Nicholas T. Young

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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

Center for Academic Innovation, University of Michigan — 2021-

Publications

Peer-Reviewed Journal Articles

8. **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 *Physical Review Physics Education Research*, 19:010134, 2023
7. **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 *Physical Review Physics Education Research*, 18:020140, 2022
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

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

2. **Nicholas T. Young**, Mark Mills, Rebecca L. Matz, Eric F. Bell, Caitlin Hayward. Complex multiple-choice questions are inequitable for low-income and domestic students (and difficult for everyone)
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

In preparation

1. 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

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

Conference 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

Colloquium

1. Toward a More Equitable and Effective Physics Graduate Admissions Process. Departmental Colloquium, University of Oklahoma — 2023

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

5. **Nicholas T. Young**, Caitlin Hayward, Eric F. Bell. The gap between physics bachelor's recipients and grad school spots is growing *Physics Today* 2023
4. **Nicholas T. Young**, Kirsten Tollefson, Marcos D. Caballero. Making graduate admissions in physics more equitable *Physics Today* 2023
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

2. **Teaching assistant, Lyman Briggs College (Michigan State University)** — Spring 2019
   Physics II
1. **Teaching assistant, Lyman Briggs College (Michigan State University)** — Fall 2018
   Physics I

Service and outreach

- 2023 APS Graduate Education Conference steering committee member — 2022-
- Peer Reviewer *Physical Review Physics Education Research* — 2022-
- Peer Reviewer MDPI journals (*Education Sciences*, *Information*) — 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

6. Rackham Professional Development Diversity, Equity, and Inclusion Certificate — 2023
5. MSU Knight Center for Environmental Journalism's Science Communication Workshop — 2020
4. MSU Graduate School Science Writing for News Outlets — 2020
3. Certificate in Science Communication, Center for Interdisciplinary Exploration and Research in Astrophysics, Northwestern University — 2019
2. Michigan State University Digital Presences and Public Scholarship Fellows Program Blogging Workshop — 2019
1. Certificate in Inclusive Inquiry STEM Education, Institute for Scientist & Engineer Educators, University of California Santa Cruz — 2019

Professional memberships

1. American Association of Physics Teachers — 2017-