MICHAEL VEROSTEK

Ithaca, New York 14850
(315) 335-3113 | mjv82@cornell.edu
www.mikeverostek.com

Education

Ph.D. in Physics, University of Rochester, Rochester, NY **2024**
Thesis title: *Admitting Students, Finding a Research Group, and Promoting Skills for Research: Examining Critical Processes in Physics Graduate Education to Facilitate Change*
Thesis advisor: Professor Benjamin Zwickl, co-advisor: Professor Steven Manly

M.A. in Physics, University of Rochester, Rochester, NY **2018**
Graduate coursework includes: Mechanics and Chaotic Dynamics, Electromagnetic Theory, Quantum Mechanics I and II, Statistical Mechanics, Data Science I and II, General Relativity

B.A. in Physics, Hamilton College, Clinton, NY **2016**
Thesis title: *A Simple Derivation of Scalar Waves in the Randall-Sundrum Spacetime*
Thesis advisor: Professor Kate Brown, co-advisor: Harsh Mathur

Research Experience

Postdoctoral Associate, Cornell University **2026-present**
Advisor: Dr. Natasha Holmes.
(a) Impact of broad relevance in a CURE-like introductory physics lab
Compared student outcomes in a skills-based introductory lab to outcomes in a lab simulating authentic experimental particle physics research. Synthesized literature on course-based undergraduate research experiences (CUREs) to develop theoretical framing. Supported analysis of survey data with hierarchical linear modeling. Results support departmental decision-making regarding lab reform efforts.
(b) Large-scale qualitative data analysis to investigate authenticity in introductory labs
Developing an analysis pipeline leveraging large language models to qualitatively code 1,000+ student memos. Comparing affordances and constraints of text embedding clustering, multi-agent LLM coding, and retrieval-augmented generation (RAG).

Postdoctoral Research Fellow, Rochester Institute of Technology **2024-2025**
Advisor: Dr. Diana Sachmpazidi.
(a) Culture around Systemic Change survey development
Conducted exploratory factor analysis on data from pilot administration of a survey designed to measure departmental culture around systemic change. Assessed psychometric properties of the instrument. Refined items and prepared for distribution to physics departments nationwide through American Institute of Physics Statistical Research Center.
(b) Advancing equity in physics graduate education

Designed interview protocol to investigate strengths and limitations of faculty efforts to improve equity and inclusion in physics graduate programs. Organized and conducted faculty interviews across multiple institutions. Supported collaborators conducting parallel sets of interviews with graduate students at those institutions.

(c) Large-scale qualitative data analysis with text embeddings

Collaborated with researchers at RIT and Northwestern University to investigate applications of novel natural language processing techniques to large-scale qualitative data. Developed skills in PyTorch to build and train machine learning models for text prediction.

Graduate Research Associate, University of Rochester **2019-2024**

Collaborated with Benjamin Zwickl at the Rochester Institute of Technology to study several topics in physics graduate education using a mix of quantitative and qualitative research methodologies.

(a) Investigating physics graduate admissions practices

Using a dataset of several thousand physics graduate students' admissions data, performed several statistical analyses in R to explore the relationship between common admissions metrics, their graduate grades, and Ph.D. completion. Statistics included correlation matrices, ANOVA, linear regression, and mediation analysis. Data visualizations also supported the analysis. Results offered new insights to admissions committees regarding which outcomes are predicted by common admissions criteria.

(b) Understanding the process by which physics Ph.D. students find research groups

Designed a study to explore physics Ph.D. students' process of finding a research group. Recruited and interviewed 40 physics Ph.D. students using cognitive task analysis and sense-making methodologies. Leveraged experience in R to create an analysis pipeline allowing for visual organization of data. Created a framework modeling how students' research interests influence when and how they search for a group.

(c) Characterizing strategies used by theoretical physicists in authentic research

Worked with two undergraduate summer research students to interview 11 theoretical physicists in order to better understand the strategies that they use to solve problems in their research. Leveraged cognitive task analysis methods to identify two processes that theorists used often in their work to make progress: making assumptions and using analogies. By identifying these expert practices, we suggested several new ways of incorporating authentic research practices into the classroom.

Senior Capstone Research, Hamilton College **2016**

Described the behavior of scalar waves in the Randall-Sundrum spacetime that was proposed to address the hierarchy problem in physics. Two solutions arise from the wave equation: zero modes, possessing a massless dispersion relation and reflecting the behavior of waves on the brane, and a continuum of massive Kaluza-Klein modes, which are suppressed near the brane.

Teaching Experience

Adjunct Professor, University of Rochester **2025**
PHY113 General Physics I

Sole instructor of record for a large-enrollment introductory physics course. Supervised and coordinated 12 graduate and undergraduate teaching assistants. Independently designed all course materials and implemented an equity-centered grading system at scale.

Adjunct Professor, Rochester Education Justice Initiative **2022-2025**
PHY100 How Things Work

Designed and implemented 3 iterations of a non-mathematical introduction to physics for incarcerated individuals at Attica Correctional Facility and Groveland Correctional Facility. Lecture and lab components were tailored to meet the educational needs of the diverse population of students and to accommodate a restricted classroom environment. Topics included introductions to mechanics, fluids, thermal physics, electromagnetism, and modern physics.

Summer Instructor, University of Rochester **2019**
PHY114P Electricity and Magnetism

Developed lecture notes and problem sets for introductory E&M. Facilitated daily workshops to support an active self-paced style of learning. Small class size allowed for individualized support and ample small-group interaction.

Teaching Assistant, University of Rochester **2017-2024**
PHY121P Mechanics & PHY122P Electricity and Magnetism

Served as teaching assistant for 10 semesters of the self-paced active learning style mechanics and electricity and magnetism classes offered at the University of Rochester. Appointed as Head Teaching Assistant for seven of the semesters. TA responsibilities included managing workshops and grading end of chapter quizzes. Head TA responsibilities required developing original curricular material, maintaining a schedule for the other teaching assistants, sending weekly progress reports to students, acting as the primary point of contact for students, and training and mentoring incoming classes of undergraduate and graduate teaching assistants.

Publications in Press

1. D. Sachmpazidi, **M. Verostek**, J. Petrella, and C. Turpen. *Psychometric evaluation of the culture around systemic change survey: A tool for assessing facets of departmental culture in physics*. Phys. Rev. Phys. Educ. Res., 22:1, 010107 (2026).

2. A.R. Piña, S. El-Adawy, **M. Verostek**, B.T. Boyle, M. Cacheiro, M. Lawler, N. Pradeep, E. Watts, C.G. West, H.J. Lewandowski, and B.M. Zwickl. *Landscape of quantum information*

science and engineering education: From physics foundations to interdisciplinary frontiers. Phys. Rev. Phys. Educ. Res., 21:2, 020131 (2025). (**Editors' Suggestion**)

3. C. Cammarota, M. Foster, **M. Verostek**, K. Patterson, M. MacIntyre, K. Dorsey, A. Camacho-Betancourt, T.E. Wong, and B.M. Zwickl. *Social Computational Literacy in Practice: A Framework Describing STEM Researchers' Communication*. Journal for STEM Education Research, 1-31 (2025).

4. **M. Verostek**, C.W. Miller, and B. Zwickl. *Modeling when and how physics PhD students search for a research group: the role of interests and prior research experience in timely group integration*. Phys. Rev. Phys. Educ. Res., 20:2, 020119 (2024). (**Editors' Suggestion**)

5. **M. Verostek**, C.W. Miller, and B. Zwickl. *Physics PhD student perspectives on the importance and difficulty of finding a research group*. Phys. Rev. Phys. Educ. Res., 20:1, 010136 (2024). **(Editors' Suggestion, Featured in Physics Magazine)**

6. **M. Verostek**, M. Griston, J. Botello, and B. Zwickl. *Beyond The Big Bang Theory: Revealing the everyday research lives of theoretical physics faculty*. Phys. Teach., 62:6, 446-450 (2024).

7. **M. Verostek**, M. Griston, J. Botello, and B. Zwickl. *Making expert processes visible: how and why theorists use assumptions and analogies in their research*. Phys. Rev. Phys. Educ. Res., 18:2, 020143 (2022).

8. **M. Verostek**, C.W. Miller, and B. Zwickl. *Analyzing admissions metrics as predictors of graduate GPA and whether graduate GPA mediates Ph.D. completion*. Phys. Rev. Phys. Educ. Res., 17:2, 020115 (2021). **(Editors' Suggestion, Featured in Physics Magazine)**

9. K. Brown, H. Mathur, and **M. Verostek**. *Exploring extra dimensions with scalar fields*. Am. J. Phys., 86:5, 327-337 (2018).

Peer-reviewed Conference Proceedings

1. A.R. Piña, S. El-Adawy, **M. Verostek**, H.J. Lewandowski, and B.M. Zwickl. *Investigating Opportunities for Growth and Increased Diversity in Quantum Information Science and Engineering Education in the U.S. based on an Analysis of the Current Educational Landscape*, ASEE Annual Conference & Exposition, American Society for Engineering Education (Montreal, QC, 2025).

2. **M. Verostek**, D. Sachmpazidi, J. Petrella, and C. Turpen. *Assessing the culture around systemic change in physics programs: A pilot study from 33 programs in the United States*, in Proceedings of the 2025 Physics Education Research Conference, PER Conference (Washington, DC, 2025)

3. **M. Verostek**, C.W. Miller, and B. Zwickl. *"It was awkward to leave, and I wish it wasn't": Physics PhD students' perceptions about switching research groups*, in Proceedings of the 2024 Physics Education Research Conference, PER Conference (Boston, MA, 2024).

4. M. Foster, M. Dunham, C. Cammarota, **M. Verostek**, B. Zwickl, and T. Wong. *Toward an Assessment of Students' (Social) Computational Literacy*, in Proceedings of the 17th International Conference on Computer-Supported Collaborative Learning, International Society of the Learning Sciences (Buffalo, NY, 2024).

5. **M. Verostek**, C.W. Miller, and B. Zwickl. *Inequities and misaligned expectations in PhD students' search for a research group*, in Proceedings of the 2023 Physics Education Research Conference, PER Conference (Sacramento, CA, 2023).

6. **M. Verostek**, M. Griston, J. Botello, and B. Zwickl. *Making expert cognitive processes visible: planning and preliminary analysis in theoretical physics research*, in Proceedings of the 2022 Physics Education Research Conference, PER Conference (Grand Rapids, MI, 2022).

7. **M. Verostek**, C.W. Miller, and B. Zwickl. *Time to PhD completion is no different between men and women despite score gap on physics GRE*, in Proceedings of the 2021 Physics Education Research Conference, PER Conference (Virtual Conference, 2021).

Presentations

Longer talks (30-60 minutes):

1. **M. Verostek**, B. Zwickl, and C. Miller. *Improving the experiences of physics PhD students by supporting their search for a research group*. American Association of Physics Teachers Summer Meeting, Washington DC, August 2025. (Invited oral presentation).

2. **M. Verostek**, D. Sachmpazidi, C. Turpen, J. Petrella, and S. Lee. *Centering community input in the design of survey tools to empirically assess cultural change in physics department*s. American Physical Society Global Physics Summit, Anaheim CA, March 2025. (Invited oral presentation).

3. **M. Verostek**, C.W. Miller, and B.M. Zwickl. *Graduate student perspectives on the importance and difficulty of finding a research group*. American Geophysical Union/American Geosciences Institute Heads & Chairs Webinar, virtual, March 2025. (Invited oral presentation)

4. **M. Verostek**, C.W. Miller, and B.M. Zwickl. *Physics Ph.D. student perspectives on the importance and difficulty of finding a research group*. Physical Review Journal Club, virtual, October 2024. (Invited oral presentation)

5. **M. Verostek** and B. Zwickl. *Computational literacy for education researchers: creating a qualitative data analysis pipeline*. Computational Literacy Across the Disciplines Workshop, University of Oslo, Oslo, Norway, May 2024. (Oral presentation)

6. **M. Verostek**, C.W. Miller, and B. Zwickl. *A call to improve support for Physics PhD students' search for a research group: problems and potential solutions*. AAAS SEA Change Webinar, virtual, March 2024. (Invited oral presentation)

7. **M. Verostek**, C.W. Miller, and B. Zwickl. *Inequities and misaligned expectations in PhD students' search for a research group*. University of Colorado Boulder, virtual, April 2023. (Invited oral presentation)

Shorter talks and posters:

1. **M. Verostek**, D. Sachmpazidi, J. Petrella, and C. Turpen. *Assessing the culture around systemic change in physics programs: A pilot study from 33 programs in the United States.* Physics Education Research Conference, Washington, DC, August 2025. (Poster)

2. **M. Verostek**, D. Sachmpazidi, C. Turpen, J. Petrella, and S. Lee. *Centering community input in the design of survey tools to empirically assess cultural change in STEM departments.* SABER East, Rochester, NY, May 2025. (Oral presentation)

3. **M. Verostek**, A.R. Piña, and B.M. Zwickl. *Transforming Data Sharing: The Role of Streamlit in Enhancing Research Transparency*. American Physical Society Global Physics Summit, Anaheim, CA, March 2025. (Oral presentation)

4. **M. Verostek**, C.W. Miller, and B. Zwickl. *"It was awkward to leave and I wish it wasn't": Physics PhD students' perceptions about switching research groups.* Physics Education Research Conference, Boston, MA, July 2024. (Poster)

5. **M. Verostek**, C.W. Miller, and B. Zwickl. *How variation in research interest development affects PhD students' search for a research group.* American Association of Physics Teachers Summer Meeting, Boston, MA, July 2024. (Oral presentation)

6. **M. Verostek**, C.W. Miller, and B. Zwickl. *To rotate or not to rotate: comparing advisor selection processes in biology and physics PhD programs and their impacts on graduate students.* SABER East, Rochester, NY, May 2024. (Oral presentation)

7. **M. Verostek**, C.W. Miller, and B. Zwickl. *Finding a research group increases sense of belonging, but struggling to find a group increases likelihood of attrition.* American Physical Society April Meeting, Sacramento, CA, April 2024. (Oral presentation)

8. **M. Verostek**, C.W. Miller, and B. Zwickl. *Inequities and misaligned expectations in PhD students' search for a research group.* Physics Education Research Conference, Sacramento, CA, July 2023. (Poster)

9. **M. Verostek**, T. Wong, B. Zwickl, K. Patterson, and M. MacIntyre. *Social Aspects of Computation Used by Researchers in Physics and Other STEM Disciplines.* American Association of Physics Teachers Summer Meeting, Sacramento, CA, July 2023. (Oral presentation)

10. **M. Verostek**, C.W. Miller, and B. Zwickl. *Inequities and misaligned expectations in PhD students' search for a research group*. Cornell University, Ithaca, NY, June 2023. (Oral presentation)

11. **M. Verostek**, C.W. Miller, and B. Zwickl. *Inequities and misaligned expectations in PhD students' search for a research group*. XDBER 2023, virtual, April 2023. (Oral presentation)

12. **M. Verostek**, M. Griston, J. Botello, and B. Zwickl. *Making expert processes visible: planning and preliminary analysis in theoretical physics research.* Physics Education Research Conference, Grand Rapids, MI, July 2022. (Poster)

13. **M. Verostek**, M. Griston, J. Botello, and B. Zwickl. *Making expert processes visible: how and why theorists use analogies in their research*. American Association of Physics Teachers Summer Meeting, Grand Rapids, MI, July 2022. (Oral presentation)

14. **M. Verostek**, B. Zwickl, and C.W. Miller. *Time to PhD completion is no different between men and women despite score gap on physics GRE.* Physics Education Research Conference, virtual, July 2021. (Poster)

15. **M. Verostek**, B. Zwickl, and C.W. Miller. *Do admissions metrics predict PhD completion directly, or indirectly through graduate GPA?*. American Association of Physics Teachers Summer Meeting, virtual, July 2021. (Oral presentation)

16. **M. Verostek**, B. Zwickl, and C.W. Miller. *Do admissions metrics predict PhD completion directly, or indirectly through graduate GPA?*. American Physical Society April Meeting, virtual, April 2021. (Oral presentation)

17. **M. Verostek**, B. Zwickl, and C.W. Miller. *Do admissions metrics predict PhD completion directly, or indirectly through graduate GPA?.* XDBER 2021, virtual, March 2021. (Poster)

18. **M. Verostek** and B. Zwickl. *Creating interdisciplinary pathways into quantum careers: opportunities for physics departments.* American Association of Physics Teachers Summer Meeting, virtual, July 2020. (Oral presentation)

Mentored Student Contributions

Mentees' peer-reviewed conference proceedings:

1. A. Claar, A. Kunz, D. Sachmpazidi, M. Verostek, D. Codding, S. Woods, B. Goldberg, and G. Cochran. *Mapping structural equity with departmental profiles in physics graduate education*, in Proceedings of the 2025 Physics Education Research Conference, PER Conference (Washington, DC, 2025).

2. D. Ryder, **M. Verostek**, and B. Zwickl. *Tools for Understanding the Microscopic World of Quantum Mechanics: Analogies in Textbooks*, in Proceedings of the 2023 Physics Education Research Conference, PER Conference (Sacramento, CA, 2023).

3. M. Griston, J. Botello, **M. Verostek**, and B. Zwickl. *When the light bulb turns on: motivation and collaboration spark the creation of ideas for theoretical physicists*, in Proceedings of the 2021 Physics Education Research Conference, PER Conference (Virtual Conference, 2021).

Mentees' conference presentations:

1. A. Camacho, K. Dorsey, **M. Verostek**, T. Wong, and B. Zwickl. *Exploring Documentation in Social Computational Literacy Across Disciplines*. RIT Undergraduate Research Symposium, Rochester, NY, August 2023.

2. K. Patterson, M. MacIntyre, **M. Verostek**, T. Wong, and B. Zwickl. *Variation in Social Aspects of Computational Literacy across Science Fields*. RIT Undergraduate Research Symposium, Rochester, NY, August 2022.

3. M. MacIntyre, K. Patterson, **M. Verostek**, T. Wong, and B. Zwickl. *Material and Cognitive Aspects of Computational Literacy in the Sciences*. RIT Undergraduate Research Symposium, Rochester, NY, August 2022.

4. M. Griston, J. Botello, **M. Verostek**, and B. Zwickl. *When the light bulb turns on: motivation and collaboration spark the creation of ideas for theoretical physicists*. Physics Education Research Conference, virtual, August 2021.

5. M. Griston, J. Botello, **M. Verostek**, and B. Zwickl. *When the light bulb turns on: motivation and collaboration spark the creation of ideas for theoretical physicists*. RIT Undergraduate Research Symposium, virtual, August 2020.

Academic & Community Service

CASTLE Journal Club organizer **2023-2025**

Managed weekly journal club meetings for Rochester Institute of Technology's Center for Advancing Scholarship to Transform Learning. Responsibilities included collecting and disseminating articles from peer researchers and maintaining a calendar of meetings.

Rochester Education Justice Initiative **2022-2025**

Taught physics to incarcerated individuals in Attica Correctional Facility and Groveland Correctional Facility. Recruited and shared instructional material with two other physics graduate students who taught similar courses for REJI.

First-year Graduate Student Mentor **2021-2023**

Provided support for helping first-year physics graduate students at the University of Rochester become socialized into the department. Responsibilities included meeting with mentees weekly to give feedback and advice on teaching, helping with coursework, and facilitating social activities.

Graduate Teaching Assistant Training **2019-2020**

Selected by the University of Rochester physics department to participate in a six-week teaching development course in order to deliver a workshop to incoming STEM Ph.D. students on implementing effective teaching strategies.

Manuscript Peer Review

Physical Review Physics Education Research, American Journal of Physics, The Physics Teacher, Acta Psychologica

Professional Associations

American Physical Society	2021-present
American Association of Physics Teachers	2020-present
Inclusive Graduate Education Network	2020-present
Phi Beta Kappa	2016-present
Sigma Xi	2016-present

Awards

CASTLE Recognition of Excellence **2024**

Rochester Institute of Technology's Center for Advancing Scholarship to Transform Learning award for excellence in service

Southworth Prize in Physics **2016**

Awarded to a senior who excels in physics at Hamilton College