JOSEPH A. MITTELSTAEDT

956-739-8948 ⋄ art.mitt@gmail.com
314 University Ave. Apt. 7 ⋄ Ithaca, NY 14850

EDUCATION

Cornell University Expected June 2022

· Ph.D in Experimental Physics

University of Chicago June 2017

· B.A. in Physics – B.A. in Mathematics
· Dean's List 2013-2017
· Member of Phi Beta Kappa Honor Society
· 2016 David W. Grainger Senior Scholarship (outstanding junior in the physics department showing promise for future physics research)
· 2015 Walter and Fay Selove Prize (Research funding for a promising undergraduate physics student)
· 2015 James Franck Institute Undergraduate Summer Support Award (Summer research funding for a promising student working in the James Franck Institute)
· Cumulative GPA: 3.89

EXPERIENCE

Cornell University April 2018 — Present
Graduate Research Assistant *Ithaca, NY*

· Developed and investigated research questions at the forefront of spintronics research with Prof. Dan Ralph
· Grew metallic heterostructures and fabricated them into micron scale devices
· Performed electrical transport measurements on a variety of materials to probe spin-to-charge and charge-to-spin transduction

Cornell University September 2017 — May 2018
Graduate Teaching Assistant *Ithaca, NY*

· Led discussion and lab sections for introductory physics courses
· Mentored students to ensure success in the course
· Created course material to facilitate learning of core concepts

Princeton Plasma Physics Laboratory June — August 2016
DOE Science Undergraduate Laboratory Intern *Princeton, NJ*

· Developed code to model the flow of plasma in a stellarator fusion reactor, working under Dr. Sam Lazerson
· Tested the performance of this code on data from the Wendelstein 7-X stellarator

University of Chicago February 2015 — February 2016
Undergraduate Research Assistant *Chicago, IL*

· Investigated instabilities in vortex rings by developing computer vision code to track their position and shape uner Prof. William Irvine
· Quantified the effect of polymer drag reduction on vortex flow

University of Texas at Brownsville June — August 2014
NSF REU Intern *Brownsville, TX*

· Analyzed methods of enhancing supernova gravitational waves with Prof. Soma Mukherjee

University of Texas-Pan American June — September 2013
Research Assistant *Edinburg, TX*

· Developed novel composite nanofibers with Prof. Karen Lozano

SKILLS AND COMPETENCIES

Computer Languages

· Python, including the scientific Python stack
· Linux operating system and command line

Scientific Processes

· Sputter Deposition
· Optical Lithography
· Atomic Force Microscopy
· X-Ray Reflectometry
· Electrical transport measurement techniques

PUBLICATIONS

- **J.A. Mittelstaedt** and D.C. Ralph, Resonant Measurement of Non-Reorientable Spin-Orbit Torque from a Ferromagnetic Source Layer Accounting for Dynamic Spin Pumping, arXiv:2106.11127, Submitted to Physical Review Applied.
- N.D. Reynolds, S. Chatterjee, G.M. Stiehl, **J.A. Mittelstaedt**, S. Karimeddiny, A.J. Buser, D.G. Schlom, K.M. Shen, D.C. Ralph, Strongly Temperature-Dependent Spin-Orbit Torques in Heavy Fermion $YbAl_3$, arXiv:2004.03678, Submitted to Science Advances.
- X. Huang, S. Sayed, **J.A. Mittelstaedt**, S. Susarla, S. Karimeddiny, L. Caretta, H. Zhang, V.A. Stoica, T. Gosavi, F. Mahfouzi, Q. Sun, P. Ercius, N. Kioussis, S. Salahuddin, D.C. Ralph, and R. Ramesh, Novel Spin–Orbit Torque Generation at Room Temperature in an All-Oxide Epitaxial $La_{0.7}Sr_{0.3}MnO_3/SrIrO_3$ System, Adv. Mater. 2021, **33**, 2008269 (2021)
- S. Karimeddiny, **J.A. Mittelstaedt**, R.A Buhrman, and D.C Ralph, Transverse and Longitudinal Spin-Torque Ferromagnetic Resonance for Improved Measurement of Spin-Orbit Torque, Phys. Rev. Applied **14**, 024024 (2020)
- V. Gupta, T.M. Cham, G.M. Stiehl, A. Bose, **J.A. Mittelstaedt**, K. Kang, S. Jiang, K.F. Mak, J. Shan, R.A. Buhrman, D.C. Ralph, Manipulation of the Van der Waals Magnet $Cr_2Ge_2Te_6$ by Spin-Orbit Torques, Nano Lett. **20** (10), 7482-7488 (2020)

RELEVANT COURSEWORK

Physics

Solid State Physics (Ashcroft & Mermin) · Quantum Mechanics (Sakurai) · Electromagnetism (Jackson) · Statistical Mechanics (Sethna)

Mathematics

Real Analysis (Rudin) · Complex Analysis (Marsden & Hoffman) · Ordinary Differential Equations (Hirsch, Smale, Devaney) · Partial Differential Equations (Shearer & Levy) · Point-Set Topology (Munkres) · Algebra (Gallian)

Statistics & Machine Learning

Bayesian Data Analysis (Gelman) · Machine Learning for Data Science (unsupervised learning)