

# Nathan Thomas Moore

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## Education

Ph.D. Physics, University of Minnesota 2006.  
PhD Thesis: "Knot Entropy," thesis advisor A.Y. Grosberg.  
B.S. Applied Physics, Grove City College 2000

## Timeline

Professor of Physics Physics Chairperson	2015-present 2012-13, 2019-2022
Associate Professor of Physics	2010-2015
Assistant Professor of Physics	2005-2010
Winona State University	Winona, Minnesota
Blue Gene Science Application Analysis IBM	2005 Rochester, Minnesota
Research and Teaching Assistant Physics Department and Army HPCRC	2000-2005 University of Minnesota, Minneapolis

## Publications

"Three chapters of homework in 11 minutes?" Nathan Moore Phys. Teach. 63, 624–625 (2025) <https://doi.org/10.1119/5.0289962>

"How Many Acres of Potatoes Does a Society Need? Using Food and Historical Claims in an Energy Context." Nathan T. Moore Phys. Teach. 63, 595–599 (2025) <https://doi.org/10.1119/5.0193574>

"Don't throw that video away! Reference Frames can fix Video Analysis with a Moving Camera," Nathan T. Moore. IOP Physics Education. 59 (2024) 015029.  
<https://arxiv.org/abs/2301.00013>

"Inexpensive Student-fabricated Solar Panels and Some Related Classroom Measurements," Nathan T. Moore and Carl D. Ferkinhoff. Submitted.  
<https://arxiv.org/abs/1712.04029>

"A model for including Arduino microcontroller programming in the introductory physics lab," Andrew J. Haugen and Nathan T. Moore.  
Submitted. <https://arxiv.org/abs/1407.7613>

"Small Oscillations via Conservation of Energy," Tia Troy, Megan Reiner, Andrew J. Haugen, and Nathan T. Moore.  
(IOP) Physics Education, vol. 52, no. 6, 2017. <http://arxiv.org/abs/1407.5243>

"Using Cognitive Acceleration Materials to Develop Pre-Service Teachers' Reasoning and Pedagogical Expertise," Nathan Moore, Jacqueline O'Donnell, and Dennis Poirier. 2012 ASQ Advancing the STEM Agenda in Education, the Workplace and Society. (peer reviewed) <http://asq.org/qic/display-item/index.html?item=34852>

“Computational Physics and Reality: Looking for Some Overlap at the Blacksmith Shop”, Nathan Moore and Nicole Schoolmeesters, submitted.

<http://arxiv.org/abs/0904.3960>

“Using Garlic As A Far-Transfer Problem of Proportional And Probabilistic Reasoning”, Nathan Moore and John Deming, Mathematics Teacher, August 2010.

<http://arxiv.org/abs/0811.2133>

“Measuring the 2D Vector Aspect of Momentum Using Only One Dimension”, Andrew Ferstl and Nathan Moore, submitted.

<http://arxiv.org/abs/0803.4142/>

“Abundance of unknots in various models of polymer loops”, N.T. Moore and A.Y. Grosberg, J. Phys. A: Math. Gen. 39, 9081, (2006).

<http://arxiv.org/abs/cond-mat/0604225>

“On the Limits of Analogy Between Self-Avoidance and Topology-Driven Swelling of Polymer Loops”, N.T. Moore and A.Y. Grosberg, Phys. Rev. E 72, 061803 (2005).

<http://arxiv.org/abs/cond-mat/0506786>

“Topologically Driven Swelling of a Polymer Loop”, N.T. Moore, R.C. Lua, A.Y. Grosberg. Proc. Natl. Acad. Sci. USA 101(37), 13431-13435, (2004).

[http://arxiv.org/abs/cond-mat/0403419/](http://arxiv.org/abs/cond-mat/0403419)

“Under-knotted and over-knotted polymers: 1. Unrestricted loops”, N.T. Moore, R.C. Lua, A.Y. Grosberg, in Physical and Numerical Models in Knot Theory, Including Applications to the Life Sciences, Series on Knots and Everything 36 363-384 (World Scientific)

[http://arxiv.org/abs/cond-mat/0403457/](http://arxiv.org/abs/cond-mat/0403457)

“Under-knotted and over-knotted polymers: 2. Compact self-avoiding loops”, R.C. Lua, N.T. Moore, A.Y. Grosberg, in Physical and Numerical Models in Knot Theory, Including Applications to the Life Sciences, Series on Knots and Everything 36 385-398 (World Scientific)

[http://arxiv.org/abs/cond-mat/0403413/](http://arxiv.org/abs/cond-mat/0403413)

## Grants and Workshops

(2019) Winona State Digital Faculty Fellow: set up, develop problems for, and share awareness of the <https://www.lon-capa.org/> open-source homework system at Winona State.

(2017) With Hannah Leverenz,  $\approx \$25K$  to publicize “Open Educational Resources,” by organizing a series of <https://software-carpentry.org/> workshops at Minnesota State institutions.

(Summers 2012, 2013, & 2015) Modeling Instruction Workshop for secondary science teachers at Winona State University.

## Professional Associations

American Association of Physics Teachers

American Modeling Teachers’ Association (AMTA, life member).

IEEE Senior member, (2016–present).

Certified Software Carpentry Instructor, Dec 2016.

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