CURRICULUM VITAE

Richard D. Robinson

Department of Materials Science and Engineering; Cornell University
214 Bard Hall; Ithaca, NY 14853; 607-255-7750
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Education and Research Experience

Cornell University, *Assistant Professor*, Department of Materials Science and Engineering, Ithaca, NY (7/2008 – present)

Lawrence Berkeley National Laboratories/University of California, Berkeley, *Lawrence Chemist Postdoctoral Fellow*, Chemistry/Materials Science, Berkeley, CA (2004 – 2008), Advisor: Professor A. Paul Alivisatos

Columbia University, *Doctor of Philosophy*, Department of Applied Physics, New York, New York, (10/2004), Advisor: Professor I. Herman
Dissertation: "Phase Transitions and Finite-Size Effects in Oxide Nanoparticles, as Studied through Raman Scattering"

Bell Laboratories, *Research Assistant* - Physical Research Laboratory, Murray Hill, NJ, Research advisors: Professor Aron Pinczuk and Dr. Loren Pfeiffer (6/99 – 9/99)

Tufts University, *Medford, Massachusetts*
Masters of Science in Mechanical Engineering
Bachelor of Science in Mechanical Engineering, Magna Cum Laude
Advisor: Professor Ioannis Miaoulis

Honors and Awards

"Emerging Investigator" selection: named by the *Journal of Materials Chemistry A* Editorial and International Editorial Advisory Boards of as one of the 36 emerging top scientists at the early stages of their careers in Materials Chemistry, March, 2014

3M Non-tenured Faculty Award, 2012, 2013, 2014

National Science Foundation (NSF) Faculty Early CAREER award, DMR-CMP, 2012

R&D 100 Award (Nanocrystal Solar Cells) 2009

NIST/NRC Post-doctoral Research Associateship Program (declined) 2008

Ford Foundation Post-doctoral Fellowship (declined) 2008

Award for Excellence in Technology Transfer (Lawrence Berkeley National Laboratory) 2007

Lawrence Chemist Postdoctoral Fellow (Lawrence Berkeley National Laboratory) 2004-2008

Ford Foundation Pre-doctoral Fellowship, 2000–2003

NDSEG Pre-doctoral Fellowship Honorable Mention, 1999

Irene Diamond Pre-doctoral Fellowship, 1998

Tau Beta Pi Engineering Honor Society

Tufts University Mechanical Engineering Department Award for Outstanding Graduate Research, 1993

National Society of Black Engineers, "Who's Who" graduate student, Region One, 1991

National Science Foundation Creativity Award, 1990–1993

Alex Elias Memorial Prize Scholarship, Tufts University, 1990

Publications

(43 total peer reviewed publications)
underlined: Robinson group Cornell Ph.D. student, M.S. student, or postdoc
italics: Robinson group Cornell undergraduate student
"*": equal contribution

Submitted

2) S.D. Perera, H. Zhang, and **R.D. Robinson**, "Nanocluster Seed-mediated Synthesis of $CuInS_2$ Quantum Dots, Nanodisks, Nanorods, and Doped Zn-Ga-$CuInS_2$ Quantum Dots," submitted to *Journal of Materials Chemistry A* (August 2014).

1) M. Fayette, A. Nelson, and **R.D. Robinson**, "Electrophoretic Deposition Improves Catalytic Performance of Co_3O_4 Nanoparticles for Oxygen Reduction/Oxygen Evolution Reactions," submitted to *Journal of Materials Chemistry A* (August 2014).

Peer-Reviewed

Cornell Independent Career (20 with R.D. Robinson as corresponding author)

21) D.-H. Ha, *A.H. Caldwell*, M.J. Ward, S. Honrao, K. Mathew, R. Hovden, M.K.A. Koker, D.A. Muller, R.G. Hennig, and **R.D. Robinson**, "Solid-Solid Phase Transformations Induced through Cation Exchange and Strain, in 2D Heterostructured Copper Sulfide Nanocrystals," accepted *Nano Letters* (2014). *http://dx.doi.org/10.1021/nl5035607*

20) O.O. Otelaja, D.-H. Ha, *T. Ly*, H. Zhang, and **R.D. Robinson**, "Highly Conductive $Cu_{2-x}S$ Nanoparticle Films through Room Temperature Processing, and an Order of Magnitude Enhancement of Conductivity via Electrophoretic Deposition," *accepted ACS Applied Materials and Interfaces* (2014). *http://dx.doi.org/10.1021/am504785f*

19) *A.H. Caldwell*, D.-H. Ha, X. Ding, and **R.D. Robinson**, "Analytical Modeling of Localized Surface Plasmon Resonance in Heterostructure Copper Sulfide Nanocrystals," *accepted Journal of Chemical Physics* (2014). *http://dx.doi.org/10.1063/1.4897635*

18) M. Aksit, *S.K. Kolli*, *I.M. Slauch*, **R.D. Robinson**, "Misfit Layered $Ca_3Co_4O_9$ as a High Figure of Merit p-type Transparent Conducting Oxide Film through Solution Processing," *Applied Physics Letters* **104**, 161901-161905 (2014). *http://dx.doi.org/10.1063/1.4871506*

17) C.R. Ocier, K. Whitham, T. Hanrath, and **R.D. Robinson**, "Chalcogenidometallate Clusters as Surface Ligands for PbSe Nanocrystal Field-Effect Transistors," *Journal of Physical Chemistry C* **118**, 3377-3385 (2014). *http://pubs.acs.org/doi/abs/10.1021/jp406369a*

16) J.B. Hertzberg*, M. Aksit*, O.O. Otelaja*, D.A. Stewart, and **R.D. Robinson**, "Direct Measurements of Surface Scattering in Si Nanosheets using a Microscale Phonon Spectrometer: Implications for Casimir-Limit Predicted by Ziman Theory," *Nano Letters* **14**, 403-415 (2014). *http://dx.doi.org/10.1021/nl402701a*
   - Featured in *Physics Today,* print magazine edition, Feb. 2014 issue *http://scitation.aip.org/content/aip/magazine/physicstoday/article/67/2/10.1063/PT.3.2262*
   - Featured in *Physics Today Online:* *http://scitation.aip.org/content/aip/magazine/physicstoday/news/10.1063/PT.5.7037*

- Cornell *Chronicle* article: http://www.news.cornell.edu/stories/2014/02/tiny-tool-measures-heat-nanoscale

15) M. Fayette and **R.D. Robinson**, "Chemical Transformations of Nanomaterials for Energy Applications," *J. Mater. Chem. A* **2**, 5965-5978 (2014). http://pubs.rsc.org/en/content/articlelanding/2013/ta/c3ta13982d
   - *Emerging Investigators themed issue: R. Robinson selected by the Editorial and International Editorial Advisory Boards of Journal of Materials Chemistry A as one of the 36 emerging top scientists at the early stages of their careers in Materials Chemistry*

14) M. Aksit, B. Hoselton, *H.J. Kim*, D.-H. Ha, and **R.D. Robinson**, "Synthesis and Properties of Electrically Conductive, Ductile, Extremely Long (~50 μm) Nanosheets of $K_xCoO_2 \cdot yH_2O$," *ACS Applied Materials and Interfaces* **5**, 8998-9007 (2013). http://dx.doi.org/10.1021/am402064g

13) H. Zhang, L.V. Solomon, D.-H. Ha, S. Honrao, R.G. Hennig, and **R.D. Robinson**, "$(NH_4)_2S$, A Highly Reactive Molecular Precursor for Low Temperature Anion Exchange Reactions in Nanoparticles," *Dalton Transactions* **42**, 12596-12599 (2013). http://pubs.rsc.org/en/content/articlelanding/2013/dt/c3dt50803j

12) *L.M. Mo*reau*, D.-H. Ha*, H. Zhang, R. Hovden, D. Muller, and **R.D. Robinson**, "Defining Crystalline/Amorphous Phases of Nanoparticles through X-ray Absorption Spectroscopy and X-ray Diffraction: The Case of Nickel Phosphide," *Chemistry of Materials* **25**, 2394-2403 (2013). http://dx.doi.org/10.1021/cm303490y

11) D.-H. Ha, *L.M. Moreau*, S. Honrao, R.G. Hennig, and **R.D. Robinson**, "The Oxidation of Cobalt Nanoparticles into Kirkendall-Hollowed CoO and Co_3O_4: the Diffusion Mechanisms and Atomic Structural Transformations," *Journal of Physical Chemistry C* **117**, 14303-14312 (2013). http://dx.doi.org/10.1021/jp402939e
   - Cover article http://pubs.acs.org/action/showLargeCover?jcode=jpccck&vol=117&issue=27
   - Invited by editor for cover article based on strength of reviews
   - Featured CHESS news item http://news.chess.cornell.edu/articles/2013/Robinson12122013.html

10) S.Z. Butler, S.M. Hollen, L. Cao, Y. Cui, J.A. Gupta, H.R. Gutierrez, T.F. Heinz, S.S. Hong, J. Huang, A.F. Ismach, E. Johnston-Halperin, M. Kuno, V.V. Plashnitsa, **R.D. Robinson**, R.S. Ruoff, S. Salahuddin, J. Shan, L. Shi, M.G. Spencer, M. Terrones, W. Windl, and J.E. Goldberger, "Progress, Challenges, and Opportunities in Two-Dimensional Materials Beyond Graphene," *ACS Nano* **7**, 2898-2926 (2013). http://dx.doi.org/10.1021/nn400280c

9) O.O. Otelaja, J.B. Hertzberg, M. Aksit, and **R.D. Robinson**, "Design and Operation of a Microfabricated Phonon Spectrometer Utilizing Superconducting Tunnel Junctions as Phonon Transducers," *New Journal of Physics* **15**, 43018-43046 (2013). http://iopscience.iop.org/1367-2630/15/4/043018/
   Arxiv version
   - Selected by the editors of *New Journal of Physics* as one of the top five leading-edge articles in Nanophysics for inclusion in the exclusive 'Highlights of 2013' collection. http://iopscience.iop.org/1367-2630/page/highlights-of-2013 May 9, 2014
   - Selected by Editor for inclusion in *IOPselect* (criteria: Substantial advances or significant breakthroughs, A high degree of novelty, and/or Significant impact on future research) http://Select.iop.org., June 11, 2013
   - Best poster award, Cornell NanoScale Science & Technology Facility (CNF) annual conference (35th anniversary), July 19, 2012

8) H. Zhang, B.-R. Hyun, F.W. Wise, **R.D. Robinson**, "A Generic Method for Rational Scalable Synthesis of Monodisperse Metal Sulfide Nanocrystals," *Nano Letters* **12**, 5856-5860 (2012). http://pubs.acs.org/doi/abs/10.1021/nl303207s

7) D.H. Ha, M.A. Islam, and **R.D. Robinson**, "Binder-free and Carbon-free Nanoparticle Batteries: A Method for Nanoparticle Electrodes without Polymeric Binders or Carbon Black," *Nano Letters* **12**, 5122-5130 (2012). http://dx.doi.org/10.1021/nl3019559
   - Best poster award, CCMR Industrial Partnerships 2013 Symposium, "Co_3O_4 Nanoparticle Assemblies for Binder-Free and Carbon-Free Nanoparticle Batteries," D.-H. Ha, M. Islam, and **R.D. Robinson**, June 4, 2013

6) *L.M. Moreau**, D.-H. Ha*, C.R. Bealing, H. Zhang, R.G. Hennig, and **R.D. Robinson**, "Unintended Phosphorus Doping of Nickel Nanoparticles during Synthesis with TOP: A Discovery through Structural Analysis," *Nano Letters* **12**, 4530-4539 (2012). *http://dx.doi.org/10.1021/nl301642g*
   - Featured on the NSF Science, Engineering, & Education Innovation (SEE Innovation) website, www.research.gov/seeinnovation. Publicly accessible website offers snapshot highlights about research and education projects in all NSF-funded research areas.

5) M. Aksit, D.P. Toledo, and **R.D. Robinson**, "Scalable Nanomanufacturing of Millimetre-Length 2D Na_xCoO_2 Nanosheets," *Journal of Materials Chemistry* **22**, 5936-5944 (2012).
   - Cover article http://pubs.rsc.org/en/content/articlepdf/2012/jm/c2jm15550h
   - Invited by editor for cover article based on strength of reviews
   - DOE EFRC science highlight (January 2012) http://science.energy.gov/bes/highlights/2012/bes-2012-01-b/
   - DOE EFRC research highlight (July 2012) http://www.energyfrontier.us/newsletter/201206/thin-oxides-thick-prospects
   - Highlighted in R&D Magazine, online (April 2012) http://www.rdmag.com/News/2012/04/Materials-Energy-Nanotechnology-Nontoxic-nanosheets-could-turn-waste-heat-into-power/

4) H. Zhang, B. Hu, L. Sun, R. Hovden, F.W. Wise, D.A. Muller, and **R.D. Robinson**, "Surfactant Ligand Removal and Rational Fabrication of Inorganically Connected Quantum Dots," *Nano Letters* **11**, 5356-5361 (2011). *http://dx.doi.org/10.1021/nl202892p*

3) J.B. Hertzberg, O.O. Otelaja, *N.J. Yoshida*, and **R.D. Robinson**, "Non-equilibrium Phonon Generation and Detection in Microstructure Devices," *Review of Scientific Instruments* **82**, 104905-104910 (2011). http://rsi.aip.org/resource/1/rsinak/v82/i10/p104905_s1

2) D.-H. Ha, *L.M. Moreau*, C.R. Bealing, H. Zhang, R.G. Hennig, and **R.D. Robinson**, "The structural evolution and diffusion during the chemical transformation from cobalt to cobalt phosphide nanoparticles," *Journal of Materials Chemistry* **21**, 11498-11510 (2011).
   - Invited article
   - Identified as a 'hot article' for Journal of Materials Chemistry http://blogs.rsc.org/jm/2011/05/06/
   - Invited by editor for cover article based on strength of reviews
   - Inside Cover selection, http://pubs.rsc.org/en/content/articlepdf/2011/jm/c1jm10337g

1) H. Zhang, D.-H. Ha, R. Hovden, L.F. Kourkoutis, and **R.D. Robinson**, "Controlled Synthesis of Uniform Cobalt Phosphide Hyperbranched Nanocrystals Using Tri-*n*-octylphosphine Oxide as a Phosphorus Source," *Nano Letters* **11,** 188-197 (2011) *(Published ASAP, Dec. 9, 2010). http://dx.doi.org/10.1021/nl103400a*

Post-doctoral Research

17) D.O. Demchenko, **R.D. Robinson**, B. Sadtler, C.K. Erdonmez, A.P. Alivisatos, L.-W. Wang, "Formation mechanism and properties of CdS/Ag_2S nanorod superlattices," *ACS Nano* **2**, 627 (2008). *http://dx.doi.org/10.1021/nn700381y*

16) **R.D. Robinson**, B. Sadtler, D.O. Demchenko, C.K. Erdonmez, L.-W. Wang, A.P. Alivisatos, "Spontaneous Superlattice Formation in Nanorods through Partial Cation Exchange," *Science* **317**, 355 (2007). http://www.sciencemag.org/content/317/5836/355.full

Graduate Research (M.S. and Ph.D.)

15) S. Banerjee, D.I. Kim, **R.D. Robinson**, I.P. Herman, Y.B. Mao, S.S. Wong, "Observation of Fano asymmetry in Raman spectra of $SrTiO_3$ and $Ca_xSr_{1-x}TiO_3$ perovskite nanocubes," *Applied Physics Letters* **89**, 223130 (2006).

14) L. M. Huang, Z.Y. Chen, J.D. Wilson, S. Banerjee, **R.D. Robinson**, I.P. Herman, R. Laibowitz, S. O'Brien, "Barium titanate nanocrystals and nanocrystal thin films: Synthesis, ferroelectricity, and dielectric properties," *Journal of Applied Physics* **100**, 34316 (2006).

13) S. Banerjee, S.G. Jia, D.I. Kim, **R.D. Robinson**, J.W. Kysar, J. Bevk, I.P. Herman, "Raman microprobe analysis of elastic strain and fracture in electrophoretically deposited CdSe nanocrystal films," *Nano Letters* **6**, 175 (2006).

12) F. Zhang, C.H. Chen, J.C. Hanson, **R.D. Robinson**, I.P. Herman, and S.W. Chan, "Phases in ceria–zirconia binary oxide (1-*x*)CeO_2–*x*ZrO_2 Nanoparticles: The Effect of Particle Size," *Journal of the American Ceramic Society* **89**, 1028 (2006).

11) **R.D. Robinson**, J. Tang, M.L. Steigerwald, L.E. Brus, and I.P. Herman, "Raman scattering in $Hf_xZr_{1-x}O_2$ nanoparticles," *Physical Review B* **71**, 115408 (2005).

10) Y. Gu, I.L. Kuskovsky, **R.D. Robinson**, I.P. Herman, G.F. Neumark, X. Zhou, S.P. Guo, M. Munoz, and M.C. Tamargo, "A comparison between optically active CdZnSe/ZnSe and CdZnSe/ZnBeSe self-assembled quantum dots: effect of beryllium," *Solid State Communications* **134**, 677 (2005).

9) J. Tang, J. Fabbri, **R.D. Robinson**, Y. Zhu, I. P. Herman, M. L. Steigerwald, and L. E. Brus, "Solid-solution nanoparticles: use of a nonhydrolytic sol-gel synthesis to prepare HfO_2 and $Hf_xZr_{1-x}O_2$ nanocrystals," *Chemistry of Materials* **16**, 1336-1342 (2004).

8) 12) Y. Gu, I.L. Kuskovsky, J. Fung, **R. Robinson**, I.P. Herman, G.F. Neumark, X. Zhou, S.P. Guo, and M.C. Tamargo, "Determination of size and composition of optically active CdZnSe-ZnBeSe quantum dots," *Applied Physics Letters* **83**, 3779 (2003).

7) **R.D. Robinson**, J.E. Spanier, F. Zheng, S.W. Chan, and I.P. Herman, "Visible thermal emission from sub-band-gap laser excited cerium dioxide particles," *Journal of Applied Physics* **92**, 1936-1941 (2002).

6) F. Zhang, S.W. Chan, J.E. Spanier, E. Apak, Q. Jin, **R.D. Robinson**, and I.P. Herman, "Cerium oxide nanoparticles: size-selective formation and structure analysis," *Applied Physics Letters* **80**, 127-129 (2002).

5) J.E. Spanier, **R.D. Robinson**, F. Zheng, S.W. Chan, I.P. Herman, "Size-dependent properties of CeO_{2-y} nanoparticles as studied by Raman scattering," *Physical Review B* **64**, 245407 (2001).

4) **R.D. Robinson**, P.Y. Wong and I.N. Miaoulis, "Thermal evaluation of zone-melting recrystallization of thin-film structures over a wide range of melting points," *Journal of Materials Research* **10**, 877-884 (1995).

3) **R.D. Robinson** and I.N. Miaoulis, "Thermal parameters affecting low temperature zone-melting recrystallization of films," *Journal of Applied Physics* **75**, 1771-1782 (1994).

2) **R.D. Robinso**n and I.N. Miaoulis, "Thermal analysis of incandescent lamp zone-melting recrystallization of thin silicon films," *Journal of Applied Physics* **73**, 439-447 (1993).

1) I.N. Miaoulis, P.Y. Wong, S.M. Yoon, **R.D. Robinson**, and C.K. Hess, "Thermal analysis of zone-melting recrystallization of silicon-on-insulator structures with an infrared heat source: an overview," *Journal of the Electrochemical Society* **139**, 2687-2696 (1992).

Refereed Conference Articles

5) Y. Gu, I.L. Kuskovsky, J. Fung, **R. Robinson**, I.P. Herman, G.F. Neumark, X. Zhou, S.P. Guo and M.C. Tamargo, "CdSe/Zn(Be)Se Quantum Dot Structures: Size, Chemical Composition, and Phonons," *Mater. Res. Soc. Symp. Proc*. **799**, Z9.7 (2003).

4) **R.D. Robinson** and I.N. Miaoulis, "A comparative study between high and low temperature thermally controlled crystallization of thin films," *Proceedings of Symposium of Crystallization and Related Phenomena in Amorphous Materials-Ceramics, Metals, Polymers, and Semiconductors*, MRS **321**, 627-632 (1994).

3) **R.D. Robinson** and I.N. Miaoulis, "Numerical simulation of zone-melting recrystallization of thin silicon films with a tungsten halogen lamp," *Proceedings of Symposium of Phase Formation and Modification by Beam-Solid Interaction*, MRS **235**, 165-169 (1992).

2) **R.D. Robinson** and I. N. Miaoulis, "Morphological Features of the Solid-Liquid Interface of a Gallium Film," *Proceedings of the Symposium of Interface Dynamics and Growth*, MRS, **237**, 139-144 (1992)

1) I.N. Miaoulis, S.M. Yoon, **R.D. Robinson**, C.K. Hess, and P.Y. Wong, "Thermal analysis of multilayer thin film structure processing with an infrared heat source - an overview," *HTD-Vol. 184, Thin Film Heat Transfer: Properties and Processing*, ASME, 81-90 (1991).

Patents

7) **Richard D. Robinson** and Obafemi O. Otelaja, "Non-Stoichiometric Copper Sulfide Nanoparticle Films, Methods and Applications," U.S. Provisional Application No. 62/058,702, filed 10/2/2014.

6) **Richard D. Robinson** and Don-Hyung Ha, "Heterostructure Nanostructure Including 2D Atomic Phase Composition, Related Methods and Applications," U.S. Provisional Application No. 62/058,728, filed 10/2/2014.

5) Mahmut Aksit and **R.D. Robinson**, "Misfit layered $Ca_3Co_4O_9$ as a high figure of merit p-type transparent conducting oxide film through solution processing," U.S. Provisional Application No. 61/977,419, filed 4/9/2014.

4) H. Zhang and **R.D. Robinson**, "Metal Chalcogenide Synthesis Method and Applications," International Application No. PCT/US2013/058676, U.S. Patent Application No. WO2014039937, filed 3/13/2014.

3) D.H. Ha and **R.D. Robinson**, "Binder-free and Carbon-free Nanoparticle Containing Component, Method and Applications," International Application No. PCT/US2013/053735, U.S. Patent Application No. WO2014025743, filed 2/13/2014.

2) Mahmut Aksit and **R.D. Robinson**, "Single Crystal Mixed Metal Oxide Nanosheet Material Compositions, Methods and Applications," International Application No. PCT/US2012/041249, U.S. Patent Application No. WO2012170627, filed 12/13/2012.

1) A.P. Alivisatos, **R.D. Robinson**, B. Sadtler, "Composite Nanorods," International Application No. PCT/US2008/069384, U.S. Patent Application No. WO2009009514, filed 1/15/2009.

Grantsmanship (total: $4,122,223)

Active (R.D. Robinson as lead PI on 3 NSF grants totaling $2,448,398)

"Chemical and Structural Engineering of Nanomaterials for Applications," 3M (non-tenured faculty award), Award No. 13564561, PI: **R.D. Robinson**
$15,000, Period: 5/16/14 – 5/15/15

"Scalable Production of High-Quality Nanoparticles," NEXUS-NY (New Energy Xcelerator in UpState NY), Clean Energy Accelerator Grant, PI: **R.D. Robinson**, Co-PI: T. Hanrath
$27,500, phase 2, Period: 5/12/14 – 10/15/14

"SNM: Scalable Production and Processing of High-Quality Metal Sulfide Nanoparticles into Energy Storage and Capture Devices," NSF–Engineering, Scalable Nanomanufacturing program (SNM), NSF Nanoscale Interdisciplinary Research Team (NIRT), CMMI-1344562, PI: **R.D. Robinson**, Co-PI: T. Hanrath.
$1,493,398, Period: 9/1/13 – 8/31/17

"Chemical Transformations of Nanoparticles for Isolation of Metastable Phases," NSF – Mathematical and Physical Sciences (MPS) CHE, CHE-1152922, PI: **R.D. Robinson**
$330,000, Period: 7/1/2012 – 6/30/2015

"CAREER: Nanoscale Phonon Spectrometer to Quantitatively Characterize Low-Dimensional Heat Transfer," NSF (MPS, DMR, Condensed Matter Physics), DMR-1149036, PI: **R.D. Robinson**
$600,000, Period: 2/1/2012 –1/31/2017

"CAREER: Nanoscale Phonon Spectrometer to Quantitatively Characterize Low-Dimensional Heat Transfer," *supplement*, NSF (MPS, DMR, Condensed Matter Physics), DMR-1149036, PI: **R.D. Robinson**
$25,000, Period: 2/1/2012 –1/31/2017

Completed (total completed: $1,631,325)

"Scalable Production of High-Quality Nanoparticles," NEXUS-NY (New Energy Xcelerator in UpState NY), Clean Energy Accelerator Grant, PI: **R.D. Robinson**, Co-PI: T. Hanrath
$10,000, phase 1, Period: 1/29/14 – 4/30/14

"Nanostructured Materials for Energy: Synthesis, Assembly, and Device Integration," 3M (non-tenured faculty award), Award No. 8932787, PI: **R.D. Robinson**
$15,000, Period: 5/16/13 – 5/15/14

"Nanometer-Scale Patterning from Templates of Covalent Organic Frameworks*," Cornell Center for Materials Research: Seed grant*," MRSEC program of the National Science Foundation (DMR1120296), NSF. PIs: W. Dichtel and **R.D. Robinson**
$229,713 (Robinson portion), Period: 5/1/2012 – 4/30/2014

"Nanostructured Materials for Energy: Synthesis, Assembly, and Device Integration," 3M (non-tenured faculty award), Award No. 6739296, PI: **R.D. Robinson**
$15,000, Period: 5/11/2012 – 6/10/2013

"Cornell Center for Materials Research: IRG Dynamics of Growth of Complex Materials," MRSEC program of the National Science Foundation (DMR0520404, DMR1120296), CCMR-IRG, NSF. PI: M. Hines
$256,614 (Robinson portion), Period: 5/1/2008 –8/31/2011

"NIMS for Photovoltaics and Energy Systems," KAUST-IRG. PIs: L. Archer, E. Giannelis.
$228,469 (Robinson portion), Period: 8/1/2008 – 5/31/2011

"Nanostructured Interfaces for Energy Generation, Conversion and Storage," EFRC, DOE, DE-SC0001086, PI: H. Abruna, Total award: $17,500,000
$861,529 (Robinson portion), Period: 8/1/09 – 7/31/14

"Development of an Anti-reflection Coating Optimized at UV-C Wavelength of 253.7 nm," CCMR-NYSTAR, Haledyne LLC. PI: **R.D. Robinson**
$15,000, Period: 9/1/10 – 1/31/11

Professional Service

- *E-MRS symposium organizer, "Nanomaterials for Energy Conversion and Storage"* that took place within the European Materials Research Society (E-MRS) Spring Meeting in Strasbourg, France, from 27–31 May, 2013. The Nanomaterials for Energy Conversion and Storage Symposium focused on the synthesis, processing, characterization, and modelling of nanostructured materials and their use in energy conversion and storage devices and systems. The Symposium received close to 300 submissions. From these, after a careful review process, 92 were selected for oral presentations, including 14 invited talks, and over 100 works were presented as posters. Over 200 attendees from all over the world finally participated to the Symposium.
- Guest Editor, *Int. J. Nanotechnology* **11**, (2014), Special Issue: Nanomaterials for Energy Conversion and Storage. Guest Editors: Andreu Cabot, Hong Liu, and Richard D. Robinson
- Session Chair (Heat Transfer: Nanowires), 14th International Conference on Phonon Scattering in Condensed Matter (PHONONS 2012), Ann Arbor, MI, July 10, 2012

Invited Presentations (total 44 since 2008)

Invited Conference Presentations

12) Gordon Research Conference (GRC) on Colloidal Semiconductor Nanocrystals (the inaugural "Quantum Dot GRC"), Smithfield, RI, July 2014.

11) Zing Nanocrystals Conference, Punta Cana, Dominican Republic, July 2014.

10) MRS Spring Meeting, San Francisco, CA, April 2014.

9) The 1st International Conference on Phononics and Thermal Energy Science (PTES2013), Shanghai, China, September 2013.

8) Cornell Center for Materials Research (CCMR) symposium, Cornell University, Ithaca, NY, May 2013.

7) American Chemical Society (ACS) Spring meeting, Fuel Cell Science and Technologies session, New Orleans, LA, April 2013.

6) American Chemical Society (ACS) Spring meeting, Advances in Batteries session, New Orleans, LA, April 2013.

5) CCMR Annual Meeting, Cornell University, Ithaca, NY, December 2012.

4) EMC^2 Annual Energy Materials Symposium, Cornell University, August 2012.

3) 2D Materials Beyond Graphene Workshop, The US Army Research Office and The Ohio State University Institute for Materials Research, Columbus, Ohio, August 2012.

2) Cornell High Energy Synchrotron Source (CHESS) Users' Meeting, Cornell University, Ithaca, NY, June 2012.

1) American Physical Society (APS) 2011 March Meeting, March 2011.

Invited Colloquia Presentations

32) Drexel University, Dept. of Chemical and Biological Engineering, November 2014.

31) Stanford University, Materials Science Department, October 2014.

30) Yale University, Mechanical Engineering and Materials Science, September 2014.

29) University of California, Irvine, Chemical Engineering\Materials Science Department Seminar, Irvine, CA, May 2014.

28) University of Washington, Inorganic Chemistry Seminar, Seattle, WA, May 2014.

27) University of Rochester, Inorganic Chemistry Seminar, Rochester, NY, May 2014.

26) University of California, Santa Barbara (UCSB), Materials Science Department Seminar, Santa Barbara, CA, May 2013.

25) University of Illinois, Urbana Champagne (UIUC), Materials Science Department Seminar, Urbana, Illinois, April 2013.

24) Washington University, Chemistry Department Seminar, Saint Louis, MO, April 2013.

23) Cornell University, Chemistry Department, Ithaca, NY, April 2013.

22) Princeton University, Chemistry Department, Princeton, NJ, February 2013.

21) University of Colorado, Boulder, Chemistry Department, Nanoparticle seminar, Boulder, CO, December 2012.

20) Boston College, Physics Department Seminar, Boston, MA, November 2012.

19) Columbia University, EFRC Seminar, New York, NY, November 2012.

18) Wayne State University, Inorganic Chemistry Seminar, Detroit, MI, October 2012.

17) University of Wisconsin–Madison, Electrical and Computer Engineering Departmental Seminar Series, Madison, WI, October 2012

16) Vanderbilt Institute of Nanoscale Science and Engineering (VINSE), Nashville, TN, October 2012.

15) Catalonia Institute for Energy Research (IREC), Barcelona, Spain, September 2012.

14) Institut Néel CNRS, Department Condensed Matter - Low Temperatures (MCBT) Seminar, Grenoble, France, September 2012.

13) Centre D'Investigacio en Nanociencia I Nanotechnologia, (CIN2), UAB campus, Bellaterra, Barcelona, Spain, September 2012.

12) IBM, Watson Research Center, Yorktown Heights, NY, June 2012.

11) University of Connecticut, Electrical and Computer Engineering Department, May 2012.

10) Rice University, Chemistry Department, April 2012.

9) University of California, Berkeley, Materials Science Department, April 2012.

8) Advanced Research Projects Agency-Energy (ARPA-E), DOE, Wash., D.C. March 2012.
7) Chemical and Biological Engineering Department, Cornell University, February 2012
6) Boston University, Chemistry Department, November 2011.
5) Schlumberger Inc., Materials Group, Boston, MA, November 2011.
4) Howard University, Physics Department, Wash., D.C. October 2011.
3) Cornell University, Dept. of Materials Science and Engineering, Ithaca, NY, May 2011.
2) The Italian Institute of Technology (IIT), Genova, Italy, October 2010.
1) Cornell High Energy Synchrotron Source (CHESS) seminar, Ithaca, NY, April 2010.

Academic Service

Departmental

Seminar organizer (Fall 2009 – present)

Faculty search committee (Fall 2009 internal committee, Fall 2010 – Spring 2012 official committee)

Strategic Planning subcommittee on Research Priorities and Opportunities (Fall 2009)

Graduate Student Admissions committee (January 2009, 2010, 2011, 2013)

Engineering College and University

Faculty Advisor for 20 Engineering undergraduate students (2010 - 2012)

Faculty Advisor for 20 Materials Science undergraduate majors (2012 - 2014)

National Science Foundation Review, CHESS and ERL Projects Status. Panelist (November 2, 2010)

Panelist for Orientation for the Diversity Programs in Engineering's (DPE) Office (August 24, 2010)

Panelist for reimagining Cornell, Bain & Company strategic consulting (April 14, 2010)

Professional Societies (current and past)

- American Institute of Chemical Engineers (AIChE)
- American Physical Society (APS)
- American Society for Engineering Education (ASEE)
- American Chemical Society (ACS)
- Materials Research Society (MRS)
- National Society of Black Physicists (NSBP)

Graduate Field Memberships

- Applied and Engineering Physics
- Chemical and Bio-molecular Engineering
- Electrical and Computer Engineering
- Materials Science and Engineering

Center Memberships

Cornell Center for Materials Research (CCMR) (January 2009 – present)

EMC^2 (September 2009 – July 2014)

KAUST (August 2008 – May 2011)

Courses Taught

Spring 2014: MSE 2060 – "*Atomic and Molecular Structure of Matter"*
(53 registered students + ~4 unregistered)

Spring 2013: MSE 2060 – "*Atomic and Molecular Structure of Matter"*
(65 registered students + ~7 unregistered)

Fall 2012: MSE 5880 – *"The Science of Nanoparticles"*
(20 registered students + ~4 unregistered)

Spring 2012: MSE 2060 – "*Atomic and Molecular Structure of Matter"*
(50 registered students + ~6 unregistered)

Fall 2011: MSE 6060 "– "*Condensed Matter Structure*"
(16 registered students + ~2 unregistered)

Spring 2011: MSE 2060 – "*Atomic and Molecular Structure of Matter"*
(56 registered students + ~6 unregistered)

Fall 2010: MSE 5880 – *"The Science of Nanoparticles"*
(14 registered students)

Fall 2010: ENGRD 1050 – "*Engineering Seminar"*
(20 registered students)

Spring 2010: MSE 2060 – "*Atomic and Molecular Structure of Matter"*
(69 registered students + ~5 unregistered)

Fall 2009: MSE 6060 – "*Condensed Matter Structure*"
(18 registered students + ~4 unregistered)

Fall 2009: CHEME 7920 – *"Principles and Practices of Graduate Research"*
(19 registered students)

Spring 2009: MSE 5880 – "*The Science of Nanoparticles*," New elective course targeted at upper-level undergraduate and graduate students, conceived and developed
(18 registered students + ~4 unregistered)

Teaching workshops

- National Effective Teaching Institute (NETI) three-day workshop on effective teaching for engineering instructors, given by Richard Felder, Rebecca Brent, and Mike Prince. Sponsored by the Chemical Engineering and Educational Research and Methods Divisions of the American Society for Engineering Education, Louisville, KY, June 17-19, 2010
- One-day career development workshop "Getting Your Academic Career Off to a Good Start," presented by Richard Felder and Rebecca Brent, Cornell University, Sept. 20, 2010
- 2nd Annual Celebration of Teaching Excellence at Cornell, Teaching workshops sponsored by the Center for Teaching Excellence, Academic Technologies, the Engineering Teaching Excellence Institute, the Cornell University Libraries, January 17, 2012

Students Advised

Postdoctoral Researchers

Matthew Fayette (7/2013 – 7/2014)

Jared Hertzberg (9/2009 – 10/2012)

Mohammad A. Islam (7/2009 – 8/2009, 6/2010 – 8/2010)

Sanjaya Dulip Perera (9/2013 – present)

Haitao Zhang (7/2009 – 10/2013)

Ph.D. Graduate Students

Mahmut Aksit (MSE, B exam passed 4/2014, PhD thesis title: Inorganic Thin Films and Nanosheets: Fabrication, Characterization and Simulation)

Michael Corbett (MSE, *transferred to the Scripps Research Institute*)

Xiaoyue Ding (AEP)

Don-Hyung Ha (MSE, B exam scheduled 8/25/2014), Best poster award, CCMR Industrial Partnerships 2013 Symposium, 6/4/2013

Andrew Nelson (MSE)

Obafemi Otelaja (ECE), Best poster award, CNF annual conference (35th anniversary) 7/19/2012

Louis Solomon (MSE)

David Toledo (MSE, *currently on leave*)

Curtis Williamson (CBE, Robinson primary advisor, T. Hanrath co-advisor)

Masters of Science Students

Joseph Caron (MSE)

Christian Ocier (MSE, joint advisee with T. Hanrath, graduated 5/2014)

IGERT Students (Secondary Advisor)

Eric Choudhary (Chemistry, PI: Peng Chen, B exam 5/9/2014)

Ryan Patrick Bisbey (Chemistry, PI: William Dichtel)

M. Eng Students

Ben Hoselton (AEP, 8/2012-5/2013, graduated May 2013)

Senior Thesis Students

- Ashish Banerjee (Graduated 2010; MS from Columbia University) Title: "*Porous Semiconducting ZnO Thin Films for Organic Photovoltaics*"
- Andrew Caldwell (Graduated 2014, begins PhD program at MIT fall 2014, Senior Thesis Winner 2014) Title: *"Localized Surface Plasmon Resonance Tunability by Heterostructure Formation in Copper Sulfide Nanoparticles"*
- Liane Moreau (Graduated 2012; currently at Northwestern MSE, Senior Thesis Winner 2012, 4 papers published – 2 first author: *Nano Letters* and *Chemistry of Materials*) Title: "*Unintended Phosphorus Doping of Nickel Nanoparticles During Synthesis with TOP*"
- Thach Nguyen (Graduated 2010; currently at Surmet) Title: "*Synthesis and Characterization of Sodium Cobalt Oxide Xerogels for Thermoelectric Applications*"

Undergraduate Researchers (Cornell)

1. Louis Antonelli (MSE, 9/2011 – 12/2011)
2. Ashish Banerjee (5/2009 – 5/2010, MS from Columbia University)

3. Denzel Bridges (MSE, 6/2011 – 9/2011, **ELI funding**)
4. Andrew Caldwell (MSE, 9/1/2011 – 7/1/2014, currently PhD student at MIT starting Fall 2014) (successfully applied for and won Hunter Rawlings Fellowship during work in Robinson group)
5. Jesseon Chang (AEP, 5/2010 – 12/2010)
6. Austin Cheng (AEP, 9/2010 – 12/2010)
7. Brennan Chu (MSE, 9/2011 – 10/2011)
8. Michael Jamie Cummins (MSE, 2/2012 – 5/2012)
9. Mark Cunningham (AEP, 9/2009 – 12/2009)
10. Shawn Darnell (MSE, 1/2009 – 5/2009)
11. Elise Goldfine (MSE, 2/2014 – present, **ELI funding**)
12. Bo Hu (ChemE, 9/2010 – 7/2011)
13. Jatin Khanna (MSE, 2/2012 – 3/2012)
14. Ha Kim (MSE, 1/2011 – 1/1/2014, **ELI funding**)
15. Sanjeev Kolli (MSE, 8/2013 – present) (successfully applied for and won Hunter Rawlings Fellowship during work in Robinson group)
16. Belinda Li (MSE, 1/2009 – 12/2010, **ELI funding**)
17. Alex Lin (AEP, 5/2010 – 5/2011)
18. Ten Loh (MSE, 5/2010 – 5/30/12, **ELI funding**)
19. Tiffany Ly (MSE, 8/30/12 – present, **ELI funding**)
20. Alexander Montelione (MSE, 2/2012 – 1/30/13)
21. Liane Moreau (MSE, 1/2009 – 8/2012, currently PhD student at Northwestern, **ELI funding**)
22. Thach Nguyen (9/2008 – 5/2010, currently at Surmet)
23. Aashika Shah (MSE, 3/2012 – 10/2012)
24. Joseph Singh (Chemistry, 9/2010 – 5/2011)
25. Ian Slauch (MSE, 9/2012 – 5/2014)
26. Stephanie Stoughton (MSE, 9/2009 – 5/2011)
27. Sarah Terry (AEP, 9/2010 – 5/2011)
28. Wenny Wu (ChemE, 1/2010 – 5/2010)
29. Naoki John Yoshida (AEP, 9/2009 – 9/2012)
30. Sophia Young (ChemE, 9/2014 – present)

REU (Research Experiences for Undergraduates – NSF) Students

Alexandria Cruz (CCMR, summer 2014)
Diana Gooding (CCMR, summer 2012)
Leah Hall (CCMR, summer 2013)
Amy Miller (CCMR, summer 2010)
Maia Saito (CCMR, summer 2011)
Victoria Savikhin (NNIN, summer 2011)

Visiting Students

Maria Ibáñez i Sabaté (University of Barcelona, summer 2012)

Graduate Students, Ph.D. Minor Committee Member

Student	Department	Exam	Advisor
Hao Chen	Chemistry	A exam	F. DiSalvo
Hao Chen	Chemistry	B exam	F. DiSalvo
Eric Choudhary	Chemistry	A exam	P. Chen
Eric Choudhary	Chemistry	B exam	P. Chen
Douglas DeSario	Chemistry	A exam	F. DiSalvo

Douglas DeSario	Chemistry	B exam	F. DiSalvo
Byungki Jung	MSE, field rep.	A exam	M. Thompson
Anna Legard	MSE, field rep.	A exam	B. van Dover
Krian Mathew	MSE	A exam	R. Hennig
Chung-Han Wu	MSE	A exam	G. Malliaras
Chung-Han Wu	MSE	B exam	G. Malliaras
Xinwei Wu	MSE, field rep.	A exam	R. Dieckmann
Ningmu Zou	Chemistry	A exam	P. Chen

Outreach Activities (since 2008)

- Cornell Science Sampler Series, Teacher Workshop (provides science teachers of the New York City area with an opportunity for professional development), October 25, 2014, Keynote Talk: T. Hanrath and **R.D. Robinson**
- NSF REU "Hot Materials Talks", CCMR sponsored 5 Hot Materials Talks throughout the summer. The talk was designed to explain the interesting field of Nanomaterials for Energy Applications to the REU and NNIN undergraduates. ~40 students attended. June 26, 2014 http://www.ccmr.cornell.edu/educational/reu/hotmaterialstalks
- CATALYST Academy and CURIE Academy Field Session, presentation to undergraduates. CATALYST Academy's mission is to advance diversity in engineering and related disciplines. Cornell's faculty and graduate students lead participants in classes, lab sessions, and project research. July 18, 2014; July 17, 2013; July 18, 2012; and July 20, 2011, www.engineering.cornell.edu/diversity/summer/high_school/catalyst/index.cfm http://www.engineering.cornell.edu/diversity/summer/high_school/curie/
- College of William and Mary, Presentation (skype) to class of rising 7th graders for summer nanoscience program for economically disadvantaged, high-ability students in Virginia. July 25, 2013 and July 19, 2012
- SoNIC Summer Research Workshop, http://www.cs.cornell.edu/workshop/sonic/, presentation to undergraduate students from Historically Black Colleges and University's about science and research. June 13, 2013; June 14, 2012; and June 16, 2011
- Research presentation to RET teachers, Cornell University, presentation about nanoscience to high school and jr high school public school teachers in the RET program. July 6, 2012
- Howard University, Physics Department recruiting visit for Cornell. October 28, 2011
- DeWitt Middle School, "Look to the Future Day," presentation to 8th grade students about Materials Science careers and Nanotechnology. May 26, 2011
- 2010 NNIN Laboratory Experience for Faculty, Hosted Prof. Kimani Stancil, Howard University. "Nanorod alignment and polymer influences," $12,000 awarded to the project. Summer 2010
- Exploration in Engineering, presentation by **R.D. Robinson** about MSE to high school students and pre-freshmen that will be enrolling in Cornell in the fall. College of Engineering. August 4, 2010
- Assisting National Geographic to develop and promote a film for their series, "Hidden Worlds." The film describes and shows the nanoworld on an elementary school level. This film will be shown in IMAX theatres around the country.
- Sloan Faculty Fellow (mentor diversity graduate students in engineering), Cornell University, College of Engineering, January 2010 – present
- Exploration in Engineering, presentation by **R.D. Robinson** about MSE to high school students and pre-freshmen that will be enrolling in Cornell in the fall. College of Engineering. August 4, 2010

- Engineering College's Community Dinner for the Engineering Pre-freshman Summer Program students. July 12, 2010
- Research Experience for Teachers and REU mentor (Summers 2010 - 2014)
- Engineering Admissions and Diversity Programs in Engineering Fall Diversity Hosting Weekend dinner. The dinner gives prospective students the chance to interact with current Cornell Engineering students, faculty, and staff. October of 2008 and 2009.
- Diversity Programs in Engineering First Friday dinner. Presentation by **R.D. Robinson** to Under-Represented Minority (URM) students, November 9, 2009.
- PBS NOVA, **R.D. Robinson** featured in videos profiling scientists. Goal is to increase accessibility of science to schoolchildren. Webcast available continuously to the public. Site has been visited by more than 800,000 people. (2009 – current)
- Cornell Science Sampler Series, Teacher Workshop (provides science teachers of the New York City area with an opportunity for professional development), March 20, 2009, Keynote Talk: **R.D. Robinson**