M. Cole Stewart

428 S South Lane Rm 2506, East Lansing, MI 48824 | (205) 657-2024 | stewa873@msu.edu
https://sites.google.com/view/colestewart

EDUCATION

COLLEGE OF ENGINEERING & COLLEGE OF NATURAL SCIENCES,
Michigan State University — East Lansing, MI
Doctor of Philosophy — August 2022 – present
Primary Department: Computational Mathematics, Science, and Engineering
Secondary Department: Physics and Astronomy
Specialty: Computational Plasma Physics
GPA: 3.55

COLLEGE OF ARTS AND SCIENCES, University of Alabama — Tuscaloosa, AL
Bachelor of Science in Physics and Mathematics — August 2018 – May 2022
Concentration: Graduate School Track (PH)
Minor: Blount Scholars Program
Institutional Honors: Magna Cum Laude, University Honors
GPA: 3.82

TEACHING EXPERIENCE

Graduate Teaching Assistant, *Optimization Methods in Data Science,* Department of Computational Mathematics, Science and Engineering, Michigan State University; *August 2025 – December 2025*

- Graduate Teaching Assistant for this upper-level class required for the BS in Data Science under supervision of Dr. Firas Khasawneh
- Facilitate a partially flipped classroom covering topics such as preliminary linear algebra and calculus, optimality conditions for unconstrained and linearly constrained problems, least squares, gradient method, Newton's methods, convex optimization, and more
- Responsible for creating the rubrics for homework assignments, quizzes, and exams, as well as grading in-class assignments for effort and then the homework, quizzes, and exams for credit in a class of 59 students
- Serve as the primary lecturer and facilitator when Dr. Khasawneh is absent, which happened seven times
- Facilitate three weekly office hours and track students' questions as they relate to the learning objectives to create better data for review days before exams and for future iterations of the course
- Received excellent reviews after the course through the Student Perceptions of Learning Survey and RateMyProfessors; for more information, refer to my website

Founder and Lecturer, *Linear Algebra Bootcamp*, Department of Computational Mathematics, Science and Engineering, Michigan State University; *August 2024*

- Organized a bootcamp regarding introductory and intermediate linear algebra to better prepare incoming graduate students to take their first core course, *Introduction to Numerical Linear Algebra*
- This bootcamp was and is necessary due to the interdisciplinary nature of the department, with students entering with a wide variety of backgrounds

- Developed the curriculum for a two-hour workshop and lectured and facilitated the first instantiation of it
- Distributed material for review and stored for future use by the Curriculum Liaison and the First Year Liaison
- Serves in part of the requisite material for the Certificate in College Teaching

SELECTED ACADEMIC ADMINISTRATION EXPERIENCE

Representative, ***Graduate Advisory Committee for the Office of Research Regulation and Support***, Michigan State University, *June 2025 – present*

- MSU's ORRS is responsible for ensuring university research is safe, legal, and fair.
- I am one of the four graduate students in the pilot of the graduate advisory committee that is run by Dr. Laura McCabe, the Associate Vice President for Research Regulatory Support.
- We were responsible for feedback from graduate students regarding indirect cost structures, IRB processes, modifications, and resources.
- Provided input regarding a system for the compartmentalization of compliance, monitoring, oversight, reporting, and facility management into budget requests to replace the old indirect cost system following the executive order limiting indirect costs.

Representative, ***Advisory Committee to the Chair,*** Department of Computational Mathematics, Science and Engineering, Michigan State University, *September 2023 – August 2025*

- Served as the first graduate student representative on the CMSE department's Advisory Committee
- Stressed the importance of increasing the visibility and recruitment CMSE's graduate program and provided an elegant solution to increasing advertising
- Advocated for firmer, quantitative expectations for graduate teaching assistants to protect both parties
- Oversaw appointment processes and requests of internal university faculty
- Encouraged better oversight of other departmental committees to ensure further institutional knowledge
- Coordinated with other advisory committee representatives and senior faculty within the department to develop a pitch for expanding the amount of tenure-track faculty positions within the department
- Mandated graduate-student representation on search committees
- Assisted in the amending of departmental bylaws to ensure adherence
- Proposed a restructuring of the departmental colloquia which has low attendance historically to decrease the cost as well as increase attendance by highlighting the research of faculty within CMSE

President, ***Computational Mathematics, Science and Engineering Graduate Student Organization***, Michigan State University, *August 2024 – August 2025*

- Led the only graduate student organization for the department
- Oversaw a cabinet of 10 officers and ensured proper and transparent communication, and fulfillment of responsibilities
- Developed a strong sense of community within the graduate students of CMSE and the collective department
- Revised the organization's constitution and created its bylaws and other policies

- Organized informal events, monthly social events, and several professional development events, including a talk from MSU's Office of the Ombudsperson and a career panel comprising of representatives from industry, academia, and national labs
- Through targeted recruiting and adapting to feedback, increased attendance drastically, up to 50% of department graduate students for formal social events, 40% for professional development events, 30% for weekly, informal events, and 18% for DEI audience-targeted events
- Initiated and oversaw the development of the CMSE-GSO Website which was launched in August 2025
- Created three resource documents pertaining to first-year graduate students, international students, and general CMSE graduate students, respectively

Representative, *Council of Graduate Students*, Michigan State University, *August 2024 – August 2025*

- Attended monthly meetings regarding the business of the Council of Graduate Students (COGS), which include funding opportunities, events, and general advocacy for graduate students at MSU
- Served on the COGS DEI Student Award Committee, reading and ranking applications based on the provided criteria
- Served on the University Curriculum Committee for a semester, which oversees all curriculum proposals and changes at the university
- Served on the COGS Finance Committee, going through applications for graduate student funding opportunities, including conference support and awards
- While on the COGS Finance Committee, also revised bylaws and parameters to mitigate discrepancies and create better defined boundaries

Representative, *Engineering Graduate Studies Committee*, Michigan State University, *May 2023 – May 2024*

- Advised and assisted in matters related to graduate studies within the College of Engineering, including approving proposals for graduate courses and programs
- Assisted in the selection of the Fitch H. Beach Award, the College's premier award for graduate researchers

Vice President, *Computational Mathematics, Science and Engineering Graduate Student Organization,* Michigan State University, *August 2023 – August 2024*

- Assisted the president, and conducted in their absence, the responsibilities of the Graduate Student Organization
- Focused on the development of a sense of community within a young department as well as increased transparency in departmental policy
- Implemented an increase in representatives and liaisons of graduate students to departmental committees
- Helped with creation and implementation of weekly departmental graduate student newsletters highlighting graduate resources, work, and events

Mentor, *Peer Mentorship Program*, Michigan State University, *May 2023 – present*

- Assists in the transition into graduate school for the first year PhD students in the Department of Computational Mathematics, Science, and Engineering
- Help manage and set expectations of graduate life, as well as introduce them to, and encourage them to be a part of, the departmental graduate student community

Mentor, ***Advanced Computational Research Experience REU Program*****,** Michigan State University, *May 2023 – August 2023*

- Mentored and guided undergraduates participating in the REU to ease their transition to the CMSE community and the greater Lansing area
- Further advised the students on any obstacles they might face in the workplace

President, ***Society of Physics Students*****,** University of Alabama; *February 2020 – May 2022*

- Figurehead of the undergraduate physics program and led the rest of the executive committee
- Set and planned biweekly meetings and other events such as review nights for both fellow undergraduates, as well as for high school students and their upcoming AP tests
- Oversaw the expansion of the SPS Tutor Program, easing access to high-level tutoring by upper-level undergraduate students and connected the Program to the Athletic Tutoring Program
- Increased participation from roughly 10% of the undergraduate physics majors to 45%

President, ***Sigma Pi Sigma,*** University of Alabama; *October 2020 – May 2022*

- Sigma Pi Sigma is the national honors society for undergraduate physics majors
- Rebooted the local chapter for the first time in several years; inductions held in Spring 2021

CERTIFICATES AND AWARDS

Certificate in College Teaching**,** Michigan State University; *in progress*

- Improve teaching skills for teaching now and anticipate teaching best practices in the future
- Develop disciplinary teaching strategies, create effective learning environments, incorporate technology in teaching, understand the university context, and assess student learning
- Includes coursework in disciplinary pedagogy, a mentored-teaching project, a teaching e-portfolio, and relevant workshop attendance

Certificate in Community Engagement, Michigan State University; *in progress*

- Develop skills to disseminate disciplinary knowledge and experiences with a community partner through collaboration and engagement
- Use core engagement competencies such as community collaboration techniques and community-engaged scholarship to design and implement a project that best serves a community

CMSE Community Engagement Award**,** CMSE 10th Anniversary Awards, Michigan State University; *August 2025*

- The award to recognize outstanding contributions that strengthen the CMSE community and climate through the demonstration of sustained engagement to build a sense of departmental community and identity
- This award recognized contributions to departmental identity for the entire existence of CMSE

CyberAmbassador Program Certificate; *Fall 2024*

- Funded by NSF Grant #1730137, this develops professional skills for success in interdisciplinary work in STEM, such as communication, teamwork, and leadership

- In-depth investigation of differing styles, skills, and scenarios to contextualize best practices

Entering Mentoring Certificate*; Fall 2024*

- Housed within the Center for the Improvement of Mentored Experiences in Research (CIMER), this is an evidence-based, interactive mentor training curriculum
- Covered concepts such as aligning expectations, maintaining effective communication, assessing understanding, and more

Sigma Pi Sigma Award**,** University of Alabama Department of Physics and Astronomy; *April 2022*

- The award to recognize a student displaying extreme service and commitment within the Alabama Physics Department through a sustained devotion to the development of departmental culture and identity
- Received in part due to the department's chapter of SPS winning their first ever Distinguished Chapter Award under my leadership

RESEARCH

Plasma Theory and Simulation Group, Michigan State University; *August 2022 – present*

- Investigated a fundamental flaw in common PIC/MCC codes, a simulation between two plates of a capacitor displaying the divergence in particle density while increasing macroparticle weight
- Discovered to be caused by cold particles which accumulate in the bulk of the plasma due to minimal collisional mechanisms in the current system due to the underrepresentation of intracell coulomb collisions
- Presented findings at ICOPS 2023, APS GEC 2023, and USLTPSS 2024

Che Research Group, University of Alabama at Huntsville; *May 2021– August 2021*

- Conducted research through CPU2AL regarding magnetic reconnection
- The basis of research was the expansion of the magnetic island surrounding magnetic energy conversion to a release of thermal and kinetic energies
- Used a data simulation from a NASA supercomputer in *Interactive Data Language*

Piepke Research Group, University of Alabama; *January 2020 – May 2020*

- Conducted and set up research in neutrino physics with a partner
- Set up a VME crate to read out all the modules onto a PC

Hauser Lab Group, University of Alabama; *July 2018 – August 2019*

- Conducted physics research and managed three labs under UA professor, condensed matter experimentalist Dr. Adam Hauser
- Conducted both off-axis and on-axis sputtering

SELECTED CONFERENCES

CMSE 10 Year Anniversary and 5th Annual Data Science Student Conference**,** East Lansing, MI; *August 2025*

- Attendee and award recipient

United States Low Temperature Plasma Summer School, Ann Arbor, MI; *June 2024*

- Author (poster): *The Effect of Super-particle Weight Factor on Particle-in-Cell Simulations in Low-pressure Capacitively-Coupled Plasmas*

APS Gaseous Electronics Conference, Ann Arbor, MI; *October 2023*

- Author (poster): *The Effect of Super-particle Weight Factor on Particle-in-Cell Simulations in Low-pressure Capacitively-Coupled Plasmas*

International Conference on Plasma Science**,** Santa Fe, NM; *May 2023*

- Author (poster): *The Effect of Super-particle Weight Factor on Particle-in-Cell Simulations in Low-pressure Capacitively-Coupled Plasmas*

Michigan Institute for Plasma Science and Engineering Conference**,** Ann Arbor, MI; *October 2022*

- Attendee

Conference for Undergraduate Women in Physics**,** virtual; *January 2022*

- Attendee; organizing leader for the University of Alabama's attendees, one of the largest groups in attendance.
- Since then, CUWiP has been renamed to CU*iP to broaden their scope to cover more than just women who are underrepresented minorities in STEM

Conference for Undergraduate Women in Physics**,** Tuscaloosa, AL; *January 2019*

- Attendee and Volunteer: helped direct attendees to event locations.

SELECTED HONOR SOCIETIES

- *Sigma Pi Sigma; October 2020 – present*
- *Pi Mu Epsilon; March 2021 – present*
- *National Society of Collegiate Scholars; October 2019 – present*

RELEVANT COURSEWORK

Graduate Courses**,** Michigan State University

- Numerical Methods for Differential Equations
  - Learned finite difference modeling in MATLAB, creating stencils as well as using the built-in functions.
- Parallel Computing
  - Learned how to parallelize programs in C/C++ as well as MATLAB.
- Electrodynamics of Plasmas
  - Learned the basics of the electromagnetics of plasmas.
- Numerical Linear Algebra
  - Studied the basic algorithms used to solve sparse and dense linear systems.
- Advanced Topics of Plasma
  - Covered a more in-depth study of industrial plasma processing including collisions and cross sections, diffusion, time-varying fields, instabilities, and sheath dynamics.
- Classical Mechanics
  - Reviewed the basics of analytical mechanics using Lagrangian and Hamiltonian methods.
- Classical Electrodynamics I
  - Covered graduate-level electrostatics, magnetostatics, special relativity, and electrodynamics.

- Applied Machine Learning
    - Covered practical Python-based machine learning techniques and functions including supervised learning, unsupervised learning, and reinforcement learning

- Special Topics in Scientific Machine Learning and Model Reduction
    - Covered some key examples of science-informed machine learning in a pilot course
- Communications, Teamwork, Ethics and Leadership Training for Multidiscplinary Research Teams
    - Learned best practices and soft skills when it comes to leading and participating in a team environment

Undergraduate Physics Courses**,** University of Alabama

- The entire coursework for the graduate school track.

Undergraduate Math Courses**,** University of Alabama

- The entire coursework for the general track with a concentration in statistics, as well as abstract algebra.

Blount Scholars Program**,** University of Alabama

- The Blount Scholars Program is one of the premier honors programs at UA, focusing on liberal arts education, encouraging a more well-rounded and wholistic approach to higher education.
- Through Blount, I developed higher levels of critical thought, communication, analysis, and writing skills.
- My capstone project was a series of vignettes highlighting the effect of my neurological speech disorder has on my character.

TECHNICAL SKILLS

Research Tools

- Advanced: Python (numpy, scipy, scikit-learn, Pandas) and MATLAB
- Intermediate: C/C++, Python (Keras, TensorFlow)

Teaching Technologies

- Advanced: D2L Brightspace, Zoom, Crowdmark
- Intermediate: iClicker, Desmos, GeoGebra, Kahoot, Slack
- Familiar: Gradescope, Turnitin, Blackboard, Github

Productivity and Presentation

- Advanced: Microsoft Office Suite, Google Workspace, and LATEX
- Intermediate: Canva

Field-Specific Software

- Advanced: XPDP1 codebase from PTSG
- Familiar: XOOPIC from PTSG

SELECTED CLUBS AND ORGANIZATIONS

Plasma Theory and Simulation Group**;** Michigan State University; *August 2022 – present*
CMSE Graduate Student Organization**;** Michigan State University; *August 2022 – present*
Society of Physics Students**;** *September 2018 – present*
Sigma Pi Sigma; National Physics and Astronomy Honor Society; *October 2020 – present*
Council of Graduate Students**;** Michigan State University; *August 2024 – August 2025*

Che Research Group, University of Alabama at Huntsville; *May 2021– August 2021*
Piepke Research Group, University of Alabama; *January 2020 – May 2020*
Hauser Lab Group**;** University of Alabama; *July 2018 – August 2019*