

# Matthew Cole Stewart

428 S South Lane Rm 1515, East Lansing, MI 48824 | (205) 657-2024 | [stewa873@msu.edu](mailto:stewa873@msu.edu)

## 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: 3.38

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

## RESEARCH

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

- Investigated a fundamental flaw in xpdpl, a simulation between two plates of a capacitor displaying the reverse association between macroparticle weight and electron density.
- Presented findings at ICOPS 2023

***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*

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

- Conducted and set up research in neutrino physics with a partner.
- Together, we set up a VME crate to read out all the modules onto a PC.
- It was quite problematic as the manual was not updated to match the new specifications of the provided equipment.

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

- Conducted physics research and managed three labs under UA professor, Dr. Adam Hauser whose field is condensed matter.
- Conducted both off-axis and on-axis sputtering.
- The group gained another lab, so I was delegated to set-up and organize the new and old rooms.

## CONFERENCES

***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.

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

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

## **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, *in progress*
- Classical Mechanics, *in progress*

### **Physics Courses**, University of Alabama

- The entire coursework for the graduate school track.

### **Math Courses**, University of Alabama

- The entire coursework for the general track with a concentration in statistics.

## **SELECTED HONOR SOCIETIES**

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

## **SELECTED LEADERSHIP EXPERIENCE**

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

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

### **Vice President**, *Computational Math, Science, and Engineering Graduate Student Organization*, Michigan State University, August 2023 – present

- Assist the president, and conduct in his absence, the responsibilities of the Graduate Student Organization.
- Focuses on the development of a sense of community within a young department as well as increased transparency in departmental policy.

**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, *Advance Computational Research Experience REU Program***, Michigan State University, *May 2023 – present*

- Mentors and guides an undergraduate participating in the REU to ease their transition to the CMSE community and the greater Lansing area.
- Further advises 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 lead the rest of the executive committee.
- Set and plan biweekly meetings and other events such as review nights for both fellow undergraduates, as well as for high school students and their upcoming AP test.

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

- The same election as Society of Physics Students, 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.

## **SELECTED CLUBS AND ORGANIZATIONS**

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

***Graduate Student Organization***; Michigan State University; *August 2022 – present*

***Society of Physics Students***; University of Alabama; *September 2018 – present*

***Sigma Pi Sigma***; University of Alabama; *October 2020 – present*

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

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

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