

# STEPHANIE M. STEWART

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Ph.D. Student | Biomathematics '29 | North Carolina State University

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## EDUCATION

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### Ph.D. in Biomathematics

May 2029

North Carolina State University | 4.00 GPA

Selected Coursework: Control Systems and Dynamics, Biological Modelling, Machine Learning

Social Chair, Association of Women in Math

Mentor for Undergrads Union Grads mentorship program

### Bachelor of Science in Mathematics

July 2024

East Carolina University | 3.86 GPA | Class Rank: 1 of 811

Brinkley-Lane Scholar, Honors College graduate

Minor: Hispanic Studies, Composite Natural Sciences

Selected Coursework: Applied Statistics, Actuarial Risk Analysis, Linear Algebra, Advanced Calculus, Optimization, Differential Equations

## RESEARCH EXPERIENCE

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### East Carolina University Department of Biology

2021 – 2024

Undergraduate Researcher, Schmidt Lab

- Developed agent-based models in NetLogo to analyze sperm motility via Markov random walks, deriving a power-log function for system characterization.
- Refined and enhanced research manuscript for final publication; currently under peer review.
- Awarded 2nd place in the NCAS John Bowley Dereix Research Award for an outstanding oral presentation on sperm motility models at the 119th NCAS Annual Meeting.

### Publication (Undergoing Peer Review): “Modeling Diffusive Search by Non-Adaptive Sperm: Empirical and Computational Insights”

Benjamin M. Brisard, Kylie D. Cashwell, **Stephanie M. Stewart**, Logan M. Harrison, Aidan C. Charles, Chelsea V. Dennis, Ivie R. Henslee, Ethan L. Carrow, Heather A. Belcher, Debajit Bhowmick, Paul Vos, Martin Bier, David M. Hart, Cameron A. Schmidt. (2024). *bioRxiv*. <https://doi.org/10.1101/2024.06.17.599386>

### East Carolina University Department of Computer Science

August – May 2021

Undergraduate Researcher, Huang research team

- Surveyed community college students on their perceptions of AI in electrical systems engineering courses.
- Coded a training simulation for students to practice their skills in a virtual reality space.
- Presented findings at an ECU department symposium for Community-Based Research.

### Brody School of Medicine

2021 – 2022

Undergraduate Researcher, Geyer Lab

- Managed data for mouse colony of over 100 individuals
- Genotyped each mouse via PCR and gel electrophoresis to determine which mice were suitable for experiments

## SKILLS

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**Coding:** High proficiency in NetLogo, proficiency in C++, Python

- Employed **NetLogo** and **Python** to model and simulate sperm motility dynamics in undergraduate research, leveraging agent-based modeling and data visualization techniques.
- Developed **C++** algorithms to solve complex mathematical problems, including numerical methods and simulations, in coursework as a mathematics major.

**Computation:** Proficiency in MATLAB

- Applied MATLAB for developing and simulating biological models and control systems as part of graduate-level coursework, including data analysis, differential equation solving, and system optimization.

**Web Development:** experience with GoDaddy, WordPress, and Google Sites

- Developed and launched personal website and Hurricane Tech consultation business site using GoDaddy.
- Designed and managed NCSU Biomathematics departmental website using WordPress, integrating themes, plugins, and custom features.
- Experience with domain management, hosting, and website maintenance.

**Laboratory:** General wet lab skills

- **Animal Handling:** Experience working with mice, including genotyping, colony management and sample collection.
- **Molecular Techniques:** Proficient in DNA extraction, agarose gel electrophoresis, PCR, and genotyping.
- **Lab Skills:** Familiar with lab equipment, protocols, and maintaining a clean, organized workspace.

**Language:** Highly Proficient in Spanish

- **C1 Level Spanish:** Advanced proficiency with strong command of conversational and academic Spanish.
- **Study Abroad:** Immersed in Spanish language and culture during a 4-month program in Santander, Spain for the Fall 2022 semester.

## PROFESSIONAL TRAINING

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**IACUC Animal Safety**, Institutional Animal Care and Use Committee (IACUC)

**Chemical Hygiene/Laboratory Safety Training**, Environmental Health & Safety (EH&S)

**CPR/AED and First Aid**, American Red Cross

Expires 2025

**Internationally Licensed BODYPUMP Instructor**, Les Mills International

**Certified Group Fitness Instructor**, American Council on Exercise

Expires 2028

## PRESENTATIONS

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**Oral Presentation**, “Fertilization and Information Theory: a Stochastic Model of Sperm Cell Population Dynamics,” North Carolina Academy of Science 119<sup>th</sup> Annual Meeting, April 2023.

**Poster Presentation**, “Sperm Information Games: Is Sperm Selection a Natural Consequence of Large Numbers and Microenvironmental Complexity?,” Triangle Consortium for Reproductive Biology, February 2023.

**Poster Presentation**, “Sperm Information Games,” ECU Research and Creative Achievements Week, April 2023.

**ACE Continuing Education Credit Workshop**, “How to teach Hips & Heels,” ECU Campus Recreation and Wellness training workshop, March 2023.

**Master Class Presenter**, “Hips & Heels,” Southeastern Collegiate Fitness Exposition, Spring 2023.

## HONORS AND AWARDS

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<b>Brinkley-Lane Scholars</b> ECU’s top merit scholarship program valued at \$64,000	Fall 2021 – Present
<b>Honors College Chancellor’s fellow</b>	Fall 2021 – Present
<b>Brody School of Medicine Early Assurance - Alternate</b>	Fall 2021 – Present
<b>The North Carolina Academy of Science John Bowley Dereix Research Award, 2<sup>nd</sup> place</b> For outstanding oral presentation at the 119 <sup>th</sup> NCAS Annual Meeting	Spring 2023
<b>Undergraduate Research and Creative Activity Award</b> Assistantship for publication of <i>Sperm Information Games</i> paper	Spring 2023
<b>Ji and Li Family Foundation Scholarship Award</b> Outstanding performance in Mathematics	Spring 2023
<b>Honors College Dean’s List</b> Maintenance of a 3.5 GPA	Spring 2023
<b>Dr. Robert J. Hursey Scholarship Award</b> Outstanding performance in Mathematics	Spring 2022, Fall 2022
<b>Honors College Chancellor’s List</b> Maintenance of a 4.0 GPA	Fall 2021, Spring 2022

**Foreign Languages and Literatures Hispanic Studies Award** Fall 2022  
Study Abroad award for leadership in departmental affairs

**Foreign Languages and Literatures Leadership Award** Spring 2022  
Award for leadership positions in departmental organizations

## **LEADERSHIP**

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**Group Fitness and Personal Training Demo Team Captain** Spring 2023  
Organized fitness presentation at the Southeastern Collegiate Fitness Exposition

**Campus Recreation and Wellness Advisory Board** Fall 2021 – Present  
Honors College Representative

**Foreign Lang. and Literatures Council of Student Ambassadors** Fall 2021 – Present  
Secretary, Outreach Chair

**Hooked! On K-Pop dance team** Spring 2023 – Present  
Dance captain, Public Relations Coordinator

**Pro-Vax Pirates student organization** Fall 2021 – Spring 2022  
Founding member, event coordinator

## **WORK EXPERIENCE**

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**Foraging Vintners Limited**  
**Bartender and Public Relations Coordinator** Summer 2023  
Bar service for manx business during Isle of Man TT race 2023

**East Carolina University Campus Recreation and Wellness** 2021 – Present  
**Group Fitness Instructor**  
ACE-Certified Dance fitness instructor

## **OUTREACH**

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**Beach Protection Projects – Isle of Man govt.**  
Conservation projects in the Isle of Man, UK; 10 hours over 2 months

**Community Wellness Projects – Erasmus Santander**  
Local volunteer projects in Santander, Spain; 20 hours over 3 months

**FLLCSA Outreach projects**  
Hosting community-based events in partnership with local AMEXCAN chapter, organized ESL volunteership at local worship services; 10 hours

**EC Scholars and Honors College service**

Includes roadway cleanup, teaching at the ECU Community School, organizing holiday gift drives, and packing food with the Backpack Buddies program; 30 hours

## REFERENCES

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**Cameron A. Schmidt, Ph.D.**

Dept. of Biology

East Carolina University

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**Todd Fraley, Ph.D.**

Dean of the Honors College

East Carolina University

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