

N. Peter Armitage

September 20th, 2022

Department of Physics and Astronomy
Johns Hopkins University
Bloomberg Building 309
3701 San Martin Dr.
Baltimore, MD 21218 USA

Tel: +1 (410) 516-0214
Fax: +1 (410) 516-7239

npa@pha.jhu.edu

<http://physics-astronomy.jhu.edu/directory/n-peter-armitage/>

<https://sites.google.com/site/nparmitagegroup/>

RESEARCH INTERESTS

Correlated electrons, quantum phase transitions, quantum measurement, topological states of matter, superconductivity, quantum magnetism, electron glasses, optical spectroscopy, terahertz instrumentation, microwave spectroscopy

APPOINTMENTS

Professor, Dept of Physics and Astronomy, The Johns Hopkins University, July 2017 – Present

Visiting Professor, Institute for Solid State Physics, University of Tokyo, Sept. 2018-March 2019

Vice-Chair for Research and Facilities, Dept of Physics and Astronomy, The Johns Hopkins University, Sept. 2013 – present

Associate Professor with tenure, Dept of Physics and Astronomy, The Johns Hopkins University, July 2013 – June 2017

Asst. Professor, Dept of Physics and Astronomy, The Johns Hopkins University, July 2006 – June 2013 (*on leave July 2005 – July 2006*)

EDUCATION AND TRAINING

NSF International Research Fellow, University of Geneva, Switzerland, September 2004-July 2006: group of Dirk van der Marel

Postdoctoral Fellow, University of California, Los Angeles, October 2001-August 2004: group of George Gruner

Stanford University, Stanford, CA, 2002

Ph.D. in Physics

Dissertation: "Doping the copper-oxygen planes with electrons: The view with photoemission", Advisor: Z.-X. Shen

Rutgers University, New Brunswick, NJ, 1994

B.Sc. in Physics,

AWARDS AND HONORS

- **2019-2024 Fellow** of the Canadian Institute for Advance Research (CIFAR) program in Quantum Materials
- **2020** Gordon and Betty Moore Foundation, EPIQS Experimental Investigator
- **2019 Nakamura Lecturer** University of Santa Barbara, Dept. of Materials Science and Engineering
- **2019 Zhong-Guan-Cun Forum Lecturer** IoP, Chinese of Academy of Sciences
- **2018-2019 JSPS Invitational Fellowships for Research** in Japan and Visiting Professor at the University of Tokyo
- **2016 Ludwig Genzel Prize** for exceptional contributions to the field of condensed-matter spectroscopy
- **2011, 2010, 2009 Kavli Frontiers Fellow, National Academy of Sciences**
- **2010 DARPA Young Faculty Award**
- **2009 NSF Career Award**
- **2007 Alfred P. Sloan Research Fellowship**
- **2005 William L. McMillan Award** for outstanding contributions in condensed matter physics from University of Illinois
- **2004 W.E. Spicer Award** for scientific excellence from *Stanford Synchrotron Radiation Laboratory*
- **2004 NSF International Research Fellowship Award** for research at University of Geneva 2004-2005
- **Richard T. Weidner Prize** for Physics Honors, Rutgers University, 1994
- **Mary Wheeler Wigner Memorial Scholarship** for undergraduate research, Rutgers University, 1993

MENTORING

Postdoctoral Fellows:

Kota Katsumi	September 2022 - present
Liyu Shi	October 2021 - present
Santhosh Kadakuntla	April 2021 - present
Anaëlle Legros	March 2019 – Dec. 2021: Lecturer Montpellier
Fahad Mahmood	July 2016 – July 2020: Asst. Professor Univ. Illinois
Mintu Mondal	June - 2016 - June 2017: Asst. Prof, IACS Kolkata
Chris Morris	Oct. 2011 - July 2015: Industry
Yuval Lubashevky	Aug. 2011 – May 2014: Industry
Andreas Stier	Aug. 2011 – April 2013, group leader TU Munich
LiDong Pan	June 2011 – August 2015: Industry
Mohammad Neshat	Nov. 2010 – Oct. 2012: Assoc. Prof. Univ. Tehran
Rolando Valdes Aguilar	Nov. 2008 – Aug. 2012: Asst. Prof. Ohio State

Graduate Students:

Will Liang
 Ralph Romero
 Sirak Mekonen
 Zhenisbek Tagay

David Barbalas	
Rishi Bhandia	
Prashant Chauhan	PhD. Oct. 2022 (Staff Intel)
Dipanjan Chaudhuri	PhD. Oct. 2021 (Postdoc UIUC)
Xinshu Zhang	PhD. April 2021 (Postdoc UCLA)
Youcheng Wang	PhD. Sept. 2020 (Postdoc NHMFL)
Bing Chen	PhD. Sept. 2019 (Postdoc Stanford, then Ames)
Nicholas Laurita	PhD. July 2017 (Lockheed Research Staff)
Liang Wu	PhD. December 2015, (Asst. Prof., Univ. of Penn.)
Grace Bosse	PhD. August 2015, (Lecturer Univ. N. Florida)
Wei Liu	PhD. Dec. 2012, (Industry)
Lucas Bilbro	PhD. July 2012 (Industry)

Undergraduate:

Alec Farid	Fall 2014
Daniel Weissglass	Summer 2012 – Fall 2013
Jiyeong Kim	Summer 2010 – Spring 2012
Alex Day	Fall 2008 – Summer 2010
Matthew Pines	Summer 2007
James McIver	Spring 2007, Harvard PhD., now group leader Hamburg

PUBLICATIONS

Publications: 135 Citations: 11,200+ h-index: 49 [Google Scholar]

135. Tanya Berry, Nicodemos Varnava, Dominic Ryan, Veronica Stewart, Riho Rästa, Ivo Heinmaa, Nitesh Kumar, Walter Schnelle, Rishi Bhandia, Christopher Pasco, **N.P. Armitage**, Raivo Stern, Claudia Felser, David Vanderbilt, Tyrel M McQueen
Magnetic phase crossover in strongly correlated EuMn_2P_2
arXiv preprint arXiv:2209.01707

134. Alexey Kimel, Anatoly Zvezdin, Sangeeta Sharma, Samuel Shallcross, Nuno De Sousa, Antonio Garcia-Martin, Georgeta Salvan, Jaroslav Hamrle, Ondrej Stejskal, Jeffrey Mccord, Silvia Tacchi, Giovanni Carlotti, Pietro Gambardella, Gian Salis, Markus Muenzenberg, Martin Schultze, Vasily Temnov, Igor V Bychkov, Leonid N Kotov, Nicolò Maccaferri, Daria Ignatyeva, Vladimir Belotelov, Claire Donnelly, Aurelio Hierro Rodriguez, Iwao Matsuda, Thierry Ruchon, Mauro Fanciulli, Maurizio Sacchi, Chunhui Rita Du, Hailong Wang, **N Peter Armitage**, Mathias Schubert, Vanya Darakchieva, Bilu Liu, Ziyang Huang, Baofu Ding, Andreas Berger, Paolo Vavassori
The 2022 Magneto-Optics Roadmap
Journal of Physics D: Applied Physics

133. Thomas Halloran, Yishu Wang, Mengqun Li, Ioannis Rousochatzakis, Prashant Chauhan, MB Stone, Tomohiro Takayama, Hidenori Takagi, **N.P. Armitage**, Natalia B Perkins, Collin Broholm
Magnetic excitations and interactions in the Kitaev hyperhoneycomb iridate
Physical Review B 106 (6), 064423 (2022)

132. A Legros, K.W. Post, Prashant Chauhan, D.G. Rickel, Xi He, Ivan Bozovic, S.A. Crooker, **N.P. Armitage**
Evolution of the cyclotron mass with doping in LaSrCuO_4
arXiv preprint arXiv:2205.12444
131. D. Barbalas, A. Legros, G. Rimal, S. Oh, **N.P. Armitage**
Disorder-enhanced effective masses and deviations from Matthiessen's rule in PdCoO_2 thin films
arXiv preprint arXiv:2205.05006
130. D Chaudhuri, D Barbalas, R Romero III, F Mahmood, J Liang, ...
Anomalous high-temperature THz nonlinearity in superconductors near the metal-insulator transition
arXiv preprint arXiv:2204.04203
129. Prashant Chauhan, Candice Thomas, Tyler Lindemann, Geoffrey C. Gardner, J. Gukelberger, M. J. Manfra, **N. P. Armitage**
Measurements of cyclotron resonance of the interfacial states in strong spin-orbit coupled 2D electron gases proximitized with aluminum
Applied Physics Letters 120 (14), 142105
128. J. R. Chamorro, P. Chauhan, C. Sun, N. Varnava, M. J. Winiarski, N. Ng, H. K. Vivanco, L. A. Pressley, C. M. Pasco, D. Vanderbilt, Yi Li, **N. P. Armitage**, T. M. McQueen
Anomalous Residual Surface Conductivity in a Superconductor with Strong Spin-Orbit Coupling
Submitted 2022
- 127 Q.L. He, T.L. Hughes, **N.P. Armitage**, Y. Tokura, K.L. Wang
Topological spintronics and magnetoelectronics
Nature Materials 21 (1), 15-23 (2022).
- 126 Wang, LS; Xu, Y; Huang, YY; Ni, JM; Zhao, CC; Dai, YF; Pan, BY; Hong, XC; Chauhan, P; Koochpayeh, SM; **Armitage, NP**; SY Li
Quantum Critical Magnetic Excitations in Spin-1/2 and Spin-1 Chain Systems, accepted
Physical Review X 12 (2), 021020 (2022)
- 125 Mahmood, Fahad; Ingram, David; He, Xi; Clayhold, JA; Bozovic, Ivan, **N.P. Armitage**, Effect of radiation-induced defects on the superfluid density and optical conductivity of overdoped $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$
Physical Review B 105 (17), 174501 (2022)
- 124 Chauhan, Prashant; Budhani, Ramesh; **Armitage, NP**,
Anomalous small superconducting gap in the strong spin-orbit coupled superconductor: β -Tungsten, Physical Review B 105 (6), L060503
- 123 Zhang, Xinshu; Xu, Yuanyuan; Zhong, Ruidan; Cava, RJ; Drichko, N; **Armitage, N.P.**

In-and out-of-plane field induced quantum spin-liquid states in a more ideal Kitaev material: $\text{BaCo}_2(\text{AsO}_4)_2$, arXiv preprint arXiv:2106.13418 (2021), Accepted Nature Materials

122 Mekonen, Sirak M; Kang, Chang-Jong; Chaudhuri, Dipanjan; Barbalas, David; Ran, Sheng; Kotliar, Gabriel; Butch, Nicholas P; **Armitage, NP**
An optical investigation of the heavy fermion normal state in superconducting UTe_2 ,
Physical Review B 106 (8), 085125

121 Rishi Bhandia, Bing Cheng, Tobias L Brown-Heft, Shouvik Chatterjee, Christopher J Palmström, **NP Armitage**
THz-range Faraday rotation in the Weyl semimetal candidate Co_2TiGe
Journal of Applied Physics 128 (24), 2443032020 (2020).

120 Youcheng Wang, HP Nair, NJ Schreiber, JP Ruf, Bing Cheng, DG Schlom, KM Shen, **NP Armitage**
Separated transport relaxation scales and interband scattering in SrRuO_3 , CaRuO_3 , and SrRuO_3 thin films
Physical Review B 103 (20), 205109 (2021).

119 B Cheng, T Schumann, S Stemmer, **N.P. Armitage**
Probing charge pumping and relaxation of the chiral anomaly in a Dirac semimetal
Science Advances 7 (16), eabg0914 (2021)

118 Anaëlle Legros, Shang-Shun Zhang, Xiaojian Bai, Hao Zhang, Zhiling Dun, W Adam Phelan, Cristian D Batista, Martin Mourigal, **NP Armitage**
Observation of 4- and 6-magnon bound-states in the spin-anisotropic frustrated antiferromagnet FeI_2
Physical Review Letters 127, no. 26 267201 (2021)

117 F Mahmood, D Chaudhuri, S Gopalakrishnan, R Nandkishore, **N.P. Armitage**
Observation of a marginal Fermi glass using THz 2D coherent spectroscopy
Nature Physics (2021). <https://doi.org/10.1038/s41567-020-01149-0>

116 CM Morris, Nisheeta Desai, J Viirik, D Huvonen, U Nagel, T Room, JW Krizan, RJ Cava, TM McQueen, SM Koohpayeh, Ribhu K Kaul, **NP Armitage**
Duality and domain wall dynamics in a twisted Kitaev chain
Nature Physics 1-5 (2021).

115 Z. Tagay, F. Mahmood, A. Legros, T. Sarkar, R.L. Greene, **N.P. Armitage**
BCS d-wave behavior in the THz electrodynamic response of an electron-doped cuprate superconductor
Physical Review B 104 (6), 064501 (2021)

114 D. Barbalas, S Chatterjee, DG Schlom, KM Shen, **NP Armitage**
Terahertz Electrodynamics of Mixed-Valent YbAl_3 and LuAl_3 Thin Films
The European Physical Journal B 94 (9), 1-8 (2021)

- 113 Youcheng Wang, G Bossé, HP Nair, NJ Schreiber, JP Ruf, B Cheng, C Adamo, DE Shai, Y Lubashevsky, DG Schlom, KM Shen, **NP Armitage**
Subterahertz Momentum Drag and Violation of Matthiessen's Rule in an Ultraclean Ferromagnetic Metallic Thin Film
Physical Review Letters 125 (21), 217401 (2021)
- 112 Dipanjan Chaudhuri, Maryam Salehi, Sayak Dasgupta, Mintu Mondal, Jisoo Moon, Deepti Jain, Seongshik Oh, **NP Armitage**
Ambipolar magneto-optical response of ultra-low carrier density topological insulators
Physical Review B 103 (8), L081110 (2021)
- 111 A Alexandradinata, **NP Armitage**, A Baydin, W Bi, Y Cao, HJ Changlani, ...
The Future of the Correlated Electron Problem
arXiv preprint arXiv:2010.005842020
- 110 Xinshu Zhang, Yi Luo, T Halloran, J Gaudet, Huiyuan Man, SM Koohpayeh, **NP Armitage**
Low Energy Magneto-optics of TbTiO in [111] Magnetic Field
Physical Review B 103 (14), L140403 (2021).
- 109 K Wang, Bing Xu, CW Rischau, N Bachar, B Michon, J Teyssier, Y Qiu, T Ohtsuki, Bing Cheng, **NP Armitage**, S Nakatsuji, D van Der Marel
Unconventional free charge in the correlated semimetal $\text{Nd}_2\text{Ir}_2\text{O}_7$
Nat. Phys. **16**, 1194–1198 (2020).
- 108 KW Post, A Legros, DG Rickel, J Singleton, RD McDonald, Xi He, I Bozovic, X Xu, X Shi, **N.P. Armitage**, SA Crooker
Observation of cyclotron resonance and measurement of the hole mass in optimally-doped $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$
Physical Review B 103 (13), 134515
- 107 Bing Cheng, Natsuki Kanda, Tatsuhiko N Ikeda, Takuya Matsuda, Peiyu Xia, Timo Schumann, Susanne Stemmer, Jiro Itatani, **N.P. Armitage**, Ryusuke Matsunaga
Efficient Terahertz Harmonic Generation with Coherent Acceleration of Electrons in the Dirac Semimetal Cd_3As_2
Physical Review Letters 124 (11), 117402 (2020)
- 167 L Wu, A Farid, NJ Laurita, T Mueller, **N.P. Armitage**
A compact broadband terahertz range quarter-wave plate
Journal of Infrared, Millimeter, and Terahertz Waves, 1-13 (2020)
- 105 T Matsuda, N Kanda, T Higo, **N.P. Armitage**, S Nakatsuji, R Matsunaga
Room-temperature terahertz anomalous Hall effect in Weyl antiferromagnet Mn_3Sn thin films
Nature Communications 11 (1), 1-8 (2020)
- 104 P Chauhan, F Mahmood, HJ Changlani, SM Koohpayeh, **N.P. Armitage**
Tunable Magnon Interactions in a Ferromagnetic Spin-1 Chain
Physical Review Letters 124 (3), 037203 (2020)

103 **N.P. Armitage**

Superconductivity mystery turns 25
Nature **576**, 386-387 (2019)

102 A Mukherjee, J Seo, MM Arik, H Zhang, C Zhang, T Kirzhner, DK George, AG Markelz, **N.P. Armitage**, G Koren, JYT Wei, J Cerne
Linear dichroism infrared resonance in over-, under-, and optimally-doped cuprate superconductors
Physical Review B 102 (5), 054520 (2020)

101 Bing Cheng, T Schumann, YC Wang, XS Zhang, D Barbalas, S Stemmer, **N.P. Armitage**

A large effective phonon magnetic moment in a Dirac semimetal
Nano Letters 20 (8), 5991-5996 (2020)

100. Y Wan, **N.P. Armitage**

Resolving continua of fractional excitations by spinon echo in THz 2D coherent spectroscopy
Physical Review Letters 122 (25), 257401 (2019)

99. Bing Cheng, Youcheng Wang, D. Barbalas, Tomoya Higo, S. Nakatsuji, and **N.P. Armitage**

Terahertz conductivity of the magnetic Weyl semimetal Mn_3Sn films
Appl. Phys. Lett. 115, 012405 (2019)

98. Bing Cheng, P. Taylor, P. Folkes, Charles Rong, **N. P. Armitage**

Magnetoterahertz Response and Faraday Rotation from Massive Dirac Fermions in the Topological Crystalline Insulator $Pb_{0.5}Sn_{0.5}Te$
Phys. Rev. Lett. 122, 097401 (2019)

97. J Steinberg, **N.P. Armitage**, F.H.L. Essler, S Sachdev

NMR relaxation in Ising spin chains
Physical Review B 99.3 035156 (2019)

96. **N.P. Armitage**, L Wu

On the matter of topological insulators as magnetoelectrics
SciPost Physics 6 (4), 046

95. P. Chauhan, F. Mahmood, D. Yue, P.C. Xu, X. Jin, **N.P. Armitage**

Nodeless bulk superconductivity in the time-reversal symmetry breaking Bi/Ni bilayer system
Physical Review Letters 122, 017002 (2019).

94. Fahad Mahmood, Xi He, Ivan Bozovic, and **N.P. Armitage**

Locating the missing superconducting electrons in overdoped cuprates
Physical Review Letters 122 (2), 027003 (2019)

93. Mintu Mondal, Dipanjan Chaudhuri, Maryam Salehi, Cheng Wan, N.J. Laurita, Bing Cheng, Andreas V. Stier, Michael A. Quintero, Jisoo Moon, Deepti Jain, Pavel P.

Shibayev, James R. Neilson, Seongshik Oh, **N.P. Armitage**
Electric field modulated topological magnetoelectric effect in Bi_2Se_3
Physical Review B 98 (12), 121106 (2018)

92. Xinshu Zhang, Fahad Mahmood, Marcus Daum, Zhiling Dun, Joseph A.M. Paddison, Nicholas J. Laurita, Tao Hong, Haidong Zhou, **N.P. Armitage**, Martin Mourigal
Hierarchy of exchange interactions in the triangular-lattice spin-liquid YbMgGaO_4
Physical Review X 8 (3), 031001 (2018)

91. Y. Wang, I. Tamir, D. Shahar, **N.P. Armitage**
Absence of Cyclotron Resonance in the Anomalous Metallic Phase in InOx
Physical Review Letters 120 (16), 167002 (2018)

90. **N.P. Armitage**, E. J. Mele, Ashvin Vishwanath
Weyl and Dirac Semimetals in Three Dimensional Solids
Reviews of Modern Physics 90 (1), 015001 (2018)

89. Bing Cheng, T. Ohtsuki, Dipanjan Chaudhuri, S. Nakatsuji, Mikk Lippmaa, and **N. P. Armitage**
Dielectric anomalies and interactions in the 3D quadratic band touching Luttinger semimetal $\text{Pr}_2\text{Ir}_2\text{O}_7$
Nature Communications 8 (1), 2097 (2017)

88. **N.P. Armitage**
Inertial effects in systems with magnetic charge
Physica B: Condensed Matter (2017)

87. N.J. Laurita, C.M. Morris, S.M.Koohpayeh, W.A. Phelan, T.M. McQueen, **N.P. Armitage**
Impurities or a neutral Fermi surface? A further examination of the low-energy ac optical conductivity of SmB_6
Physica B: Condensed Matter (2017).

86. N. J. Laurita, Yi Luo, Rongwei Hu, Meixia Wu, S. W. Cheong, O. Tchernyshyov, and **N. P. Armitage**
Anomalous exchange interactions between RE^{+3} and Mn^{+3} moments in multiferroic h- REMnO_3
Physical Review Letter (2017).

85. N. J. Laurita, G. G. Marcus, B. A. Trump, J. Kindervater, M. B. Stone, T. M. McQueen, C. L. Broholm, **N. P. Armitage**
Low energy magnon dynamics and magneto-optics of the skyrmionic Mott insulator Cu_2OSeO_3
Physical Review B, 95(23), 235155. (2017).

84. Dipanjan Chaudhuri, Bing Cheng, Alexander Yaresko, Quinn D. Gibson, R. J. Cava, **N.P. Armitage**
Optical investigation of the strong spin-orbital coupled magnetic semimetal YbMnBi_2

Physical Review B 96 (7), 075151(2017).

83. R. M. Ireland, Liang Wu, M. Salehi, S. Oh, **N. P. Armitage**, H. E. Katz
Nonvolatile Solid-State Charged-Polymer Gating of Topological Insulators into the
Topological Insulating Regime
Physical Review Applied 9(4), 044003 (2017).

82. Liang Wu, M. Salehi, N. Koirala, J. Moon, S. Oh, **N.P. Armitage**
Quantized Faraday and Kerr rotation and axion electrodynamics of the surface states of
three-dimensional topological insulator
Science 354, 1124-1127 (2016).

81. L. Zhao, C. A. Belvin, R. Liang, D. A. Bonn, W. N. Hardy, **N. P. Armitage**, D. Hsieh
A global inversion-symmetry-broken phase inside the pseudogap region of $\text{YBa}_2\text{Cu}_3\text{O}_y$
Nature Physics (2016).

80. Bing Cheng, Liang Wu, S. K. Kushwaha, R. J. Cava, and **N. P. Armitage**
Measurement of the topological surface state optical conductance in bulk-insulating Sn-
doped $\text{Bi}_{1.1}\text{Sb}_{0.9}\text{Te}_2\text{S}$ single crystals
Phys. Rev. B **94**, 201117(R) (2016).

79. N. J. Laurita, C. M. Morris, S. M. Koohpayeh, P. F. S. Rosa, W. A. Phelan, Z. Fisk, T.
M. McQueen, **N. P. Armitage**
Anomalous three-dimensional bulk ac conduction within the Kondo gap of SmB_6
single crystals
Phys. Rev B 94, 165154 (2016).

78. A. Akrap, M. Haki, S. Tchoumakov, I. Crassee, J. Kuba, M. O. Goerbig, C. C.
Homes, O. Caha, J. Novak, F. Teppe, S. Koohpayeh, Liang Wu, **N. P. Armitage**, A.
Nateprov, E. Arushanov, Q. D. Gibson, R. J. Cava, D. van der Marel, C. Faugeras, G.
Martinez, M. Potemski, M. Orlita
Magneto-optical signature of massless Kane electrons in Cd_3As_2
Phys. Rev. Lett. 117, 136401 (2016).

77. Matthew Brahlek, Nikesh Koirala, Maryam Salehi, Jisoo Moon, Wenhan Zhang,
Haoxiang Li, Xiaoqing Zhou, Myung-Geun Han, Liang Wu, Thomas Emge, Hang-Dong
Lee, Can Xu, Seuk Joo Rhee, Torgny Gustafsson, **N. Peter Armitage**, Yimei Zhu,
Daniel S. Dessau, Weida Wu, Seongshik Oh
Disorder-driven topological phase transition in Bi_2Se_3 films
Phys. Rev. B 94, 165104 (2016).

76. **N. Peter Armitage**
Kitaev's exact solution approximated
Nature Materials 15, 701–702 (2016).

75. A. Farid, N.J. Laurita, B. Tehrani, J. Hester, M.M. Tenteris, **N.P. Armitage**
Inkjet Printed Wire-Grid Polarizers for the THz Frequency Range
Infrared Millimeter Terahertz Waves (2016).

74. N.J. Laurita, Bing Cheng, R. Barkhouser, V.A. Neumann, and **N.P. Armitage**
A Modified 8f Geometry With Reduced Optical Aberrations For Improved Time Domain Terahertz Spectroscopy
Infrared Millimeter Terahertz Waves (2016).
73. Liang Wu, Tim Mueller, **N.P. Armitage**
A compact broadband Terahertz range quarter-wave plate
Submitted Journal of Infrared, Millimeter and Terahertz waves (2016).
72. Liang Wu, R.M. Ireland, M. Salehi, B. Cheng, N. Koirala, S. Oh, H. E. Katz, **N.P. Armitage**
Tuning and Stabilizing Topological Insulator Bi_2Se_3 in the Intrinsic Regime by Charge Extraction with Organic Overlayers
Appl. Phys. Lett. 108, 221603 (2016).
71. Bing Cheng, Liang Wu, N. J. Laurita, Harkirat Singh, Madhavi Chand, Pratap Raychaudhuri, and **N.P. Armitage**
Anomalous gap edge dissipation in disordered superconductors on the brink of localization
Phys. Rev. B 93, 180511(R) (2016).
70. G. Bossé, LiDong Pan, Y. Li, L. H. Greene, J. Eckstein, and **N.P. Armitage**
Hund's coupling and anomalous frequency and temperature dependent scattering in the almost quantum critical heavy fermion system CeFe_2Ge_2
Phys. Rev. B 93, 085104 (2016).
69. Nikesh Koirala, Matthew Brahlek, Maryam Salehi, Liang Wu, Jixia Dai, Justin Waugh, Thomas Nummy, Myung-Geun Han, Jisoo Moon, Yimei Zhu, Daniel Dessau, Weida Wu, **N. Peter Armitage**, Seongshik Oh
Record surface state mobility and quantum Hall effect in topological insulator thin films via interface engineering
Nano Letters 15, 8245-8249 (2015).
68. LiDong Pan, Christopher M. Morris, Kate A. Ross, Edwin Kermarrec, Bruce D. Gaulin, S. M. Koohpayeh, and **N.P. Armitage**
Measurement of monopole inertia in a quantum spin ice
Nature Physics December (2015) doi:10.1038/nphys3608.
67. Liang Wu, Wang-Kong Tse, M. Brahlek, C. M. Morris, R. Valdés Aguilar, N. Koirala, S. Oh, and **N.P. Armitage**
High-Resolution Faraday Rotation and Electron-Phonon Coupling in Surface States of the Bulk-Insulating Topological Insulator $\text{Cu}_{0.02}\text{Bi}_2\text{Se}_3$
Phys. Rev. Lett. 115, 217602 (2015).
66. Maryam Salehi, Matthew Brahlek, Nikesh Koirala, Jisoo Moon, Liang Wu, **N.P. Armitage**, Seongshik Oh
Stability of low-carrier-density topological-insulator Bi_2Se_3 thin films and effect of capping layers
APL Materials 3, 091101 (2015).

65. V. A. Neumann, N. J. Laurita, LiDong Pan, **N.P. Armitage**
Reduction of Effective Terahertz Focal Spot Size By Means Of Nested Concentric Parabolic Reflectors
AIP Advances 5, 097203 (2015).
64. N. J. Laurita, J. Deisenhofer, LiDong Pan, C. M. Morris, A. Loidl, and **N.P. Armitage**
Singlet-triplet excitations in the spin-orbital liquid candidate FeSc_2S_4
Phys. Rev. Lett. 114, 207201 (2015).
63. LiDong Pan, Se Kwon Kim, A. Ghosh, Christopher M. Morris, Kate A. Ross, Edwin Kermarrec, Bruce D. Gaulin, S. M. Koohpayeh, Oleg Tchernyshyov and **N.P. Armitage**
Low Energy Electrodynamics of Novel Spin Excitations in the Quantum Spin Ice $\text{Yb}_2\text{Ti}_2\text{O}_7$
Nature Communications 5, 4970 (2014).
62. **N.P. Armitage**
Cuprate superconductors: Dynamic stabilization?
Nature Materials 7, (2014).
61. Wei Liu, LiDong Pan, and **N.P. Armitage**
Broadband Corbino spectrometer at ^3He temperatures and high magnetic fields
Rev. Sci. Instrum. 85, 093108 (2014).
60. **N.P. Armitage**
Constraints on Jones transmission matrices from time-reversal invariance and discrete spatial symmetries
Phys. Rev. B 90, 035135 (2014).
59. Y. Lubashevsky, LiDong Pan, T. Kirzhner, G. Koren, and **N.P. Armitage**
Optical Birefringence and Dichroism of Cuprate Superconductors in the THz regime
Phys. Rev. Lett. 112, 147001 (2014).
58. C.M. Morris, R. Valdes Aguilar, S. M. Koohpayeh, J. Krizan, R. J. Cava, O. Tchernyshyov, T. M. McQueen, and **N.P. Armitage**
A hierarchy of bound states in the 1D ferromagnetic Ising chain CoNb_2O_6 investigated by high resolution time-domain terahertz spectroscopy
Phys. Rev. Lett. 112, 137403 (2014).
57. J.P. Sheckelton, F. Foronda, LiDong Pan, R. D. McDonald, **N.P. Armitage**, T. Imai, S. J. Blundell, and T. M. McQueen
Local magnetism and electronic correlations in the geometrically frustrated cluster magnet $\text{LiZn}_2\text{Mo}_3\text{O}_8$
Phys. Rev. B 89, 064407 (2014).
56. M. Neshat and **N.P. Armitage**
Developments in time-domain THz ellipsometry
Journal of Infrared, Millimeter, and Terahertz Waves 34, 682–708 (2013).

55. Wei Liu, LiDong Pan, Jiajia Wen, Minsoo Kim, G. Sambandamurthy, and **N.P. Armitage**,
Microwave Spectroscopy Evidence of Superconducting Pairing in the Magnetic-Field-Induced Metallic State of InO_x Films at Zero Temperature
Phys. Rev. Lett. 111, 067003 (2013).
54. Liang Wu, R. Valdés Aguilar, M. Brahlek, A. V. Stier, L. S. Bilbro, Y. Lubashevsky, N. Bansal, S. Oh, **N.P. Armitage**
A sudden collapse in the transport lifetime across the topological phase transition in $\text{Bi}_{2-x}\text{In}_x\text{Se}_3$
Nature Physics 9, 410–414 (2013).
53. R. Valdes Aguilar, L. Wu, A.V. Stier, L.S. Bilbro, M. Brahlek, N. Bansal, S. Oh, **N.P. Armitage**
Aging and reduced bulk conductance in thin films of the topological insulator Bi_2Se_3
Journal of Applied Physics 113, 153702 (2013).
52. M. Neshat and **N.P. Armitage**
Terahertz time-domain spectroscopic ellipsometry: Instrumentation and calibration
Optics Express Vol. 20, No. 27 29063 (2012).
51. James R. Neilson, Anna Llobet, Andreas V. Stier, Liang Wu, Jiajia Wen, Jing Tao, Yimei Zhu, Zlatko B. Tesanovic, **N.P. Armitage**, Tyrel M. McQueen
Mixed-Valence-Driven Heavy-Fermion Behavior and Superconductivity in KNi_2Se_2
Phys. Rev. B 86, 054512 (2012).
50. G. Bossé, L. S. Bilbro, R. Valdés Aguilar, LiDong Pan, Wei Liu, A. V. Stier, Y. Li, L. H. Greene, J. Eckstein, and **N.P. Armitage**
Low energy electrodynamics of the Kondo-lattice antiferromagnet CeCu_2Ge_2
Phys. Rev. B 85, 155105 (2012).
49. C. Morris, R.Valdés Aguilar, A.V. Stier, and **N.P. Armitage**
Polarization modulation time-domain terahertz polarimetry
Imaging and Applied Optics (2012), *Proceedings 2012 OSA Optical Sensors Meeting*
48. C. Morris, R.Valdés Aguilar, A.V. Stier, and **N.P. Armitage**
Polarization modulation time-domain terahertz polarimetry
Optics Express, Vol. 20 Issue 11, pp.12303-12317 (2012).
47. M. Neshat and **N.P. Armitage**
Improved measurement of polarization state in terahertz polarization spectroscopy
Optics Letters, Vol. 37, Issue 11, pp. 1811-1813 (2012).
46. M. Neshat and **N.P. Armitage**
Polarization State Measurements of Terahertz Time-Domain Pulses
CLEO Technical Digest, San Jose California 2012.

45. R. Valdés Aguilar, A. V. Stier, W. Liu, L. S. Bilbro, D. K. George, N. Bansal, L. Wu, J. Cerne, A. G. Markelz, S. Oh, and **N.P. Armitage**
Terahertz Response and Colossal Kerr Rotation from the Surface States of the Topological Insulator Bi_2Se_3
Phys. Rev. Lett. 108, 087403 (2012).
44. G. Sambandamurthy, and **N.P. Armitage**
Magnetic field-induced novel insulating phase in 2D superconductors
Chapter in “Conductor Insulator Quantum Phase Transitions”, Ed. V. Dobrosavljevic, N. Trivedi, and J.M. Valles Jr., Oxford University Press 2012, Available at arXiv:1109.4087
43. W. Liu, R. Valdés Aguilar, Yufeng Hao, R. S. Ruoff, and **N.P. Armitage**
Broadband microwave and time-domain terahertz spectroscopy of chemical vapor deposition grown graphene
J. Appl. Phys. **110**, 083510 (2011).
42. L.S. Bilbro, R. Valdes-Aguilar, G. Logvenov, O. Pelleg, I. Bozovic, **N.P. Armitage**
On the possibility of fast vortices in the cuprates: A vortex plasma model analysis of THz conductivity and diamagnetism in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$
Phys. Rev. B 84, 100511(R) (2011).
41. L.S. Bilbro, R. Valdes-Aguilar, G. Logvenov, O. Pelleg, I. Bozovic, **N.P. Armitage**
Probing the time scales of superconducting correlations above T_c in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ by THz spectroscopy
Nature Physics 7, 298 (2011).
40. Wei Liu, Minsoo Kim, G. Samandamurthy, **N.P. Armitage**,
Dynamical study of phase fluctuations and their critical slowing down in amorphous superconducting films
Phys. Rev B 84, 024511 (2011).
39. V.K. Thorsmolle and **N.P. Armitage**
Ultrafast Many-body Relaxation in an Electron Glass
Phys. Rev. Lett. 105, 086601 (2010).
38. R. Valdés Aguilar, L.S. Bilbro, S. Lee, C. W. Bark, J. Jiang, J.D. Weiss, E.E. Hellstrom, D.C. Larbalestier, C. B. Eom, and **N.P. Armitage**
Pair-breaking effects and coherence peak in the terahertz conductivity of superconducting in $\text{BaCo}_{2x}\text{Fe}_{2-2x}\text{As}_2$ thin films
Phys. Rev. B Rapid Comm., 82 180514 (2010).
37. **N.P. Armitage**, P. Fournier, R. Greene
Progress and Perspectives in the Electron-Doped Cuprates
Rev. of Mod. Phys. 82, 2421 (2010).
36. **N.P. Armitage**, Riccardo Tediosi, E. Giannini, L. Forro, D. van der Marel
Infrared Conductivity of Elemental Bismuth under Pressure: Evidence for an Avoided Lifshitz-Type Semimetal-Semiconductor Transition
Phys. Rev. Lett. 104, 237401 (2010).

35. V. Guritanu, **N.P. Armitage**, R. Tediosi, S. S. Saxena, A. Huxley, and D. van der Marel van Mechelen, D. van der Marel
Optical spectra of the heavy fermion uniaxial ferromagnet UGe_2
Phys. Rev. B 78, 172 (2008).
34. J. L. M. van Mechelen, D. van der Marel, C. Grimaldi, A. B. Kuzmenko, **N.P. Armitage**, N. Reyren, H. Hagemann, and I. I. Mazin
Electron-Phonon Interaction and Charge Carrier Mass Enhancement in $SrTiO_3$
Phys. Rev. Lett. 100, 226403 (2008).
33. **N.P. Armitage**, R. Crane, A. Johansson, G. Sambandamurthy, D. Shahar, and G. Gruner
Direct observation of quantum superconducting fluctuations in an insulating groundstate
Physica B 403, 1208–1210 (2008).
32. Riccardo Tediosi, **N.P. Armitage**, E. Giannini, D. van der Marel
Charge carrier interaction with a purely electronic collective mode: Plasmarons and the infrared response of elemental bismuth
Phys. Rev. Lett. 99, 016406 (2007).
31. R. Crane, **N.P. Armitage**, A. Johansson, G. Sambandamurthy, D. Shahar, and G. Gruner
Fluctuations, dissipation, and nonuniversal superfluid jumps in two-dimensional superconductors
Phys. Rev. B 75, 094506 (2007).
30. R. Crane, **N.P. Armitage**, A. Johansson, G. Sambandamurthy, D. Shahar, and G. Gruner
Survival of Superconducting Correlations Across the 2D Superconductor-Insulator Transition: A finite frequency study
Phys. Rev. B 75, 184530 (2007).
29. S. R. Park, Y. S. Roh, Y. K. Yoon, C. S. Leem, J. H. Kim, B. J. Kim, H. Koh, H. Eisaki, **N.P. Armitage**, C. Kim
Electronic structure of electron-doped order $Sm_{1.85}Ce_{0.15}CuO_4$: Strong pseudogap effects, nodeless gap, and signatures of short-range
Phys. Rev. B 75, 060501(R) (2007).
28. F. Ronning, K. M. Shen, **N.P. Armitage**, A. Damascelli, D.H. Lu, Z.-X. Shen, L. L. Miller, C. Kim
Anomalous high energy dispersion in photoemission spectra from insulating cuprates
Phys. Rev. B 71, 094518 (2005).
27. S. R. Park, Y. S. Roh, Y. K. Yoon, C. S. Leem, J. H. Kim, B. J. Kim, H. Koh, H. Eisaki, **N.P. Armitage**, and C. Kim
Angle resolved photoemission studies on $Sm_{2-x}Ce_xCuO_4$: remnant Fermi surfaces and coupling to (p,p) scattering
JOUR. PHYS. CHEM. SOL. 65 (8-9): 1403-1407 (2004).

26. K.M. Shen, F. Ronning, D.H. Lu, W.S. Lee, N.J.C. Ingle, W. Meevasana, F. Baumberger, A. Damascelli, **N.P. Armitage**, L.L. Miller, Y. Kohsaka, M. Azuma, M. Takano, H. Takagi, Z.-X. Shen
Missing Quasiparticles and the Chemical Potential Puzzle in the Doping Evolution of the Cuprate Superconductors
Phys. Rev. Lett. 93, 267002 (2004).
25. **N.P. Armitage** and Jiangping Hu
On the detection of time-reversal symmetry breaking by photoemission with circularly polarized light in Bi₂212
Phil. Mag. Lett. 84, 105–107 (2004).
24. M. Briman, **N.P. Armitage**, E. Helgren, G. Gruner
Dipole Relaxation Losses in DNA
NanoLetters 4, 733 (2004).
23. **N.P. Armitage**, J.-C. P. Gabriel, G. Gruner
Quasi-Langmuir-Blodgett Thin Film Deposition of Carbon Nanotubes
J. App. Phys. 95, 3228 (2004).
22. E. Helgren, **N.P. Armitage**, G. Gruner
Frequency-dependent conductivity of electron glasses
Phys. Rev. B 69, 014201 (2004)
21. K.M. Shen, T. Yoshida, D.H. Lu, F. Ronning, **N.P. Armitage**, W.S. Lee, X.J. Zhou, A. Damascelli, D.L. Feng, N.J.C. Ingle, H. Eisaki, Y. Kohsaka, H. Takagi, T. Kakeshita, S. Uchida, P.K. Mang, M. Greven, Y. Onose, Y. Taguchi, Y. Tokura, Seiki Komiya, Yoichi Ando, M. Azuma, M. Takano, A. Fujimori, Z.-X. Shen
Fully Gapped Single-Particle Excitations in the Lightly Doped Cuprates
Phys. Rev. B 69, 054503 (2003).
20. **N.P. Armitage**, M. Briman, G. Gruner
Charge Transfer and Charge Transport on the Double Helix
Phys. Stat. Sol. (b) 241, 69 (2003).
19. **N.P. Armitage**, E. Helgren, G. Gruner
'Taxonomy' of Electron Glasses
Proceedings of the NATO ARW on 'Concepts in Electron Correlation', Kluwer Academic Publishers, The Netherlands 2003.
18. F. Ronning, T. Sasagawa, Y. Kohsaka, K.M. Shen, A. Damascelli, C. Kim, T. Yoshida, **N.P. Armitage**, D.H. Lu, D.L. Feng, L.L. Miller, H. Takagi, Z.-X. Shen
Evolution of a metal to insulator transition in Ca_{2-x}Na_xCuO₂Cl₂, as seen by angle-resolved photoemission
Phys. Rev. B 67, 165101 (2003).
17. E. Helgren, **N.P. Armitage**, G. Gruner

Electrodynamics of a Coulomb Glass in n-type Silicon
Phys. Rev. Lett. 89, 246601 (2002).

16. **N.P. Armitage**, D. H. Lu, C. Kim, A. Damascelli, K. M. Shen, F. Ronning, D. L. Feng, P. Bogdanov, X. J. Zhou, W. L. Yang, Z. Hussain, P. K. Mang, N. Kaneko, M. Greven, Y. Onose, Y. Taguchi, Y. Tokura, and Z.-X. Shen
Angle-resolved photoemission spectral function analysis of the electron-doped cuprate $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$
Phys. Rev. B 68, 064517 (2003).

15. D.L. Feng, A. Damascelli, K. M. Shen, N. Motoyama, D. H. Lu, H. Eisaki, K. Shimizu, J.-i. Shimoyama, K. Kishio, N. Kaneko, M. Greven, G. D. Gu, X.J. Zhou, C. Kim, F. Ronning, **N.P. Armitage**, Z.-X. Shen
Electronic structure of the tri-layer cuprate $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_{10+d}$
Phys. Rev. Lett. 88, 107001 (2002).

14. C. Kim, A. Mehta, D.L. Feng, K.M. Shen, **N.P. Armitage**, K. Char, S.H. Moon, Y.Y. Xie, and J. Wu
X-ray diffraction measurements of the c-axis Debye-Waller factors of $\text{YBa}_2\text{Cu}_3\text{O}_7$ and $\text{HgBa}_2\text{CaCu}_2\text{O}_6$
Phys. Rev. B(Rapid Comm.) 67, 092508R (2003).

13. **N.P. Armitage**, F. Ronning, D.H. Lu, C. Kim, A. Damascelli, K.M. Shen, Z.X. Shen, P. Mang, N. Kaneko, M. Greven, Y. Onose, Y. Taguchi, Y. Tokura
Doping Dependence of $\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_4$ investigated by angle-resolved photoemission
Phys. Rev. Lett. 88 257001 (2002).

12. F. Ronning, C. Kim, K.M. Shen, **N.P. Armitage**, A. Damascelli, D.H. Lu, Z.-X. Shen, L.L. Miller
Universality of the electronic structure from a half filled CuO_2 plane.
Phys. Rev. B 67, 035113 (2003).

11. D. L. Feng, C. Kim, H. Eisaki, D. H. Lu, K. M. Shen, F. Ronning, **N.P. Armitage**, A. Damascelli, N. Kaneko, M. Greven, J.-i. Shimoyama, K. Kishio, R. Yoshizaki, G. D. Gu, Z.-X. Shen
Nature of the Electronic Excitations near the Brillouin Zone Boundary of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$
Phys. Rev. B. 65 220501 (2002).

10. **N.P. Armitage**, D.H. Lu, C. Kim, A. Damascelli, K.M. Shen, F. Ronning, P. Bogdanov, Z.X. Shen, Y. Onose, Y. Taguchi, Y. Tokura
Anomalous Electronic Structure and Pseudogap Effects in $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$
Phys. Rev. Lett. 87 147003 (2001).

9. D.L. Feng, **N.P. Armitage**, D.H. Lu, A. Damascelli, J.P. Hu, P. Bogdanov, A. Lanzara, F. Ronning, K.M. Shen, J.-i. Shimoyama, K. Kishio, H. Eisaki, C. Kim, and Z.-X. Shen
Bilayer Splitting in the Electronic Structure of Heavily Overdoped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$
Phys. Rev. Lett. 86, 5550 (2001).

8. K.M. Shen, A. Damascelli, D.H. Lu, **N.P. Armitage**, F. Ronning, D.L. Feng, C. Kim, Z.-X. Shen, I.I. Mazin, D.J. Singh, S. Nakatsuji, Y. Maeno, T. Kimura and Y. Tokura
Surface electronic structure of Sr_2RuO_4
Phys. Rev. B (Rapid Comm.) 64 180502(R) (2001).

7. D.H. Lu, D.L. Feng, **N.P. Armitage**, K.M. Shen, A. Damascelli, C. Kim, F. Ronning, D.A. Bonn, R. Liang, W.N. Hardy, A.I. Rykov, S. Tajima, Z.-X. Shen
Superconducting Gap and Strong In-Plane Anisotropy in Untwinned $\text{Y}_2\text{Ba}_2\text{Cu}_3\text{O}_{7-d}$
Phys. Rev. Lett. 86, 4370 (2001).

6. **N.P. Armitage**, D.H. Lu, D.L. Feng, C. Kim, A. Damascelli, K.M. Shen, F. Ronning, Y. Onose, Y. Taguchi, Y. Tokura, Z.X. Shen
Anisotropy of the Superconducting Gap in $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$: Results from Photoemission
Phys. Rev. Lett. 86, 1126 (2001).

5. A. Damascelli, D.H. Lu, K.M. Shen, **N.P. Armitage**, F. Ronning, D.L. Feng, C. Kim, Z.-X. Shen, T. Kimura, Y. Tokura, Z.Q. Mao, Y. Maeno
Fermi surface, surface states, and surface reconstruction in Sr_2RuO_4
Phys. Rev. Lett. 85, 5194 (2000).

4. **N.P. Armitage**, D.H. Lu, C. Kim, A. Damascelli, K.M. Shen, F. Ronning, Z.-X. Shen, Y. Onose, Y. Taguchi, Y. Tokura.
A photoemission investigation of the superconducting gap in an electron-doped cuprate superconductor
J. Electron Spectr. Relat. Phenom., 114-116 (2001) 623-627.

3. A. Damascelli, K.M. Shen, D.H. Lu, **N.P. Armitage**, F. Ronning, D.L. Feng, C. Kim, Z.-X. Shen, T. Kimura, Y. Tokura, Z.Q. Mao, Y. Maeno.
Fermi Surface of Sr_2RuO_4 from Angle Resolved Photoemission.
J. Electron Spectr. Relat. Phenom., 114-116 (2001) 641-646.

2. **N.P. Armitage**, D.H. Lu, C. Kim, A. Damascelli, K.M. Shen, F. Ronning, Y. Onose, Y. Taguchi, Y. Tokura, Z.X. Shen
Electronic Structure of $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$: Evidence for a Disparity Between Hole and Electron Doped Cuprate Superconductors
Physica C 341-348 (2000) 2083-2086.

1. F. Ronning, C. Kim, A. Damascelli, **N.P. Armitage**, D.H. Lu, K.M. Shen, L.L. Miller, Y.J. Kim, M.A. Kastner, R.J. Birgeneau, and Z.-X. Shen
ARPES Features of the AF Insulators $\text{Sr}_2\text{CuO}_2\text{Cl}_2$ and $\text{Ca}_2\text{CuO}_2\text{Cl}_2$ Close to the AF Zone Boundary
Physica C 341-348 (2000) 2087-2090

PROFESSIONAL SERVICE

- 2022 APS Richard L. Greene Thesis Award Committee.

- 2021-2024 American Physical Society – Executive Committee, Division of Condensed Matter Physics
- 2021 Max Planck Dresden Director Hiring Committee
- 2021 Co-organizer Aspen Center for Physics, Topological Materials across the Correlation Spectrum
- 2020 Conference Organizer – Low Energy Electrodynamics of Solids
- 2020 DoD Topological Materials Advisory Panel
- 2020 Conference Organizer– The Future of the Correlated Electron System
- 2019 LBNL DOE external referee
- 2019 Conference Organizer – The challenge of 2D superconductivity
- 2017 LANL LDRD external site visit panel member
- 2017 Quantum 4 Africa; Program Committee Member
- 2016 Materials and Mechanisms of Superconductivity; Program Committee Member
- Site visit Harvard/MIT/Howard STC Center for Integrated Quantum Materials
- Panelist and Author for DOE report on “Basic Research Needs (BRN) for Quantum Materials for Energy Relevant Technology”
- DMP Focus session organizer for Topological Materials 2016 March Meeting
- External Thesis referee, University of Augsburg
- Chair 2014 Gordon Conference on “Correlated Electron Systems”
- Lecturer 2014 Paul Scherrer Institut Summer School
- Vice-Chair 2013-2015 Proposal Review Panel, LCLS, SLAC
- 2014 APS March Meeting DMP Topological Materials Focus Session coorganizer
- 2013 External Review Committee Member Cornell Center for Materials Research
- 2011-2015 Proposal Review Panel, LINAC Coherent Light Source, SLAC
- External Thesis referee, University of British Columbia
- European Research Council External Referee
- External Referee Dutch Science Foundation
- External Referee Georgian Science Foundation
- Vice-Chair 2012 Gordon Conference on “Correlated Electron Systems”
- Co-Organizer Lorentz Center Conference on “Strongly disordered superconductors and electronic segregation”, Leiden August 2011.
- Lecturer 2011 Princeton Summer School for Condensed Matter Physics
- External Referee for Phd. Thesis Sophie Charpetier, Univ. of Sherbrooke
- Subject Organizer for Strong Correlated Electron Systems for APS March meeting, 2009, 2010
- Organizer 2010, 2011 National Academy Kavli Frontiers of Science Conference
- Multiple time Professor Extraordinaire Demonstration Show at JHU Physics Fair
- Multiple time Demonstration Show for Roland Park Elementary Sch. 5th Grade
- Lecturer 2008 Boulder Summer School for Condensed Matter Physics
- Co-Organizer for 2010 JHU Conference on “Exotic Insulating States of Matter”
- Proposal Referee for US DOE, *Office of Basic Energy Sciences*
- Civilian Research and Development Foundation Proposal Referee
- *NSF* Proposal Referee and Panelist
- *Petroleum Research Fund* Proposal Referee
- Faculty reviewer for updated edition Tipler/Mosca's *Physics for Scientists & Engineers*

- Referee- *Nature*
- Referee- *Science*
- Referee- *Nature Physics*
- Referee- *Nature Materials*
- Referee- *Proceedings of the National Academy*
- Referee - *Physical Review Letters*
- Referee - *Physical Review B*
- Referee – *New Journal of Physics*
- Referee – *Europhysics Letters*
- Referee - *Journal of Electron Spectroscopy and Related Phenomena*
- Referee – *Journal of Physics and Chemistry of Solids*
- Referee - *Physica Status Solidi*

GRANTS

(Contribution from multi-investigator grants given as a proportion considering the total number of PIs)

Canadian Institute for Advanced Research (CIFAR) Fellow
07/01/2019 – 07/01/25 \$240,000

Gordon and Betty Moore Foundation, EPIQS Experimental Investigator
4/01/2020 - 4/01/2025, \$1,600,000

MURI: Implementation of axion electrodynamics in topological films and devices
Army Research Office
05/01/2020 – 04/30/2025, \$892,857 (7 PIs)

The Future of the Correlated Electron Problem Workshop
NSF
\$49,673, 11/01/2019 – 02/29/2020

Non-linear THz optical effects as a probe of Berry's phase in topological materials
NSF
\$360,000 11/01/2019-11/30/2022

Long-term High-Temperature Coherence in Driven Superconductors
DARPA
\$254,069 10/01/2018 - 03/31/2021

MRI: Acquisition of Magnetic Property Measurement System
NSF
06/01/2019 - 05/31/2020, \$458,254

EFRC: The Institute for Quantum Matter
Department of Energy

08/01/2018 – 07/31/2022, \$395 833.333 (with 11 PIs)

Engineering topological surface states in 2D chalcogenide heterostructures
National Science Foundation
\$330,000 10/01/15 - 10/01/18 (with 4 PIs)

THz Measures of Axion Electrodynamics and Exotic Superconducting Interfaces in
Topological Insulator Films and Their Heterostructures
Army Research Office
\$523,251 9/01/15 - 2/28/20

Low energy electrodynamics of strongly interacting disordered systems: quantum phase
transitions and many-body localization
National Science Foundation
\$360,000 7/01/15 - 7/01/18

Johns Hopkins Institute for Quantum Matter, Department of Energy, 09/01/14 - 08/31/17,
\$714,000 (7 co-PIs)

NSF, "Gate-Modulated Charge Density-Dependent Physics of Low-Dimensional
Inorganic Semiconductors in Organic Multilayers," with Howard E. Katz, Seongshik Oh,
Norman P. Armitage, 09/01/13 - 08/31/16 \$520,000

CERDEC-STCD US Army, "A Novel Low Cost Fabrication Technique for Produce
Topological Insulators for use in RF switches - Bismuth Selenide Thin Films", \$20,000
03/2012 – 03/2013

Johns Hopkins Institute for Quantum Matter, Department of Energy, 09/01/11 - 08/31/14,
\$660,000 (6 co-PIs)

Funding for workshop "2012 Low energy electrodynamics of solids", 07/11, Institute of
Complex Adaptive Matter, \$15,000, (with Dmitri Basov)

Funding for workshop "Lorentz Center workshop on Strongly disordered
superconductors and electronic segregation", 02/11, Institute of Complex Adaptive
Matter, \$5,000 (with Lev Ioffe)

Moore Foundation "Terahertz investigations of complex condensed matter", 9/10/- 9/15,
\$2,401,755

DARPA Young Faculty Award, Department of Defense, 07/01/10 – 06/30/12, \$299,066

Equipment Supplement for IQM: Acquisition of a high-resolution Raman spectrometer for
measurements on correlated electron systems, 09/01/10 – 08/31/11, (Lead PI, but with
C. Broholm) \$417,625

JHU Workshop on "Exotic superconducting and insulating phases of quantum matter",
01/10, Institute of Complex Adaptive Matter, \$20,000

NSF Career Award: Terahertz and microwave investigations of complex quantum matter, National Science Foundation, 07/01/09 - 06/30/14, \$691,160

Time-Domain Terahertz Ellipsometer (TDTE) for Reflection-Mode Sensing, Department of Defense, 07/01/08 - 12/31/08, \$50,000

Johns Hopkins Institute for Quantum Matter, Department of Energy, 09/01/08 - 08/31/11, \$642,860 (5 co-PIs)

NSF MRI: Acquisition of a high field, multi-probe cryogenic system for quantum and nanostructured materials research, National Science Foundation, 10/01/08 - 09/30/09, \$501,374 (8 co-PIs)

Invention, Development, and Application of a Time-domain THz Ellipsometer, JHU Applied Physics Laboratory Partnership Award, 02/15/06 - 02/15/07, ~ \$20,000

Alfred P. Sloan Foundation Fellowship, 09/16/07 - 09/15/09, \$45,000

PATENTS

Patent No. 7,956,525 - Flexible Nanostructure Electronic Devices
Issued to UCLA Technology Transfer office, June 7, 2011.

Patent filed with JHU Technology Transfer on –*Time-domain THz ellipsometry*
Public disclosure March 2012
Provisional patent filed January 2013
Patent approved 2016

Provisional patent under preparation
A Broad-band THz quarter wave plate

TEACHING

	Course taught		Enrollment
Spring 2022	171.622	Adv. Cond Matter Physics	10
Fall 2021	171.703	Adv. Statistical Mechanics	20
Spring 2021	171.622	Adv. Cond Matter Physics	10
Fall 2020	171.312	Statistical Mechanics	10
Spring 2020	171.622	Adv. Cond Matter Physics	10
Fall 2019	171.312	Statistical Mechanics	10
Spring 2018	171.104	Intro to Physics for Bio Major	340
Fall 2017	171.312	Statistical Mechanics	10
Spring 2017	171.104	Intro to Physics for Bio Major	290

Fall 2016	171.312	Statistical Mechanics	10
Spring 2016	171.104	Intro to Physics for Bio Major	250
Fall 2015	171.312	Statistical Mechanics	10
Spring 2015	171.104	Intro to Physics for Bio Major	250
Fall 2014	171.105	Intro to Mechanics for Phys. Maj.	35
Spring 2014	171.622	Adv. Cond Matter Physics	5
Fall 2013	171.105	Intro to Mechanics for Phys. Maj.	35
Spring 2013	171.622	Adv. Cond Matter Physics	5
Fall 2012	171.105	Intro to Mechanics for Phys. Maj.	34
Spring 2012	171.62	Adv. Cond Matter Physics	15
Fall 2011	171.15	Intro to Mechanics for Phys. Maj.	30
Fall 2010	171.405 / 171.621	Intro to Condensed Matter	10
Fall 2009	172.114	Frontier Physics w/ Tchernyshyov	20
Fall 2009	171.405 / 171.621	Intro to Condensed Matter	10
Spring 2009	173.308	Advanced Laboratory	20
Fall 2008	171.405 / 171.621	Intro to Condensed Matter	10
Spring 2008	173.308	Advanced Laboratory	20
Fall 2007	171.405 / 171.621	Intro to Condensed Matter	10
Spring 2007	172.114	Frontier Physics w/ Markovic	20
Fall 2006	173.308	Advanced Laboratory	4

DEPARTMENTAL AND UNIVERSITY SERVICE

2021-2022 KSAS Faculty Senate Chair

2021-2022 KSAS Faculty Senate Secretary

Department Vice-chair for Research: September 2013 – present
 Managed space and renovations to laboratory buildings

Lead acquisition of \$500,000 project for Helium Requiifier in Bloomberg Center

Faculty Czar of Helium Requiifier in Bloomberg Center August 13 – present

Member of Department Graduate Admissions Committee Fall 2012

Physical Science Machine Shop Faculty Advisor Spring 2007 –Sept. 2013

Chairman of Recruitment Committee Fall 2009 –Fall 2012

Dept. of Physics and Astronomy, Graduate Admissions Committee
 Spring 2013

Dept. of Physics and Astronomy, Faculty Search Committee
 Spring 2013

Served on approximately 20 PhD. thesis defenses, 25 Graduate Board Orals, and 25 Preliminary Oral Exams, and a reader of 10 PhD. theses.

PERSONAL

Interests: World history, Politics, Philosophy, Bicycling, Running, Skiing, Mountaineering, Anything outdoors...

2 time National Collegiate Cycling Champion

Multiple-time State Cycling Champion (New Jersey and California)