

Katherine N. Quinn

PhD, Physics

Cornell University

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Areas of Specialization

Condensed Matter Theory · Statistical Physics · Information Geometry · Physics Education Research

Education

Current **PhD, Physics**

Cornell University | Adviser: Prof. James Sethna

Graduate School Deans Scholar

Spring **Master of Science**

2016 Cornell University | Adviser: Prof. James Sethna

Spring **Bachelor of Science**

2013 Honours Mathematics and Physics

McGill University

Distinction, First Class Honours, Dean's Honour List

Spring **Pre-University DEC Science**

2010 John Abbot College

Dean's List

Teaching Experience

Fall **Teaching Assistant**

2018 Cornell, Waves and Thermal Physics

2017-2018 **Instructor and Curriculum Designer**

Cornell Prison Education Program

Introductory College-Level Conceptual Physics at Five Points Correctional Facility and Cayuga Correctional Facility

Spring **Grader and Guest Lecturer**

2018 Cornell, Basic Training in Condensed Matter Physics

2014-2017 **Graduate Teaching Assistant Training Facilitator**

Cornell Physics Department

Developed, Coordinated and Directed a the Cornell Physics Department's Teaching Assistant Training Program

2013-2015 **Teaching Assistant**

Cornell, Auto-Tutorial Section of Introductory Physics

Awards, Scholarships and Fellowships

- 2018 **Bouchet Graduate Fellow**
Graduate Honour Society
Inducted by Cornell Chapter
- 2015-2018 **Natural Sciences and Engineering Research Council (NSERC) Fellow**
Three-Year Canadian Postgraduate Scholarships-Doctoral
- 2013 **Hartman Memorial Endowment Fund Scholarship**
Cornell University Entrance Scholarship
- 2009 **J.W. McConnell Scholarship**
McGill University Entrance Scholarship

Peer-Reviewed Publications

- Current **Katherine N. Quinn**, Colin B. Clement, Francesco De Bernardis, Michael D. Niemack, and James P. Sethna.
Visualizing probabilistic models: Intensive Principal Component Analysis.
(Under Review with PNAS) <https://arxiv.org/abs/1810.02877>
- 2019 **Katherine N. Quinn**, Heather Wilber, Alex Townsend, and James P. Sethna.
Chebyshev approximation and the global geometry of model predictions.
Physical Review Letters **122** 158302
<https://link.aps.org/doi/10.1103/PhysRevLett.122.158302>
- 2019 Cole Walsh, **Katherine N. Quinn**, C. Wieman, and N.G. Holmes.
Quantifying critical thinking: Development and validation of the Physics Lab Inventory of Critical thinking (PLIC).
Physical Review, PER (Accepted, May 9 2019)
<https://arxiv.org/abs/1901.06961>
- 2019 **Katherine N. Quinn**, Kathryn L. McGill, Michelle M. Kelley, Emily M. Smith, and N.G. Holmes.
Who does what now? How physics lab instruction impacts student behaviors.
2018 Physics Education Research Conference Proceedings
<http://dx.doi.org/10.1119/perc.2018.pr.Quinn>
- 2019 Cole Walsh, **Katherine N. Quinn**, and N. G. Holmes.
Assessment of critical thinking in physics labs.
2018 Physics Education Research Conference Proceedings
<http://dx.doi.org/10.1119/perc.2018.pr.Walsh>
- 2018 **Katherine N. Quinn**, Carl E. Wieman, and N.G. Holmes.
Interview Validation of the Physics Lab Inventory of Critical thinking (PLIC).
2017 Physics Education Research Conference Proceedings pp. 234-237
<https://doi.org/10.1119/perc.2017.pr.076>

- 2017 James P. Sethna, Matthew K. Bierbaum, Karin A. Dahmen, Carl P. Goodrich, Julia R. Greer, Lorien X. Hayden, Jaron P. Kent-Dobias, Edward D. Lee, Danilo B. Liarte, Xiaoyue Ni, **Katherine N. Quinn**, Archishman Raju, D. Zeb Rocklin, Ashivni Shekhawat, and Stefano Zapperi.
Deformation of Crystals: Connections with Statistical Physics.
Annual Review of Materials Research **47** pp. 217-246
<https://doi.org/10.1146/annurev-matsci-070115-032036>
- 2013 **Katherine Quinn**, D.H. Ryan, P.C. Canfield, S.L. Bud'ko, and J.M. Cadogan.
A search for field-induced ordering in the optimally doped Ba(Fe,Co)2As2 superconductor.
Journal of Applied Physics **113** 17E127
<https://doi.org/10.1063/1.4795421>

Publications in Preparation

- Current **Katherine N. Quinn**, Mark K Transtrum, Ben Machta, and James Sethna.
Multiparameter models in physics.
(Invited by *Reports on Progress in Physics*)

Invited Talks

- 2019 Visualizing Probabilities: Intensive Principal Component Analysis
Theoretical Physics for Machine Learning
Aspen, Colorado
- 2018 Visualizing Probabilities: Intensive Principal Component Analysis
Machine Learning and Statistical Physics
New York City, New York
- 2018 Bounding Model Predictions and Visualizing Probabilistic Data
Princeton
Princeton, New Jersey
- 2018 Visualizing Probabilistic Models
Yale Bouchet Conference
New Haven, Connecticut

Contributed Talks

- 2018 Visualizing Theory Space: An isometric embedding of probabilistic predictions, from the Ising model to the cosmic microwave background
APS March Meeting
Los Angeles, California
- 2018 The Impact of Student Behaviour in Physics Lab Classes
American Association of Physics Teachers Summer Meeting
Washington, DC

- 2016 Cosmology & Cosmic Microwave Background
North Carolina Museum of Natural Sciences
Raleigh, North Carolina
- 2016 Information Geometry with Parameter Dependent Correlations in Data: a Bayesian Analysis of the Λ CDM Cosmological Model Predictions for the Cosmic Microwave Background
StatPhys 26
Lyon, France
- 2016 Information Geometry with Correlated Data: Bayesian Explorations of the Cosmological Predictions for the Microwave Background Radiation
APS March Meeting
Baltimore, Maryland

Contributed Poster Presentations

- 2018 The PLIC: Physics Lab Inventory of Critical Thinking
APS March Meeting
Los Angeles, California
- 2018 Who does what now? How physics lab instruction impacts student behaviors
Physics Education Research Conference
Washington, DC
- 2017 Interview validation of the Physics Lab Inventory of Critical thinking (PLIC)
American Association of Physics Teacher Summer Meeting
Cincinnati, Ohio

Professional Activities

- 2017-2018 **Reviewer**, Physics Education Research Conference
 Peer-reviewed paper submissions for the PERC 2017 and PERC 2018 proceedings
- 2016-
 Current **Graduate Student Ambassador**, Cornell Graduate School
 Assist Cornell Graduate School with Recruitment of Diverse Students
- 2017-2018 **Elected Representative**, Cornell University Assembly
 Representative of Cornell's Graduate & Professional Student Association
- 2017-2018 **Treasurer**, Cornell Graduate Women in Science
- Spring **Workshop Facilitator**, Expanding Your Horizons
 2017 Volunteer Facilitator of a Physics Workshop for Seventh and Eight Grade Girls
- 2016-2017 **Council Member**, Physics Diversity and Inclusion Council
 Graduate Representative for the Cornell Physics Department
- 2016 **Conference Organiser**, Women in Physics
 Planned and Organized Reunion Conference for Cornell Women in Physics 40th Anniversary
- 2016-2017 **President & Founding Member**, Cornell Graduate Women in Science

2015 **Vice-President**, out in Science, Technology, Engineering and Math (oSTEM)