

Erik C. Garnett

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EDUCATION

Stanford University	Postdoctoral Fellow, Sept. 2009-July '12
University of California, Berkeley	Ph.D. in Chemistry, May 2009
University of Illinois, Urbana-Champaign	B.S. in Chemistry, May 2004

RESEARCH EXPERIENCE

Group Leader, FOM-AMOLF Institute, Amsterdam

- Launched new research direction for AMOLF in solar energy conversion – first of 3 new faculty

Dr. Mark Brongersma, Dr. Mike McGehee, Dr. Yi Cui groups – Postdoctoral Fellowship

- Nanostructured inorganic, organic and hybrid tandem photovoltaics with photonic enhancement
- Plasmonics for self-limited nanowelding and light trapping

Dr. Peidong Yang group, University of California, Berkeley, CA

- Silicon nanowire synthesis, doping, and structural characterization
- Nanowire transistor, solar cell and capacitor device fabrication and testing

Dr. David Ginley group, National Renewable Energy Lab, Golden, CO

- Combinatorial corrosion cell (Summer 2003); Ink-jet printed PEDOT/PSS films (Summer 2004)

Dr. Andrzej Wieckowski group, University of Illinois, Urbana-Champaign

- Analyzed Pt/Ru and Pt/Pd nanoparticle fuel cell catalyst activity via electrochemical techniques
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PUBLICATIONS

“Passivation coating on electrospun copper nanofibers for stable transparent electrodes” Po-Chun Hsu, Hui Wu, Tom J Carney, Matt T McDowell, Y Yang, **Erik C Garnett**, M Li, Liangbing Hu, Yi Cui, **ACS Nano**, **6**, 5150-5156 (2012).

“Hybrid Si Nanocone-Polymer Solar Cells” Sangmoo Jeong, **Erik C. Garnett**, Shuang Wang, Zongfu Yu, Shanhui Fan, Mark L. Brongersma, Michael D. McGehee, Yi Cui, **Nano Letters**, **12**, 2971-2976 (2012)

“Self-limited plasmonic welding of silver nanowire junctions” **Erik C. Garnett**, Wenshan Cai, Judy J. Cha, Fakhruddin Mahmood, Stephen T. Connor, M. Greyson Cristoforo, Yi Cui, Michael D. McGehee and Mark L. Brongersma, **Nature Materials**, **11**, 241-249 (2012).

“Absorption of Light in a Single-nanowire Silicon Solar Cell Decorated with an Octahedral Silver Nanocrystal” Sarah Brittman, Hanwei Gao, **Erik C. Garnett** and Peidong Yang, **Nano Letters**, **11**, 5189-5195 (2011).

“Nanowire Solar Cells” (Invited Review) **Erik C. Garnett**, Mark L. Brongersma, Yi Cui and Michael D. McGehee, **Annual Review of Materials Research**, **41**, 269-295 (2011).

“Silicon nanowire hybrid photovoltaics” **Erik C. Garnett**, Craig Peters, Mark Brongersma, Yi Cui, Mike McGehee, ***Proceedings of the 2010 35th IEEE Photovoltaic Specialists Conference***, 00934, June 20-25, 2010.

“Fast and Scalable Printing of Large Area Monolayer Nanoparticles for Nanotexturing Applications” Sangmoo Jeong, Liangbing Hu, Hye-Ryoung Lee, **Erik Garnett**, Jang-Wook Choi and Yi Cui. ***Nano Letters***, **10**, 2989-2994 (2010).

“Light Trapping in Silicon Nanowire Solar Cells” **Erik Garnett** and Peidong Yang. ***Nano Letters***, **10**, 1082-1087 (2010).

“Oligo- and Polythiophene/ZnO Hybrid Nanowire Solar Cells” Alejandro L. Briseno, Thomas W. Holcomb, Akram I. Boukai, **Erik C. Garnett**, Steve W. Shelton, Jean J.M. Frechet, and Peidong Yang. ***Nano Letters***, **10**, 334-340 (2010).

“Dopant profiling and surface analysis of silicon nanowires using capacitance-voltage measurements” **Erik C. Garnett**, Yu-Chih Tseng, Devesh Khanal, Junqiao Wu, Jeffrey Bokor and Peidong Yang. ***Nature Nanotechnology***, **4**, 311-314 (2009).

“Silicon Nanowire Radial p-n Junction Solar Cells” **Erik C. Garnett** and Peidong Yang. ***J. Am. Chem. Soc.*** **130**, 9224-9225 (2008).

“Enhanced thermoelectric performance of rough silicon nanowires” Allon I. Hochbaum, Renkun Chen, Raul Diaz Delgado, Wenjie Liang, **Erik C. Garnett**, Mark Najarian, Arun Majumdar and Peidong Yang. ***Nature*** **451**, 163-167 (2008).

“Growth and Electrical Characteristics of Platinum-Nanoparticle-Catalyzed Silicon Nanowires” **Erik Garnett**, Wenjie Liang, and Peidong Yang. ***Advanced Materials*** **19**, 2946-2950 (2007).

“Effects of Nafion as a binding agent for unsupported nanoparticle catalysts” M.S. McGovern, **E.C. Garnett**, C. Rice, R.I. Masel, A. Wieckowski. ***Journal of Power Sources***, **115**, 35-39 (2003).

INVITED TALKS

- “Nanoscale Solar Cells: The Garnett Group’s Research at AMOLF” FOM Institute AMOLF, Amsterdam, The Netherlands, September 10, 2012
- “Advanced Nanostructures for Energy, Photonics and Electronics” Cleantech 2012, Santa Clara Convention Center, CA, June 21, 2012
- “Advanced Nanostructures for Energy, Photonics and Electronics” Columbia University, Department of Chemistry, February 10, 2012
- “Advanced Nanostructures for Energy, Photonics and Electronics” University of Texas, Department of Chemical Engineering, February 1, 2012
- “Advanced Nanostructures for Energy, Photonics and Electronics” MIT, Department of Chemistry, January 12, 2012
- “Advanced Nanostructures for Energy, Photonics and Electronics” Boston College, Department of Chemistry, December 1, 2011
- “Plasmonics and Nanophotonics for Next Generation Photovoltaics” *Next Generation Photovoltaics – from ideas to applications* Conference, Erlangen, Germany, December 10-12, 2011
- “Contact Effects in Organic Photovoltaics” *Global Climate & Energy Project Annual Review*, Stanford University, October 4-5, 2011
- “Advanced Nanostructured Solar Cells” FOM Institute AMOLF, Amsterdam, The Netherlands, September 29, 2011

- “Advanced Nanostructured Solar Cells” University of Washington, Department of Electrical Engineering, April 21, 2011
- “SPIE Advanced Lithography Panel on Nanotechnology and Energy”, February 28, 2011, San Jose, CA
- “Advanced Nanostructured Solar Cells” Columbia University, Department of Mechanical Engineering, February 17, 2011
- “Advanced Nanostructured Solar Cells” Harvard University, Department of Chemistry, January 28, 2011
- “Advanced Nanostructured Solar Cells” University of Minnesota, Department of Chemical Engineering and Materials Science, January 18, 2011
- “Advanced Nanostructured Solar Cells” *Printed Electronics USA* and *Photovoltaics USA* Conference, Santa Clara, CA, December 1-2, 2010
- “Solar Cell Tutorial” *Printed Electronics USA* and *Photovoltaics USA* Conference, Santa Clara, CA, December 1-2, 2010
- “Advanced Nanostructured Solar Cells” *University of Massachusetts, Amherst*, IGERT Nanotechnology Seminar Series, October 21, 2010
- “Low-Cost Tandem Solar Cells” *Applied Materials* Advanced Research Projects Group, Santa Clara, CA, August 3, 2010
- “Improved Light Trapping in Silicon Nanowire Photovoltaics” *American Chemical Society* Meeting, San Francisco, CA, March 25, 2010
- “Silicon Nanowire Photovoltaics: the search for a new optical limit” *Materials Research Society* Meeting, Boston, MA, November, 30, 2009 (in place of Prof. Peidong Yang)

AWARDS

- Global Climate & Energy Project Distinguished Student Lecturer Award (2011)
- Materials Research Society Graduate Student Award Gold Medalist (Spring 2009)
- Computational Nanoscience Innovation, 1st Place, \$5,000 – Bears Breaking Boundaries Contest, http://contest.berkeley.edu/main_pages/7 (2008)
- Barry M. Goldwater Scholarship - \$7,500 for academic excellence and future promise (2003)

EDUCATIONAL OUTREACH/VOLUNTEER WORK

- Manuscript Reviewer: *Nano Letters*; *ACS Nano*; *Journal of the American Chemical Society*; *Energy & Environmental Science*; *ACS Applied Materials & Interfaces*, *IEEE Transactions on Electron Devices*, *Journal of Photonics for Energy*, 2008-present
- Research Proposal Reviewer, California Energy Commission, 2010-2011
- Research mentor, Center for Advanced Molecular Photovoltaics (CAMP)/King Abdullah University of Science and Technology (KAUST) summer internship program, Stanford University, Summer 2010
- “Nano-Raspberry Solar Cells” activity developer/presenter, Community in the Classroom (CIC), May 30, 2008 and May 28, 2009 – led 200 8th grade students in making solar cells from Raspberry juice and TiO₂ nanoparticles with each student succeeding to make a working device
- “Electricity and Food” activity developer/presenter, Community in the Classroom (CIC), various elementary school classes in Berkeley and Oakland, CA, 2006-2009
- “Blackberry Solar Cells” activity leader, Exploration in Nanoscience and Technology, Johns Hopkins Center for Talented Students in conjunction with Center of Integrated Nanomechanical Systems (COINS), Berkeley, CA, October 27, 2007
- “Nanoscience and Energy” presenter/advisor, COINS summer workshop, Berkeley, CA, Summer 2007

- “Introduction to nanowire electronics” workshop, Nanoscience summer camp, Lawrence Hall of Science, Berkeley, CA, August 2007
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TEACHING EXPERIENCE

- Nanoscience and Nanotechnology (graduate course, 1 lecture), Stanford (Spring 2011)
 - Solar Cells (graduate course, 2 lectures), Stanford (Fall 2009, 2010)
 - Analytical Chemistry (senior course, led lab and discussion sections), Berkeley (Spring 2007)
 - Solid State Chemistry (graduate course, developed and graded homework and exams), Berkeley (Spring 2006)
 - Introduction to Chemistry (freshman course for engineers, led lab and discussion sections), Berkeley (Fall 2004)
 - Introduction to Chemistry II (freshman course for chemistry majors, led discussion section), Illinois (Spring 2004)
 - Introduction to Chemistry I (freshman course for chemistry majors, led discussion section), Illinois (Fall 2003)
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REFERENCES

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