CURRICULUM VITAE

**Richard D. Robinson**

Department of Materials Science and Engineering; Cornell University

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**Education and Research Experience**

**Cornell University**,Department of Materials Science and Engineering, Ithaca, NY

*Associate Professor* (7/2015 – present)

*Assistant Professor* (7/2008 – 7/2015)

**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**

Carpenter Advising Award nominee, award for advisors who have demonstrated exceptional commitment and service in their advising role of freshman in Cornell Engineering, 2017

Cornell Engineering Research Excellence Award, 2015

Fulbright Scholar, 2015

“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**

underlined: Robinson group Cornell Ph.D. student, M.S. student, or postdoc

*italics*: Robinson group Cornell undergraduate student

“\*”: equal contribution, “†”:corresponding authors

**Peer-Reviewed**

*Cornell Independent Career* (30 with R.D. Robinson as corresponding author)

36) C.B. Williamson\*, D.R. Nevers\*, A. Nelson, I. Hadar, U. Banin†, T. Hanrath†, **R.D. Robinson**†, “Chemically Reversible Isomerization of Inorganic Clusters,” *Science* **363**, 731 (2019) DOI: [10.1126/science.aau9464](http://science.sciencemag.org/content/363/6428/731)

35) A. Nelson, S. Honrao, R.G. Hennig, and **R.D. Robinson**, “Nanocrystal Symmetry Breaking and Accelerated Solid-State Diffusion in the Lead−Cadmium Sulfide Cation Exchange system,” *Chem. Mater.* **31**, 991 (2019). DOI: [10.1021/acs.chemmater.8b04490](https://pubs.acs.org/doi/10.1021/acs.chemmater.8b04490)

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34) A. Bhargava\*, C.Y. Chen, K.D. Finkelstein, M.J. Ward, **R.D. Robinson**, “X-ray Emission Spectroscopy: An Effective Route to Extract Site Occupation of Cations,” *Phys. Chem. Chem. Phys.* **20**, 28990 (2018). DOI: 10.1039/c8cp04628j

* Front Cover article, November 2018
* Included in themed collection: [2018 PCCP HOT Articles](https://pubs.rsc.org/en/journals/articlecollectionlanding?sercode=cp&themeid=3dd0aacc-aeb6-44c7-b3fc-07776c5cbcde)

33) D.R. Nevers\* C.B. Williamson\*, B.H. Savitzky, I.H. Hadar, U. Banin, L.F. Kourkoutis, Tobias Hanrath†, and **R.D. Robinson**†, “Mesophase Formation Stabilizes High-purity Magic-sized Clusters,” *JACS* **140**, 3652 (2018) DOI: [10.1021/jacs.7b12175](https://pubs.acs.org/doi/abs/10.1021/jacs.7b12175)

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32) D.R. Nevers\* C.B. Williamson\*, Tobias Hanrath†, and **R.D. Robinson**†, “Surface Chemistry of Cadmium Sulfide Magic-sized Clusters: A Window into Ligand-Nanoparticle Interactions,” *Chem. Comm.* **53**, 2866-2869 (2017) DOI: [10.1039/c6cc09549f](http://pubs.rsc.org/en/content/articlepdf/2017/CC/C6CC09549F)

31) A. Nelson\*, D.-H. Ha\*, **R.D. Robinson**, “Selective Etching of Copper Sulfide Nanoparticles and Heterostructures through Sulfur Abstraction: Phase Transformations and Optical Properties,” *Chemistry of Materials* **28**, 8530-8541 (2016) DOI: [10.1021/acs.chemmater.6b02764](http://pubs.acs.org/doi/abs/10.1021/acs.chemmater.6b02764)

30) B. D. A. Levin, E. Padgett, C.-C. Chen, M. C. Scott, R. Xu, W. Theis, Y. Jiang, Y. Yang, C. Ophus, H. Zhang, D.-H. Ha, D. Wang, Y. Yu, H. D. Abruña, **R. D. Robinson**, P. Ercius, L. F. Kourkoutis, J. Miao, D. A. Muller, R. Hovden, “Nanomaterial datasets to advance tomography in scanning transmission electron microscopy,” *Scientific Data* 3, 160041 (2016). [doi:10.1038/sdata.2016.41](http://www.nature.com/articles/sdata201641)

29) A. Nelson\*, K.E. Fritz\*, S. Honrao, R.G. Hennig, **R.D. Robinson**†, and J. Suntivich†, “Increased Activity in Hydrogen Evolution Electrocatalysis for Partial Anionic Substitution in Cobalt Oxysulfide Nanoparticles,” *J. Mater. Chem. A* **4**, 2842-2848 (2016)[*DOI: 10.1039/c5ta08706f*](http://pubs.rsc.org/en/content/articlehtml/2016/ta/c5ta08706f)

28) C.B. Williamson, D.R. Nevers, T. Hanrath†, **R.D. Robinson**†, “The Prodigious Effects of Concentration Intensification on Nanoparticle Synthesis: A High-Quality, Scalable Approach,” *J. Am. Chem. Soc.* **137**, 15843 (2015).[*DOI:**10.1021/jacs.5b10006*](https://pubs.acs.org/doi/10.1021/jacs.5b10006)

27) S.D. Perera, X. Ding, A. Bhargava, R. Hovden, A. Nelson, L.F. Kourkoutis, **R.D. Robinson**, “Enhanced Supercapacitor Performance for Equal Co-Mn Stoichiometry in Colloidal Co3-xMnxO4 Nanoparticles, in Additive-Free Electrodes,” *Chem. Mater.* **27**, 7861-7873 (2015). [*10.1021/acs.chemmater.5b02106*](http://pubs.acs.org/doi/abs/10.1021/acs.chemmater.5b02106)

* Top 10 downloaded paper of *Chemistry of Materials*, December 2015

26) D.-H. Ha\*, *T. Ly*\*, J.M. Caron, H. Zhang and **R.D. Robinson**, “A General Method for High-Performance, Additive-Free Li-ion Battery Electrodes from Colloidal Nanoparticles: The Case of MnS, Cu2-xS, and Ge,” *ACS Appl. Mater. Inter.* **7**, 25053-25060 (2015). [*DOI: 10.1021/acsami.5b03398*](http://pubs.acs.org/doi/abs/10.1021/acsami.5b03398)

25) O.O. Otelaja and **R.D. Robinson**, “Enhancement of Phonon Backscattering due to Confinement of Ballistic Phonon Pathways in Silicon as Studied with a Microfabricated Phonon Spectrometer,” *Applied Physics Letters* **107**, 173102 (2015).[*http://dx.doi.org/10.1063/1.4934534*](http://dx.doi.org/10.1063/1.4934534)

24) C.R. Ocier, D.-M. Smilgies, **R.D. Robinson**, and T. Hanrath, “Reconfigurable Nanorod Films: An in Situ Study of the Relationship between the Tunable Nanorod Orientation and the Optical Properties of Their Self-Assembled Thin Films,” *Chemistry of Materials* **27**, 2659–2665 (2015). DOI: 10.1021/acs.chemmater.5b00503

23) M. Fayette, A. Nelson, and **R.D. Robinson**, “Electrophoretic Deposition Improves Catalytic Performance of Co3O4 Nanoparticles for Oxygen Reduction/Oxygen Evolution Reactions,” *Journal of Materials Chemistry A* **3**, 4274–4283(2015). DOI: [10.1039/C4TA04189E](http://pubs.rsc.org/en/content/articlehtml/2014/ta/c4ta04189e)

22) S.D. Perera, H. Zhang, X. Ding, A. Nelson, and **R.D. Robinson**, “Nanocluster Seed-mediated Synthesis of CuInS2 Quantum Dots, Nanodisks, Nanorods, and Doped Zn-Ga-CuInS2 Quantum Dots,” *Journal of Materials Chemistry C* **3**, 1044-1055 (2015). [*http://dx.doi.org/10.1039/c4tc01887g*](http://dx.doi.org/10.1039/c4tc01887g)

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,” *Nano Letters* **14**, 7090–7099(2014). [*http://dx.doi.org/10.1021/nl5035607*](http://dx.doi.org/10.1021/nl5035607)

20) O.O. Otelaja, D.-H. Ha, *T. Ly*, H. Zhang, and **R.D. Robinson**, “Highly Conductive Cu2-xS Nanoparticle Films through Room Temperature Processing, and an Order of Magnitude Enhancement of Conductivity via Electrophoretic Deposition,” *ACS* *Applied Materials and Interfaces* **6**, 18911–18920 (2014). [*http://dx.doi.org/10.1021/am504785f*](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,” *Journal of Chemical* *Physics* **141**, 164125-8 (2014). [*http://dx.doi.org/10.1063/1.4897635*](http://dx.doi.org/10.1063/1.4897635)

18) M. Aksit, *S.K. Kolli*, *I.M. Slauch*, **R.D. Robinson**, “Misfit Layered Ca3Co4O9 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*](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*](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*](http://dx.doi.org/10.1021/nl402701a)

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* Featured in *Physics Today Online:* [*http://scitation.aip.org/content/aip/magazine/physicstoday/news/10.1063/PT.5.7037*](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*](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*](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 KxCoO2∙yH2O,” *ACS Applied Materials and Interfaces* **5**, 8998-9007 (2013). [*http://dx.doi.org/10.1021/am402064g*](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**, “(NH4)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](http://pubs.rsc.org/en/content/articlelanding/2013/dt/c3dt50803j%20)

* Featured as a “Hot” article for June, <http://blogs.rsc.org/dt/2013/06/03/junes-hot-articles/>

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*](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 Co3O4: the Diffusion Mechanisms and Atomic Structural Transformations,” *Journal of Physical Chemistry C* **117**, 14303-14312 (2013). [*http://dx.doi.org/10.1021/jp402939e*](http://dx.doi.org/10.1021/jp402939e)

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* Invited by editor for cover article based on strength of reviews
* Featured CHESS news item [*http://news.chess.cornell.edu/articles/2013/Robinson12122013.html*](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*](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/*](http://iopscience.iop.org/1367-2630/15/4/043018/)

[*Arxiv version*](http://arxiv.org/ftp/arxiv/papers/1303/1303.6133.pdf)

* 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*](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*](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*](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*](http://dx.doi.org/10.1021/nl3019559)

* Best poster award, CCMR Industrial Partnerships 2013 Symposium, “Co3O4 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*](http://dx.doi.org/10.1021/nl301642g)

* Featured on the NSF Science, Engineering, & Education Innovation (SEE Innovation) website, [*www.research.gov/seeinnovation*](http://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 NaxCoO2 Nanosheets,” *Journal of Materials Chemistry* **22**, 5936-5944 (2012).

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* 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/*](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*](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*](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).

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* Invited by editor for cover article based on strength of reviews
* Inside Cover selection, [*http://pubs.rsc.org/en/content/articlepdf/2011/jm/c1jm10337g*](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*](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/Ag2S nanorod superlattices," *ACS Nano* **2**, 627 (2008). [*http://dx.doi.org/10.1021/nn700381y*](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*](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 SrTiO3 and CaxSr1-xTiO3 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*)CeO2–*x*ZrO2 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 HfxZr1-xO2 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 HfO2 and HfxZr1-xO2 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 CeO2-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**

8) **Richard D. Robinson** Tobias Hanrath, Douglas Robert Nevers, Curtis B. Williamson, “Dimensionally Focused Nanoparticle Synthesis Methodology,” U.S. Provisional Application No. 15/516,131, filed 03/31/2017. **Allowed: 6/25/2018**

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 Ca3Co4O9 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. U.S. Patent Application No. 15/302,319, filed 10/6/2016.

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. **Allowed: 10/17/2016**

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.

**Internal (Cornell) and Outside Media Exposure** *(Media type & name, web address, date)*

* Natural History Museum, May 24, 2016. PBS NOVA’s Secret Life of Scientists. Public talk at the American Museum of Natural History in New York City. The evening event featured five all-star scientist in a program of live interviews and an audience Q&A, peppered with short films from NOVA’s The Secret Life of Scientists and Engineers and the Museum’s Shelf Life series. This event was produced in collaboration with The Secret Life of Scientists and Engineers, an Emmy-nominated web series and website from PBS’s NOVA and hosted by Faith Salie of NPR’s “Wait, Wait…Don’t Tell Me!”. <https://www.amnh.org/explore/news-blogs/podcasts/secret-life-of-scientists-live> <https://www.facebook.com/events/470351593153816/>
* Scientific American, Israel edition. R. Robinson is featured in a spotlight article. The article focuses on the recent discovery of nano-heterostructures by the Robinson lab. Several photos of the work and of PI Robinson are displayed, as well as links to Cornell, Robinson lab, and the highlighted *Nano Letters* paper by the Robinson group. Article title: “Nanotechnology: Science adolescence,” (translated). Published online: March 8, 2016,  [http://www.sciam.co.il/ננוטכנולוגיה-מדע-בהתבגרות/](http://www.sciam.co.il/%D7%A0%D7%A0%D7%95%D7%98%D7%9B%D7%A0%D7%95%D7%9C%D7%95%D7%92%D7%99%D7%94-%D7%9E%D7%93%D7%A2-%D7%91%D7%94%D7%AA%D7%91%D7%92%D7%A8%D7%95%D7%AA/)
* The Times of Israel – feature article or R. Robinson and nanotechnology research, and integration of nanotechnology into applications. Article gives media exposure to the Robinson’s group research on nanotechnology and Cornell University. <http://www.timesofisrael.com/israel-is-the-go-to-place-for-nanotech-research/>

**Students Advised**

**Postdoctoral Researchers**

Matthew Fayette (7/2013 – 7/2014) (currently NIST)

Haixiang Han (1/2019 – current )

Jared Hertzberg (9/2009 – 10/2012) (currently IBM)

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

Sanjaya Dulip Perera (9/2013 – 6/2015) (currently Texas State University)

Haitao Zhang (7/2009 – 10/2013) (currently Corning)

**Ph.D. Graduate Students**

Mahmut Aksit (MSE, B exam passed 4/2014, PhD thesis title: “Inorganic Thin Films and Nanosheets: Fabrication, Characterization and Simulation”) (currently at 3M)

Anuj Bhargava (MSE, 2016-current)

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

Xiaoyue Ding (AEP, 2014-2015, transferred to AEP advisor 2015)

Don-Hyung Ha (MSE, B exam passed 8/2014, Best poster award, CCMR Industrial Partnerships 2013 Symposium, 6/4/2013, postdoc at MIT) (currently tenure track faculty position at in the engineering school at Chung-Ang University, S. Korea)

Andrew Nelson (MSE, 2013-current)

Obafemi Otelaja (ECE, B exam passed 10/2015, PhD thesis title: “Carrier Transport in Nanostructures: Probing Phonons and Electrons”, MS degree 1/27/2014, PhD 2/1/2016) (currently at IBM)

* Best poster award, CNF annual conference 35th anniversary, 7/19/2012

Louis Solomon (MSE, currently on leave)

David Toledo (MSE, currently on leave)

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

Yuan “Frank” Yao (MSE, 2018-current)

**Masters of Science Students**

Anuj Bhargava (MSE, graduated MS 8/2016, currently in PhD program Cornell MSE)

Shinjini Biswas (MSE, 2016-2018, “Excellence in MSE Masters Research” Award)

Joseph Caron (MSE, “Large-scale Processing and Synthesis Techniques to Address Challenges for Nanoparticle Commercialization”, graduated 8/2015, currently at Fraunhofer Center for Sustainable Energy Systems CSE)

Krista Hirsch (CBE, kh737, 2018-present)

Shantanu Kallakuri (MSE, 2018-2020)

Jonathan Neff (MSE, 2016-2018, withdrew to pursue a brewery)

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

Zhiqi Wang (MEng, 2016-2017, "Outstanding M.Eng. Project Award")

Yuan “Frank” Yao (MSE, 2016-2018, currently in PhD program Cornell MSE)

Yuanmeng Vanessa Zhang (MSE, 2015-2017, “Excellence in MSE Masters Research Award”)

**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, currently at MIT MSE PhD program, Senior Thesis Winner 2014) Title: *“Localized Surface Plasmon Resonance Tunability by Heterostructure Formation in Copper Sulfide Nanoparticles”*
* Cindy” Yi Hsin Chen (current)
* Emily Greenstein(Graduated 2018)
* Sanjeev Kolli(Graduated May 2016) Title: *“A Study on the Scalable Synthesis of Ductile 2-D Nanosheets of NaxCoO2”*
* Tiffany Ly (Graduated 2015, currently at Northwestern MSE PhD program) Title: “*Chemical Transformation of Co to Co2N Nanoparticles for Additive-Free Lithium-Ion Battery Electrodes*”
* Liane Moreau (Graduated 2012; currently at Northwestern MSE program, 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*”
* Daniel Zhang (current)
* Yizhi Zhu (Graduated 2017; currently at U Chicago IME) Title: “Cation Exchange of Metal Oxide Spinel Nanocrystals and Characterization of Post-treatment Nanocrystals”

**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. “Cindy” Yi Hsin Chen (MSE, 2/2017 – present, **ELI funding**, awarded the “Undergraduate Research Opportunities Best Poster Award” at the Semiconductor Research Corporation's Techcon 2018 in Austin, TX. Poster title: "Controlling Charge Transport in Spinel Oxides through Manipulation of Cation Site Occupation")
	7. Austin Cheng (AEP, 9/2010 – 12/2010)
	8. Brennan Chu (MSE, 9/2011 – 10/2011)
	9. Michael Jamie Cummins (MSE, 2/2012 – 5/2012)
	10. Mark Cunningham (AEP, 9/2009 – 12/2009)
	11. Shawn Darnell (MSE, 1/2009 – 5/2009)
	12. David Faris (MSE, 2/2018 – current)
	13. Elise Goldfine (MSE, 2/2014 – 5/2014, **ELI funding**)
	14. Emily Greenstein (MSE, 8/2017 – 5/2018)
	15. Audrey Gunawan (MSE, 3/2018 – current)
	16. Cayla Hamann (MSE, 1/2017 – 5/2017)
	17. Hayley Hirsh (MSE, 10/2014 – 5/2015)
	18. Bo Hu (ChemE, 9/2010 – 7/2011)
	19. Jatin Khanna (MSE, 2/2012 – 3/2012)
	20. Ha Kim (MSE, 1/2011 – 1/1/2014, **ELI funding**)
	21. Sanjeev Kolli (MSE, 8/2013 – 2016) (successfully applied for and won Hunter Rawlings Fellowship during work in Robinson group, currently PhD student at UCSB)
	22. Belinda Li (MSE, 1/2009 – 12/2010, **ELI funding**)
	23. Alex Lin (AEP, 5/2010 – 5/2011)
	24. Ten Loh (MSE, 5/2010 – 5/30/12, **ELI funding**)
	25. Tiffany Ly (MSE, 8/30/12 – 5/30/15, winner of the MSE department’s Materials Achievement Award, currently PhD student at Northwestern, **ELI funding**)
	26. Alexander Montelione (MSE, 2/2012 – 1/30/13)
	27. Liane Moreau (MSE, 1/2009 – 8/2012, currently PhD student at Northwestern, **ELI funding**)
	28. Thach Nguyen (9/2008 – 5/2010)
	29. Aashika Shah (MSE, 3/2012 – 10/2012)
	30. Joseph Singh (Chemistry, 9/2010 – 5/2011)
	31. Ian Slauch (ChemE, 9/2012 – 5/2014)
	32. Stephanie Stoughton (MSE, 9/2009 – 5/2011)
	33. Sarah Terry (AEP, 9/2010 – 5/2011)
	34. Wenny Wu (ChemE, 1/2010 – 5/2010)
	35. Naoki John Yoshida (AEP, 9/2009 – 9/2012)
	36. Sophia Young (ChemE, 9/2014 – 5/2015)
	37. Daniel Zhang (MSE, 8/2017 – present, **ELI funding**)
	38. Yizhi Zhu (MSE, 6/2015 – 5/2017)

**REU (Research Experiences for Undergraduates – NSF)** **Students**

1. Samantha Hilston (CCMR, summer 2017)
2. Alexandria Cruz (CCMR, summer 2014)
3. Diana Gooding (CCMR, summer 2012)
4. Leah Hall (CCMR, summer 2013)
5. Amy Miller (CCMR, summer 2010)
6. Maia Saito (CCMR, summer 2011)
7. Victoria Savikhin (NNIN, summer 2011)
8. Whitney Tso (CCMR, summer 2018)

**Visiting Students**

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

* 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**