

MICHAEL C. MCALPINE
DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING
PRINCETON UNIVERSITY
D414 ENGINEERING QUAD • OLDEN ST • PRINCETON, NJ 08544
MCM@PRINCETON.EDU • WWW.PRINCETON.EDU/~MCM
PHONE: (609) 258-8613 • FAX: (609) 258-1918

ACADEMIC TRAINING

California Institute of Technology <i>Pasadena, CA</i>	Postgraduate	2006-2008
Harvard University <i>Cambridge, MA</i>	Ph.D. in Chemistry	June 2006
■ GPA 3.93/4.0, received M.A. in June 2002		
Brown University <i>Providence, RI</i>	B.S. in Chemistry	May 2000
■ GPA 4.0/4.0, graduated Magna Cum Laude, Sigma Xi, Phi Beta Kappa		

PROFESSIONAL EXPERIENCE

Princeton University	Assistant Professor of Mechanical and Aerospace Engineering. Associated with: Princeton Institute for the Science and Technology of Materials (PRISM); Department of Chemistry	2008- <i>Present</i>
California Institute of Technology <i>Professor James R. Heath</i>	Post-Doctoral Researcher; Nanoscience & technology	2006-2008
Harvard University <i>Professor Charles M. Lieber</i>	Graduate Researcher; Nanoscience & technology	2000-2006
Brown University <i>Professor Sergiu M. Gorun</i>	Undergraduate Researcher; Inorganic Chemistry	1999-2000
University of Pennsylvania <i>Professor Andrew M. Rappe</i>	Undergraduate Researcher; Theoretical Chemistry	1998

TEACHING EXPERIENCE

Princeton University	Instructor, MSE 302 – Laboratory Techniques in Materials Science	2008- <i>Present</i>
Harvard University	Teaching Fellow, Inorganic Chemistry	2001
Harvard University	Teaching Fellow, Quantum Chemistry	2000
Brown University	Teaching Assistant, Introductory Chemistry	1999

SYNERGISTIC ACTIVITIES

MRS Spring Meeting	Symposium Co-Organizer	2010
Princeton Summer Undergraduate Research Experience (PSURE)	Undergraduate Research Advisor	2009
NSF-REU Program	Undergraduate Research Advisor	2009
NSF Panel (CMMI) – NanoManufacturing	Review Panelist	2009
Princeton 6th Annual Science and Engineering Expo	Outreach Participant	2009
Grover Middle School, Princeton Junction, NJ	Outreach Participant	2009
Princeton University, Department of Chemistry	Junior Paper Undergraduate Advisor	2008-Present
Princeton University, Dept. of Mechanical Engineering	Seminar Committee	2008-Present
Innovations Academy Charter School	Honorary Teacher	2008-Present
California Institute of Technology	Minority Undergraduate Research Fellow (MURF) Co-Mentor	2007
American Chemical Society	Member	2005-2006
Materials Research Society	Member	2003-Present
Brown University	Volunteer Teacher, ESL (via Howard Swearer Center)	1997-1998

PEER-REVIEWED PUBLICATIONS

- D. Wang, B. A. Sheriff, M. C. McAlpine, J. R. Heath. “Development of ultra-high density silicon nanowire arrays for electronics applications.” *Nano Research* **1**, 9-21 (2008).
- M. C. McAlpine, H. D. Agnew, R. D. Rohde, M. Blanco, H. Ahmad, A. D. Stuparu, W. A. Goddard III, J. R. Heath. “Peptide-nanowire hybrid materials for selective sensing of small molecules.” *Journal of the American Chemical Society* **130**, 9583-9589 (2008).
- Y. Dong, G. Yu, M. C. McAlpine, W. Lu, C. M. Lieber. “Si/a-Si core/shell nanowires as nonvolatile crossbar switches.” *Nano Letters* **8**, 386-391 (2008).
- M. C. McAlpine, H. Ahmad, D. Wang, J. R. Heath. “Highly ordered nanowire arrays on plastic substrates for ultrasensitive flexible chemical sensors.” *Nature Materials* **6**, 379-384 (2007).
- M. C. McAlpine, R. S. Friedman, C. M. Lieber. “High-performance nanowire electronics and photonics on glass and plastic substrates.” *Proceedings of the IEEE* **93**, 1357-1363 (2005).

- R. S. Friedman, M. C. McAlpine, D. S. Ricketts, D. Ham, C. M. Lieber. “Fully integrated high frequency nanowire ring oscillators.” *Nature* **434**, 1085 (2005).
- S. Jin, D. Whang, M. C. McAlpine, R. S. Friedman, Y. Wu, C. M. Lieber. “Scalable interconnection and integration of nanowire devices without registration.” *Nano Letters* **4**, 915-919 (2004).
- M. C. McAlpine, R. S. Friedman, S. Jin, K.-h. Lin, W. U. Wang, C. M. Lieber. “High-performance nanowire electronics and photonics on glass and plastic substrates.” *Nano Letters* **3**, 1531-1535 (2003).
- M. C. McAlpine, R. S. Friedman, C. M. Lieber. “Nanoimprint lithography for hybrid plastic electronics.” *Nano Letters* **3**, 443-445 (2003).

BOOK CHAPTERS

- M. Blanco, M. C. McAlpine, J. R. Heath. “First Principles Molecular Modeling of Sensing Material Selection for Hybrid Biomimetic Nano-Sensors,” in *Computational Methods for Sensor Material Selection*. Eds: M. A. Ryan, A. V. Shevade, C. J. Taylor, M. L. Homer, M. Blanco. (Springer Verlag, New York, 2009).

PATENTS

- J. R. Heath, M. C. McAlpine. Nanowire-based “electronic nose” on various substrates. U.S. Patent Pending CIT-4825-P
- C. M. Lieber, Y. Dong, W. Lu, G. Yu, M. C. McAlpine, Nanoscale wire-based memory devices. U.S. Patent Pending 61/011,919
- C. M. Lieber, D. Whang, S. Jin, Y. Wu, M. C. McAlpine, R. S. Friedman. Nanoscale arrays, robust nanostructures, and related devices. U.S. Patent Pending 10/995,075

AWARDS

- American Asthma Foundation (AAF, formerly SPAR) Early Excellence Award, 2009
- Air Force (AFOSR) Young Investigator, 2008
- Intelligence Community (IC) Young Investigator, 2008
- Outstanding Speaker Award from the IEEE Engineering in Medicine and Biology, 2008
- Intelligence Community (IC) Postdoctoral Research Fellow, 2006-2008
- National Science Foundation (NSF) Graduate Research Fellowship, 2000-2003
- Leallyn B. Clapp Prize for best senior thesis in Chemistry, 2000
- Outstanding Chemistry Student Award awarded by the Rhode Island Section of the American Chemical Society, 2000
- Junior Prize in Chemistry awarded to one Junior Chemistry concentrator, 1999
- E. Ward Plummer Award for outstanding student paper in the NSF-REU program, 1998

INVITED PRESENTATIONS

- “Nanotechnology Enabled Flexible Sensors for Medical Diagnostics,” 4th Global Plastic Electronics Conference & Showcase, Fall 2008.
- “Application of Semiconductors and Nanowires on Plastic Substrates for Medical Devices and Biosensors,” IEEE EMBS Buenaventura Chapter, Summer 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” Intelligence Community (IC) Postdoctoral Research Fellowship Colloquium, Spring 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” JASON Meeting, Spring 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” The University of Texas at Austin, 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” The University of Washington, 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” The University of Texas at Dallas, 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” Hughes Research Laboratories, 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” Princeton University, 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” The University of Minnesota, Twin Cities, 2008.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” Massachusetts Institute of Technology, 2007.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” Georgia Institute of Technology, 2007.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” University of Southern California, 2007.
- “Integrated Nanowire Electronics and Sensors on Flexible Plastic Substrates,” DuPont Central Research and Development, 2007.
- “Investment Opportunities in Nanobio Applications: Beyond Imaging & Drug Delivery,” SoCalBio Investor Conference, Spring 2007.
- “Discriminating Chemical Sensors of Nanowire Arrays on Flexible Plastic Substrates,” Intelligence Community (IC) Postdoctoral Research Fellowship Colloquium, Spring 2007.

CONTRIBUTED PRESENTATIONS

- “Peptide-Nanowire Hybrid Materials for Selective Sensing of Small Molecules,” MRS Conference, Spring 2009.
- “Peptide-Nanowire Hybrid Materials for Selective Sensing of Small Molecules,” MRS Conference, Fall 2008.
- “Perfectly Aligned Nanowires on Plastic Substrates for Ultra-Sensitive Flexible Sensors,” MRS Conference, Spring 2007.

- “Fully Integrated High Frequency Nanowire Ring Oscillators,” ACS Conference, Spring 2005.
- “High-Performance Nanowire Electronics and Photonics and Nanoscale Patterning on Flexible Plastic Substrates,” IEEE NDSI Conference, Spring 2004. (*poster*)
- “Nanoimprint Lithography and Nanowire Electronics on Flexible Plastic Substrates,” MRS Conference, Spring 2003.
- “Nanoimprint Lithography and Nanowire Electronics on Flexible Plastic Substrates,” NNT Conference, Fall 2002. (*poster*)

REVIEWER SERVICE

Reviewed articles and proposals for the following journals and agencies: National Science Foundation, Journal of the American Chemical Society, Nano Letters (Designated Top 20 Reviewer 2005-2006), Materials Research Society Bulletin, Angewandte Chemie International Edition, Applied Physics Letters, Materials Research Society Symposium Proceedings, Materials Science and Engineering B, Nature Materials, Nature

PRESS REPORTS

Research highlights featured in: Nature Chemistry, Nature Nanotechnology, Science Magazine (“Inorganic Electronics Begin to Flex Their Muscle.” *Science* **312**, 1593 [2006]), Thomas Reuters’ ScienceWatch, Analytical Chemistry, EE Times, ACS press releases, Photonics Spectra magazine, Phys.org, Slashdot.org, Nanowerk, SoCalBio Synergies, Nanotechweb.org, Technology Research News, Materials Today, Harvard Crimson