

Noah Mitchell

University of California at Santa Barbara
Kavli Institute for Theoretical Physics & Department of Physics
Kohn Hall, Santa Barbara, CA 93106

npmitchell@kitp.ucsb.edu
+1 (507) 301-1283
Citizenship: USA

Current Appointment

KITP Postdoctoral Scholar Dec. 2018 - present
**Kavli Institute for Theoretical Physics &
University of California at Santa Barbara**
Mentors: Zvonimir Dogic & Boris Shraiman

Education & Training

2018 Ph.D. **University of Chicago**, Physics
Principal mentor: William T. M. Irvine
Other mentors: Heinrich Jaeger, Vincenzo Vitelli, Sid Nagel
Topics: Fracture, topological metamaterials, nanoparticle mechanics, turbulence
Thesis: Geometric Control of Fracture and Topological Metamaterials

2013 M.S. **University of Chicago**, Physics

2011-2012 **University of Minnesota**, undergraduate research assistant, visiting undergraduate
Mentor: Evan Skillman
Topics: Star formation in dwarf galaxies, galactic winds

2012 B.A. **St. Olaf College**, Physics, *summa cum laude, with distinction*
Mentor: David Nitz
Topics: Atomic spectroscopy of neutral Cerium

Awards

Yodh Prize for experimental physics, University of Chicago 2017
Best poster, Soft Condensed Matter Gordon Research Seminar 2017
Robert A. Millikan Fellow, University of Chicago 2015-16
Robert G. Sachs Fellow, University of Chicago 2013
McCormick Fellow, University of Chicago 2012-14
Wentzel Teaching Prize 2nd place, University of Chicago 2013
NSF GRFP Honorable Mention 2013
David B. Fossan Endowed Scholar, for excellence in Physics 2011-12
Buntrock Regent Scholar, highest academic scholarship, St. Olaf College 2008-2012
National Merit Scholarship 2008-2012

Publications

Condensed Matter Physics

- [9] **N. P. Mitchell**, R. Carey, J. Hannah, Y. Wang, M. Cortes, S. McBride, H. Jaeger.
“Conforming Nanoparticle Sheets to Surfaces with Gaussian Curvature.” *Soft Matter*, **14**,
9107-9117 (2018)
- [8] **N. P. Mitchell**, L. M. Nash, W. T. M. Irvine. “Tunable Band Topology in Gyroscopic
Lattices.” *Physical Review B*, **98**, 174301 (2018)
- [7] **N. P. Mitchell**, L. M. Nash, W. T. M. Irvine. “Realization of a Topological Phase Transition
in a Gyroscopic Lattice.” *Physical Review B Rapid* **97**, 100302(R) (2018).
- [6] **N. P. Mitchell**, L. M. Nash, D. Hexner, A. Turner, W. T. M. Irvine. “Amorphous

Topological Insulators Constructed from Random Point Sets.” *Nature Physics* **14**, 380-385 (2017).

- [5] **N. P. Mitchell**, V. Koning, V. Vitelli, W. T. M. Irvine, “Fracture in Sheets Draped on Curved Surfaces.” *Nature Materials* **16**, 89-93 (2016).

Astrophysics & Atomic Physics

- [4] K. B. W. McQuinn, E. D. Skillman, T. N. Heilman, **N. P. Mitchell**, T. Kelley. “Galactic Outflows, Star Formation Histories, and Timescales in Starburst Dwarf Galaxies from STARBIRDS.” *Monthly Notices of the Royal Astronomical Society* **477**, Issue 3, 1 January 1753, 3164-3177 (2018).
- [3] D. E. Nitz, J. J. Curry, M. Buuck, A. DeMann, **N. P. Mitchell**, W. Shull, “Transition Probabilities of Ce I Obtained from Boltzmann Analysis of Visible and Near-Infrared Emission Spectra.” *Journal of Physics B: Atomic, Molecular and Optical Physics* **51** 045007 (2018).
- [2] K. B. W. McQuinn, E. D. Skillman, A. E. Dolphin, **N. P. Mitchell**. “Calibrating UV Star Formation Rates for Dwarf Galaxies From STARBIRDS.” *The Astrophysical Journal* **808** 109 (2015).
- [1] K. B. W. McQuinn, **N. P. Mitchell**, E. D. Skillman. “The Panchromatic Starburst Irregular Dwarf Survey (STARBIRDS): Observations and Data Archive”, *The Astrophysical Journal Supplement Series* **218** 29 (2015).
Data archive published in the *Mikulski Archive for Space Telescopes (MAST)* (2015).

Invited Seminars

“Fracture in Sheets Draped on Curved Surfaces.” ETH Zürich, Switzerland. *April 17, 2018.*

“Spinning topology in ordered and amorphous metamaterials.”

University of Washington. *August 31, 2018.*

ETH Zürich, Switzerland. *April 19, 2018.*

New York University, NY. *April 11, 2018.*

University of California, Santa Barbara, CA. *March 29, 2018.*

LASSP Seminar, Cornell University, NY. *March 22, 2018.*

Syracuse University, NY. *March 19, 2018.*

Stanford University, CA. *March 1, 2018.*

“Chiral waves from spinning tops: topology without long-range order.” JFI Friday Seminar.

University of Chicago, IL. *August 25, 2017.*

“Guiding Cracks with Geometry.” James Franck Institute Friday Seminar.

University of Chicago, IL. *May 15, 2015.*

“Guiding Cracks with Geometry.” St. Olaf College Physics Colloquium Series.

St. Olaf College, MN. *April 29, 2015.*

“Geometrically Frustrated Fracture Mechanics.” SoftlMeta Matter Conference.

Chicago, IL. *September 30, 2014.*

Conference Talks

N. P. Mitchell, L. M. Nash, D. Hexner, A. M. Turner, W. T. M. Irvine. “Realization of a Topological Phase Transition in a Gyroscopic Lattice.” APS March Meeting. Los Angeles, CA. *March 6, 2018.*

N. P. Mitchell, L. M. Nash, D. Hexner, A. M. Turner, W. T. M. Irvine. “Amorphous Topological Insulators Constructed from Random Point Sets.” APS March Meeting. Los Angeles, CA. *March 6, 2018.*

- N. P. Mitchell**, L. M. Nash, D. Hexner, A. M. Turner, W. T. M. Irvine. “Amorphous Gyroscopic Topological Metamaterials.” APS March Meeting. New Orleans, LA. *March 13, 2017.*
- N. P. Mitchell**, V. Koning, V. Vitelli, W. T. M. Irvine. “Fracture in Sheets Draped on Curved Surfaces.” APS March Meeting. Baltimore, MD. *March 15, 2016.*
- N. P. Mitchell**, V. Koning, V. Vitelli, W. T. M. Irvine. “Geometrically Frustrated Fracture Mechanics.” APS March Meeting. San Antonio, TX. *March 3, 2015.*
- N. P. Mitchell**, V. Koning, V. Vitelli, W. T. M. Irvine. “Fracture on Curved Surfaces.” APS March Meeting 2014. Denver, CO. *March 5, 2014.*
- N. P. Mitchell**, K. B. W. McQuinn, E. D. Skillman. “UV-derived Star Formation Rates in Nearby Starburst Dwarf Galaxies.” Physics at University of Minnesota Expo. Minneapolis, MN. *August 10, 2011.*

Poster Presentations

- N. P. Mitchell**, L. M. Nash, D. Hexner, A. M. Turner, W. T. M. Irvine. “Amorphous Gyroscopic Topological Insulators.” Gordon Research Conference. New London, NH. *August 12-18, 2017.* Won prize for **best poster**. Won **Winstein Travel Prize** to attend.
- N. P. Mitchell**, V. Koning, V. Vitelli, W. T. M. Irvine. “Fracture in Sheets Draped on Curved Surfaces.”
- Industry Associates Meeting at the University of Chicago. Chicago, IL. *October 27, 2016.*
 - Physics and Mechanics of Soft Complex Materials, Institut d’Études Scientifiques de Cargèse. *August 8-20, 2016.* Won **Winstein Travel Prize** to attend.
- N. P. Mitchell**, K. B. W. McQuinn, E. D. Skillman. “UV derived Star Formation Rates and Emission Timescale in Nearby Starburst Dwarf Galaxies.”
- 79th Annual Meeting of the Minnesota Academy of Science. Northfield, MN. *January 21, 2012.*
 - American Astronomical Society Meeting. Austin, TX. *January 8-12, 2012.*
- N. P. Mitchell**, M. Buuck, D. E. Nitz. “Measurement of Atomic Transition Probabilities for Neutral Cerium.”
- St. Olaf Science Symposium. Northfield, MN. *May 6, 2011.*
 - Midstates Consortium for Math and Science at Washington University in St. Louis. St. Louis, MO. *November 12-14, 2010.*

Teaching

Department of Physics, The University of Chicago

- Grader Soft Condensed Matter (PHYS 367), Winter 2018
- T.A. Experimental Physics (PHYS 211), Autumn 2016
- T.A. Electronics (PHYS 226), Spring 2016
- Grader Advanced Electrodynamics (PHYS 322), Winter 2016
- T.A. Advanced Electrodynamics (PHYS 322), Winter 2015
- T.A. Experimental Physics (PHYS 211), Spring 2014
- T.A. Optics and Waves (PHYS 133), Spring 2013
- T.A. Electricity and Magnetism (PHYS 132), Winter 2013
- T.A. Mechanics (PHYS 131), Fall 2012

Department of Physics, St. Olaf College

T.A. Introductory Astronomy (PHYS 112), Spring 2012

T.A. Principles of Physics I (PHYS 124), Fall 2011

Grader Principles of Physics II (PHYS 125), Spring 2010

Workshops

Illinois Soft Materials Workshop. University of Illinois at Urbana-Champaign. *June 6, 2018.*

Gordon Research Conference: Soft Condensed Matter, Colby-Sawyer College. New London, NH. *August 12-18, 2017.*

Physics and Mechanics of Soft Complex Materials, Institut d'Études Scientifiques de Cargèse. Cargèse, France. *August 8-20, 2016.*

Topological Matter at H-Zero, Lorenz Center at University of Leiden. *May 9-13, 2016.*

Crafting the Lecture: A Student-Centered Approach, UChicago GRAD. *April 14, 2016.*

Dark Matter Detectors Summer School, KICP and Fermilab. *July 2012.*

In the News

Topological Metamaterials

picked up by Phys.org, Space Daily, ChemEurope, Science Newslines, Nanowerk Nanotechnology News, AAAS EurekAlert

Fracture

K. Kamrin, "Elastic Sheets: Cracks by Design." *Nature Materials* **16**, 8-9 (2017)

"Physicists find way to control fractures." University of Leiden News, October 2016.

Astrophysics

J. Hargis. "High Level Science Products: The STARBurst IRregular Dwarf Survey (STARBIRDS)." *MAST News*, April 2017.

Honor Societies

Phi Beta Kappa 2012

Sigma Pi Sigma (*Society of Physics Students' Honor Society*) 2011

National Merit Finalist 2008

National Honor Society 2007, Saint Louis University High School chapter

Outreach and Service

Reviewer

Physical Review X, Physical Review B, New Journal of Physics, PNAS, ICEEEE

Undergraduate Research supervisor

Ryan Spieler (summer 2018)

Jingyang Zheng (REU, summer 2016)

Maria Cortes (co-supervised with Yifan Wang, REU, summer 2015)

Jacob Mazor (spring 2015)

Apostolos Apostolou (summer 2014)

Group Leader, Expanding Your Horizons symposium for middle-school girls. *March 2017.*

Instructor, Artifice Tech Education Program, *Fall 2015 – Spring 2016, weekly.*

Co-led after school courses on coding, electronics, and robotics for ages 12-15 at UChicago Woodlawn Charter School.

Instructor, Science and Technology Outreach Mentoring Program, *Oct. 2014-June 2015, weekly.*

STOMP staffs the science component of an after-school program at the North Kenwood Oakland (NKO) and Donoghue elementary schools. Instructors design engaging education science and technology activities for student in K-5th grade.

Organizer and Instructor, Bike Physics With A Bang! *June-July 2015, July 2016.*

Using bicycles as a centerpiece for demonstrating the principles of physics, this program targets underprivileged preteens on Chicago's South Side. Activities explore energy, angular momentum, pressure, and concepts from materials science. (Four sessions / year)

Exhibitor, *The Art of Science*, Second Friday Pilsen Art Show.

Science-based visual art show

Prize Winner, Science Art Show, Feb. 25, 2016.

Finalist in competition of science-based art

Participant, Interdivisional Science-Art Show, June 4, 2015.

Exhibition of science-based art

Demonstrator, *Physics With A Bang!* at University of Chicago, *2012-present, one day annually.*

Annual open house for students, families, and teachers. Lab tours offer participation in hands-on activities related to their research.

Demonstrator, Young Scholar's Program, *2013-2016, one day annually.*

The Young Scholars Program offers mathematically talented seventh through twelfth graders an opportunity to explore mathematics that are not generally taught in schools

Demonstrator, Science Night at Lee Elementary, "Fun with Marangoni Flows."

October 2, 2014.

Session Chair, APS March Meeting 2014, Session M17: Fracture and Other Problems in Statistical Physics. *March 5, 2014.*

Demonstrator, Women in Physics Conference, U. Chicago, *January 18, 2014.*

Science Fair Judge, Harte Elementary School, *Nov 6, 2013.*

Volunteer, *Science Club*, Andrew Carnegie Elementary School, *2013-2014, monthly.*

Demonstrator, *Science on the Screen* at U. Chicago, *April 21, 2013.*

Physics Dept. Mentor to first-year physics majors at St. Olaf College, *2011-12.*

Research Assistant preparing the manuscript of *The Image in Mind* by Prof. Charles Taliaferro (philosophy of science) St. Olaf College: Northfield, MN. *Winter 2010.*

Director of the Nature and Astronomy Center at Many Point Scout Camp, Ponsford, MN, *June – August 2009.*

References

Professor William Irvine
Department of Physics
The University of Chicago
wtmirvine@uchicago.edu
+1 (773) 702-7197

Professor Vincenzo Vitelli
Department of Physics
The University of Chicago
vitelli@uchicago.edu
+1 (773) 834-8829

Professor Heinrich Jaeger
Department of Physics
The University of Chicago
h-jaeger@uchicago.edu
+1 (773) 702-6074

Professor Sidney Nagel
Department of Physics
The University of Chicago
srnagel@uchicago.edu
+1 (773) 702-7190