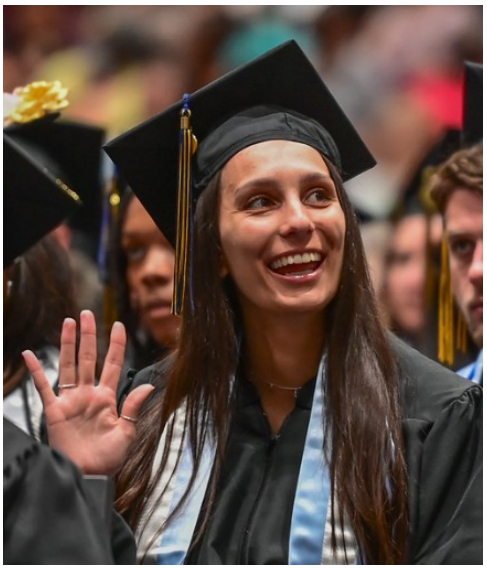
- On February 24, Dr. Weber delivered a Fourth Monday Colloquium talk to our campus community. The presentation, titled "Perception of Academic Skills Sets in Introductory Biology Courses," focused on the challenges students face in adopting soft skills, such as collaboration and study strategies, that will forward their success in STEM fields.

Pi Day 2025

Led by Dr. Allen in collaboration with the NCWU Science Club and the ZTLC (Zipf Teaching and Learning Center), our campus celebrated Pi Day (March 24.... 3-14) by consuming many delicious pies and enjoying each other's company.



Goodbye for now!



⋆ Special thanks to Dr. Carl Lewis (Criminal Justice) for his ceaseless work photographing life at Wesleyan and generously sharing his photos with the community.