Nicholas T. Young

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Email: ntyoung@umich.edu
Web: nickyoungper.com

Education

Michigan State University

PhD in Physics, Computational Mathematics, Science, and Engineering — 2021

Dissertation: *The Past, Present, and Future of Graduate Admissions in Physics*

Advisor: Marcos "Danny" Caballero

MS in Physics — 2020

Ohio State University

BS in Physics and Astronomy/Astrophysics — 2017

Appointments

Postdoctoral Fellow — 2021-

Center for Academic Innovation, University of Michigan

Publications

Peer-Reviewed Journal Articles

6. **Nicholas T. Young**, Marcos D. Caballero. Predictive and explanatory models might miss informative features in educational data. *Journal of Educational Data Mining*, 13 (4), 2021

5. **Nicholas T. Young**, Marcos D. Caballero. Physics Graduate Record Exam does not help applicants "stand out." *Physical Review Physics Education Research*, 17:010144, 2021

4. Nils J. Mikkelsen, **Nicholas T. Young**, Marcos D. Caballero. Investigating institutional influence on graduate program admissions by modeling physics Graduate Record Examination cutoff scores. *Physical Review Physics Education Research*, 17:010109, 2021

3. Dehui Hu, Kingston Chen, Anne E. Leak, **Nicholas T. Young**, Brianna Santangelo, Benjamin M. Zwickl, and Kelly Norris Martin. Characterizing mathematical problem solving in physics-related workplaces using epistemic games. *Physical Review Physics Education Research*, 15:020131, 2019

2. **Nicholas T. Young**, Grant Allen, John M. Aiken, Rachel Henderson, and Marcos D. Caballero. Identifying features predictive of faculty integrating computation into physics courses. *Physical Review Physics Education Research.* 15:010114, 2019

1. **Nicholas T. Young** and Andrew F. Heckler. Observed hierarchy of student proficiency with period, frequency, and angular frequency. *Physical Review Physics Education Research.* 14:010104, 2018

Peer-Reviewed Conference Proceedings

6. **Nicholas T. Young**, Briley L. Lewis, Emily Kerr, Prasanth H. Nair. Using blogs to make peer-reviewed research more accessible. Submitted to *Proceedings of the 2022 Physics Education Research Conference, 2022*

5. Sarah Jane Bork, **Nicholas T. Young**, Joi-Lynn Mondisa. Exploring the Relationship Between Culture and Science, Engineering, and Mathematics Graduate Students' Mental Health. *American Association of Engineering Educations Annual Conference 2022*

4. **Nicholas T. Young** and Marcos D. Caballero. Using Machine Learning to Understand Physics Graduate School Admissions. In *Proceedings of the 2019 Physics Education Research Conference*, 2019

3. **Nicholas T. Young**, Brianna Santangelo, Kelly Norris Martin, Anna E. Leak, and Benjamin M. Zwickl. Models of Math Use in Non-Academic Workplace Settings. In *Proceedings of the 2017 Physics Education Research Conference*, 2017

2. Brianna Santangelo, **Nicholas T. Young**, Anna E. Leak, Kelly Norris Martin, and Benjamin M. Zwickl. Integration of mathematics and communication in physics-intensive workplaces. In *Proceedings of the 2017 Physics Education Research Conference*, 2017

1. J. R. Smith, A. Byrum, T. M. McCormick, **Nicholas T. Young**, Christopher Orban, and C. D. Porter. A Controlled Study of Stereoscopic Virtual Reality in Freshman Electrostatics. In *Proceedings of the 2017 Physics Education Research Conference*, 2017

Under Review Journal Articles

3. **Nicholas T. Young**, K. Tollefson, Remco G. T. Zegers, Marcos D. Caballero. Rubric-based holistic review: a promising route to equitable graduate admissions in physics (*arXiv physics.ed-ph:2110.04329*)

2. **Nicholas T. Young**, N. Verboncoeur, Dao Chi Lam, Marcos D. Caballero. Rubric-based holistic review represents a change from traditional graduate admissions approaches in physics (*arXiv physics.ed-ph: 2112.06886*)

1. **Nicholas T. Young**, Rebecca L. Matz, Eric F. Bell, Caitlin Hayward. How researchers calculate students' grade point average in other courses has minimal impact

Under Review Conference Proceedings

1. Rebecca L. Matz, **Nicholas T. Young**, Caitlin Hayward. Faculty Interpretations of Course Equity Data. *American Educational Research Association* 2023 Annual Meeting

In preparation

2. Victoria S. Farrar, Montserrat Valdivia Medinaceli, **Nicholas T. Young**, Emily Bonem, Stefano Fiorini, Benjamin Koester, Rebecca L. Matz, Natalia Caporale. Equity gaps associated with student demographics persist into upper-division biology courses across multiple institutions

1. **Nicholas T. Young**, Mark Mills, Rebecca L. Matz, Eric F. Bell, Caitlin Hayward. Complex multiple-choice are more difficult than traditional multiple-choice questions but do not increase inequity in introductory physics

Awards and Fellowships

Best student paper, American Society of Engineering Educators Annual Conference	2022
Best platform presentation by visiting researcher, Wayne State University Graduate Research Symposium	2022
Physical Review PER Editor's Suggestion: Physics Graduate Record Exam does not help applicants "stand out"	2021
American Association for the Advancement of Science Mass Media Fellowship	2021
Michigan State University College of Natural Science Dissertation Completion Fellowship	2021
Michigan State University Hub for Innovation in Learning and Technology Graduate Fellowship	2020
Physics Education Research Conference Proceedings Notable Paper	2019
Michigan State University College of Natural Science Recruiting Fellowship	2017

Invited Talks

3. **Nicholas T. Young**. Making your science understandable. American Physical Society March Meeting — 2022

2. **Nicholas T. Young**, Grant Allen, John M. Aiken, Rachel Henderson, and Marcos D. Caballero. Why physics instructors choose to include computation in their courses. Partnership for Integrating Computation into Undergraduate Physics (PICUP) Capstone Conference — 2021

1. **Nicholas T. Young**, Marcos D. Caballero. Addressing Rare Outcomes in PER Quantitative Studies. American Association of Physics Teachers Winter Meeting — 2021

Conference activity

Contributed talks

8. **Nicholas T. Young**. Using Random Forest to Study Physics Graduate School Admissions. Physics Education Research Conference, Grand Rapids, Michigan — 2022

7. **Nicholas T. Young**, Mark Mills, Rebecca L. Matz, Eric Bell, and Caitlin Hayward. Who Answers Complex Multiple-choice Questions in Physics Correctly? American Association of Physics Teachers Summer Meeting, Grand Rapids, Michigan — 2022

6. **Nicholas T. Young**, Rebecca L. Matz, Heather Rypkema, Susan Cheng, Holly Derry, W. Carson Byrd, Ben Koester, Eric Bell, and Caitlin Hayward. Developing Course Equity Reports to Understand and Reduce Inequity in University of Michigan Classes. Data for Public Good Symposium, Ann Arbor, Michigan — 2022

5. **Nicholas T. Young**, Nicole Verboncoeur, Marcos D. Caballero. Rethinking Physics Graduate Admissions for a Post-Covid World. American Physical Society April Meeting (virtual) — 2021

4. **Nicholas T. Young**, Marcos D. Caballero. The Physics GRE does not help "overlooked" applicants. American Association of Physics Teachers Summer Meeting (virtual) — 2020

3. **Nicholas T. Young**, Marcos D. Caballero. Using Machine Learning to Understand Physics Graduate School Admissions. American Association of Physics Teachers Summer Meeting, Provo, Utah — 2019

2. **Nicholas T. Young**, Marcos D. Caballero. Using Machine Learning to Predict Integrating Computation into Physics Courses. American Association of Physics Teachers Summer Meeting, Washington D.C — 2018

1. **Nicholas T. Young**, Andrew F. Heckler. Modeling Student Understanding of Period, Frequency, and Angular Frequency. American Association of Physics Teachers Summer Meeting, Cincinnati, Ohio — 2017

Poster Presentations

11. **Nicholas T. Young**, Briley L. Lewis, Emily Kerr, Prasanth H. Nair. Using blogs to make peer-reviewed research more accessible. Physics Education Research Conference, Grand Rapids, Michigan — 2022

10. **Nicholas T. Young**, Mark Mills, Rebecca L. Matz, Eric Bell, and Caitlin Hayward. Who Answers Complex Multiple-choice Questions in Physics Correctly? American Association of Physics Teachers Summer Meeting, Grand Rapids, Michigan — 2022

9. **Nicholas T. Young**, Aalayna Green, Caroline Blommel, Ellie Louson. Developing a Faculty-Facing Resource for Experiential Interdisciplinary Undergraduate Teaching, xDBER (virtual) — 2021

8. **Nicholas T. Young**, Marcos D. Caballero. Addressing Rare Outcomes in PER Quantitative Studies. American Association of Physics Teachers Winter Meeting (virtual) — 2021

7. **Nicholas T. Young**, Marcos D. Caballero. The Physics GRE does not help "overlooked" applicants. American Association of Physics Teachers Summer Meeting (virtual) — 2020

6. **Nicholas T. Young**, Marcos D. Caballero. Using Machine Learning to Understand Physics Graduate School Admissions. American Association of Physics Teachers Summer Meeting, Provo, Utah — 2019

5. **Nicholas T. Young**. PERbites. Communicating Science Conference – American Institute of Physics, College Park, Maryland — 2019

4. **Nicholas T. Young**, Marcos D. Caballero. Using Machine Learning to Predict Integrating Computation into Physics Courses. American Association of Physics Teachers Summer Meeting, Washington D.C — 2018

3. **Nicholas T. Young**, Marcos D. Caballero. Using Machine Learning to Predict Integrating Computation into Physics Courses. Spring Meeting of the APS Ohio-Region Section and the AAPT Michigan Section, East Lansing, Michigan — 2018

2. **Nicholas T. Young**, Andrew F. Heckler. Modeling Student Understanding of Period, Frequency, and Angular Frequency. American Association of Physics Teachers Summer Meeting, Cincinnati, Ohio — 2017

1. **Nicholas T. Young**, Brianna Santangelo, Kelly Norris Martin, Anne E. Leak, Benjamin M. Zwickl. Models of Math Use in Non-Academic Workplace Settings. Physics Education Research Conference, Cincinnati, Ohio — 2017

Popular press	3. **Nicholas T. Young**, Heather Rypkema, Eric Bell. Leveraging Institutional Data to Advance Equity in STEM Courses *American Association for the Advancement of Science (AAAS) Improving Undergraduate STEM Education (IUSE) blog*	2022
	2. **Nicholas T. Young**. Eliminating the GRE *Physics Today*	2021
	1. **Nicholas T. Young**.I know some algorithms are biased-because I created one *Scientific American*	2019
Supervised personnel	**Undergraduate students supervised on research**	
	5. Julia Marchese (University of Michigan)	
	4. Chi Dao Lam (Michigan State University)	
	3. Nicole Verboncoeur (Michigan State University)	
	2. Tabitha Hudson (Michigan State University)	
	1. Nils Johannes Mikkelsen (University of Oslo)	
Teaching experience	**Teaching assistant, Lyman Briggs College (Michigan State University)** Physics II	Spring 2019
	Teaching assistant, Lyman Briggs College (Michigan State University) Physics I	Fall 2018
Service and outreach	2023 APS Graduate Education Conference steering committee member	2022-
	Peer Reviewer *Physical Review Physics Education Research*	2022-
	Peer Reviewer *Education Sciences*	2022-
	American Association of Physics Teachers Committee on Graduate Education in Physics member	2020-
	PERbites blog writer and editor in chief	2018-
	Peer Reviewer *Physics Education Conference Proceedings*	2017-
	Cientifico Latino Graduate School Mentorship Initiative mentor	2019-2022
	MSU Physics Education Research Lab webmaster	2018-2021
	Letters to a Pre-Scientist pen pal	2019-2020
	Undergraduate Research Mentor, Thon Summer Undergraduate Research Program, University of Oslo, Norway	2019
	Science and Leadership at Michigan State (SL@MS) summer camp volunteer	2018-2019
Training and certifications	Rackham Professional Development Diversity, Equity, and Inclusion Certificate	In progress
	MSU Knight Center for Environmental Journalism's Science Communication Workshop	2020
	MSU Graduate School Science Writing for News Outlets	2020

	Certificate in Science Communication, Center for Interdisciplinary Exploration and Research in Astrophysics, Northwestern University	2019
	Michigan State University Digital Presences and Public Scholarship Fellows Program Blogging Workshop	2019
	Certificate in Inclusive Inquiry STEM Education, Institute for Scientist & Engineer Educators, University of California Santa Cruz	2019
Professional memberships	American Physical Society	2022-
	American Association of Physics Teachers	2017-