Paul M. Neves

Massachusetts Institute of Technology
Department of Physics
Cambridge, MA 02139
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Education:

PhD – Massachusetts Institute of Technology (in progress) 2019–
BS Physics – University of Maryland, College Park 2015–2019
Summa Cum Laude
Physics Departmental High Honors
Honors College Citation – University Honors

Appointments:

Graduate Student – Massachusetts Institute of Technology; Cambridge, MA 2019–
Current project: Searching for flat bands in intermetallic Kagome compounds
Advisor: J. Checkelsky

Student Mentor – Massachusetts Institute of Technology; Cambridge, MA 2020–
Physics Department (COVID-19 academic continuity)

Teaching Assistant – University of Maryland; College Park, MD 2019–2019
PHYS161 General Physics: Mechanics and Particle Dynamics

Workshop Coordinator/Manager – University of Maryland; College Park, MD 2017–2019
UMD Physics Makers

Research Assistant – University of Maryland; College Park, MD 2016–2019
Dept. of Physics Honors Thesis: Effect of Chemical Substitution on the Skyrmion Phase in Poly-Crystalline Cu_2OSeO_3
Advisor: N. Butch

Outreach Host – University of Maryland; College Park, MD 2016–2017
Physics Outreach

Student Assistant – University of Maryland; College Park, MD 2016–2017
Lecture Demonstration Facility

Tutor/Fundraiser – University of Maryland, College Park, MD 2015–2019
Society of Physics Students

Research Intern – NIST Center for Neutron Research, MD 2014–2014
Project: Direct Measurement of the Orientation of Atomic Vibrations Using Inelastic Neutron Scattering
Advisor: D. Parshall

Research Interests:

- Experimental condensed matter physics: electronic properties, magnetic phases, effects of extreme conditions (low temperature, high magnetic field, applied pressure)
- Materials synthesis: bulk single crystals, poly-crystals
- Instrumentation design/construction

Awards and Distinctions:

NSF Graduate Research Fellowship Honorable Mention	2019
Goldwater Scholar	2018
Ovshinsky Student Travel Award Honorable Mention	2018
Society of Physics Students Undergraduate Research Award	2018
Baroni Scholarship	2016
University of Maryland, College Park Banneker/Key Scholarship	2015–2019
National Merit Scholar	2015
National Presidential Scholar Semifinalist	2015
National AP Scholar	2015

Professional Societies:

- American Physical Society
- Sigma Pi Sigma physics honor society
- Society of Physics Students

Presentations:

2019

1. May 2019: UMD Physics Department Research Showcase – College Park, Maryland. Talk: "All Tied Up in Knots: Skyrmions in Chemically Substituted Cu2OSeO3."

2018

2. October 2018: American Conference on Neutron Scattering – College Park, Maryland. Talk: "Simultaneous in situ Neutron Measurement of AC Susceptibility at High Pressures and Low Temperatures at The NIST Center for Neutron Research."
3. September 2018: 10th International Workshop on Sample Environment at Scattering Facilities – Potsdam, Germany. Talk: "Multi-Application Neutron in-situ AC Susceptometer (MANiACS) for Simultaneous Neutron Measurements at Low Temperatures and High Pressure at the NCNR."
4. August 2018: NIST Summer Undergraduate Research Fellowship Colloquium – Gaithersburg, Maryland. Plenary Talk: "All Tied Up in Knots: Skyrmions in Chemically Substituted Cu_2OSeO_3."
5. June 2018: American Conference on Neutron Scattering – College Park, Maryland. Poster: "Simultaneous In Situ Neutron Measurement of AC Susceptibility at High Pressures and Low Temperatures at the NIST Center for Neutron Research."
6. March 2018: APS March Meeting – Los Angeles, California. Talk: "Characterization of Zn Doped Insulating Magnetic Skyrmion Material Cu_2OSeO_3."

2017

7. August 2017: NIST Summer Undergraduate Research Fellowship Colloquium – Gaithersburg, Maryland. Talk: "The Hunt for Magnetic Skyrmions."
8. November 2017: NIST Center for Neutron Research Low-Q Seminar – Gaithersburg, Maryland. Talk: "Prototyping A Compact Superconducting Multidirectional Helmholtz Coil for SANS Skyrmion Measurements, a SURF Summer Project."

2016

9. September 2016: 9th International Workshop on Sample Environment at Scattering Facilities – Gettysburg, Maryland. Best Poster: "Simultaneous in situ Neutron Measurement of AC Susceptibility at High Pressures and Low Temperatures at the NIST Center for Neutron Research."
10. August 2016: NIST Summer Undergraduate Research Fellowship Colloquium – Gaithersburg, Maryland. Talk: "Designing an AC Magnetic Susceptometer Measurement Technique in Conjunction with High Pressures and Low Temperatures in Neutron Beam Experiments."
11. May 2016: Honors Seminar - Re-discovering the Higgs & Searching for Invisible Matter Poster Session – College Park, Maryland. Poster: "Recreating the IceCube Search for Neutrino Point-Sources."

2014

12. August 2014: NIST Summer High School Internship Program Colloquium – Gaithersburg, Maryland. Poster/talk: “Direct Measurement of the Orientation of Atomic Vibrations Using Inelastic Neutron Scattering.”

Publications:

In Preparation

1. DJ Campbell, J Collini, J Slawinska, C Autieri, L Wang, K Wang, B Wilfong, YS Eo, P Neves, D Graf, EE Rodriguez, NP Butch, M Buongiorno Nardelli, and J Paglione, "DJ Campbell, J Collini, J Slawinska, C Autieri, L Wang, K Wang, B Wilfong, YS Eo, P Neves, D Graf, EE Rodriguez, NP Butch, M Buongiorno Nardelli, J Paglione," arXiv preprint arXiv:2009.05984 (2020).
2. J. A. Rodriguez, S. Ran, S. R. Saha, P. Neves, M. Zic, Y. Vekhov, S. Gladchenko, N. P. Butch, "Neutron scattering study of uranium ditelluride," in preparation (2020).

2020

3. Paul M Neves, Dustin A Gilbert, Sheng Ran, I-Lin Liu, Shanta Saha, John Collini, Markus Bleuel, Johnpierre Paglione, Julie A Borchers, and Nicholas P Butch, "Effect of chemical substitution on the skyrmion phase in Cu_2OSeO_3," *Physical Review B* **102**, 134410 (2020).

2019

4. Sheng Ran, I-Lin Liu, Yun Suk Eo, Daniel J Campbell, Paul M Neves, Wesley T Fuhrman, Shanta R Saha, Christopher Eckberg, Hyunsoo Kim, David Graf, Fedor Balakirev, John Singleton, Johnpierre Paglione, and Nicholas P Butch, "Extreme magnetic field-boosted superconductivity," *Nature Physics* **15**, 1250-1254 (2019).
5. Dustin A Gilbert, Alexander J Grutter, Paul M Neves, Guo-Jiun Shu, Gergely Zimanyi, Brian B Maranville, Fang-Cheng Chou, Kathryn Krycka, Nicholas P Butch, Sunxiang Huang, and Julie A Borchers, "Precipitating Ordered Skyrmion Lattices from Helical Spaghetti and granular powders," *Phys. Rev. Materials* **3**, 014408 (2019).
6. Paul M Neves, Juscelino Leao, and Nicholas P Butch, "MANiACS: A Multi-Application Neutron in-situ AC Susceptometer," *Neutron News* **30,** 17-18 (2019).

2018

7. Colin Heikes, I-Lin Liu, Tristin Metz, Chris Eckberg, Paul M Neves, Yan Wu, Linda Hung, Phil Piccoli, Huibo Cao, Juscelino Leao, Johnpierre Paglione, Taner Yildirim, Nicholas P Butch, and William Ratcliff II, "Mechanical control of crystal symmetry and superconductivity in Weyl semimetal $MoTe_2$," *Phys. Rev. Materials* **2**, 074202 (2018); Editor's Suggestion.

Other

8. John Evans, Brady Easterday, Paul Neves, Brandon Grinkemeyer, Matt Marks, Matthew Spooner, Stephanie Williams, Peter Zhou, Brendan Van Hook, and David Long, "Construction of a Kibble Balance—The Device that Redefined the Kilogram," *Journal of Undergraduate Reports in Physics* **28**, (2019).
9. Paul Neves, "SURFing from Susceptometers to Skyrmions: The Making of a Neutron MANiAC," *NIST Taking Measure Blog* (2018).
10. Allison Schwam and Paul Neves, "Boyhood Remained," *Poetry WTF?!* (2018); UMD Writing FrankenTerps Literary Competition Best Poem.

Outreach:

2018

1. December 2018: University of Maryland Physics Makers Workshop Leader - College Park, Maryland. Lecture: “Digital and Analog I/O, Pulse Width Modulation (PWM), and RC Filters.”
2. September 2018: University of Maryland Physics Makers Workshop Leader – College Park, Maryland. Lecture: “Arduino Programming Basics.”
3. July 2018: National Institute of Standards and Technology Taking Measure Blog – Gaithersburg, Maryland. “SURFing from Susceptometers to Skyrmions: The Making of a Neutron MANiAC.”
4. February 2018: University of Maryland Solid State Physics Seminar (PHYS838C) - College Park, Maryland. Presentation: “The Hunt for Magnetic Skyrmions.”

2017

5. November 2017: University of Maryland Physics Makers Workshop Leader – College Park, Maryland. Lecture: “Digital and Analog I/O, Pulse Width Modulation (PWM), and RC Filters.”
6. July 2017: NIST Center for Neutron Research Middle School Teacher Outreach Speaker – Gaithersburg, Maryland. “Crystal Growth.”
7. April 2017: University of Maryland Physics Makers Workshop Leader – College Park, Maryland. Lecture: “Arduino Basics.”
8. March 2017: University of Maryland Physics Outreach Maryland Day Co-Host – College Park, Maryland. Lecture: “The Physics of Fantastic Worlds: From Star Wars to Harry Potter.”
9. March 2017: University of Maryland Physics is Phun Co-Host – College Park, Maryland. Lecture: “The Physics of Fantastic Worlds: From Star Wars to Harry Potter.”

2016

10. December 2016: University of Maryland Physics Discovery Day Host – College Park, Maryland. Lecture: “Electricity & Magnetism.”
11. October 2016: University of Maryland Physics is Phun Host – College Park, Maryland. Lecture: “Full Spectrum.”