Julia A. Mundy, Ph.D.
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Appointments

Assistant Professor of Physics, Harvard University, 07/2018 –

Research Associate in Physics, Harvard University, 01/2018 – 06/2018

Postdoctoral Fellow, University of California, Berkeley and Affiliated Researcher, Lawrence Berkeley National Laboratory, 07/2015 – 12/2017

AAAS Fellow, US Department of Education, 05/2014 – 06/2015

High School Chemistry/Physics Teacher, Teach for America, 07/2006-06/2008

Education

Ph.D. in Applied Physics, Cornell University, 05/2014

A.M. in Chemistry (earned concurrent with A.B.), Harvard University, 06/2006

A.B. *magna cum laude* with highest honors in Chemistry and Physics, Harvard University, 06/2006

Honors and Awards

Sloan Research Fellow, Alfred P. Sloan Foundation, 2022

Kavli Fellow, National Academy of Sciences, 2021

Early Career Award, Department of Energy, 2021

Packard Fellowship for Science and Engineering, 2020

Materials Research Prize for Young Investigators, ETH Zurich, 2019

Early Career Editorial Board Member, *Physical Review Materials*, 2019 -

Young Scientist Prize in Magnetism, International Union of Pure and Applied Physics, 2019
Citation: "For creating the world's highest temperature ferrimagnetic-ferroelectric multiferroic using atomically engineered ferroic layers leading to electric field control of magnetism."
Given annually to one early career scientist in the field of magnetism.

George E. Valley, Jr. Prize, American Physical Society, 2018
Citation: "For the pico-engineering and synthesis of the first room-temperature magnetoelectric multiferroic material."
Given biennially to one early career physicist.

Moore Fellow in Materials Synthesis, Gordon and Betty Moore Foundation, 2018
In recognition of exceptional potential in the area of quantum materials synthesis
One of four recipients over six-year program.

Oxide Electronics Prize for Excellency in Research, 2017

Citation: "For utilizing analytic electron microscopy to understand the connection between atomic structure and ferroelectricity in geometric ferroelectrics, using this new knowledge to engineer superior materials – in particular for creating the world's highest temperature ferrimagnetic ferroelectric using atomically engineered ferroic layers."
Inaugural recipient, to be awarded annually to a scientist under the age of 40.

UC President's Postdoctoral Fellowship, University of California, 2015, 2016

Education Policy Fellowship, American Physical Society/American Institute of Physics, 2014

William Nichols Findley Award for exceptional research, Cornell University, 2014

Materials Research Society Graduate Student Gold Award, 2013

Trevor R. Cuykendall Award for teaching, Cornell University, 2011

Castaing Award, Microbeam Analysis Society, 2011

National Defense Science and Engineering Graduate Fellowship (physics), 2009

National Science Foundation Graduate Research Fellowship (physics), 2009

Selected Publications (*h*-index = 29).

42. G. A. Pan*, Q. Song*, D. Ferenc Segedin, M. C. Jung, H. El-Sherif, E. E. Fleck, B. H. Goodge, S. Doyle, D. Córdova Carrizales, A. T. N'Diaye, P. Shafer, H. J. Paik, L. F. Kourkoutis, I. El Baggari, A. S. Botana, C. M. Brooks, and **J. A. Mundy**. "Synthesis and electronic properties of $Nd_{n+1}Ni_nO_{3n+1}$ Ruddlesden-Popper nickelate thin films." *Physical Review Materials*, 6, 055003 (2022).

41. **J. A. Mundy***, B. F. Grosso*, C. A. Heikes*, D. Ferenc Segedin, Z. Wang, Y.-T. Shao, C. Dai, B. H. Goodge, Q. N. Meier, C. T. Nelson, B. Prasad, F. Xue, S. Ganschow, D. A. Muller, L. F. Kourkoutis, L.-Q. Chen, W. D. Ratcliff, N. A. Spaldin, R. Ramesh and D. G. Schlom. "Liberating a hidden antiferroelectric phase with interfacial electrostatic engineering." *Science Advances*, 8(5), eabg5860, 2021.

40. R. Held, **J. A. Mundy**, M. E. Holtz, D. Hodash, T. Mairoser, D. A. Muller and D. G. Schlom. "Fabrication of chemically and structurally abrupt $Eu_{1-x}La_xO$/SrO/Si interfaces and their analysis by STEM-EELS." *Physical Review Materials*, 5, 12, 124419, 2021.

39. G. A. Pan, D. Ferenc Segedin, H. LaBollita, Q. Song, E. M. Nica, B. H. Goodge, A. T. Pierce, S. Doyle, S. Novakov, D. Cordova Carrizales, A. T. N'Diaye, P. Shafer, H. J. Paik, J. T. Heron, J. A. Mason, A. Yacoby, L. F. Kourkoutis, O. Erten, C. M. Brooks, A. S. Botana, and **J. A. Mundy**. "Superconductivity in a quintuple-layer square-planar nickelate." *Nature Materials,* 21, 160–164, 2022.

38. M.E. Holtz, E.S. Padgett, R. Steinhardt, C.M. Brooks, D. Meier, D.G. Schlom, D.A. Muller, and **J.A. Mundy**. "Dimensionality-induced change in topological order in multiferroic oxide superlattices." *Physical Review Letters*, 126, 157601, 2021.

37. R. A. Steinhardt, C. M. Brooks, G. C. Correa, M. E. Holtz, R. Ramesh, D. A. Muller, **J. A. Mundy**, and D. G. Schlom. "$DyFe_2O_4$: A new trigonal rare-earth ferrite grown by molecular-beam epitaxy." *APL Materials*, 9, 041106, 2021.

36. R. Held, T. Mairoser, A. Melville, **J. A. Mundy**, M. E. Holtz, D. Hodash, Z. Wang, J. T. Heron, S. T. Dacek, B. Holländer, D. A. Muller and D. G. Schlom. "Exploring the intrinsic limit of the charge-carrier-induced increase of the Curie temperature of Lu- and La-doped EuO thin films." *Physical Review Materials*, 4, 104412, 2020.

35. S. Fan, H. Das, A. Rébola, K. A. Smith, **J. Mundy**, C. Brooks, M. E. Holtz, D. A. Muller, C. J. Fennie, R. Ramesh, D. G. Schlom, S. McGill and J. L. Musfeldt. "Site-specific spectroscopic measurement of spin and charge in $(LuFeO_3)_m/(LuFe_2O_4)_1$ multiferroic superlattices." *Nature Communications*, 11, 5582, 2020.

34. **J. A. Mundy**[*], C. A. Heikes[*], B. F. Grosso[*], D. Ferenc Segedin, Z. Wang, B. H. Goodge, C. T. Nelson, B. Prasad, L. F. Kourkoutis, W. D. Ratcliff, N. A. Spaldin, D. G. Schlom, R. Ramesh. "A high-energy density antiferroelectric formed by interfacial electrostatic engineering." *In review, 2021. arXiv:*1812.09615.

33. J. T. Heron, **J. A. Mundy**. "Electric and magnetic domains inverted by a magnetic field." *Nature*, 435 (560), 2018.

32. Z. Chen, Z. Chen, Z. Q. Liu, M. E. Holtz, C. J. Li, X. R. Wang, W. M. Lü, M. Motapothula, L. S. Fan, J. A. Turcaud, L. R. Dedon, C. Frederick, R. J. Xu, R. Gao, A. T. N'Diaye, E. Arenholz, **J. A. Mundy**, T. Venkatesan, D. A. Muller, L. W. Wang, J. Liu, L. W. Martin. "Electron Accumulation and Emergent Magnetism in Heterostructures." *Physical Review Letters*, 119 (15), 156801, 2018.

31. M. E. Holtz, K. Shapovalov, **J. A. Mundy**, C.L. Chang, Z. Yan, E. Bourret, D. A. Muller, D. Meier, A. Cano. "Topological defects in hexagonal manganites - inner structure and emergent electrostatics." *Nano Letters*, 17 (10), 5883, 2017.

30. W. Wang, **J. A. Mundy**, C. M. Brooks, J. A. Moyer, M. E. Holtz, D. A. Muller, D. G. Schlom, W. Wu. "Visualizing weak ferromagnetic domains in multiferroic hexagonal ferrite thin film." *Physical Review B*, 95 (13), 134443, 2017.

29. **J. A. Mundy**[*], J. Schaab[*], Y. Kumagai[*], A. Cano, M. Stengel, I. Krug, D. Gottlob, H. Doganay, M. E. Holtz, R. Held, Z. Yan, E. Bourret, C. Schneider, D. G. Schlom, D. A. Muller, R. Ramesh, N. Spaldin, D. Meier. "Functional electronic inversion layers at ferroelectric domain walls." *Nature Materials*, 16, 622, 2017.

28. S. Saremi, R. Xu, L. R. Dedon, **J. A. Mundy**, S. L. Hsu, Z. Chen, A. R. Damodaran, S. P. Chapman, J. T. Evans, L. W. Martin. "Ion bombardment for electrical isolation in ferroelectric thin films." *Advanced Materials*, 28(48), 10750, 2016.

27. **J. A. Mundy**[*], C. M. Brooks[*], M. E. Holtz[*], J. A. Moyer, H. Das, A. F. Rébola, J. T. Heron, J. D. Clarkson, S. M. Disseler, Z. Liu, A. Farhan, R. Held, R. Hovden, E. Padgett, Q. Mao, H. Paik, R. Misra, L. F. Kourkoutis, E. Arenholz, A. Scholl, J. A. Borchers, W. D. Ratcliff, R. Ramesh, C. J. Fennie, P. Schiffer, D. A. Muller, D. G. Schlom. "Atomically engineered ferroic

layers yield a room-temperature magnetoelectric multiferroic." *Nature*, 537, 523, 2016. Citations: 223

26. H. Paik, J. A. Moyer, T. Spila, J. W. Tashman, **J. A. Mundy**, E. Freeman, N. Shukla, J. M. Lapano, R. E. Engel-Herbert, W. Zander, J. Schbert, D. A. Muller, S. Data, P. Schiffer, D. G. Schlom. "Transport properties of ultra-thin VO_2 Films on (001) TiO_2 grown by reactive molecular-beam epitaxy." *Applied Physics Letters*, 107(16), 163101, 2015.

25. C. M. Brooks, R. B. Wilson, A. Schäfer, **J. A. Mundy**, M. E. Holtz, D. A. Muller, J. Schubert, D. G. Cahill, D. G. Schlom. "Tuning thermal conductivity in homoepitaxial $SrTiO_3$ films via defects." *Applied Physics Letters,* 107 (5), 051902, 2015.

24. S. Disseler, J. A. Borchers, C. M. Brooks, **J. A. Mundy**, J. A. Moyer, D. A. Hillsberry, E. L. Thies, D. A. Tenne, P. Schiffer, D. A. Muller, D. G. Schlom, W. D. Ratcliff. "Magnetic structure and ordering of multiferroic hexagonal $LuFeO_3$." *Physical Review Letters,* 114 (21), 217602, 2015.

23. T. Mairoser, **J. A. Mundy**, A. Melville, D. Hodash, P. D. Cueva, R. Held, A. Glavic, J. Schubert, D. A. Muller, D. G. Schlom, A. Schmehl. "High-quality EuO thin films the easy way via topotactic transformation." *Nature Communications,* 6, 7716, 2015.

22. B.S. Holinsworth, D. Mazumdar, C. M. Brooks, **J. A. Mundy**, H. Das, J. G. Cherian, S. A. McGill, C. J. Fennie, D. G. Schlom, J. L. Musfeldt. "Direct band gaps in multiferroic h-$LuFeO_3$." *Applied Physics Letters,* 106 (8), 082902, 2015.

21. T. Yajima, Y. Hikita, M. Minohara, C. Bell, **J. A. Mundy**, L. F. Kourkoutis, D. A. Muller, H. Kumigashira, M. Oshima, H. Y. Hwang. "Controlling band alignments by artificial interface dipoles at perovskite heterointerfaces." *Nature Communications*, 6, 6759, 2015.

20. Y. Nie, Y. Zhu, C. H. Lee, L. F. Kourkoutis, **J. A. Mundy**, J. Junquera, P. Ghosez, X. Xi, K. M. Shen, D. A. Muller, D. G. Schlom. "Atomically precise interfaces from non-stoichiometric deposition." *Nature Communications*, 5, 4530, 2014.

19. **J. A. Mundy,** Y. Hikita, T. Hidaka, T. Yajima, T. Higuchi, H. Y. Hwang, D. A. Muller, L. F. Kourkoutis. "Visualizing the interfacial evolution from charge compensation to metallic screening across the manganite metal-insulator transition." *Nature Communications,* 5, 3464, 2014.

18. J. A. Moyer, R. Misra, **J. A. Mundy**, C. M. Brooks, J. T. Heron, D. A. Muller, D. G. Schlom, P. Schiffer. "Intrinsic magnetic properties of hexagonal $LuFeO_3$ and the effects of nonstoichiometry." *APL Materials,* 2 (1), 012106, 2014.

17. R. Jany, C. Richter, C. Woltmann, G. Pfanzelt, B. Förg, M. Rommel, T. Reindl, U. Waizmann, J. Weis, **J. A. Mundy**, D. A Muller, H. Boschker, J. Mannhart. "Monolithically integrated circuits from functional oxides." *Advanced Materials Interfaces,* 1 (1), 1300031, 2014.

16. J. W. Tashman, J. H. Lee, H. Paik, J. A. Moyer, R. Misra, **J. A. Mundy**, T. Spila, T. A. Merz, J. Schubert, D. A. Muller, P. Schiffer, D. G. Schlom. "Epitaxial growth of VO_2 by periodic annealing." *Applied Physics Letters,* 104 (6), 063104, 2014.

15. **J. A. Mundy**[*]**,** D. R. Hodash[*], A. M. Melville, R. Held, T. Mairoser, D. A. Muller, L. F. Kourkoutis, A. Schmehl, D. G. Schlom. "Hetero-epitaxial EuO interfaces studied by analytic electron microscopy." *Applied Physics Letters,* 104 (9), 091601, 2014.

14. N. Quackenbush, J. Tashman, **J. Mundy,** S. Sallis, H. J. Paik, R. Misra, J. A. Moyer, J. H. Guo, D. A. Fischer, J. C. Woicik, D. A. Muller, D. G. Schlom, L. F. J. Piper. "Nature of the metal insulator transition in ultrathin epitaxial vanadium dioxide." *Nano Letters*, 13 (10), 4857, 2013.

13. M. P. Warusawithana, C. Richter, **J. A. Mundy,** P. Roy, J. Ludwig, S. Paetel, T. Heeg, A.A. Pawlicki, L. F. Kourkoutis, M. Zheng, M. Lee, B. Mulcahy, W. Zander, Y. Zhu, J. Schubert, J. N. Eckstein, D. A. Muller, C. S. Hellberg, J. Mannhart, D. G. Schlom. "$LaAlO_3$ stoichiometry found key to electron liquid formation at $LaAlO_3/SrTiO_3$ interfaces." *Nature Communications,* 4, 2351, 2013. Citations: 234

12. C. H. Lee, N. D. Orloff, T. Birol, Y. Zhu, V. Goian, R. Haislmaier, E. Vlahos, **J. A. Mundy,** L. F. Kourkoutis, Y. Nie, M. D. Biegalski, J. Zhang, M. Bernhagen, N. A. Benedek, Y. Kim, J. D. Brock, R. Uecker, X. X. Xi, B. Gopalan, D. Nuzhnyy, S. Kamba, D. A. Muller, I. Takeuchi, J. C. Booth, C. J. Fennie, D. G. Schlom. "Synthesis of defect-mitigating tunable dielectric materials with atomic-layer control." *Nature,* 502 (7472), 532*,* 2013. Citations: 203

11. C. H. Lee, N. J. Podraza, Y. Zhu, R. J. Berger, S. Shen, M. Sestak, R. W. Collins, L. F. Kourkoutis, **J. A. Mundy,** H. Wang, Q. Mao, X. Xi, L. J. Brillson, J. B. Neaton, D. A. Muller, D.G. Schlom. "Effect of reduced dimensionality on the optical band gap of $SrTiO_3$." *Applied Physics Letters*, 102 (12), 122901, 2013.

10. P. Cueva, R. Hovden, **J. A. Mundy**, H. L. Xin, D. A. Muller. "Data processing for atomic resolution electron energy loss spectroscopy." *Microscopy and Microanalysis,*18 (4), 667, 2012.

9. **J. A. Mundy**, Q. Mao, C. M. Brooks, D. G. Schlom, D. A. Muller. "Atomic-resolution chemical imaging of oxygen local bonding environments by electron energy loss spectroscopy." *Applied Physics Letters*, 101(4), 042907, 2012.

8. E. J. Monkman, C. Adamo, **J. A. Mundy**, D. E. Shai, J. W. Harter, D. Shen, B. Burganov, D. A. Muller, D. G. Schlom, K. M. Shen. "Quantum many-body interactions in digital oxide superlattices." *Nature Materials,* 11, 855, 2012. ***(J. A. Mundy cover credit)***

7. C. M. Brooks, R. Misra, **J. A. Mundy**, L. A. Zhang, B. S. Holinsworth, K. R. O'Neal, T. Heeg, W. Zander, J. Schubert, J. L. Musfeldt, D. G. Schlom. "The adsorption-controlled growth of $LuFe_2O_4$ by molecular-beam epitaxy." *Applied Physics Letters*, 101 (13), 132907, 2012.

6. Y. Yu, H. L. Xin, R. Hovden, D. Wang, E. D. Rus, **J. A. Mundy**, D. A. Muller, H. D. Abruna. "Three-dimensional tracking and visualization of hundreds of Pt-Co fuel cell nanocatalysts during electrochemical aging." *Nano Letters,* 12, 4417, 2012.

5. D. Wang, Y. Yu, H. L. Xin, R. Hovden, P. Ercius, **J. A. Mundy,** H. Chen, J. H. Richard, D. A. Muller, F. J. DiSalvo. "Tuning oxygen reduction reaction activity via controllable dealloying: A model study of ordered Cu_3Pt/C intermetallic nanocatalysts." *Nano Letters*, 12 (10), 5230, 2012. Citations: 278

4. Z. Liu, H. L. Xin, Y. Yu, Y. Zhu, J. Zhang, **J. A. Mundy**, D. A. Muller, F. T. Wagner, F.T. "Atomic-scale compositional mapping and 3-Dimensional electron microscopy of dealloyed $PtCo_3$ catalyst nanoparticles with spongy multi-core/shell structures." *Journal of The Electrochemical Society*, 159 (9) F554, 2012.

3. H. L. Xin,* **J. A. Mundy**,* Z. Liu, R. Cabezas, R. M. Hovden, L. F. Kourkoutis, J. Zhang, N. P. Subramanian, R. Makharia, F. T. Wagner, D. A. Muller. "Atomic-resolution spectroscopic imaging of ensembles of nanocatalyst particles across the life of a fuel cell." *Nano Letters,* 12, 490, 2012. Citations: 197

2. H. K. Sato, **J. A. Mundy**, T. Higuchi, Y. Hikita, C. Bell, D. A. Muller, H. Y. Hwang. "Nanometer-scale epitaxial strain release in perovskite heterostructures using $SrAlO_x$ sliding buffer layers." *Applied Physics Letters*, 98, 171901, 2011.

1. S. M. Dounce, **J. Mundy**, H. L. Dai. "Crystallization at the glass transition in supercooled thin films of methanol." *The Journal of Chemical Physics*, 126(19), 191111 (2007).

Invited Presentations and Seminars

53. Israeli-American Kavli Frontiers of Science, 03/2022 (*postponed due to COVID*)

52. Frontiers in Imaging and Quantum-Enabled Technologies for the Physical and Life Sciences, Johns Hopkins University, 04/2022
Superconductivity in a quintuple-layer nickelate

51. UCLA Materials Science Seminar, 04/2022
Design and Construction of Multifunctional Oxide Heterostructures

50. APS March Meeting, 03/2022
An Antiferromagnetic Metal in a Correlated Insulator

49. Materials Research Society Fall Meeting, 11/2021
An Antiferromagnetic Metal in a Correlated Insulator

48. University of Minnesota, Materials Science Colloquium, 10/2021
Design and Construction of Multifunctional Oxide Heterostructures

48. MaNEP Mini-Workshop on Oxide Heterostructures, 10/2021

Superconductivity in a quintuple-layer nickelate

47. Harvard University, Applied Physics Colloquium, 10/2021
Design and Construction of Multifunctional Oxide Heterostructures

46. [***Plenary Speaker***] Advanced Light Source User Meeting, 08/2021
Design and Construction of Multifunctional Oxide Heterostructures

45. Northwestern University Materials Science Colloquium, 06/2021
Design and Construction of Multifunctional Oxide Heterostructures

44. [***Plenary Speaker***] Fundamental Physics of Ferroelectrics, 01/2021
Uncovering a hidden ground state in a multiferroic using interfacial electrostatic engineering.

43. [*cancelled due to COVID*] Materials Research Society, Spring Meeting, 03/2020

42. Materials Research Society, Fall Meeting, 11/2019
Uncovering hidden grounds in a multiferroic using interfacial electrostatic engineering

41. Symposium on the Epitaxy of Complex Oxides, 07/2019
Uncovering hidden grounds in a multiferroic using interfacial electrostatic engineering

40. Eleventh Workshop on Competing Interactions and Colossal Responses in
Transition Metal Oxides and Related Compounds, 06/2019
Uncovering hidden grounds in a multiferroic using interfacial electrostatic engineering

39. American Physical Society, March Meeting, 03/2019
George E. Valley, Jr. Prize Talk: Picoscale Engineering of Oxide Quantum Materials

38. NIST Center for Neutron Research, Special Seminar, 12/2018
A high-energy density antiferroelectric formed by interfacial electrostatic engineering

37. University of Maryland, Condensed Matter Seminar, 12/2018
Emergent Phenomena in Oxide Thin Films

36. NSF Nanoscale Science and Engineering Grantees Conference, 12/2018
Advances in Thin Film Deposition of Quantum Materials

35. Harvard University, Quantum Materials and Devices Seminar, 10/2018
Design and Construction of Oxide Heterostructures with Emergent Properties

34. Pittsburgh Quantum Institute, Condensed Matter Seminar, 09/2018
Using Interfacial Electric Fields at Domain Walls to Stabilize Novel Ground States

33. Gordon Research Conference on Multiferroic/Magnetoelectric Materials, 08/2018
Construction of an Antiferroelectric by Interfacial Electrostatic Engineering

32. International Conference on Magnetism, 07/2018

Manipulating the Ground State in Ultrathin Films of $BiFeO_3$ by Interfacial Electrostatic Fields

31. American Conference on Neutron Scattering, 06/2018
Engineering Spin Frustration at Ferroic Interfaces

30. Center for Integrated Quantum Materials Workshop, 06/2018
Atomic-resolution Imaging of Charge Transfer at Topological Defects in a Ferroelectric

29. American Physical Society, March Meeting, 03/2018
Atomic-resolution Imaging of Electronic Inversion Layers at Ferroelectric Domain Walls

28. Workshop on Fundamental Physics of Ferroelectrics and Related Materials, 01/2018
Atomic-resolution Imaging of Electronic Inversion Layers at Ferroelectric Domain Walls

27. Advanced Light Source Spin Materials Program Review, 01/2018
Probing Magnetoelectric Coupling in Atomically-Engineered Multiferroics with Soft X-rays

26. Electronic Materials and Applications, 01/2018
Manipulating the Ground State in Ultrathin Films of Multiferroic $BiFeO_3$

25. Materials Research Society, Fall Meeting, 11/2017
Atomically Engineered Ferroic Layers Yield a Room-temperature Magnetoelectric Multiferroic

24. University of California, Berkeley, Condensed Matter "290K" Seminar, 09/2017
Design and Construction of Oxide Heterostructures with Emergent Properties

23. Symposium on the Epitaxy of Complex Oxides, 08/2017
Synthesis of Metastable Hexagonal Oxides by Molecular-beam Epitaxy

22. Cornell University PARADIM Electron Microscopy Summer School, 06/2017
Atomic-resolution Imaging of Electronic Inversion Layers at Ferroelectric Domain Walls

21. Pacific Northwest National Laboratory, Environmental Molecular Sciences Seminar, 06/2017
Atomic-Scale Ferroic Engineering to Create a High-Temperature Magnetoelectric Multiferroic

20. Materials Research Society, Spring Meeting, 04/2017
Functional Electronic Inversion Layers at Ferroelectric Domain Walls

19. Massachusetts Institute of Technology, Materials Science Seminar, 04/2017
Atomic-Resolution Imaging of Functional Properties at Buried Interfaces

18. Stanford University Gaballe Laboratory for Advanced Materials Special Seminar, 03/2017
Atomically Engineered Ferroic Layers Yield a Room-temperature Magnetoelectric Multiferroic

17. University of Chicago, Institute of Molecular Engineering Seminar, 02/2017
    Design and Construction of Oxide Heterostructures with Emergent Properties

16. University of California, Davis, Physics Colloquium, 02/2017
    Design and Construction of Oxide Heterostructures with Emergent Properties

15. Brown University, Physics Department Seminar, 02/2017
    Design and Construction of Oxide Heterostructures with Emergent Properties

14. New York University, Physics Department Seminar, 01/2017
    Design and Construction of Oxide Heterostructures with Emergent Properties

13. Princeton University, Physics Department Seminar, 01/2017
    Design and Construction of Oxide Heterostructures with Emergent Properties

12. Electronic Materials and Applications, 01/2017
    Atomically Engineered Ferroic Layers Yield a Room-temperature Magnetoelectric Multiferroic

11. Harvard University, Physics Department Seminar, 12/2012016
    Design and Construction of Oxide Heterostructures with Emergent Properties

10. The Ohio State University, Materials Science Colloquium, 11/2016
    Design and Construction of Multifunctional Oxide Heterostructures

9. University of California, Davis, Condensed Matter Physics Seminar, 11/2016
    Ferroic Engineering of Atomic Layers to Create a Room-Temperature Multiferroic

8. Lawrence Berkeley National Laboratory, Advanced Light Source User Meeting, 10/2016
    Atomically Engineered Ferroic Layers Yield a Room-Temperature Magnetoelectric Multiferroic

7. University of California, Irvine, Condensed Matter Physics Seminar 09/2016
    Atomically Engineered Ferroic Layers Yield a Room-Temperature Magnetoelectric Multiferroic

6. The Ohio State University, Materials Science Seminar, 09/2016
    Atomically Engineered Ferroic Layers Yield a Room-Temperature Magnetoelectric Multiferroic

5. Lawrence Berkeley National Laboratory, Advanced Light Source Seminar, 07/2016
    Atomically Engineered Ferroic Layers Yield a Room-Temperature Magnetoelectric Multiferroic

4. University of California, Berkeley, Materials Science Seminar, 04/2016
    Ferroic Engineering of Atomic Layers to Create a Room-Temperature Multiferroic

3. American Physical Society, March Meeting, 03/2016
    Engineering Domain Walls and Planar Rumpling to Create a Room-Temperature Multiferroic

2. University of British Columbia, Condensed Matter Seminar, 11/2015
Engineering Domain Walls and Planar Rumpling to Create a Room-Temperature Multiferroic

1. Naval Research Laboratory, Materials Science Seminar, 01/2014
Atomic-Resolution Two-Dimensional Mapping of Local Bonding Changes at Transition Metal Oxide Interfaces

Current External Funding

Teaching Experience

Physics 15a, Introductory Mechanics and Relativity.
Spring 2019: Course Overall: 4.3/5.0, Instructor Overall: 4.6/5.0
Spring 2020: Instructor Overall: 4.9/5.0
Spring 2021: Course Overall: 4.4/5.0, Instructor Overall: 4.8/5.0

Applied Physics/Physics 195, Introduction to Solid State Physics.
Fall 2020: Course Overall: 4.1/5.0, Instructor Overall: 4.4/5.0
Fall 2021: Course Overall: 4.8/5.0, Instructor Overall: 4.9/5.0

Advising

Research Associate: Dr. Charles Brooks (2018 -)

Post-doctoral Fellow: Dr. Qi Song (2018 - 2020), Dr. Johanna Nordlander (2020 -), Dr. Ari Turkiewicz (2022-)

PhD Thesis Advisees: Grace Pan (Physics, 2018 -), Spencer Doyle (Physics, 2019 -), Dan Ferenc Segedin (Physics, 2019 -), Maggie Anderson (Physics, 2021 -), Zubia Hasan (Physics, 2021 -), Elise Koskelo (Physics, 2021 -), Nicole Taylor (Applied Physics, 2021 -).

Graduate Research Advisees: Dylan Renaud (Applied Physics, Fall 2018), Will Wang (Engineering Sciences, Spring 2019), James Ehrets (Physics, Fall 2019), Kaylyn Holmes (Applied Physics, Fall 2021).

Post-Bac Bridge Research Advisee: Kaylyn Holmes (Fall 2019 – Spring 2021)

Undergraduate Research Advisees: Grant Meiners (Fall 2018), Xaviera Zime (Fall 2018 – Spring 2019), Dylan Zhou (Spring/Summer 2019), Denisse Cordova Carrizales (Summer 2019 – present), Timothy Daniel (Summer 2019 – Spring 2021), Jessica Dong (Fall 2019 - 2022), Raymond Jow (Fall 2019 - 2022), Sahar Khashayar (Fall 2019), Erika Ortega Ortiz (Summer 2020 - 2022), Lerato Tenaka (2021 - 2022), Ana Kimber (Fall 2021), Denise Navarro (2021 – 2022).

Harvard Committees and Service

Physics Department Graduate Admissions Committee, 2018- 2022

HQI Postdoctoral Fellowship Committee, 2018 – present

John Harvard Distinguished Science Fellowship Committee, Physical Science, 2018 – 2019

Physics Department Colloquium Co-organizer, 2019 – 2020

Instructional Machine Shop Committee, 2019 – present

First-Generation Student Faculty Mentor, 2019 – present

Applied Physics Admissions Committee co-chair, 2021 – 2022

HQI Summer Undergraduate Research Fellowship, 2022

External Synergistic Activities

Conference Organization:

- "Emergent Phenomena in Quantum Systems Young Investigator Workshop."
  Conference co-chair (2018) and conference lead organizer (2019)
  Weeklong workshop for 52 participants on current topics in quantum systems/materials.
- APS March Meeting, 2019
  Co-organizer of focus session on "Dielectric and Ferroic Oxides"
- Spring MRS Meeting, 2019
  Co-organizer of symposium on "Emergent Phenomena in Oxide Quantum Materials"
- APS March Meeting, 2022
  Co-organizer of focus session on "Emergent Properties of Complex Oxides: Bulk, thin films and heterostructures"

Education and Outreach:

- *Inaugural AAAS Science and Technology Policy Fellow at US Department of Education*, selected by American Physical Society/American Institute of Physics (2014 – 2015).
  Served in the Office of STEM and worked to coordinate STEM education efforts both within the Department of Education and through collaborations across government agencies (Department of Education representative to CoSTEM working groups on K-12 Teachers, Undergraduate Education, Graduate Education and White House Counsel on Women and Girls STEM working group).
- *High School Chemistry, Physics Teacher* in Baton Rouge, LA and New Haven, CT with Teach for America (2006 – 2008).
  Designed and taught inquiry-based physics/chemistry courses. Awarded Amgen Fellowship as one of top 5 out of 5,000+ new math/science teachers to program.

Other:

- Editorial Board Member, *Physical Review Materials,* 2019 -
- Review Committee, *APL Materials*, 2021
- Journal Referee: *Nature*, *Physical Review Letters*, *Physical Review B*, Physical Review Materials, *Nano Letters*, *Applied Physics Letters*, *Journal of Applied Physics*, *MRS Communications*
- Panel Reviewer: NSF Condensed Matter Physics Program, NDSEG Graduate Fellowship, Brookhaven National Laboratory Center for Functional Materials User Program, NIST Center for Neutron Research User Program