

Jason M. May — Department of Physics & Astronomy — University of Utah
March 2021

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Education

Ph.D. Candidate in Physics, University of Utah	Fall 2017-Present
Research Area: Physics Education Research	
Committee: Jordan Gerton (Chair), Lauren Barth-Cohen, Claudia De Grandi, Pearl Sandick, Michael Vershinin	
M.S. in Physics, University of Utah	Fall 2017-Spring 2020
B.S. (Magna Cum Laude) in Physics, Boise State University	Fall 2012-Spring 2017
Emphasis: Secondary Education	

Fellowships and Awards

National Science Foundation Graduate Research Fellow	Fall 2019-Present
National Science Foundation	
Physics & Astronomy Diversity Award	Spring 2020
Department of Physics & Astronomy, University of Utah	
Outstanding Teaching Assistant Award	Spring 2018
Department of Physics & Astronomy, University of Utah	
Barbara Lotze Endowed Scholarship for Future Teachers	Jan 2017
American Association of Physics Teachers	
Micron & Noyce Internship	Summer 2016
IDoTeach Program, Boise State University	
Barbara Lotze Endowed Scholarship for Future Teachers	Jan 2016
American Association of Physics Teachers	
Micron Scholarship	Spring 2015
IDoTeach at Boise State University	

Grants

Exploring Students' Learning of Data Analysis in a Three-Dimensional Lab Environment, National Science Foundation (DUE-IUSE, #1938721) Lauren Barth-Cohen (PI), Jordan Gerton (Co-PI), Claudia De Grandi (Co-PI), and David Goldenberg (Co-PI). \$299,191. (05/20-04/23).

- Co-wrote grant with PI and Co-PIs
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Publications and Presentations

- May, J.**, De Grandi, C., Gerton, J., Barth-Cohen, L., Beehler, A., & Montoya, B. (submitted). Bringing Three-Dimensional Learning to Undergraduate Physics: Insights from an Introductory Physics Laboratory Course. *American Journal of Physics*.
- Adams, A., **May, J.**, Barth-Cohen, L., & De Grandi, C. (2021, accepted). Developing an Assessment to Investigate Data Analysis in Introductory Physics. Paper submitted to the *2021 Annual Meeting of the American Educational Research Association (AERA)*.
- May, J.** & Barth-Cohen, L. (2021). Students' Dynamic Framing of Epistemic Agency. In E. de Vries, J. Ahn, & Y. Hod (Eds.), *Proceedings of International Conference of the Learning Sciences (ICLS) 2021*. Bochum, Germany: International Society of the Learning Sciences.
- May, J.**, De Grandi, C., Gerton, J. M., & Beehler, A. (2021). Bringing Argument-Driven Inquiry into IPLS Labs. Contributed talk presented at the *2021 American Association of Physics Teachers (AAPT) National Meeting*. Virtual meeting. Contributed Talk, Presented, 01/2021.
- May, J.**, Barth-Cohen, L., Gerton, J. M. & De Grandi, C. (2020). Students' dynamic engagement with experimental data in a physics laboratory setting. *Physics Education Research Conference (PERC) Proceedings*.
- May, J.**, De Grandi, C., Gerton, J. M. & Barth-Cohen, L. (2020). Three-Dimensional Learning in Introductory Physics for Life Sciences Laboratory Courses. Poster presented at the *2020 American Association of Physics Teachers (AAPT) National Meeting*. Grand Rapids, MI. Poster, Submitted, 07/23/2020.
- May, J.** & Barth-Cohen, L. (2019). Exploring Students' Enactment of Data Analysis Practices in Interdisciplinary IPLS Laboratory Courses. Poster presented at the *2019 Physics Education Research Conference (PERC)* as supported by the *American Association of Physics Teachers (AAPT) National Meeting*. Provo, Utah. Poster, Submitted, 07/25/2019.
- May, J.**, Gerton, J., De Grandi, C., Barth-Cohen, L., & Montoya, B. (2019). Implementation and Adaption of Evidence-Based IPLS Laboratories. Poster presented at the *2019 American Association of Physics Teachers (AAPT) Annual Conference*, Provo, Utah. Poster, Submitted, 07/22/2019.
- May, J.**, Gerton, J., De Grandi, C., Barth-Cohen, L., & Montoya, B. (2019). Student Surveys and Mindset Interventions: Analysis from Reformed IPLS Labs. Poster presented at the *2019 American Association of Physics Teachers (AAPT) Annual Conference*, Provo, Utah. Poster, Submitted, 07/22/2019.
- Gerton, J. M., **May, J. M.**, De Grandi, C., Barth-Cohen, L., Corwin, L., & Shorter, S. (2019). Exploring Mindset and Response to Failure in Reformed IPLS Labs. Contributed talk at the *2019 American Association of Physics Teachers (AAPT) Annual Conference*, Provo, Utah. Contributed Talk, Presented, 07/2019.
- Bryant, S., Shrestha, N., Carnig, P., Kosydar, S., Belzeski, P., **May, J.**, McDaid, L., & Fologea, D. (2016). Mechanism of Interaction between Adenosine Phosphates and Lysenin Channels. Poster presented at the *2016 Biophysical Society Meeting*, Los Angeles, USA. Poster, Submitted, 03/2016.
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Research Projects

Graduate Research Assistant

Spring 2018-Present

Exploring Students' Learning of Data Analysis in a Three-Dimensional Lab Environment

Research Advisors: Lauren Barth-Cohen, Jordan Gerton, & Claudia De Grandi

- The purpose of this project is to advance understanding of how undergraduate students learn and develop experimental data-based skills while reasoning about complex biological and physical systems. To do so, it will build on complementary scholarship in mathematics education, computational thinking, and undergraduate laboratory instruction. Students' engagement with experimental data is a crucial and primary practice for knowledge building in these settings, where the intention is to build a conceptual understanding through iterations of data collection, cleaning, manipulation, mathematics, and interpretation. This project will use class observations and interviews to develop a new theoretical understanding of students' learning and enactment of data analysis. That new understanding will guide the design and validation of a task-based assessment tool and a student attitudes and perceptions

survey. Information from the assessment and survey will in turn be used to gain insight into students' conceptual shifts.

- Collected, coded, and analyzed observational data of student groups in laboratory settings to investigate students' mechanisms of enacting data-based action in lab environments.
- Developed open-response pre/post task-based assessment and corresponding interview protocol through: a) consultation with biology and physics experts, b) think-aloud interviews with STEM faculty and graduate students, and c) conducted think-aloud and pilot interviews with graduate and undergraduate students in STEM fields. Currently overseeing interview analysis that is investigating how students engage in sense-making processes when recognizing and handling complex erroneous experimental data.
- Mentoring undergraduate researchers and junior graduate students in various research project activities and manuscript development.

Undergraduate Research Assistant

Summer 2015

Single Molecule Characterization and Controlled Transport Using Lysenin Channels

Research Advisors: Daniel Fologea

- Production of synthetic lipid membranes embedded with pore-forming protein lysenin synthetic lipid membrane.
- Analysis of single-molecule identification and motility through lysenin lipid membrane channels using electrophysiology and fluorescence spectroscopy.

Undergraduate Research Assistant

Spring 2015-Fall 2016

Assessing Teachers' Ability to Interpret and Respond to Students' Mathematical Thinking

Research Advisors: Michele Carney

- Co-developed, implemented, and collected student artifacts from K-12 classroom students designed to elicit students' mathematical thinking through open-ended questions.
- Analyzed student artifacts using qualitative coding methods to identify themes and patterns in students' mathematical thinking.
- Analyzed teachers' interpretations and responses to students' mathematical thinking via open-ended questions using qualitative coding methods.

Teaching Experience

Mentor Teaching Assistant

Summer 2019-Fall 2020

Department of Physics & Astronomy, University of Utah

- Serving as Mentor Teaching Assistant (TA) for PHYS 2015 and PHYS 2025, introductory physics laboratories for life sciences (*IPL²S*, see **Curriculum Development Projects**)
- Consulted with faculty instructors on development and refinement of laboratory curriculum, course documentation, and pedagogical practices.
- Led weekly instructional team grading and preparatory meetings with graduate student TAs and undergraduate Learning Assistants (LAs).
- Co-organized departmental TA orientation for incoming graduate students to learn about pedagogical techniques, departmental policy, and relevant learning theories.
- Observed and mentored department TAs to provide pedagogical feedback and support and bolster the educational community within the department.

Teaching Assistant

Fall 2017-Spring 2019

Department of Physics & Astronomy, University of Utah

- Taught weekly laboratory sessions for undergraduate life science and other non-physics majors students.
- Led weekly instructional team grading and preparatory meetings with graduate student TAs and undergraduate Learning Assistants (LAs).

Undergraduate Laboratory Instructor

Spring 2015-Spring 2017

Department of Physics, Boise State University

- Taught PHYS 101-L, a one-semester introductory, algebra-based physics laboratory course for non-science majors, and PHYS 211-L, the first of a two-semester sequence of introductory, calculus-based physics laboratory courses for physics and engineering majors.

Curriculum Development Projects

Graduate Teaching Assistant Orientation

Summer 2019-Current

Department of Physics & Astronomy, University of Utah

- Developed an implemented two-week intensive orientation for incoming graduate students to train and support them in their roles as teaching assistants.
- Orientation included: Teaching Pedagogies and Learning Theories, Scientific Inquiry, Online Instruction, Implicit Bias and Discrimination in the Classroom, and Diversity, Equity, and Inclusion in the Classroom.

Intro Physics Labs for Life Sciences (IPL²S)

Fall 2017-Fall 2020

Department of Physics & Astronomy, University of Utah

Project Lead: Jordan Gerton

- The purpose of this project is to iteratively reform the algebra-based introductory physics laboratory courses at the University of Utah using recent curricular reform efforts in the *Introductory Physics for Life Sciences (IPLS)* community. Reform efforts have produced a novel approach to teaching 21st century scientific practices in a research-based laboratory setting, aligned with NGSS 3D Learning and Argument-Driven Inquiry instructional model. Students in these courses work in groups to investigate biological and physical phenomena (e.g. biological kinematics, molecular motors, electrophoresis, axonal signal transport) using complex experimental apparatus and methods.
- Led instructional reform team, at the direction of Dr. Jordan Gerton, in the complete redesign of two-semester course sequence, based on IPLS curriculum developed from Project NEXUS at University of Maryland, College Park. This redesign included iterations of testing and rewriting laboratory curriculum, testing laboratory equipment, reviewing literature on undergraduate laboratory instruction and student learning, and consultation with faculty from the Department of Physics & Astronomy, School of Biological Sciences, Department of Mathematics, and School of Medicine.
- Mentored over 25 graduate TAs and undergraduate LAs during the course reform process to introduce pedagogical techniques necessary for proper instruction in the course.

Modeling and Data Analysis Literacy (MoDAL)

Fall 2015-Summer 2016

Boise State University

Project Leads: Michele Carney and Joe Champion

- Developed mathematics and statistics curriculum that emphasizes student interactions with digital educational interfaces focusing on modeling and literacy with quantitative data.

- Served as facilitator of 2016 Data & Statistics Workshop (professional development), including corresponding with and collecting student artifacts from over 100 secondary teachers across Idaho, crafting and managing website and online documents for workshop participants, and drafting project reports for project leads.

Professional Development

2021 PEER-Chicago Workshop	Summer 2021
2019 National Teaching Assistant Workshop	May 2019

Service and Outreach

Peer Review

Reviewer , 2021 Annual Meeting of the International Society of the Learning Sciences	Fall 2020
Reviewer , 2021 Annual International NARST Conference	Fall 2020
Reviewer , 2020 Proceedings of the Physics Education Research Conference (PERC)	Summer 2020

American Association of Physics Teachers

AAPT Summer 2020 Meeting , Session Organizer	Summer 2020
Session Title: Exploring the Implementation of the NGSS Framework in Undergraduate Science Disciplines	

University of Utah

College of Science Scholarship and Awards Committee , GSAC Representative	2020-2021
Graduate Student Advisory Council , Chair	Aug 2020-Present
Graduate Student Advisory Council , Chair-Elect	Aug 2019-July 2020
Graduate Student Advisory Council , Member	Aug 2018-Jul 2019

IDoTeach, Boise State University

STEM Educators Club , President and Founder	2016-2017
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Professional Membership

International Society for the Learning Sciences , Member	2020-Present
American Association of Physics Teachers , Member	2018-Present
