

Katherine Aidala

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Research Interests I pursue scanning probe microscope applications to nanoscale science and engineering.
Current projects include

- Using scanning probe microscopy to investigate the transport properties of monolayers and thin films of organic semiconductors (in collaboration with Ken Carter, UMass, Amherst).
- Investigating the evolution of magnetic states in ferromagnetic nanostructures with magnetic force microscopy (in collaboration with Mark Tuominen, UMass Amherst)
- Imaging and measuring properties such as elasticity and adhesion of predatory bacteria (in collaboration with Megan Nunez, MHC, Megan Ferguson, SUNY New Paltz, and Eileen Spain, Occidental)
- Imaging defect dynamics in diblock copolymers at elevated temperatures (in collaboration with Ward Lopes, MHC)

Education **Harvard University** *Cambridge, MA*
Ph.D. in Applied Physics, September 2006
Masters in Applied Physics, March 2005
Specializing in condensed matter physics and nano-scale science and engineering
Advisor: Robert M. Westervelt
Dissertation: Imaging Magnetic Focusing in a Two-Dimensional Electron Gas

Yale University *New Haven, CT*
B.S. in Applied Physics and Psychology (double major), 2001
Advisor: Robert Schoelkopf (physics)

Professional Societies American Physical Society
American Association of Physics Teachers
Sigma Xi
Materials Research Society

Teaching
Experience

Physics 216 Electromagnetism and Circuits

Mount Holyoke College, 2006f, 2007s, 2008s

Second semester of the introductory sequence to physics, with calculus.

Physics 308 Analog Electronics

Mount Holyoke College, 2007f

Physics 211/Gender Studies 243 Women and Gender in Science

Mount Holyoke College, 2008s

Seeks to answer, “Why are women under-represented in science?” by exploring relevant literature taken mostly from social science articles and reviews.

Publications

C. Volle, M. Ferguson, K. Aidala, E. Spain, M. Nunez. “Quantitative Changes in the Elasticity and Adhesive Properties of *E. coli* ZK1056 Prey Cells during Predation by *Bdellovibrio bacteriovorus* 109J.” *Langmuir*, in press.

K.E. Aidala, R.E. Parrott, T. Kramer, E.J. Heller, R.M. Westervelt, M.P. Hanson, A.C. Gossard. “Imaging Coherent Magnetic Focusing.” *Nature Physics*, **3**, 464 (2007).

P.Fallahi, K.E. Aidala, R.M. Westervelt, M. Hanson, A.C. Gossard. “Imaging a Few-Electron Quantum Dot in a Magnetic Field.” Submitted, *Applied Physics Letters*.

K.E. Aidala, R.E. Parrott, E.J. Heller, R.M. Westervelt. “Imaging Electrons in a Magnetic Field.” *Physica E*, **34**, 409 (2006).

E.J. Heller, K.E. Aidala, B.J. LeRoy, A.C. Bleszynski, A. Kalben, R.M. Westervelt, K.D. Maranowski, and A.C. Gossard. “Thermal averages in a quantum point contact with a single coherent wave packet.” *Nano Letters*, **5**(7), 1285 (2005).

B.J. LeRoy, A.C. Bleszynski, K.E. Aidala, R.M. Westervelt, A. Kalben, E.J. Heller, S.E.J. Shaw, K.D. Maranowski, A.C. Gossard. “Imaging Electron Interferometer”, *Physical Review Letters*, **94**, 126801 (2005).

A. Bleszynski, K. Aidala, B. LeRoy, R. Westervelt, E. Heller, K. Maranowski, A. Gossard. “Imaging Electron Interferometer.” *Physics of Semiconductors: 27th International Conference on the Physics of Semiconductors*, July 2004, AIP Conference Proceedings **772**, 1461 (2005).

R.M. Westervelt, M.A. Topinka, B.J. LeRoy, A.C. Bleszynski, K. Aidala, S.E.J. Shaw, E.J. Heller, K.D. Maranowski, A.C. Gossard. “Imaging electron waves.” *Physica E*, **24**, 63 (2004).

T.R. Stevenson, F.A. Pellerano, C.M. Stahle, K. Aidala, R.J. Schoelkopf. “Multiplexing of radio-frequency single electron transistors.” *Applied Physics Letters*, **80**(16), 3012 (2002).

T.R. Stevenson, F.A. Pellerano, C.M. Stahle, K. Aidala, R.J. Schoelkopf. “Wavelength division multiplexing scheme for radio-frequency single electron transistors.” *AIP Conference Proceedings*, **605**(1), 289 (2002).

“Scanning Probe Microscopy: From living cells to quantum electrons.” Physics Colloquium, Wake Forest University, Winston-Salem, NC (2007). *invited*

“Imaging Electron Motion in a Two-Dimensional Electron Gas with Scanning Probe Microscopy.” Physics seminar, Amherst College, Amherst, MA (2007). *invited*

“Imaging electrons in a two-dimensional electron gas in a magnetic field.” Frontiers of Nanoscale Science and Technology, Tokyo, Japan (2007) *invited*

“Imaging magnetic focusing in a two-dimensional electron gas.” International Conference on the Properties of Semiconductors, Vienna, Austria (2006).

“Imaging electron waves in a magnetic field.” International Conference on Nanoscience and Technology, Basel, Switzerland. (2006).

“Imaging electron focusing.” American Physical Society March Meeting, Baltimore, MD (2006), *invited*

“The scanning probe microscope in nanoscience.” Physics seminar, Mount Holyoke College, South Hadley, MA (2006).

“Imaging electron flow and interference in a two-dimensional electron gas.” Physics seminar, Boston University, Boston, MA (2005).

“Imaging electron motion with scanning probe microscopy.” Applied physics seminar, BBN Technologies, Cambridge, MA (2005).

“Imaging cyclotron orbits in a two-dimensional electron gas.” 16th International Conference on Electronic Properties of Two-Dimensional Systems, Albuquerque, NM (2005).

“Scanned Gate Microscopy.” With B. Lee. UC Santa Barbara, group meeting of collaborators (2004).

“V-shaped Imaging Interferometer.” American Physical Society March Meeting, Montreal, Canada (2004).

“Imaging Electron Flow in a Two-Dimensional Electron Gas.” With A. Bleszynski. UC Santa Barbara, Applied Physics Colloquium (2003).

“Imaging Electron Interferometer.” American Physical Society March Meeting, Austin, TX (2003).