

## JENNIFER E. HOFFMAN

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*Hoffman's research program combines molecular beam epitaxy and scanning probe microscopy to image and manipulate the nanoscale electronic and magnetic properties of quantum materials.*

### EDUCATION

- Ph.D. in Physics, University of California, Berkeley, 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, 1999

### RESEARCH APPOINTMENTS

- Professor, Harvard University, Physics Department, 3/2015-present
- Professor, University of British Columbia, Physics & Astronomy Department, 7/2015-6/2016
- 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

### 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, 2001-2003
- Berkeley Physics Department Fellow, 1999-2001
- Barry Goldwater Scholar, 1998-1999
- Robert Byrd Scholar, 1996-1999
- National Merit Scholar, 1996-1997

### SELECTED PUBLICATIONS

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

- "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*
- "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*
- "Acoustic Buffeting by Infrasound 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*
- "Revealing the Empty-State Electronic Structure of Single-Unit-Cell  $\text{FeSe/SrTiO}_3$ "

**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

- “Fermi Surface and Pseudogap Evolution in a High  $T_c$  Superconductor”  
**Science** 344, 608-611 (2014) ([link](#))  
Y. He, Y. Yin, M. Zech, A. Soumyanarayanan, M.M. Yee, T.L. Williams, M.C. Boyer, K. Chatterjee, W.D. Wise, I. Zeljkovic, T. Kondo, T. Takeuchi, H. Ikuta, P. Mistark, R.S. Markiewicz, A. Bansil, E.W. Hudson, J.E. Hoffman
- “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
- “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](#))  
A. Soumyanarayanan, M. Yee, Y. He, J. van Wezel, D. Rahn, K. Rossnagel, E. Hudson, M. Norman, J.E. Hoffman
- “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
- “STM imaging of inversion-symmetry-breaking structural distortion in Bi-based cuprates”  
**Nature Materials** 11, 585 (2012) ([link](#))  
I. Zeljkovic, E.J. Main, T.L. Williams, M. C. Boyer, K. Chatterjee, W. D. Wise, Yi Yin, Martin Zech, Takeshi Kondo, T. Takeuchi, Hiroshi Ikuta, Jinsheng Wen, Zhijun Xu, G.D. Gu, E.W. Hudson, J.E. Hoffman
- “Spectroscopic scanning tunneling microscopy insights into Fe-based superconductors”  
**Reports on Progress in Physics** 74, 124513 (2011) ([link](#))  
Jennifer E. Hoffman
- “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
- “Scanning Tunneling Spectroscopy and Vortex Imaging in the 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
- “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
- “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
- “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
- “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
- “A 4-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
- “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

## 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](#))

### Courses Taught

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

- Freshman Seminar 24k, “Building a Scanning Tunneling Microscope” (developed a new course!)
- Physics 11a, Introductory mechanics (for pre-meds and engineers, 160 students)
- Physics 15b, Electricity & magnetism (2<sup>nd</sup> semester for physics majors)
- Physics 15c, Wave phenomena (3<sup>rd</sup> semester for physics majors)
- Physics 153, Electricity & magnetism (for senior physics majors)
- Physics 191, Advanced Lab (for senior physics majors)
- Physics 195, Solid State Physics (for senior physics majors)
- UBC Physics 107, Enriched Introductory Physics (for ambitious freshman, 100 students)
- Physics 15a, Mechanics & Special Relativity (1<sup>st</sup> semester for physics majors)

### Advising

- Research advisor: 18 grad students (10 PhD, 3 Masters completed), 22 undergraduates, 9 postdocs, 31 undergraduates

### Outreach

- CUWiP lecturer (Conference for Undergraduate Women in Physics), Harvard, 2017
- Vancouver Institute lecturer, 2016
- Albert Einstein Festival lecturer, Harvard, 2007-2009, 2014
- Taught cryogenics classes to K-5 students at Einstein’s Workshop, 2013-2014
- Research Science Institute Mentor, 2005, 2010, 2011  
(Mentored three high school students through 6-week summer research projects.)
- 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” ([http://www.learner.org/courses/physics/unit/unit\\_vid.html?unit=6](http://www.learner.org/courses/physics/unit/unit_vid.html?unit=6))

## PERSONAL

- 3 children, born in 2006, 2009, 2012
- Competitive long distance runner, highlights include:
  - 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, qualified for US National Team)
  - 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, [#11 all-time US women](#))
  - USA Track & Field [Athlete of the Week](#), Sept 23, 2016
  - Lumberjack 100 Miler, April 2017, 1<sup>st</sup> place *overall* (male & female)
  - World Championship 24-Hour Run, **Team USA Gold Medal**, Belfast, 2017