

## JENNIFER E. HOFFMAN

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### EDUCATION

- Ph.D. in Physics, University of California, Berkeley, 12/2003  
*Thesis: "A Search for Alternative Electronic Order in the High Temperature Superconductor  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$  by Scanning Tunneling Microscopy"* ([link](#))
- M.A. in Physics, University of California, Berkeley, 5/2001
- B.A. *magna cum laude* with Highest Honors in Physics, Harvard University, 6/1999

### RESEARCH APPOINTMENTS

- Professor, Harvard University, Physics Department, 3/2015-present
- Professor, Physics & Astronomy Department, University of British Columbia, 7/2015-6/2015
- Associate Professor, Harvard University, Physics Department, 7/2010-2/2015
- Assistant Professor, Harvard University, Physics Department, 1/2005-6/2010
- Postdoctoral Fellow, Stanford University, Applied Physics Department, 9/2003-12/2004
- Graduate Research Assistant, UC Berkeley, 6/1999-8/2003

### ACADEMIC HONORS

- Canada Excellence Research Chair, 2015-2016
- Moore Foundation Experimental Investigator Award, 2014
- Radcliffe Fellowship, 2013
- Sloan Fellowship, 2010
- NSF CAREER Award, 2008
- Presidential Early Career Award for Scientists and Engineers, 2006
- Fannie & John Hertz Foundation Fellow, 9/2001-9/2003
- Berkeley Physics Department Fellow, 9/1999-8/2001
- Barry Goldwater Scholar, 9/1998-6/1999
- Robert Byrd Scholar, 9/1996-6/1999
- National Merit Scholar, 9/1996-6/1997

### PUBLICATIONS

(See [Google Scholar](#) for citation count, over 4000 total.)

1. "Imaging the granular structure of high- $T_c$  superconductivity in underdoped  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "  
***Nature*** 415, 412-416 (2002) ([link](#))  
*K. M. Lang, V. Madhavan, J. E. Hoffman, E. W. Hudson, H. Eisaki, S. Uchida, J. C. Davis*
2. "A Four-Unit Cell Periodic Pattern of Quasi-Particle States Surrounding Vortex Cores in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "  
***Science*** 295, 466-469 (2002) ([link](#))  
*J. E. Hoffman, E. W. Hudson, K. M. Lang, V. Madhavan, H. Eisaki, S. Uchida, J. C. Davis*
3. "Imaging quasiparticle interference in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "  
***Science*** 297, 1148-1151 (2002) ([link](#))  
*J. E. Hoffman, K. McElroy, D.-H. Lee, K. M. Lang, H. Eisaki, S. Uchida, J.C. Davis*
4. "Relating atomic scale electronic phenomena to wave-like quasi-particle states in superconducting  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "

- Nature** 422, 592-596 (2003) ([link](#))  
*K. McElroy, R. W. Simmonds, J. E. Hoffman, D.-H. Lee, J. Orenstein, H. Eisaki, S. Uchida, J. C. Davis*
5. "Incommensurate, dispersive, density of states modulations in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "  
**Physica C** 388, 225-226 (2003) ([link](#))  
*K. McElroy, J. E. Hoffman, D. H. Lee, K. M. Lang, H. Eisaki, S. Uchida, J. C. Davis*
  6. "STM study of novel resonances in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "  
**Physica B** 329, 1365-1366 (2003) ([link](#))  
*E. W. Hudson, V. Madhavan, K. McElroy, J. E. Hoffman, K. M. Lang, H. Eisaki, S. Uchida, J. C. Davis*
  7. "Vortex-induced quasi-particle 'checkerboard' in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "  
**Physica C** 388, 703-704 (2003) ([link](#))  
*J. E. Hoffman, E. W. Hudson, K. M. Lang, H. Eisaki, S. Uchida, J. C. Davis*
  8. "Metal-coated carbon nanotube tips for magnetic force microscopy"  
**Appl. Phys. Lett.** 85, 6263 (2004) ([link](#))  
*Z. Deng, E. Yenilmez, J. Leu, J. E. Hoffman, E. W. J. Straver, H. Dai, K. A. Moler*
  9. "Coincidence of Checkerboard Charge Order and Antinodal State Decoherence in Strongly Underdoped Superconducting  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ "  
**Phys. Rev. Lett.** 94, 197005 (2005) ([link](#))  
*K. McElroy, D.-H. Lee, J. E. Hoffman, K. M. Lang, J. Lee, E. W. Hudson, H. Eisaki, S. Uchida, J. C. Davis*
  10. "Controlled manipulation of individual vortices in a superconductor"  
**Appl. Phys. Lett.** 93, 172514 (2008) ([link](#))  
*E. W. J. Straver, J. E. Hoffman, O. M. Auslaender, D. Rugar, K. A. Moler*
  11. "Mechanics of Individual, Isolated Vortices in a Cuprate Superconductor"  
**Nature Physics** 5, 35 (2009) ([link](#))  
*O. M. Auslaender, L. Luan, E. W. J. Straver, J. E. Hoffman, N. C. Koshnick, E. Zeldov, D. A. Bonn, R. Liang, W. N. Hardy, K. A. Moler*
  12. "Scanning Tunneling Spectroscopy and Vortex Imaging in the Iron-Pnictide Superconductor  $\text{BaFe}_{1.8}\text{Co}_{0.2}\text{As}_2$ "  
**Phys. Rev. Lett.** 102, 097002 (2009) ([link](#))  
*Y. Yin, M. Zech, T. L. Williams, X. F. Wang, G. Wu, X. H. Chen, J. E. Hoffman*
  13. "Scanning Tunneling Microscopy and Spectroscopy on Iron-Pnictides"  
**Physica C** 469, 535 (2009) ([link](#))  
*Y. Yin, M. Zech, T. L. Williams, J. E. Hoffman*
  14. "Proximity to understanding the cuprates"  
**Physics** 3, 23 (2010) ([link](#))  
*Jennifer E. Hoffman*
  15. "Sign Flips and Spin Fluctuations in Iron High- $T_c$  Superconductors"  
**Science** 328, 441-443 (2010) ([link](#))  
*Jennifer E. Hoffman*
  16. "Nanoscale Imaging and Control of Resistance Switching in  $\text{VO}_2$  at Room Temperature"  
**Appl. Phys. Lett.** 96, 213106 (2010) ([link](#))  
*Jeehoon Kim, Changhyun Ko, Alex Frenzel, Shriram Ramanathan, Jennifer. E. Hoffman*
  17. "High Temperature Superconductivity: To pair or not to pair?"  
**Nature Physics** 6, 404-405 (2010) ([link](#))  
*Jennifer E. Hoffman*
  18. "Spectroscopic scanning tunneling microscopy insights into Fe-based superconductors"  
**Reports on Progress in Physics** 74, 124513 (2011) ([link](#))  
*Jennifer E. Hoffman*
  19. "STM imaging of inversion-symmetry-breaking structural distortion in the Bi-based cuprate superconductors"  
**Nature Materials** 11, 585 (2012) ([link](#))

- Ilija Zeljkovic, Elizabeth J. Main, Tess L. Williams, M. C. Boyer, Kamalesh Chatterjee, W. D. Wise, Yi Yin, Martin Zech, Takeshi Kondo, T. Takeuchi, Hiroshi Ikuta, Jinsheng Wen, Zhijun Xu, G. D. Gu, E. W. Hudson, Jennifer E. Hoffman*
20. "Imaging the impact of single oxygen atoms on superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "  
**Science** 337, 320 (2012) ([link](#))  
*Ilija Zeljkovic, Zhijun Xu, Jinsheng Wen, Genda Gu, R. S. Markiewicz, Jennifer E. Hoffman*
  21. "Suppression of Superconductivity by Twin Boundaries in FeSe Thin Films."  
**Phys. Rev. Lett.** 109, 137004 (2012) ([link](#))  
*Can-Li Song, Yi-Lin Wang, Ye-Ping Jiang, Lili Wang, Ke He Xi Chen, Jennifer E. Hoffman, Xu-Cun Ma, Qi-Kun Xue*
  22. "Microcantilever Q control via capacitive coupling"  
**Applied Physics Letters** 101, 173110 (2012) ([link](#))  
*M. Huefner, A. Pivonka, Jeehoon Kim, Cun Ye, M. A. Blood-Forsythe, Martin Zech, Jennifer E. Hoffman*
  23. "A quantum phase transition from triangular to stripe charge order in  $\text{NbSe}_2$ "  
**Proceedings of the National Academy of Sciences** 110, 1623 (2013). ([link](#))  
*Anjan Soumyanarayanan, M.M. Yee, Yang He, Jasper van Wezel, D.J. Rahn, K. Rossnagel, E.W. Hudson, M.R. Norman, Jennifer E. Hoffman*
  24. "Pairing insights in iron-based superconductors from scanning tunneling microscopy"  
**Current Opinion in Solid State & Materials Science** 17, 39 (2013) ([link](#))  
*Can-Li Song, Jennifer E. Hoffman*
  25. "Nanoscale Surface Element Identification and Dopant Homogeneity in the High- $T_c$  Superconductor  $\text{Pr}_x\text{Ca}_{1-x}\text{Fe}_2\text{As}_2$ "  
**Physical Review B** 87, 201108R (2013) ([link](#))  
*Ilija Zeljkovic, Dennis Huang, Can-Li Song, Bing Lv, Ching-Wu Chu, Jennifer E. Hoffman*
  26. "Dopant clustering, electronic inhomogeneity, and vortex pinning in iron-based superconductors"  
**Physical Review B** 87, 214519 (2013) ([link](#))  
*Can-Li Song, Yi Yin, Martin Zech, Tess Williams, Michael Yee, Gen-Fu Chen, Jian-Lin Luo, Nan-Lin Wang, Eric W. Hudson, Jennifer E. Hoffman*
  27. "Interplay of chemical disorder and electronic inhomogeneity in unconventional superconductors"  
**Physical Chemistry Chemical Physics** 15, 13462 (2013) ([link](#))  
*Ilija Zeljkovic, Jennifer E. Hoffman*
  28. "Charge ordering driven by Fermi-arc instability in underdoped cuprates"  
**Science** 343, 390 (2014) ([link](#))  
*R. Comin, A. Frano, M. M. Yee, Y. Yoshida, H. Eisaki, E. Schierle, E. Weschke, R. Sutarto, F. He, A. Soumyanarayanan, Y. He, M. LeTacon, I. Elfimov, J.E. Hoffman, B. Keimer, G.A. Sawatzky, A. Damascelli*
  29. "Imaging the Electron-Boson Coupling in Superconducting FeSe"  
**Physical Review Letters** 112, 157002 (2014) ([link](#))  
*Can-Li Song, Yi-Lin Wang, Ye-Ping Jiang, Zhi Li, Lili Wang, Ke He, Xi Chen, Jennifer E. Hoffman, Xu-Cun Ma, Qi-Kun Xue*
  30. "Fermi Surface and Pseudogap Evolution in a High  $T_c$  Superconductor"  
**Science** 344, 608-611 (2014) ([link](#))  
*Yang He, Yi Yin, M. Zech, Anjan Soumyanarayanan, Michael M. Yee, Tess L. Williams, M. C. Boyer, Kamalesh Chatterjee, W. D. Wise, Ilija Zeljkovic, Takeshi Kondo, T. Takeuchi, H. Ikuta, Peter Mistark, Robert S. Markiewicz, Arun Bansil, E. W. Hudson, Jennifer E. Hoffman*
  31. " $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  Superconductor Nanowire Devices"  
**Physica C**, 10.1016/j.physc.2014.06.010 (2014) ([link](#))  
*N. E. Litombe, A. T. Bollinger, J. E. Hoffman, I. Bozovic*
  32. "Catching Relativistic Electrons"  
**Nature** 513, 319 (2014) ([link](#))  
*Zhihuai Zhu, Jennifer E. Hoffman*

33. "Nanoscale interplay of strain and doping in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ "  
**Nano Letters** 14, 6749 (2014) ([link](#))  
*Ilija Zeljkovic, Jouko Nieminen, Dennis Huang, Tay-Rong Chang, Yang He, Horng-Tay Jeng, Zhijun Xu, Jinsheng Wen, Genda Gu, Hsin Lin, Robert S. Markiewicz, Arun Bansil, Jennifer E. Hoffman*
34. "Momentum-Resolved STM Studies of Rashba-Split Surface States on the Topological Semimetal Sb"  
**Journal of Electron Spectroscopy & Related Phenomena** 201, 66-73 (2015) ([link](#))  
*Anjan Soumyanarayanan, Jennifer E. Hoffman*
35. "Spin-Polarized Quantum Well States on  $\text{Fe}_x\text{Bi}_{2-x}\text{Se}_3$ "  
**Physical Review B** 91, 161306 (2015) ([link](#))  
*Michael Yee, Z.-H. Zhu, Anjan Soumyanarayanan, Yang He, Can-Li Song, Ekaterina Pomjakushina, Zaher Salman, Amit Kanigel, Kouji Segawa, Yoichi Ando, Jennifer E. Hoffman*
36. "Revealing the Empty-State Electronic Structure of Single-Unit-Cell  $\text{FeSe}/\text{SrTiO}_3$ "  
**Physical Review Letters** 115, 017002 (2015) ([link](#))  
*Dennis Huang, Can-Li Song, Tatiana A. Webb, Shiang Fang, Cui-Zu Chang, Jagadeesh S. Moodera, Efthimios Kaxiras, Jennifer E. Hoffman*
37. "Single Vortex Pinning and Penetration Depth in Superconducting  $\text{NdFeAsO}_{1-x}\text{F}_x$ "  
**Physical Review B** 92, 134509 (2015) ([link](#)), Editor's selection  
*Jessie T. Zhang, Jeehoon Kim, Magdalena Huefner, Cun Ye, Stella Kim, Paul Canfield, Ruslan Prozorov, Ophir M. Auslaender, Jennifer E. Hoffman*
38. "Bounds on Nanoscale Nematicity in Single-Layer  $\text{FeSe}/\text{SrTiO}_3$ "  
**Physical Review B** 93, 125129 (2016) ([link](#))  
*Dennis Huang, Tatiana A. Webb, Shiang Fang, Can-Li Song, Cui-Zu Chang, Jagadeesh S. Moodera, Efthimios Kaxiras, Jennifer E. Hoffman*
39. "Dumbbell Defects in  $\text{FeSe}$  Films: A Scanning Tunneling Microscopy and First Principles Investigation"  
**Nano Letters** 16, 4224 (2016) ([link](#))  
*Dennis Huang, Tatiana A. Webb, Can-Li Song, Cui-Zu Chang, Jagadeesh S. Moodera, Efthimios Kaxiras, Jennifer E. Hoffman*
40. "A Tale of Two Domes"  
**Physics** 9, 38 (2016) ([link](#))  
*Dennis Huang, Jennifer E. Hoffman*
41. "Acoustic Buffeting by Infrasonics in a Low Vibration Facility"  
**Review of Scientific Instruments** 87, 093901 (2016) ([link](#))  
*B. P. MacLeod, Jennifer E. Hoffman, S. A. Burke, D. A. Bonn*
42. "Etching of Cr Tips for Scanning Tunneling Microscopy of Cleavable Oxides"  
**Review of Scientific Instruments** 88, 023705 (2017) ([link](#))  
*Dennis Huang, Stephen Liu, Ilija Zeljkovic, John F. Mitchell, Jennifer E. Hoffman*
43. "Optical Nanoscopy of High- $T_c$  Cuprate Nano-Constrictions Patterned by Helium Ion Beams"  
**Nano Letters** 17, 1582 (2017) ([link](#))  
*Adrian Gozar, Nicholas Litombe, Jennifer E. Hoffman, Ivan Bozovic*
44. "Monolayer  $\text{FeSe}$  on  $\text{SrTiO}_3$ "  
**Annual Reviews of Condensed Matter Physics** 8, 311-336 (2017) ([link](#))  
*Dennis Huang, Jennifer E. Hoffman*

#### Submitted Preprints

45. "Imaging the Kondo Insulating Gap on  $\text{SmB}_6$ " (1308.1085)  
*Michael M. Yee, Yang He, Anjan Soumyanarayanan, Dae-Jeong Kim, Zachary Fisk, Jennifer E. Hoffman*
46. "Imaging the Nanoscale Band Structure of Topological Sb" (1311.1758)  
*Anjan Soumyanarayanan, Michael M. Yee, Yang He, Hsin Lin, Dillon R. Gardner, Arun Bansil, Young S. Lee, Jennifer E. Hoffman*

## INVITED PRESENTATIONS

### Conferences:

1. International Conference on Physics and Chemistry of Molecular and Oxide Superconductors (MOS), Hsinchu, Taiwan, 14 August 2002. "Imaging Quasiparticle Interference in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ ."
2. Aspen Center for Physics, conference on Condensed Matter Physics: Complex Quantum Order, Aspen, Colorado, 11 February 2003. "Quasiparticle Interference in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ ."
3. Symposium on Advances and Applications in Scanning Probe Microscopy, Detroit, Michigan, 17 May 2004. "Fourier Transform Scanning Tunneling Spectroscopy."
4. International Conference on Spectroscopies in Novel Superconductors, Sitges, Spain, 12 July 2004. "Destruction of antinodal state coherence via 'checkerboard' charge ordering in strongly underdoped superconducting  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ ."
5. Low Temperature Physics, Orlando, Florida, 13 August 2005. "Manipulation of Single Vortices in Superconducting Nb Using a Magnetic Force Microscope."
6. Princeton Program on Iron-based High Temperature Superconductors, Princeton, New Jersey, 14 November 2008. "STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
7. ICAM Workshop on Fe-pnictide and Related Superconductors, College Park, Maryland, 17 November 2008. "STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
8. SuperStripes 2008, International Conference on FeAs High- $T_c$  Superconducting Multilayers and Related Phenomena, Rome, Italy, 12 December 2008. "STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
9. Aspen Winter Conference on Condensed Matter Physics, Aspen, Colorado, 13 January 2009, "STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
10. American Physical Society March Meeting, Portland, OR, 18 March 2010  
Invited talk: "Scanning Tunneling Microscopy and Spectroscopy of Iron-Based Superconductors."
11. 4th I2CAM/FAPERJ Summer School on "New Phenomena in Quantum Matter", Rio de Janeiro, Brazil, June 2010. Two pedagogical lectures on STM studies of superconductors.
12. International Conference on Nanoscience & Technology, Beijing, China, 26 August 2010, "Nanoscale Imaging of Correlated Electron Systems."
13. Aspen Winter Conference on Condensed Matter Physics, Aspen, Colorado, 23 January 2011, "Imaging the Disordered Orders in Cuprate Superconductors."
14. Minnesota Workshop on Unconventional Superconductivity, Minneapolis, MN, 22 April 2011, "STM Imaging of Broken Symmetry States in Cuprate Superconductors."
15. Cargese ICAM Summer School "Multiband and multiorbital effects in novel materials" at the Institut d'Etude Scientifique in Cargese, Corsica, France, August 1-13, 2011. Two pedagogical lectures on STM studies of superconductors.
16. International Conference on Superconductivity & Magnetism, Istanbul, Turkey, 1 May 2012. "Single Vortex Manipulation in Superconducting  $\text{NdFeAsO}_{1-x}\text{F}_x$ ."
17. Gordon Conference on Correlated Electron Systems, Mt. Holyoke, MA, 26 June 2012. "Imaging the impact of single dopants on inhomogeneous electronic states in cuprate and pnictide superconductors."
18. American Physical Society March Meeting, Baltimore, March 20, 2013  
Invited talk: "Imaging the Impact of Impurities on Topological Surface States"
19. Gordon Conference on Superconductivity, Les Diablerets, Switzerland, May 15, 2013  
"Imaging Fermi Surface Pairing and Coherence in  $\text{Bi}_2\text{Sr}_2\text{CuO}_{6+x}$ "
20. Spectroscopies of Novel Superconductors, Berkeley, CA, June 24, 2013  
"Visualizing antinodal pair decoherence in  $\text{Bi}_2\text{Sr}_2\text{CuO}_{6+x}$ "
21. Scanning Probe Microscopy for Study of Quantum Materials, Vancouver, Canada, June 29, 2013  
"Nanoscale Band Structure Microscopy on Topological Sb(111)"

22. International workshop on recent developments in Fe-based high-temperature superconductors, Long Island, NY, Sept 5, 2013. "Inhomogeneity in Fe-based superconductors: Bosons, twin boundaries, defects, dopants, vortices"
23. CIFAR, Vancouver, Canada, Oct 18, 2013  
"Fermi surface reconstruction & pseudogap in cuprate superconductors"
24. Correlated Oxides and Oxide Interfaces, Minneapolis, MN, May 1, 2014.  
"Fermi Surface & Pseudogap Evolution in a Cuprate Superconductor"
25. Advances in Nanostructured Superconductors, Madrid, Spain, May 7, 2014  
"Fermi Surface & Pseudogap Evolution in a Cuprate Superconductor"
26. UBC-Max Planck Workshop on mixed valence materials, Vancouver, BC, May 15, 2014  
"Nanoscale Spectroscopy on  $\text{SmB}_6$ "
27. International Max Planck Research School (IMPRS) Summer School, June 30, 2014  
"Quasiparticle Interference Imaging of Superconductors"
28. Low Energy Electrodynamics in Solids, France, June 3, 2014  
"Nanoscale Spectroscopy on  $\text{SmB}_6$ "
29. Strongly Correlated Electron Systems (SCES), Grenoble, France, July 8, 2014  
**Plenary Talk** on "Nanoscale Imaging on Topological Materials"
30. Boulder Summer School on Superconductivity, Boulder, CO, July 22-23, 2014  
Two pedagogical lectures on STM experiments on superconductors
31. APS March Meeting, San Antonio, TX, March 2-6, 2015
32. International Winterschool on Electronic Properties of Novel Materials: Molecular Nanostructures, Kirchberg/Tirol, Austria, March 8-14, 2015
33. CIFAR Quantum Materials, Vancouver, Canada, May 6-9, 2015
34. Frontiers in Quantum Materials and Devices Workshop, Harvard, USA, May 21-22, 2015
35. Gordon Research Conference on Superconductivity, Hong Kong, May 24-29, 2015  
"Band structure & nematicity in a single atomic layer of FeSe"
36. Strongly Correlated Topological Insulators:  $\text{SmB}_6$  and Beyond, U. Michigan, June 2-5, 2015
37. EPIQS Moore Foundation Symposium, Palo Alto, CA, Aug 5-7, 2015
38. Gordon Conference on Strongly Correlated Electrons, Mt. Holyoke, MA, June 26-30, 2016
39. EPIQS Trans-Pacific Conference on Topological Quantum Materials, Moorea, Dec 3-7, 2016
40. Frontiers of Condensed Matter Physics, Bristol, UK, Jan 9-10, 2017
41. iNANO, Aarhus, Denmark, Jan 11, 2017
42. Conference for Undergraduate Women in Physics, Cambridge, MA, Jan 13-15, 2017

**Upcoming Invited Conference Talks:**

43. Alexander M. Cruickshank Lecturer at the Gordon Research Conference on Superconductivity, Waterville Valley, NH, June 4-9, 2017

**Colloquia & Seminars:**

1. Massachusetts Institute of Technology, Department of Physics, 17 April 2002.  
"Imaging Quasiparticle Interference in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ ."
2. Stanford University, Department of Applied Physics, 28 May 2002.  
"Checkerboards in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ ."
3. Stanford University, Department of Applied Physics, 15 July 2002.  
"Incommensurate Conductance Modulations from Quasiparticle Scattering in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ ."
4. Harvard University, Department of Physics, 3 April 2003.  
"Wavefunction Imaging in High Temperature Cuprate Superconductors."
5. Yale University, Department of Applied Physics, 17 April 2003.  
"Wavefunction Imaging in High Temperature Cuprate Superconductors."

6. University of California, Berkeley, Department of Physics, 28 April 2003.  
"Wavefunction Imaging in High Temperature Cuprate Superconductors."
7. University of California, Los Angeles, Department of Physics, 21 May 2003.  
"Wavefunction Imaging in High Temperature Cuprate Superconductors."
8. California Institute of Technology, Department of Physics, 23 May 2003.  
"Scanning Tunneling Spectroscopy of High Temperature Cuprate Superconductors."
9. Northeastern University, Department of Physics, 14 October 2004.  
"Imaging Checkerboards in a High-Temperature Superconductor."
10. University of Michigan, Department of Physics, 1 February 2005.  
"Single vortex imaging & manipulation in superconducting Nb and  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ ."
11. Rutgers University, Department of Physics, 13 September 2005.  
"Single vortex manipulation & depinning force measurements in superconducting Nb."
12. U.S. Coast Guard Academy, public science lecture, 6 February 2006.  
"Playing Checkers with Superconducting Vortices."
13. Bates College, 24 March 2006.  
"Playing Checkers with Superconducting Vortices."
14. Rhode Island College, 19 October 2007.  
"Playing Checkers with Superconducting Vortices."
15. University of Maryland, College Park, CNAM Seminar, 6 November 2008.  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
16. Oak Ridge National Lab, 17 December 2008,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
17. Stanford University, 23 January 2009,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
18. University of California at Berkeley, Condensed Matter Seminar, 26 January 2009,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
19. Harvey Mudd College, Physics Department Colloquium, 27 January 2009,  
"High Temperature Superconductivity in Iron Arsenides"
20. University of California at Los Angeles, Condensed Matter Seminar, 28 January 2009,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
21. Johns Hopkins University, Institute for Quantum Matter Seminar, 9 March 2009,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
22. Reed College, Physics Department Colloquium, 25 March 2008,  
"High Temperature Superconductivity in Iron Arsenides"
23. University of British Columbia, Condensed Matter Seminar, 26 March 2009,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
24. Oregon State University, Physics Department Colloquium, 30 March 2009,  
"Imaging the New Iron Arsenic High- $T_c$  Superconductors"
25. Brookhaven National Lab, 10 April 2009,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
26. Cornell University, LASSP Seminar, 14 April 2009,  
"STS and Vortex Imaging in the Pnictide Superconductor  $\text{Ba}(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ ."
27. Harvard University, Physics Colloquium, 29 March 2010,  
"Got Mott? Nanoscale Explorations of Electronic Transitions."
28. University of Illinois, Urbana-Champaign, Condensed Matter Seminar, 23 April 2010,  
"Nanoscale Explorations of the Insulator-Metal Transition in  $\text{VO}_2$ ."
29. University of Minnesota, Condensed Matter Seminar, 30 September 2010.  
"Nanoscale Explorations of the Insulator-Metal Transition in  $\text{VO}_2$ ."

30. University of Minnesota, Physics Colloquium, 29 September 2010  
"Nanoscale Imaging of Cuprate and Iron Pnictide High-Tc Superconductors."
31. Yale University, Physics Colloquium, 18 October 2010,  
"Nanoscale Explorations of High Temperature Superconductors."
32. Michigan State University, Physics Colloquium, 31 March 2011,  
"The Competitive Landscape of High-Tc Superconductivity."
33. Brown University, Physics Colloquium, 25 April 2011,  
"The Competitive Landscape of High-Tc Superconductivity."
34. Brookhaven National Lab, Condensed Matter Seminar, 13 July 2011  
"STM imaging of symmetry-breaking structural distortion in the Bi-based cuprates"
35. McGill University, Montreal, Canada, Physics Colloquium, 2 Sept 2011  
"The Competitive Landscape of High-Tc Superconductivity."
36. Stanford University, Condensed Matter Seminar, 18 Oct 2011  
"Imaging the impact of single dopants on the electronic order and disorder of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
37. University of Illinois, Urbana-Champaign, Condensed Matter Seminar, 7 Nov 2011  
"Imaging the impact of single dopants on the electronic order and disorder of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
38. Purdue University, Condensed Matter Seminar, 16 Dec 2011  
"Imaging the impact of single dopants on the electronic order and disorder of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
39. Penn State University, Physics Colloquium, 19 Jan 2012  
"The effect of a single atom on high-Tc superconductivity"
40. Columbia University, Condensed Matter Seminar, 15 February 2012  
"Imaging the impact of single dopants on the competing phases of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
41. Rutgers University, Condensed Matter Seminar, 6 March 2012  
"Imaging the impact of single dopants on the competing phases of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
42. Technion Israel Institute of Technology, Condensed Matter Seminar, 13 March 2012  
"Imaging the impact of single dopants on the competing phases of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
43. Weizmann Institute of Science, Condensed Matter Seminar, 14 March 2012  
"Imaging the impact of single dopants on the competing phases of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
44. Hebrew University of Jerusalem, Seminar, 18 March 2012  
"Imaging the impact of single dopants on the competing phases of  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
45. Caltech, Condensed Matter Seminar, 26 March 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
46. Johns Hopkins, Condensed Matter Seminar, 28 March 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
47. Colorado University, Boulder, Seminar, 30 March 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
48. University of California, Berkeley, Condensed Matter Seminar, 9 April 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
49. Louisiana State University, Physics Colloquium, 19 April 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
50. Harvard University, Physics Colloquium, 23 April 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
51. University of Maryland, College Park, 26 April 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
52. NIST Gaithersburg, 27 April 2012  
"Imaging the Impact of Single Oxygen Atoms on Superconducting  $\text{Bi}_{2+y}\text{Sr}_{2-y}\text{CaCu}_2\text{O}_{8+x}$ "
53. Université de Sherbrooke, Condensed Matter Seminar, 28 August 2013  
"Nanoscale Band Structure Imaging on Topological  $\text{Sb}(111)$  and  $\text{SmB}_6$ "



54. University of Michigan, Condensed Matter Seminar, 17 September 2013  
“Nanoscale Band Structure Imaging on Topological Sb(111) and SmB<sub>6</sub>”
55. Yale University, Condensed Matter Seminar, 7 November 2013  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
56. University of Victoria, Physics Colloquium, 20 November 2013  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
57. University of British Columbia, Physics Colloquium, 21 November 2013  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
58. Simon Frazier University, Physics Colloquium, 22 November 2013  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
59. Ohio State University, Physics Colloquium, 26 November 2013  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
60. Rutgers University, Condensed Matter Seminar, 2 December 2013  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
61. Carnegie Mellon University, Physics Colloquium, 9 December 2013  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
62. Wellesley College, Physics Colloquium, 13 March 2014  
“Nanoscale Imaging of Topological Sb”
63. Brookhaven National Laboratory, Physics Colloquium, 18 March 2014  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
64. University of Waterloo, Physics Colloquium, 20 March 2014  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
65. Boston College, Physics Colloquium, 2 April 2014  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
66. State University of New York at Stony Brook, Physics Colloquium, 22 April 2014  
“Nanoscale Band Structure Imaging of Topological Materials: Sb and SmB<sub>6</sub>”
67. University of Madrid, IfiMAC Seminar, 8 May 2014  
“Topological Materials at the Nanoscale”
68. University of Hamburg, Germany, Department Seminar, 23 June 2014  
“Topological Materials at the Nanoscale”
69. Max Planck Institute for Solid State Research, Hamburg, Germany, Seminar, 24 June 2014  
“Fermi Surface & Pseudogap Evolution in a Cuprate Superconductor”
70. ETH Zurich, Physics Colloquium, 22 October 2014  
“Topological Materials at the Nanoscale”
71. University of Florida, Physics Colloquium, 8 January 2015  
“Imaging High-T<sub>c</sub> Superconductivity in a Single Atomic Layer of FeSe”
72. University of South Florida, Physics Colloquium, 9 January 2015  
“Imaging High-T<sub>c</sub> Superconductivity in a Single Atomic Layer of FeSe”
73. University of Illinois, Urbana-Champaign, Physics Colloquium, 11 February 2015  
“Imaging High-T<sub>c</sub> Superconductivity in a Single Atomic Layer of FeSe”
74. University of Chicago, Physics Colloquium, 12 February 2015  
“Imaging High-T<sub>c</sub> Superconductivity in a Single Atomic Layer of FeSe”
75. Argonne National Laboratory, Condensed Matter Physics Seminar, 13 February 2015  
“Imaging High-T<sub>c</sub> Superconductivity in a Single Atomic Layer of FeSe”
76. Dartmouth College, Physics Colloquium, 20 February 2015  
“Imaging High-T<sub>c</sub> Superconductivity in a Single Atomic Layer of FeSe”
77. Cornell University, Solid State Seminar, 17 March 2015  
“Imaging High-T<sub>c</sub> Superconductivity in a Single Atomic Layer of FeSe”

78. University of Texas, Austin, Physics Colloquium, 22 April 2015
79. Temple University, Physics Colloquium, 28 November 2016
80. St. Andrews University, Physics Seminar, 13 January 2017
81. University of Connecticut, Physics Colloquium, 28 April 2017
82. Colorado University Boulder, Physics Colloquium, 3 May 2017
83. Colorado University Boulder, Condensed Matter Seminar, 4 May 2017

**Upcoming Colloquia & Seminars:**

84. Monash University, Physics Colloquium & Public Lecture, Melbourne, Australia, Aug 2017

**FUNDING**

**United States, Foundation & Federal Funding**

- AFOSR, FA9550-05-1-0371 (single PI)  
“Vortex Pinning in the High-Tc Superconductor  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ ”  
\$342,958 from 5/15/2005-6/14/2008
- NSF, DMR-0508812 (single PI)  
“Scanning Tunneling Spectroscopy Studies of Organic Superconductors”  
\$300,000 from 7/1/2005-6/30/2008
- NSEC, NSF PHY-0117795 (collaborator)  
“Construction of a Magnetic Force Microscope”  
and “Construction of a Spin-Polarized Scanning Tunneling Microscope”  
\$297,812 from 9/1/2005-6/30/2011 (Hoffman allocation)
- AFOSR DURIP, FA9550-06-1-0359 (single PI)  
“Construction of an Ultra-High Vacuum, Low Temperature Spin-Polarized Scanning Tunneling Microscope to Manipulate and Image Magnetic Nanostructures”  
\$233,180 from 5/15/2006-5/14/2007
- AFOSR PECASE, FA9550-06-1-0531 (single PI)  
“Construction of an Ultra-High Vacuum, Low Temperature Spin-Polarized Scanning Tunneling Microscope to Manipulate and Image Magnetic Nanostructures”  
\$500,000 from 9/1/2006-8/31/2011
- NSF Career Award, DMR-0847433 (single PI)  
“Spin-Resolved Imaging of Correlated Electron Systems Including Cuprates and Pnictides”  
\$539,500 from 7/1/2009-6/30/2014
- Sloan Foundation Fellowship (single PI)  
“Spin resolved imaging and manipulation of correlated electron systems”  
\$50,000 from 9/1/2010-8/31/2012
- NSF ARI-R<sup>2</sup>, AST-0963347 (lead PI)  
“Helium Recovery & Reliquefaction For Low Temperature Research”  
\$1,300,000 from 10/1/2010-9/30/2013
- NSF DMR-1106023 (single PI)  
“Nanoscale Studies of Topological Insulators”  
\$375,000 from 7/1/2011-6/30/2014
- U.S.-Israel Binational Science Foundation, Award 2010305 (lead PI)  
“Nanoscale Electronic and Magnetic Imaging of Organic Superconductors”  
\$75,000 from 10/1/2011-9/30/2014 (Hoffman allocation)
- NSF Science & Technology Center, DMR-1231319 (collaborator)  
“Center for Integrated Quantum Materials”  
\$269,575 from 11/1/2013-6/30/2017 (Hoffman allocation)
- DOE Energy Frontier Research Center (collaborator)

“Integrated Mesoscale Architectures for Sustainable Catalysis”

\$80,006 from 12/1/2014-7/31/2016

Total Award Amount: \$10,170,000 from 8/1/2014-7/31/2018 – shared among 12 PIs

- NSF DMR-1410480 (single PI)

“Nanoscale Imaging of Topological Superconductivity in Heterostructures”

\$405,835 from 9/1/2014-8/31/2017

- Emergent Phenomena in Quantum Systems, Gordon & Betty Moore Foundation (single PI)

“Quantum 3D Printing”

\$1,800,000 from 12/1/2014-11/30/2019

Total external funding: \$6,278,660

(sub-total as lead PI: \$5,921,473)

### **Harvard Internal Funding**

- Clarke Award

“Scanning Tunneling Microscope Construction”

\$6,000 from 7/1/2005-6/30/2007

- Clarke Award

“Spin-Polarized Scanning Tunneling Tip Fabrication System”

\$5,766 from 7/1/2008-6/30/2010

- HUCE Seed Funding

“Scanning Tunneling Microscope Studies of Iron-Pnictide High- $T_c$  Superconductors”

\$14,000 from 5/1/2009-4/30/2010

- Merck Fund

“Imaging Correlated Electrons in Exotic Materials”

\$750,000 from 7/1/2010-6/30/2015

- HUCE Seed Funding

“The role of near-surface defects in  $\text{TiO}_2$  photocatalysis”

\$24,438 from 6/1/2013-6/30/2014 (Hoffman allocation)

### **Canadian Funding**

- Canada Excellence Research Chair (collaboration)

“Quantum Materials & Devices Based on Oxide Heterostructures”

\$10M from 7/1/2015-6/30/2022 (terminated on Dec 31, 2016)

- NSERC Discovery Grant (single PI)

“Growth & Spectroscopic Imaging of Interface Superconductivity”

\$355,000 from 8/1/2015-7/31/2020 (terminated on Dec 31, 2016)

- CIFAR Associate Fellow:

\$20,000 from 7/1/2016-6/30/2017

### **COURSES TAUGHT**

(See syllabi, websites, and Q details: <http://hoffman.physics.harvard.edu/courses.php>)

- Spring 2005: Freshman Seminar 24k, “Building a Scanning Tunneling Microscope” (8 students)  
Q evaluations: course overall, 4.38; instructor overall, 4.50
- Fall 2005: Physics 11a, Introductory Mechanics (160 students)  
Q evaluations: course overall, 2.89; instructor overall, 3.16
- Spring 2006: Physics 15c, Wave Phenomena (17 students)  
Q evaluations: course overall, 4.14; instructor overall, 4.43
- Fall 2007: Physics 15b, Introductory Electromagnetism (23 students)  
Q evaluations: course overall, 4.39; instructor overall, 4.61

*(natural sciences benchmark: course:3.72; instructor: 3.91)*

- Spring 2008: Physics 15c, Wave Phenomena (16 students)  
Q evaluations: course overall, 4.40; instructor overall, 4.73  
*(natural sciences benchmark: course: 3.65; instructor: 3.77)*
- Fall 2008: Physics 15c, Wave Phenomena (38 students)  
Q evaluations: course overall, 4.23; instructor overall, 4.48  
*(natural sciences benchmark: course: 3.70; instructor: 3.89)*
- Spring 2009: Physics 153, Advanced Electromagnetism (35 students)  
Q evaluations: course overall, 3.68; instructor overall, 3.97  
*(natural sciences benchmark: course: 3.68; instructor: 3.87)*
- Fall 2010: Physics 15c, Wave Phenomena (26 students)  
Q evaluations: course overall, 4.23; instructor overall, 4.40  
*(natural sciences benchmark: course: 3.76; instructor: 3.96)*
- Spring 2011: Physics 191, Advanced Laboratory (13 students)  
Q evaluations: course overall, 4.82; instructor overall, 4.36  
*(natural sciences benchmark: course: 3.70; instructor: 3.91)*
- Fall 2011: Physics 15c, Wave Phenomena (25 students)  
Q evaluations: course overall, 4.07; instructor overall, 4.37  
*(natural sciences benchmark: course: 3.89; instructor: 4.04)*
- Spring 2012: Physics 15c, Wave Phenomena (37 students)  
Q evaluations: course overall, 4.00; instructor overall, 4.20  
*(natural sciences benchmark: course: 3.84; instructor: 4.03)*
- Fall 2014: Physics 195, Solid State Physics (19 students)  
Q evaluations: course overall, 4.30; instructor overall, 4.30  
*(natural sciences benchmark: course: 3.82; instructor: 4.01)*
- Spring 2015: Physics 191, Advanced Lab (21 students)
- Spring 2017: Physics 15a, Mechanics & Special Relativity (38 students)

**Hoffman, instructor overall: 4.29**

**Natural sciences benchmark, instructor overall: 3.92**

#### **UBC courses**

- Fall 2015: Physics 107, Enriched Physics (for First-Years) (100 students)

#### **TEACHING AWARDS**

- Spark Award, “for inspiring the next generation of women in science”, Harvard, 2009
- Fannie Cox Award, given annually to two faculty members in recognition of “outstanding teaching in introductory science courses.” Harvard, 2012 ([link](#))
- Roslyn Abramson Award, given annually to two tenure track faculty members in recognition of “excellence and sensitivity in teaching undergraduates.” Harvard, 2012 ([link](#))

#### **ADVISING**

##### **Postdocs:**

- Heon-Ick Ha (Jan 2005 – Aug 2006, STM construction → postdoc in Organismic and Evolutionary Biology at Harvard → Research Ventures & Licensing at Partners Healthcare since 2012 ([link](#)))
- Martin Zech (June 2007 – March 2009, STM imaging of high- $T_c$  superconductors → Attocube in Germany)
- Jeehoon Kim (June 2007 – May 2010, CAFM imaging of  $VO_2$  & MFM imaging of Fe-based superconductors → staff scientist at Los Alamos National Lab → professor at POSTECH, Korea)

- Magdalena Huefner (March 2011 – Sept 2013, force microscopy studies of VO<sub>2</sub>, Nd<sub>2</sub>Fe<sub>14</sub>B, NdFeAsO<sub>1-x</sub>F<sub>x</sub> → postdoc with Prof. Elke Scheer at U. Konstanz, Germany)
- Can-Li Song (June 2011 – Aug 2014, MBE growth and STM imaging of Fe-based superconductors → Assistant Professor, Tsinghua University, China)
- Zhihui Zhu (Sept 2013 – present, STM imaging of topological materials)
- Maoz Ovidia (Sept 2013 – present, force microscope upgrade to study superconductivity)
- Jason Hoffman (April 2015 – present, oxide MBE)
- Mohammad Hamidian (Aug 2015 – present, STM on strongly correlated electron materials)
- Jianfeng Ge (Sept 2016 – present, 4-probe STM)

**Graduate Student Research Advisees:**

- Yi Yin (Jan 2005 – Sept 2009, PhD 2009 on STM studies of high-T<sub>c</sub> superconductors → postdoc with John Martinis at UCSB → tenured professor of physics at Zhejiang University, China)
- Liz Main (Jan 2005 – Dec 2011, PhD 2011 on STM studies of cuprate superconductors → Data Quality Specialist, EnerNOC, Boston)
- Tess Williams (July 2006 – Sept 2011, PhD 2011 on STM studies of cuprate superconductors → Power Systems Engineer at Pacific Northwest National Laboratory)
- Adam Pivonka, (Sept 2005 – Sept 2012, PhD 2012 on force microscopy studies of VO<sub>2</sub> and Nd<sub>2</sub>Fe<sub>14</sub>B → McKinsey & Co., New York)
- Anjan Soumyanarayanan, (March 2009 – June 2013, PhD 2013 on STM studies of topological materials → postdoc with Prof. Christos Panagopoulos at National Technical University, Singapore)
- Ilija Zeljkovic, (Feb 2008 – May 2013, PhD 2013 on STM studies of high-T<sub>c</sub> superconductors → Assistant Professor at Boston College)
- Michael Yee, (Nov 2009 – June 2014, PhD 2014 on STM studies of high-T<sub>c</sub> superconductors and topological materials → McKinsey & Co, Toronto)
- Nick Litombe, SEAS, April 2008 – May 2015, fabrication of cuprate nanowires, → Science & Technology Policy Fellow, DOE
- Yang He, Sept 2010 – Oct 2015, STM studies of high-T<sub>c</sub> superconductors and topological materials, → Goldman Sachs
- Dennis Huang, Nov 2011 – May 2016, MBE growth and STM studies of Fe-superconductors
- Tatiana Webb, May 2014 – present, MBE growth & scanning probe lithography
- Eddie Ji, MSc from UBC, Sept 2014 – present, force microscope upgrade
- Harry Pirie, Jan 2015 – present, Smb6 analysis & MBE growth
- Yau Chuen (Oliver) Yam, MSc from UBC, Feb 2015 – May 2017, STM imaging of topological materials
- Muhammed Saleem, MSc from UBC, Sept 2015 – May 2017, MFM image analysis of Nd<sub>2</sub>Fe<sub>14</sub>B
- Yi Liu, Sept 2015 – present, STM imaging of topological materials
- Alyson Spitzig, MSc from UBC, Sept 2015 – present, VO<sub>2</sub> analysis & building an oxide MBE system

**Graduate Student Research Advisees (temporary):**

- Sang Chu (force microscope construction, May 2005 – May 2007, MA in spring 2007 → Goldman Sachs)
- Cun Ye, visiting grad student from Tsinghua University in China from Sept 2011 – Aug 2012, force microscope studies of VO<sub>2</sub> and Nd<sub>2</sub>Fe<sub>14</sub>B
- Alex Frenzel, Sept 2009 – Aug 2010, force microscope studies of VO<sub>2</sub> → Nuh Gedik group at MIT
- Martin Blood-Forsythe, Nov 2011 – Aug 2012, force microscope studies of VO<sub>2</sub> and Nd<sub>2</sub>Fe<sub>14</sub>B → Alan Asperu-Guzik in Chemistry at Harvard
- Thomas Plumb-Reyes, Sept-Dec 2013, force microscope upgrade (SEAS student, now rotating with SEAS advisor)

- Jing Shi, July 2013 – March 2014, MBE growth and STM studies of Fe-based superconductors → Philip Kim group
- Sarah Schlotter, Jan 2013 – March 2014, force microscope upgrade to study surface catalysis

**Graduate Student Non-Research Advisees:**

- Mentees through HGWISE: Shannon Fogwell, Susanne Pielawa, Monica Allen, Olivia Miller, Zamyra Chan, Christina Chang, Elise Novitski, Emma Rosenfeld
- Quals/Thesis Committee: Mason Klein, Christine Wang, Adrian del Maestro, Chris Chou, Timofey Rostunov, Haruka Tanji, Matt Hummon, Susanne Pielawa, Yejin Huh, Suzanne Pittman, James McIver, Alex Frenzel, Yihua Wang, Jing Shi

**Undergraduate Research Advisees:**

- Julia Mundy '06 (Jan-June 2005, STM construction → Cornell, Applied Physics PhD program)
- Max Chalfin '08 (Spring-Aug 2007, MFM construction → Stanford, Applied Physics PhD program → Algorithmist, Hudson River Trading, NYC)
- Stefan Wernli '08 (June-Aug 2007, data acquisition programming → Microsoft)
- Sam Cross '08 (Summers 2005 and 2006, vibration isolation construction → MIT, Mechanical Engineering PhD program)
- Cleo Leung '08 (June 2005-Aug 2006, STM construction)
- Sam Lederer '09 (June-Dec 2008, construction of gas panel for  $^3\text{He}$  cryostat → Stanford, Physics PhD program)
- Hasan Korre '09 (Sept 2005-June 2008, electronics & programming for STM → MIT, Electrical Engineering PhD program)
- Stanley Chiang '09 (June-Aug 2008, construction of vibration isolation for force microscope → Goldman Sachs)
- Noah Bruegmann '10 (June-Aug 2008, construction of vibration isolation for STM → Sr. Business Analyst, Inflexion, Redwood City, CA)
- Jian Li '10 (Jan – April 2009, temperature sensor calibration → Software Engineer, Counsyl, San Francisco, CA)
- Michael Wong '12 (fall 2009 to June 2011, STM construction, [blog link](#) → Appl. Predictive Technology → University of Chicago, Booth School of Business)
- Russell Huang '12 (summer 2010-spring 2011, STM construction → Sachs Consulting, Astoria, NY)
- Kevin O'Connor '13 (fall 2010-summer 2011, capacitive effects in  $\text{VO}_2$  → Software Engineer, IXL Learning, San Mateo, CA)
- Michael Tom, '13 (summer 2011-spring 2012, STM construction, Software Engineer, Schrödinger, New York, USA)
- Arjun Nandkishore, '13 (fall 2011-spring 2012, STM construction → Morgan Stanley)
- Ling-Ya (Monica) Chao, '15 (fall 2011-spring 2012, single oxygen defects in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ )
- Harry Mickalide, Brown '12 (Aug 2012 – June 2013, force microscopy studies of  $\text{VO}_2$  → PhD program in Physics, University of Illinois at Urbana-Champaign)
- Jessie Zhang, MIT '15 (March 2013-Aug 2015, vortex pinning in  $\text{NdFeAsO}_{1-x}\text{F}_x$ , \*first-author paper submitted: [1504.04045](#) → PhD program at Harvard Physics)
- Stephen Liu, '14 (fall 2012-Dec 2013, chromium tip preparation for spin-polarized STM, \*first-author paper submitted: [1310.6733](#), Stanford Law School)
- Cece Shen, Wellesley '17 (June-July 2014, review of atom-moving literature & rehabilitation of Nanosurf STM)
- Nic Ontiveros, '18 (June-Aug 2015, characterizing and reducing vibrations for STM measurements)
- Trevor Chistollini, (Jan 2017 - present)

- Bryce Primavera (Jan 2017 – present)
- Alli Whelton (May 2017 – present)
- Aditya Mahadevan (May 2017 – present)
- Jason Rosenberg (start June 2017)
- Tom Pilvelait (start June 2017)
- Alex Zapien (start June 2017)

***High school research advisees:***

- Andrew Benecke (summer 2005)
- Andrew Das Sarma (summer 2010)
- Sam Backwell (summer 2011)
- Shuvom Sudhoka (summer 2017)

***Undergraduate Concentration Advisees:***

- 2005-2006: Cleo Leung
- 2006-2007: Cleo Leung , Hasan Korre, Jeanette Kurian
- 2007-2008: Cleo Leung, Hasan Korre, Jeanette Kurian, John Masi, John Bestoso, Kamilia Kaczor, Amol Jain, Siri Uotila, Chris Murphy, Daniel Koll, Quentin Sedlacek
- 2008-2009: Cleo Leung, Hasan Korre , John Masi, John Bestoso, Kamilia Kaczor, Amol Jain, Siri Uotila, Chris Murphy, Daniel Koll, Denise Shrout
- 2009-2010: John Masi, John Bestoso, Kamilia Kaczor, Amol Jain, Siri Uotila, Chris Murphy, Daniel Koll, Denise Shrout, Paige Martin
- 2010-2011: Paige Martin, Kamilia Kaczor, Chris Murphy, Shayna Skal, Aziza Suleymanzade, Samantha Whitmore
- 2011-2012: Shayna Skal, Aziza Suleymanzade, Sam Whitmore, Leah Weiss, Amy Chen, Will Chambers
- 2012-2013: Shayna Skal, Aziza Suleymanzade, Sam Whitmore, Leah Weiss, Amy Chen, Kelsey McKenna
- 2013-2014: Amy Chen, Kelsey McKenna, Emma Dowd, Jacqueline Flood
- 2014-2015: Kelsey McKenna, Emma Dowd, Jacqueline Flood
- 2016-2017: Katie Kixmoeller, Eunice Lee, Alli Whelton

***Undergraduate Sophomore Advisees:***

- 2007-2008: Alicia Lee, Denise Shrout, Peter Hedman, John Masi, John Bestoso
- 2008-2009: Ben Leibowicz, Curt Nehr Korn, Greg Malley, Matt Rienzo, Paige Martin, Steven Shepardson, Tova Holmes
- 2009-2010: Angela Chen, Evan Rosenman, Herman Gudjonson, Janelle Schlossberger, Kevin Fogarty, Marion Dierickx, Marta Bryan, Ruby Lai

**HARVARD PHYSICS DEPARTMENT COMMITTEES**

- 2004-2005: graduate admissions
- 2005-2006: graduate admissions
- 2006-2007: faculty mentorship committee
- 2007-2008: graduate admissions, committee on higher degrees
- 2008-2009: undergraduate lab committee, undergraduate curriculum committee, undergraduate study committee
- 2009-2010: Golub fellowship committee
- 2010-2011: Golub fellowship committee, Loeb lectureship committee
- 2012-2013: graduate admissions
- 2016: colloquium, junior faculty mentorship, graduate admissions, 3 faculty hiring committees

## HARVARD UNIVERSITY SERVICE

- Created new freshman seminar course: “Building a Scanning Tunneling Microscope”, Harvard, 2005
- Kirkland House resident tutor, 2006-2010
- lead PI for the NSF ARI-R<sup>2</sup> (Academic Research Infrastructure) awarded \$1,300,000 for the construction of a helium liquefier facility designed to serve > 15 PIs
- Faculty Council, 2009-2010
- Committee on Undergraduate Education, 2009-2010
- Fannie Cox Award committee, 2013, 2014, 2015
- 2016: John Harvard Distinguished Science Fellowship committee; math department faculty search committee; Committee on Appointments & Promotions (CAP), Division of Sciences Sub-Committee

## UBC COMMITTEES & SERVICE

- 2014-2015: graduate admissions
- 2015-2016: graduate admissions, Chair

## PROFESSIONAL SERVICE

- Lecturer at Boulder Summer School on Superconductivity, Colorado, June 30 – July 25, 2014
- Lecturer at the Cargese ICAM summer school “Multiband and multiorbital effects in novel materials” at the Institut d'Etude Scientifique in Cargese, Corsica, France, August 1-13, 2011.
- Lecturer at the 4th I2CAM/FAPERJ Summer School on “New Phenomena in Quantum Matter”, Rio de Janeiro, Brazil, June 2010.
- Organizer, Aspen Winter Conference in Condensed Matter Physics: High-Temperature Superconductivity, 2005
- Proposal referee: NSF (including 3 panels), DOE, DEPSCoR, ARO, SBIR, NSERC, SLAC, CDRF, German-Israeli Foundation
- Journal referee: Nature, Science, Nature Physics, Nature Communications, Proceedings of the National Academy of Sciences, Physical Review Letters, Physical Review B, Applied Physics Letters, Reviews of Scientific Instruments, Superconductor Science & Technology, New Journal of Physics, Journal of Physics Condensed Matter, ACS Nano, Europhysics Letters, Journal of Applied Physics, Measurement Science & Technology, Journal of Visualized Experiments

## OUTREACH

- Vancouver Institute Lecturer, 2016
- Taught cryogenics classes to K-5 students at Einstein’s Workshop, 2013-2014
- Video interview for NSF’s Nanoscale Informal Science Education Network (NISE net), 2012
- Research Science Institute Mentor, 2005, 2010, 2011  
(Mentored 3 high school students through 6-week summer research projects and written & oral presentations for science fair competitions. One, Andrew das Sarma, was a semi-finalist in Siemens and Intel Talent Searches with his project, and subsequently matriculated at Harvard.)
- Volunteer at the Cambridge Public Schools 8<sup>th</sup> Grade Science & Engineering Showcase, 2011
- Public Lecture at Boston Museum of Science “Nanodays” celebration, 2010
- Annenberg Media “Physics for the 21<sup>st</sup> Century”, Unit 6: “Macroscopic Quantum Mechanics” (online physics video course for teachers and interested non-physicists; available at [http://www.learner.org/courses/physics/unit/unit\\_vid.html?unit=6](http://www.learner.org/courses/physics/unit/unit_vid.html?unit=6))
- Albert Einstein Festival lecturer, Harvard, 2007-2009, 2014



## PERSONAL

- 3 children, born in 2006, 2009, 2012
- Competitive long distance runner, highlights include:
  - Superior Trail 100 Mile, 2004, 1<sup>st</sup> woman
  - Javelina 100 Miler, 1<sup>st</sup> woman (18:52, one of the top 5 female times in the US in 2004)
  - Across the Years 24-Hour Run, 2006 (126 miles, 1<sup>st</sup> woman)
  - Beast of Burden 100 Miler, 2014, 1<sup>st</sup> woman (18:47)
  - USA Track & Field 24-Hour Run, **National Champion**, 2014 (127 miles) ([link](#))
  - USA Track & Field 100-mile National Championship, 2015, 4<sup>th</sup> woman (16:48)
  - USA Track & Field 24-Hour Run, **National Champion**, 2015 (138.4 miles)
  - USA Track & Field 24-Hour Run, **National Champion**, 2016 (142 miles)
  - USA Track & Field "Athlete of the Week", September 2016 ([link](#))
  - Lumberjack 100 Miler, 2017, 1<sup>st</sup> place *overall* (male & female)