Bryce Gadway - Curriculum Vitae
Associate Professor, Department of Physics, University of Illinois at Urbana-Champaign
1110 West Green Street, Urbana, IL 61801-3080
Phone: 217-244-9284, Fax: 217-244-7559, E-mail: bgadway@illinois.edu

Education

Ph.D. Physics, Stony Brook University, 2012
Advisor: Dominik Schneble
B.A. Astronomy-Physics, Colgate University, 2007
Advisor: Enrique (Kiko) Galvez

Employment

University of Illinois at Urbana-Champaign: Associate Professor (07/2020-present)
University of Illinois at Urbana-Champaign: Assistant Professor (08/2014-07/2020)
JILA, NIST, and University of Colorado: NRC postdoctoral research fellow (2012-2014)
Advisors: Jun Ye and Deborah Jin
Stony Brook University: Research Assistant/GAANN Fellow (2007-2012)

Honors and Awards

CAREER Award recipient – National Science Foundation, 2020
Arnold O. Beckman Research Award recipient – UIUC, 2018
Young Investigator Program (YIP) award recipient – Air Force Office of Scientific Research, 2018
Outstanding Presentation - Boulder Laboratories 10th Annual Poster Symposium, 2013
President's Award to Distinguished Doctoral Students - Stony Brook University, 2013
National Research Council postdoctoral fellowship, 2012-2014
Travel Award for Excellence in Graduate Research - American Physical Society, FGSA, 2012
Jonathan Kaufman Student Excellence Prize in Physics - Stony Brook University, 2011
GAANN fellowship, 2007-2012
Leroy Apker Award - American Physical Society, 2007
Physics Alumni Award - Colgate University, 2007
Phi Beta Kappa, elected to, 2007
Travel Scholarship recipient - University of New South Wales, 2006
Mori Award for Excellence in Japanese - Colgate University, 2005
Phi Eta Sigma, elected to, 2004

Outreach

Presenter at Physics Café for Aspen workshop on Many-Body Quantum Chaos, March 2019
SURF seminar presenter at NIST Boulder, Spring 2014

Professional Service

Journal referee: Review of Modern Physics, Physical Review X, Physical Review Letters, Physical Review (A, B, and E), Nature Reviews Physics, Nature, Science, Nature Physics, Science Advances, Nature Communications, New Journal of Physics, Optics Express, ACS Photonics, JOSA B, Europhysics Letters, Entropy, the Journal of Condensed Matter Physics, and iScience

Grant proposal referee: National Science Foundation (NSF), U.S. Air Force (AFOSR), and the French National Research Agency

Member/Chair of the APS DAMOP Education Committee (2018-2020; Chair for 2019-2020)
Session sorter for the APS March Meeting 2017

Co-organizer, ICAM Workshop on "Quasiperiodicity and fractality in quantum stat mech," May 2019
Organizer, Midwest Cold Atom Workshop (MCAW), November 2018

Peer-Reviewed Journal Articles

Interactions and mobility edges: Observing the generalized Aubry-Andre model.
Fangzhao Alex An, Eric Meier, Karmela Padavic, Suraj Shankaranarayana, Sriram Ganeshan, Jed Pixley, Smitha Vishveshwara, and Bryce Gadway
Phys. Rev. Lett. **126**, 040603 (2021) – [selected as *Editor's suggestion*]

Counterdiabatic control of transport in a synthetic tight-binding lattice
Eric J. Meier, Kinfung Ngan, Dries Sels, and Bryce Gadway
Phys. Rev. Research **2**, 043201 (2020) – [selected as *Editor's suggestion*]

Framework for simulating gauge theories with dipolar spin systems
Di Luo, Jiayu Shen, Michael Highman, Bryan K. Clark, Brian DeMarco, Aida X. El-Khadra, and Bryce Gadway
Phys. Rev. A **102**, 032617 (2020)

Non-destructive dispersive imaging of rotationally excited ultracold molecules
Qingze Guan, Michael Highman, Eric J. Meier, Garrett R. Williams, Vito Scarola, Svetlana Kotochigova, Brian DeMarco, and Bryce Gadway
Phys. Chem. Chem. Phys. **22**, 20531 (2020)

Tunable Nonreciprocal Quantum Transport through a Dissipative Aharonov-Bohm Ring in Ultracold Atoms
Wei Gou, Tao Chen, Dizhou Xie, Teng Xiao, Tian-Shu Deng, Bryce Gadway, Wei Yi, and Bo Yan
Phys. Rev. Lett. **124**, 070402 (2020)

Exploring quantum signatures of chaos on a Floquet synthetic lattice
Eric J. Meier, Jackson Ang'ong'a, Fangzhao Alex An, and Bryce Gadway
Phys. Rev. A 100, 013623 (2019)

Topological characterizations of an extended Su-Schrieffer-Heeger model
Dizhou Xie, Wei Gou, Teng Xiao, Bryce Gadway, and Bo Yan
npj Quantum Information 5, Article number: 1 (2019)

Engineering tunable local loss in a synthetic lattice of momentum states
Samantha Lapp, Jackson Ang'ong'a, Fangzhao Alex An, and Bryce Gadway
New J. Phys. 21, 045006 (2019) *;* [Focus issue on "Quantum Transport in Ultracold Atoms"]

Strings of ultracold molecules in a synthetic dimension
Bhuvanesh Sundar, Matthew Thibodeau, Zhiyuan Wang, Bryce Gadway, and Kaden R. A. Hazzard
Phys. Rev. A 99, 013624 (2019)

Observation of the topological Anderson insulator in disordered atomic wires
Eric J. Meier, Fangzhao Alex An, Alexandre Dauphin, Maria Maffei, Pietro Massignan, Taylor L. Hughes, and Bryce Gadway
Science 362, 6417 (2018) ; [selected as a Research Highlight by *Nature Physics*]

Engineering a flux-dependent mobility edge in disordered zigzag chains
Fangzhao Alex An, Eric J. Meier, and Bryce Gadway
Phys. Rev. X 8, 031045 (2018)

Synthetic dimensions in ultracold polar molecules
Bhuvanesh Sundar, Bryce Gadway, and Kaden R. A. Hazzard
Scientific Reports 8, Article Number: 3422 (2018)

Sharpening the Features of Optical Lattices
Bryce Gadway
Physics 11, 19 (2018) – *Viewpoint* article highlighting work from the Porto/Rolston group at JQI

Correlated dynamics in a synthetic lattice of momentum states
Fangzhao Alex An, Eric J. Meier, Jackson Ang'ong'a, and Bryce Gadway
Phys. Rev. Lett. 120, 040407 (2018)

Polarization spectroscopy of atomic erbium in a hollow cathode lamp
Jackson Ang'ong'a and Bryce Gadway
J. Phys. B: At. Mol. Opt. Phys. 51, 045003 (2018)

Diffusive and arrested transport of atoms under tailored disorder
Fangzhao Alex An, Eric J. Meier, and Bryce Gadway
Nature Communications 8, Article Number: 325 (2017)

Direct observation of chiral currents and magnetic reflection in atomic flux lattices
Fangzhao Alex An, Eric J. Meier, and Bryce Gadway
Science Advances 3, e1602685 (2017)

Observation of the topological soliton state in the Su-Schrieffer-Heeger model
Eric J. Meier, Fangzhao Alex An, and Bryce Gadway
Nature Communications 7, 13986 (2016)

Strongly interacting ultracold polar molecules
Bryce Gadway and Bo Yan
J. Phys. B: At. Mol. Opt. Phys. 49, 152002 (2016) – *invited Topical Review article*

Atom-optics simulator of lattice transport phenomena
Eric J. Meier, Fangzhao Alex An, and Bryce Gadway
Phys. Rev. A 93, 051602(R) (2016)

Creation of a low-entropy quantum gas of polar molecules in an optical lattice
Steven A. Moses, Jacob P. Covey, Matthew T. Miecnikowski, Bo Yan, Bryce Gadway, Jun Ye, and Deborah S. Jin
Science 350, 659-662 (2015)

Atom-optics approach to studying transport phenomena
Bryce Gadway
Phys. Rev. A 92, 043606 (2015)

Many-body dynamics of dipolar molecules in an optical lattice
Kaden R. A. Hazzard, Bryce Gadway, Michael Foss-Feig, Bo Yan, Steven A. Moses, Jacob P. Covey, Norman Y. Yao, Mikhail D. Lukin, Jun Ye, Deborah S. Jin, and Ana Maria Rey
Phys. Rev. Lett. 113, 195302 (2014)

Superfluid Bloch dynamics in an incommensurate optical lattice
Jeremy Reeves, Bryce Gadway, Thomas Bergeman, Ippei Danshita, and Dominik Schneble
New J. Phys. 16 065011 (2014) ; [Focus issue on the "Frontiers of Disorder Physics"]

Suppressing the loss of ultracold molecules via the continuous quantum Zeno effect
Bihui Zhu, Bryce Gadway, Michael Foss-Feig, Johannes Schachenmayer, Michael Wall, Kaden R.A. Hazzard, Bo Yan, Steven A. Moses, Jacob P. Covey, Deborah S. Jin, Jun Ye, Murray Holland, and Ana Maria Rey
Phys. Rev. Lett. 112, 070404 (2014) ; [selected as "Editor's Suggestion"]

Observation of dipolar spin-exchange interactions with lattice-confined polar molecules
Bo Yan, Steven A. Moses, Bryce Gadway, Jacob P. Covey, Kaden R. A. Hazzard, Ana Maria Rey, Deborah S. Jin, and Jun Ye
Nature 501, 521-525 (2013) ; [selected for *Nature* News and Views]

Evidence for a quantum-to-classical transition in a pair of coupled quantum rotors
Bryce Gadway, Jeremy Reeves, Ludwig Krinner, and Dominik Schneble
Phys. Rev. Lett. 110, 190401 (2013)

Probing an ultracold-atom crystal with matter waves
Bryce Gadway, Daniel Pertot, Jeremy Reeves, and Dominik Schneble
Nature Physics 8, 544 (2012)

Glassy behavior in a binary atomic mixture
Bryce Gadway, Daniel Pertot, Jeremy Reeves, Matthias Vogt, and Dominik Schneble
Phys. Rev. Lett. 107, 145306 (2011)

Superfluidity of interacting bosonic mixtures in optical lattices
Bryce Gadway, Daniel Pertot, René Reimann, and Dominik Schneble
Phys. Rev. Lett. 105, 045303 (2010)

Collinear four-wave mixing of two-component matter waves
Daniel Pertot, Bryce Gadway, and Dominik Schneble
Phys. Rev. Lett. 104, 200402 (2010)

Analysis of Kapitza–Dirac diffraction patterns beyond the Raman–Nath regime
Bryce Gadway, Daniel Pertot, René Reimann, Martin G. Cohen, and Dominik Schneble
Optics Express 17, 19173-19180 (2009)

Versatile transporter apparatus for experiments with optically trapped Bose-Einstein condensates
Daniel Pertot, Daniel Greif, Stephan Albert, Bryce Gadway, and Dominik Schneble
J. Phys. B: At. Mol. Opt. Phys. 42, 215305 (2009)

Bell-inequality violations with single photons entangled in momentum and polarization
Bryce R. Gadway, Enrique J. Galvez, and Francisco de Zela
J. Phys. B: At. Mol. Opt. Phys. 42, 015503 (2009) ; [selected for J. Phys. B Highlights of 2009]

The unprecedented optical outburst of the quasar 3C 454.3
Massimo Villata, *et al*.
Astronomy & Astrophysics 453, 817-822 (2006)

Invited Talks

JQI Seminar, College Park, MD (virtual)
Synthetic lattices for synthetic quantum matter, November 2020

Rutgers Condensed Matter Seminar, New Brunswick, NJ (virtual)
The creation and destruction of topology in synthetic atomic wires by added disorder, June 2020

APS March Meeting 2020, Denver, CO (had to cancel due to COVID-19 outbreak)
Observation of the Topological Anderson Insulator in disordered atomic wires, March 2020

University of Indiana Physics Colloquium, Bloomington, IN
The creation and destruction of topology in synthetic atomic wires by added disorder, Feb 2020

Saturday Physics for Everyone, Urbana, IL
Artificial Topological Materials, October 2019

UIUC Condensed Matter Seminar, Urbana, IL
Synthetic lattices in quantum (and classical) systems, September 2019

Illinois State University (ISU) Colloquium, Bloomington, IL
Building artificial materials from atoms and light, February 2020

DAMOP (Division of AMO Physics, APS Meeting) 2019, Milwaukee, WI
Engineering synthetic lattices with driven optical lattices, May 2019

Illinois State University (ISU) Colloquium, Bloomington, IL
Building artificial materials from atoms and light, March 2019

Workshop on *Many-Body Quantum Chaos*, Aspen Center for Physics
Studying localization physics and chaos in synthetic lattices, March 2019

Physics of Quantum Electronics (PQE), Snowbird, Utah
Exploring topology, disorder, and interactions with atom optics, Jan 2019

Center for Ultracold Atoms (CUA) – Harvard & MIT, CUA Seminar
Synthetic lattices of laser-coupled atomic momentum states, Nov 2018

Conference on *Quantum Transport with Cold Atoms*, Congresso Stefani Franscini, Ascona
Single-particle and many-body transport phenomena in synthetic momentum-space lattices, July 2018

ZJU-UIUC Joint Research Workshop, Zhejiang University (Haining)
Ultracold bi-alkali molecules, June 2018

Zhejiang University (Hangzhou), AMO Physics Seminar (special time)
Single-particle and many-body transport phenomena in synthetic momentum-space lattices, June 2018

Washington University in St. Louis, Condensed Matter / Materials & Biological Physics Seminar
Observation of the topological Anderson insulator in disordered synthetic lattices, April 2018

Workshop on *Quantum Many-Body Systems Far from Equilibrium*, Stellenbosch
Exploring topology, disorder, and interactions in synthetic momentum-space lattices, March 2018

APS March Meeting, Los Angeles
Exploring the interplay of topology, disorder, kinetic frustration, and interactions in synthetic momentum-space lattices, March 2018

University of Oklahoma, Physics Colloquium
Observation of the topological Anderson insulator in disordered atomic wires, Feb 2018

University of Oklahoma, Condensed Matter Physics Seminar
Synthetic lattices in cold atoms and molecules: Enabling the study of unique quantum transport phenomena, Jan 2018

Indiana University, Condensed Matter Physics Seminar
Hamiltonian engineering based on synthetic lattices with cold atoms, Dec 2017

Workshop on *Artificial gauge fields and interacting topological states of matter*, Hamburg
Exploring topology, disorder, and interactions in synthetic momentum-space lattices, Dec 2017

Workshop on *Synthetic Dimensions in quantum engineered systems*, Zurich
Exploring topology, disorder, and interactions in synthetic momentum-space lattices, Nov 2017

Purdue University, AMO/CM/Purdue Quantum Center Seminar
Exploring the interplay of topology, disorder, and interactions in synthetic momentum-space lattices, Nov 2017

Stony Brook University, AMO Physics Seminar
Engineering topological & disordered quantum fluids with flying matter waves, April 2017

University of Illinois at Urbana-Champaign, Physics Colloquium
Exploring topological phases with ultracold atoms, March 2017

Indiana University-Purdue University Indianapolis, Physics Colloquium
Exploring topological and disordered systems with driven ultracold atoms, Nov 2016

Workshop on *Interacting Quantum Systems Driven out of Equilibrium*, Rice Center for Quantum Materials
Simulating Topological and Disordered Systems with Resonantly Driven Atomic Matter Waves, May 2016

Midwest Cold Atom Workshop 2015, Madison
Prospects for studying topological matter with cold atoms, Nov 2015

New Laser Scientist Conference, Tucson
Harnessing noise for the control of many-body dynamics, Oct 2014

International Conference on Atomic Physics (ICAP), Washington, D.C.
Dynamics of a long-range interacting spin system of ultracold polar molecules, Aug 2014

Stony Brook University, AMO Physics Seminar
Ultracold polar molecules: A many-body spin system with long-range interactions, April 2014

University of Connecticut, AMO Physics Seminar
Ultracold polar molecules: A many-body spin system with long-range interactions, March 2014

University of Illinois at Urbana-Champaign, QI/AMO Seminar
Ultracold polar molecules: A many-body spin system with long-range interactions, Feb 2014

Purdue University, AMO Physics Seminar
Ultracold polar molecules: A many-body spin system with long-range interactions, Jan 2014

Joint AFOSR/ARO MURI Review Meeting
Realizing a lattice spin model with ultracold dipolar molecules, Nov 2013

University of California, Berkeley, Atomic Physics Seminar
Strongly interacting bosonic mixtures in spin-dependent lattices, Jan 2012

JILA, University of Colorado at Boulder, Jun Ye group seminar
Strongly interacting bosonic mixtures in spin-dependent lattices, Jan 2012

NIST Gaithersburg, Laser Cooling and Trapping Group Seminar
Strongly interacting bosonic mixtures in spin-dependent lattices, Jan 2012

APS March Meeting, New Orleans
Testing hidden-variable theorems with single-photon entangled states, March 2008