

**CONRAD R. STOLDT**  
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University of Colorado at Boulder  
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**SUMMARY**

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*I. Education*

1999	Ph.D.	Physical & Materials Chemistry	Iowa State University
1994	B.A.	Chemistry	University of Colorado at Boulder

*II. Current University Appointment*

2016 - present    Full Professor

*III. University Publications*

Google Scholar (January 2020)  
Total citations: 2889  
*h*-index: 35  
*i10*-index: 58

*IV. University Teaching Ratings since 2009*

Average Instructor Rating:	5.0/6.0
Average Course Rating:	4.6/6.0

## EDUCATION

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1999	Ph.D.	Physical & Materials Chemistry	Iowa State University and Ames Laboratory
1994	B.A.	Chemistry	University of Colorado at Boulder

## APPOINTMENTS

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2016 – present	<i>Full Professor</i> Mechanical Engineering, University of Colorado, Boulder, CO
2009 – 2016	<i>Associate Professor</i> Mechanical Engineering, University of Colorado, Boulder, CO
2002 – 2009	<i>Assistant Professor</i> Mechanical Engineering, University of Colorado, Boulder, CO
2000 – 2002	<i>Postdoctoral Research Associate</i> Chemical Engineering, University of California, Berkeley, CA Advisor: Prof. Roya Maboudian
1996 – 1999	<i>Graduate Research Assistant</i> Chemistry, Iowa State University and Ames Laboratory DOE, Ames, IA Thesis Advisor: Prof. Patricia A. Thiel

## OTHER EXPERIENCE

- Co-Founder, Principal Scientist and Member of the Board, Solid Power Inc., June 2012-present
- Visiting Scientist, Department of Chemistry, University of Ulm, Germany, 1997
- Visiting Scientist, Chemical Separations Group, NIST Boulder, 1995

## HONORS AND AWARDS

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2014	Invitee to the 2014 U.S. Frontiers of Engineering Symposium National Academy of Engineering
2012	Woodward Outstanding Faculty Award Department of Mechanical Engineering, University of Colorado at Boulder
2008	Dean's Award for Professional Progress College of Engineering and Applied Sciences, University of Colorado at Boulder
2005	Outstanding Graduate Educator Department of Mechanical Engineering, University of Colorado at Boulder
2000	Postdoctoral Research Award Electronic Materials and Processing Division, American Vacuum Society
1999	Alpha Chi Sigma Award for Graduate Research Iowa State University
1998	Union Carbide Innovation Recognition Program Award Union Carbide Corporation

## POPULAR PRESS

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2014	Battery research featured in CU Engineering Magazine.
2013	Interviewed about vehicle batteries on "How on Earth", the KGNU Boulder radio science show; <a href="http://howonearthradio.org/archives/3291">http://howonearthradio.org/archives/3291</a>

2013 Battery research featured in Colorado Engineering Alumni Magazine

#### **GRADUATE RESEARCH ASSISTANT RECOGNITION**

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- 2010 Department of Mechanical Engineering's Outstanding Dissertation Award to Dr. Collin Becker, Ph.D. graduate in Mechanical Engineering.
- 2008 Finalist, Western Association of Graduate Schools (WAGS)/UMI Innovation in Technology Thesis Award. Dr. David Miller, Ph.D. graduate in Mechanical Engineering.
- 2008 Awardee, American Society for Engineering Education SMART scholarship. Mr. Collin Becker, PhD candidate in Mechanical Engineering.

#### **ONGOING AND COMPLETED RESEARCH GRANTS**

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1. "Ultra High Energy Solid-State Batteries for Next Generation Space Power," NASA Phase II SBIR contract to Solid Power Inc., \$750K, 6/1/15-5/31/17, (subcontract to CU-Boulder; PI: C. Stoldt for \$96K, 1/1/16-10/31/16).
2. "Continuous, Economical Manufacture of Nanocrystals for Future Industries and Medicine," National Science Foundation, \$339K, 8/15/14 – 8/14/17 (with J. Pellegrino, CU-Boulder).
3. "Iron pyrite {100}: Investigation into an electronically frustrated material," National Science Foundation, \$465K, 07/01/14 – 06/30/17 (with J. Eaves, CU-Boulder).
4. AGEP supplement to "Iron pyrite {100}: Investigation into an electronically frustrated material," National Science Foundation, \$120K, 07/1/15-06/30/17 (with J. Eaves, CU-Boulder).
5. "Sandia Excellence in Science and Engineering Fellowship: Solid Phase Li Conducting Solids", \$300,000 (\$75K/yr), 9/01/12 - 8/30/16, PI: C. Stoldt (with C. Apblett, Sandia Labs).
6. "Sustainable Energy Pathways: A Lab-to-Market Paradigm for the Optimal Design of Sustainable Energy Storage Materials", National Science Foundation, \$1.9M, 09/15/12 – 09/14/16, PI: S.-H. Lee (18% to co-PI C. Stoldt).
7. "An Ultra High Energy, Safe and Low Cost All Solid-State Rechargeable Battery for Electric Vehicles," ARPA-E RANGE Program contract to Solid Power Inc., \$3.4M, 11/01/13-10/31/16, (subcontract to CU-Boulder; PI's C. Stoldt and S.-H. Lee for \$450K, 11/01/13-10/31/16).
8. "M.E. Materials Teaching Facility: X-Ray Diffraction Instrument Acquisition," Engineering Excellence Fund, College of Engineering and Applied Sciences, University of Colorado, \$50K, 7/01/13-6/30/14.
9. "Development of Nano-Structured Composite Electrodes for All-Solid-State Lithium-Ion Batteries" NSF Phase I SBIR, \$150k, PI: D. Campbell, 1/13-6/13 (Subcontract to CU-Boulder, PI: C. Stoldt: \$26K).
10. "Solid-State Li-ion Batteries", Air Force Research Laboratories, \$96.4K, 8/20/2012 - 8/16/2013, PI: S.-H. Lee (15% to co-PI Stoldt).
11. "Pyrite FeS<sub>2</sub> Nanocrystals for Enhanced 3rd Generation Solar Photoconversion," Innovation Seed Grant (Univ. of Colorado), \$50,000, PI: C. Stoldt.
12. "Nanostructured Solid-State Composite Batteries (Phase II)," DARPA DSO, \$1,000,000, 05/10-11/12, PI: C. Stoldt (\$450K, 65% of CU budget). Co-PI: S. Lee.
13. "Nanostructured Solid-State Composite Batteries (Phase I)," DARPA DSO, \$750K, 10/08-4/10, PI: C. Stoldt (\$200K, 40% of CU budget). Co-PI: S. Lee and R. Raj.
14. "Solid-State Nanostructured Batteries: Anode Optimization for Unsurpassed Performance and Reliability", University of Colorado Technology Transfer Office PoCG, \$50,000, 06/09-12/10, PI: C. Stoldt, Co-PI: S. Lee.
15. "Scanning Micro-Raman Spectroscopy for the Study of Solid-State Electrochemistry," DoD DURIP, \$160,000, PI: C. Stoldt.

16. "Optimization of Silicon and Germanium Nanocrystal Solar Cell Architecture for Very Large Scale (VLS) Manufacturing and Commercialization," Univ. of Colorado Technology Transfer Office POCg in Energy, \$50,000, 01/01/09-12/31/10, PI: C. Stoldt.
17. "Group IV Quantum Dots for Third Generation Photovoltaics: Continuous, Large-Scale Production and Thin Film Optoelectronic Characterization," Center for Revolutionary Solar Photoconversion (CRSP) Shared Research Program, \$95,000, 01/01/09-08/31/10, PI: C. Stoldt (100% CU budget). Co-PI: M. Beard (NREL).
18. "Galvanic Corrosion: A Deteriorization Mechanism during MEMS Post-Processing," Army Research Office (ARO), \$285,000, 08/06-09/09, PI: C. Stoldt.
19. "Imaging of the onset of type 1 diabetes using targeted nanoscale contrast agents," NIH-DERC Pilot Study, \$50,000, 4/1/07-12/31/08, PI: C. Stoldt (\$38k). Co-PI: J. Hutton.
20. "Molecular Imaging of CA125 Expression in Ovarian Carcinoma Cells," Pilot Project for research in Women's Health and Gender-based Disease, \$13,200, 08/01/07 to 12/31/08, PI: C. Stoldt (\$13.2k). Co-PI: K. Shroyer.
21. "Radar Absorbing Colloidal Solutions," DARPA DSO, \$385,961, 10/1/06-8/31/07, PI: C. Stoldt (\$250k, 87% of CU budget). Co-PI: A. Pisano (UC Berkeley), Z. Popavic (CU), and M. Stowell (CU).
22. "Molecular Imaging of CA-125 Expression in Ovarian Carcinoma Cells," Cancer League of Colorado, Cancer Research Grants Program 2006, \$28,600, 7/1/06-6/30/07, PI: C. Stoldt.
23. "NIST Traceable Standards and Nanomagnetic Materials Development for Quantitative Biomagnetic Imaging Applications," NIST-CU Seed Grant, \$50,000, 6/1/06-5/31/06, PI: C. Stoldt (\$25k). Co-PI: B. Cage and S. Russek.
24. "Molecular Imaging of the Onset of Type 1 Diabetes", Butcher Award in Interdisciplinary Research for the Colorado Initiative in Molecular Biotechnology, \$71,000, 9/1/05-8/31/06 PI: C. Stoldt (\$65k). Co-PI: R. Shandas, Y.C. Lee, and J. Hutton.
25. "NUE: Integration of Nanoscale Research/Technology into a Mechanical Engineering Curriculum", NSF, \$100,000, 7/04-6/06, PI: C. Stoldt (\$85k). Co-PI: R. Mahajan and K. Gall.
26. "Adhesive Nano-structures", NSF, \$80,000, 9/04-8/05, PI: M. Dunn. Co-PI: C. Stoldt (\$10k).
27. "Micromechanics-on-a-Chip: A Universal Testbed for Evaluating Mechanical Reliability of Micro- and Nanostructures", Microsystems and Engineering Sciences Applications (MESA) Project, Sandia National Laboratories, \$100,000, 2005-2006, PI: K. Gall. Co-PI: C. Stoldt (\$10k).

#### **PUBLISHED RESEARCH JOURNAL PUBLICATIONS**

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1. Dennice M Roberts, Stephen E Russek, Conrad R Stoldt, "Synthetic iron pyrite across length scales: interfacial defects and macroscopic properties," *CrystEngComm*, 21 (2019) 3304-3312.
2. Dennice M Roberts, John D Perkins, Andrew G Norman, Conrad R Stoldt, Andriy Zakutayev, Sage R Bauers, "Amorphous sulfide heterostructure precursors prepared by radio frequency sputtering," *Journal of Vacuum Science & Technology B*, 37 (2019) 051201.
3. Yun Xu, Kevin Wood, Jaclyn Coyle, Chaiwat Engtrakul, Glenn Teeter, Conrad Stoldt, Anthony Burrell, Andriy Zakutayev, "Chemistry of Electrolyte Reduction on Lithium Silicide," *The Journal of Physical Chemistry C*, 123 (2019) 13219-13224.
4. Dennice M Roberts, Alyssa R Landin, Timothy G Ritter, Joel D Eaves, Conrad R Stoldt, "Nanocrystalline Iron Monosulfides Near Stoichiometry," *Scientific Reports*, 8 (2018) 6591.
5. J. Pellegrino, L. R. Schulte, J. de la Cruz, and C. Stoldt, "Membrane Processes in Nanoparticle Production," *J. Membrane Sci.*, doi: 10.1016/j.memsci.2016.09.018.
6. Lauryn L. Baranowski, Chelsea M. Heveran, Virginia L. Ferguson, and Conrad R. Stoldt, "Multi-Scale Mechanical Behavior of the Li3PS4 Solid-Phase Electrolyte," *ACS Appl. Mater. Interfaces*, 8 (2016) 29573-29579.

7. Yong Han, Conrad R Stoldt, Patricia A Thiel, James W Evans, "Ab Initio Thermodynamics and Kinetics for Coalescence of Two-Dimensional Nanoislands and Nanopits on Metal (100) Surfaces," *J. Phys. Chem. C* 120 (2016) 21617-21630.
8. I. Lisenker and C.R. Stoldt, (2016) "Improving NASICON Sinterability through Crystallization under High-Frequency Electrical Fields," *Front. Energy Res.* 4:13. doi: 10.3389/fenrg.2016.00013.
9. Collin R. Becker, Greg J. Gillen, Matthew E. Staymates, and Conrad R. Stoldt, "Nanoporous Silicon Combustion: Observation of Shockwave and Flame Synthesis of Nanoparticle Silicon Oxide," *ACS Appl. Mater. Interfaces*, 2015; DOI: 10.1021/acsami.5b09076.
10. Brian E. Francisco, Conrad R. Stoldt and Jean-Claude M'Peko, "Energetics of Ion-Transport in NASICON-Type Electrolytes," *J. Phys. Chem. C*, 119 (2015) 16432–16442.
11. Brian E. Francisco, Conrad R. Stoldt, and J.-Claude M'Peko, "Lithium-ion trapping from local structural distortions in NASICON electrolytes," *ACS Chemistry of Materials*, published online July, 2014 (dx.doi.org/10.1021/cm5013872).
12. T.A. Yersak, C.R. Stoldt, and S.-H. Lee, "Evolution of an iron sulfide and sulfur based cathode for all-solid-state Li-ion batteries," *J. Electrochem. Soc.* 160 (2013) A1009-A1015.
13. T.A. Yersak, H.A. Macpherson, et al., "Solid State Enabled Reversible Four Electron Storage," *Advanced Energy Materials* 3 (2013) 120-127.
14. J.L. Olson, R. Velez-Montoya, N. Mandava, and C.R. Stoldt, "Intravitreal Silicon-Based Quantum Dots as Neuroprotective Factors in a Model of Retinal Photoreceptor Degeneration", *Investigative Ophthalmology & Visual Science* 53 (2012) 5713-5721.
15. James E. Trevey, Jeremy R. Gilsdorf, Conrad R. Stoldt, Se-Hee Lee, and Ping Liu, "Electrochemical Investigation of All-Solid-State Lithium Batteries with a High Capacity Sulfur-Based Electrode," *J. Electrochem. Soc.* 159 (2012) A1019-A1022.
16. S.A. Sargsyan, B.A. Larsen, et al. "Detection of glomerular complement C3 fragments by magnetic resonance imaging in murine lupus nephritis," *Kidney International* 81 (2012) 152-159.
17. Brian A. Larsen, Kendall M. Hurst, W. Robert Ashurst, Natalie J. Serkova and Conrad R. Stoldt, "Mono and dialkoxysilane surface modification of superparamagnetic oxide nanoparticles for application as magnetic resonance imaging contrast agents," *J. Materials Research* 27 (2012) 1846-1852.
18. Brian E. Francisco, Christina M. Jones, Se-Hee Lee, and Conrad R. Stoldt, "Nanostructured all-solid-state supercapacitor based on Li<sub>2</sub>S-P<sub>2</sub>S<sub>5</sub> glass-ceramic electrolyte," *Appl. Phys. Lett.* 100 (2012) 103902.
19. Thomas A. Yersak, Yanfa Yan, Conrad Stoldt and Se-Hee Lee, "Ambient Temperature and Pressure Mechanochemical Preparation of Nano-LiTiS<sub>2</sub>," *ECS Electrochemistry Letters*, 1(1), A21 (2012).
20. H. Alex Macpherson and Conrad R. Stoldt, "Iron Pyrite Nanocubes: Size and Shape Considerations for Photovoltaic Application," *ACS Nano* 6 (2012) 8940-8949.
21. J.E. Trevey, C.R. Stoldt, and S.H. Lee, "High power nanocomposite TiS<sub>2</sub> cathodes for all-solid-state lithium batteries," *J. Electrochem. Soc.* 158 (2011) A1282-A1289.
22. Collin R. Becker, Steven Apperson, Christopher J. Morris, Shubhra Gangopadhyay, Luke J. Currano, Wayne A. Churaman, and Conrad R. Stoldt, "Galvanic Porous Silicon Composites for High-Velocity Nanoenergetics," *Nano Letters* 11 (2011) 803-807.
23. Collin R. Becker, Luke J. Currano, Wayne A. Churaman, and Conrad R. Stoldt, "Thermal Analysis of the Exothermic Reaction between Galvanic Porous Silicon and Sodium Perchlorate," *ACS Appl. Mater. Interfaces* 2 (2010) 2998-3003.
24. C.R. Becker, D.C. Miller and C.R. Stoldt, "Galvanically coupled gold/silicon on-insulator microstructures in hydrofluoric acid electrolytes: finite element simulation and morphological analysis of electrochemical corrosion," *J. Micromech. Microeng.* 20 (2010) 085017.
25. James E. Trevey, Kavic W. Rason, Conrad R. Stoldt, and Se-Hee Lee, "Improved Performance of All-Solid-State Lithium-Ion Batteries Using Nanosilicon Active Material with Multiwalled-Carbon-Nanotubes as a Conductive Additive," *Electrochem. Solid-State Letters* 13 (2010) A154-A157.

26. Natalie Serkova, Brandon Renner, Brian A. Larsen, Conrad R. Stoldt, Kendra Hasebroock, Erica L. Bradshaw, V. Michael Holers, and Joshua M. Thurman, "Renal Inflammation: Targeted Iron Oxide Nanoparticles for Molecular MR Imaging in Mice," *Radiology* 255 (2010) 517-526.
27. James Trevey, Jum Suk Jang, Yoon Seok Jung, Conrad R. Stoldt, Se-Hee Lee, "Glass-ceramic Li<sub>2</sub>S-P<sub>2</sub>S<sub>5</sub> electrolytes prepared by a single step ball milling process and their application for all-solid-state lithium-ion batteries," *Electrochem. Comm.* 11 (2009) 1830-1833.
28. Brian A. Larsen, Benjamin D. Hamilton, and Conrad R. Stoldt, "Protein Detection at Zeptomole Quantities: A Nanoparticle based Immunoassay using Total Internal Reflection Fluorescence Microscopy," *Journal of BioNanoScience* 2 (2008) 119-123.
29. David C. Miller, Collin R. Becker, and Conrad R. Stoldt, "Relation Between Morphology, Etch Rate, Surface Adhesion, And Electrochemical Characteristics For Silicon Microstructures Subject To Galvanic Corrosion," *J. of the Electrochemical Society* 155 (2008) F253-F265.
30. Conrad R. Stoldt, Michael A. Haag, and Brian A. Larsen, "Preparation of Freestanding Germanium Nanocrystals by Ultrasonic Aerosol Pyrolysis," *Applied Physics Letters* 93 (2008) 043125.
31. David C. Miller, Brad L. Boyce, Paul G. Kotula, and Conrad R. Stoldt, "Tensile Properties Of Miniaturized Monocrystalline And Polycrystalline Silicon Structures Are Governed By Galvanic Corrosion-Induced Structural Damage," *Journal of Applied Physics* 103 (2008) 123518.
32. B.A. Larsen, M.A. Haag, N.J. Serkova, K.R. Shroyer, and C.R. Stoldt, "Controlled aggregation of superparamagnetic iron oxide nanoparticles for the development of molecular magnetic resonance imaging probes," *Nanotechnology* 19 (2008) 265102.
33. David C. Miller, Brad L. Boyce, Ken Gall, and Conrad R. Stoldt, "Galvanic Corrosion Induced Degradation of Tensile Properties in Micromachined Polycrystalline Silicon", *Applied Physics Letters* 90 (2007) 191902.
34. David C. Miller, William L. Hughes, Zhong-Lin Wang, Ken Gall, and Conrad R. Stoldt, "Mechanical Effects of Galvanic Corrosion on Structural Polysilicon", *JMEMS*, 16 (1), 2007, pp. 87-101.
35. Velimir Radmilovic, Ulrich Dahmen, Di Gao, Conrad R. Stoldt, Carlo Carraro, and Roya Maboudian, "Formation of <111> fiber texture in beta-SiC films deposited on Si(100) substrates", *Diamond & Related Materials* 16 (2007) 74-80.
36. David C. Miller, Cari F. Herrmann, Hans J. Maier, Steve M. George, Conrad R. Stoldt, and Ken Gall, "Thermo-Mechanical Stability Of Multilayer Thin Films, Part II: Microstructure Evolution In Au/ Cr/ Si Microcantilevers" *Thin Solid Films*, 515, 2007, pp. 3224-3240.
37. David C. Miller, Cari F. Herrmann, Hans J. Maier, Steve M. George, Conrad R. Stoldt, and Ken Gall, "Thermo-Mechanical Stability Of Multilayer Thin Films, Part I: Mechanical Behavior Of Au/ Cr/ Si Microcantilevers," *Thin Solid Films*, 515, 2007, pp. 3208-3233.
38. Brant Cage, Stephen E. Russek, Richard Shoemaker, Alex J. Barker, Conrad Stoldt, Vasanth Ramachandaran, and Naresh S. Dalal, "The utility of the single-molecule magnet Fe<sub>8</sub> as a magnetic resonance imaging contrast agent over a broad range of concentration," *Polyhedron* 26 (2007) 2413-2419.
39. C.R. Stoldt and V.M. Bright, "Invited Review: Ultra-thin Film Encapsulation Processes for Micro-Electro-Mechanical Devices and Systems," *Journal of Physics D: Applied Physics*, 39 (2006) R163-R170.
40. A.J. Barker, B. Cage, S. Russek, and C.R. Stoldt. "Ripening during Magnetite Nanoparticle Synthesis: Resulting Interfacial Defects and Magnetic Properties," *Journal of Applied Physics* 98 (2005) 063528.
41. D.C. Miller, K. Gall, and C.R. Stoldt. "Galvanic Corrosion of Miniaturized Polysilicon Structures: Morphological, Electrical, and Mechanical Effects," *Electrochem. and Solid-State Letters* 8 (2005) G223-G226.
42. D.C. Miller, C.F. Herrmann, H.J. Maier, S.M. George, C.R. Stoldt, and K.A. Gall. "Intrinsic Stress Development and Microstructure Evolution of Au/Cr/Si Multilayer Thin Films Subject to Annealing," *Scripta Materialia* 52 (2005) 873-879.

43. G. Valente, C.R. Stoldt, R. Maboudian, and C. Carraro, "Theoretical and experimental study of the chemisorption of 1,3-disilabutane on the Si(100) surface." *Journal of Chemical Physics* 118 (2003) 6089-6097.
44. C. Fernandez-Pello, A.P. Pisano, K. Fu, D. Walther, A. Knobloch, F. Martinez, M. Senesky, C. Stoldt, R. Maboudian, S. Sanders, and D. Liepmann, 2003. "MEMS Rotary Engine Power System", *IEEE Transactions on Sensors and Micromachines*, 123-E: 326-330.
45. M.B.J. Wijesundara, C.R. Stoldt, C. Carraro, R.T. Howe and R. Maboudian, 2002. "Nitrogen doping of polycrystalline 3C-SiC films grown by single-source chemical vapor deposition." *Thin Solid Films*, 419: 69-75.
46. S. Frank, H. Wedler, R.J. Behm, J. Rottler, P. Maass, K.J. Caspersen, C.R. Stoldt, P.A. Thiel, and J.W. Evans, 2002. "Approaching the low-temperature limit in nucleation and two-dimensional growth of fcc (100) metal films Ag/Ag(100)." *Physical Review B*, 66 (15): art. no. 155435.
47. C.R. Stoldt, C. Carraro, W.R. Ashurst, D. Gao, R.T. Howe, and R. Maboudian, 2002. "A Low-Temperature CVD Process for Silicon Carbide MEMS." *Sensors and Actuators A*, 97-98: 410-415.
48. K.J. Caspersen, A.R. Layson, C.R. Stoldt, V. Fournée, P.A. Thiel, and J.W. Evans, 2002. "Development and ordering of mounds during metal(100) homoepitaxy." *Physical Review B* 65, (19): art. no. 193407.
49. C.R. Stoldt, M.C. Fritz, C. Carraro, and R. Maboudian, 2001. "Micromechanical Properties of Silicon Carbide Thin Films Deposited using Single Source CVD." *Applied Physics Letters*, 79: 347-349.
50. C.R. Stoldt, R. Maboudian, and C. Carraro, 2001. "Vibrational Spectra of Hydrogenated Buckminsterfullerene: A Candidate for the Unidentified Infrared Emission." *The Astrophysical Journal Letters*, 548: L225-L228.
51. W.W. Pai, J.F. Wendelken, C.R. Stoldt, P.A. Thiel, J.W. Evans, and D.-J. Liu, 2001. "Evolution of Two-Dimensional Wormlike Nanoclusters on Metal Surfaces." *Physical Review Letters*, 86: 3088-3091.
52. K.J. Caspersen, C.R. Stoldt, A.R. Layson, M.C. Bartelt, P.A. Thiel, and J.W. Evans, 2001. "Morphology of Multilayer Ag/Ag(100) Films Versus Deposition Temperature: STM Analysis and Atomistic Lattice-Gas Modeling." *Physical Review B*, 63: 85401.
53. C.R. Stoldt, C. Carraro, and R. Maboudian, 2000. "Deuterium Etching of the Si-rich SiC(0001) (3x3) Surface Reconstruction." *Surface Science*, 466: 66-72.
54. C.R. Stoldt, K.J. Caspersen, M.C. Bartelt, C.J. Jenks, J.W. Evans, and P.A. Thiel, 2000. "Using Temperature to Tune Film Roughness: Non-Intuitive Behavior in a Simple System." *Physical Review Letters*, 85: 800-803.
55. M.C. Bartelt, J.B. Hannon, A.K. Schmid, C.R. Stoldt, and J.W. Evans, 2000. "Island Formation During Deposition or Etching." *Colloids and Surfaces A*, 165: 373-403.
56. A.M. Cadilhe, C.R. Stoldt, C.J. Jenks, P.A. Thiel, and J.W. Evans, 2000. "Evolution of Far-From-Equilibrium Nanostructures on Ag(100) Surfaces: Protrusions and Indentations at Extended Step Edges." *Physical Review B*, 61: 4910-4925.
57. C.R. Stoldt, A.M. Cadilhe, C.J. Jenks, J.W. Evans and P.A. Thiel, 1999. "Smoluchowski Ripening of Ag Islands on Ag(100)." *Journal of Chemical Physics*, 111: 5157-5166.
58. M.C. Bartelt, C.R. Stoldt, C.J. Jenks, P.A. Thiel, and J.W. Evans, 1999. "Adatom Capture by Arrays of Two-Dimensional Ag Islands on Ag(100)." *Physical Review B*, 59: 3125-3134.
59. Z. Shen, C.R. Stoldt, C.J. Jenks, T.A. Lograsso, and P.A. Thiel, 1999. "Fine Structure on Flat Surfaces of Quasicrystalline Al-Pd-Mn." *Physical Review B*, 60: 14688-14694.
60. R.E. Sievers, U. Karst, P.D. Milewski, S.P. Sellers, B.A. Miles, J.D. Schaefer, C.R. Stoldt, C.Y. Xu, 1999. "Formation of Aqueous Small Droplet Aerosols Assisted by Supercritical Carbon Dioxide." *Aerosol Sci. Technol.*, 30: 3-15.
61. C.R. Stoldt, A.M. Cadilhe, C.J. Jenks, J.-M. Wen, J.W. Evans, and P.A. Thiel, 1998. "Evolution of Far-From-Equilibrium Nanostructures Formed by Cluster-Step and Cluster-Cluster Coalescence in Metal Films." *Physical Review Letters*, 81: 2950-2953.

62. C.R. Stoldt, A.M. Cadilhe, M.C. Bartelt, C.J. Jenks, P.A. Thiel, and J.W. Evans, 1998. "Formation and Relaxation of 2D Island Arrays in Metal(100) Homoepitaxy." *Progress in Surface Science*, 59: 67-77.
63. L. Bardotti, C.R. Stoldt, C.J. Jenks, M.C. Bartelt, J.W. Evans, and P.A. Thiel, 1998. "HRLEED Profile Analysis and Diffusion Barrier Estimation for Submonolayer Ag/Ag(100) Homoepitaxy." *Physical Review B*, 57: 12544-12549.
64. L. Bardotti, M.C. Bartelt, C.R. Stoldt, J.-M. Wen, C.-M. Zhang, C.J. Jenks, J.W. Evans, and P.A. Thiel, 1998. "Formation and Equilibration of Submonolayer Island Distributions in Ag/Ag(100) Homoepitaxy." *Langmuir*, 14 1487-1492.

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#### RESEARCH JOURNAL MANUSCRIPTS SUBMITTED AND IN PREPARATION

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- Submitted: I. Lisenker and C.R. Stoldt, "Improving NASICON Sinterability through Crystallization under High Frequency Electrical Fields," submitted to *Frontiers in Energy Research*, January 2016.
- In preparation: T. Ritter, A. Landin, J. Eaves, and C. Stoldt, "Solvothermally derived Triolite Nanosheets: Experiment and Modeling," to be submitted to *ACS Chemistry of Materials*, in preparation, expected early Spring 2016.
- In preparation: D. Roberts, A. Landin, M. Sweeney, H. Macpherson, C. Stoldt, and J. Eaves, "Basis for Resonant Light Scattering in Colloidal Iron Pyrite Nanocubes," in preparation, expected Spring 2016.

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#### BOOK CHAPTERS

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1. Carlo Carraro, Roya Maboudian, and Conrad Stoldt, "Infrared and Ultraviolet Spectra of Fullerenes: HREELS Studies and Implications for the Interstellar Medium," Chapter 2, pp. 27-37, in *Fullerenes: The Hydrogenated Fullerenes*, vol. 2, Carbon Materials: Chemistry & Physics; Cataldo, Franco; Iglesias-Groth, Susana (Eds.), Springer, New York, 2010.
2. V.M. Bright, C.R. Stoldt, D.J. Monk, M. Chapman, and A. Salian, "Packaging of Advanced Micro- and Nanosystems", Chapter 4, pp. 93-164, in *Advanced Micro & Nanosystems*, vol. 1, Enabling Technology for MEMS and Nanodevices; H. Baltes, O. Brand, G.K. Fedder, C. Hierold, J.G. Korvink, O. Tabata (Eds.), Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2004.
3. C.Y. Xu, R.E. Sievers, U. Karst, B.A. Watkins, C.M. Karbiwynk, W.C. Anderson, J.D. Schaefer, and C.R. Stoldt, 1998. "Supercritical Carbon Dioxide-Assisted Aerosolization for Thin Film Deposition, Fine Powder Generation and Drug Delivery," Ch. 18, in *Green Chemistry: Frontiers in Benign Chemical Synthesis and Processing*, Oxford University Press.

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#### PATENTS

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1. T. Yersak, C.R. Stoldt and S.-H. Lee, "Lithium All-Solid-State Battery," U.S. Patent Application No. 14/371,500, 2013.
2. Collin R. Becker, Luke J. Currano, Wayne A. Churaman, Conrad R. Stoldt, "Galvanic Porous Silicon Composites For Nanoenergetics and Monolithically Integrated Ignitor", U.S. Patent App. 13/713,043, 2012.
3. Natalie Serkova, Conrad Stoldt, Brian Larsen, Mike Holers, and Josh Thurman, "Non-invasive detection of complement-mediated inflammation using CR2-targeted nanoparticles," U.S. Patent 8,840,868, 2014.



1. C.R. Stoldt and S.-H. Lee, "All-Solid-State Lithium Metal Batteries for Next Generation Energy Storage," The 17th International Conf. on Solid-State Sensors, Actuators and Microsystems (Transducers 2013 and Eurosensors XVII) Barcelona, Spain, June 16-20, 2013. (peer-reviewed)
2. Wayne A. Churaman, Collin R. Becker, Grace D. Metcalfe, Brendan M. Hanrahan, Luke J. Currano, and Conrad R. Stoldt, "Optical Initiation of Nanoporous Energetic Silicon for Safing and Arming Technologies", Proceedings of SPIE, Optical Technologies for Arming, Safing, Fuzing, and Firing VI, Vol. 7795, Sept. 2, 2010. (peer-reviewed)
3. Larsen, B.A., Haag, M.A., Stowell, M.H.B., Walther, D., Pisano, A.P., and Stoldt, C.R., Controlling nanoparticle aggregation in colloidal microwave absorbers via interface chemistry. Proceedings of the SPIE, Smart Structures and Materials, 2007, # 6525. (peer-reviewed)
4. David C. Miller, William L. Hughes, Zhong-Lin Wang, Ken Gall, and Conrad R. Stoldt, Galvanic Corrosion: a Microsystems Device Integrity and Reliability Concern, Proc. SPIE, 6111, 2006, pp. 611105-01-12. (peer-reviewed)
5. D.C. Miller, K. Gall, and C.R. Stoldt. "Mechanical Effects of Galvanic Corrosion of Thin Film Polysilicon", in 2005 ASME International Mechanical Engineering Congress and Exposition, Orlando, Florida, November 5-11, 2005.
6. A. Barker, B. Cage, S. Russek, R. Garg, R. Shandas, and C. Stoldt. "Tailored Nanoscale Contrast Agents for Magnetic Resonance Imaging", in 2005 ASME International Mechanical Engineering Congress and Exposition, Orlando, Florida, November 5-11, 2005.
7. A. Barker, H. Zheng, K. Waters, C. Stoldt, and R. Shandas. "Processing And Characterization Of A Nanoscale Contrast Agent For Ultrasound Based Molecular Imaging: Exploration Of Acoustic And Non-Acoustic Synthesis Methods", in Proceedings of the 2005 Summer Bioengineering Conference, abstract 367323, Vail, CO, June 22-26, 2005.
8. S. Lammers, C. Stoldt, J. Hutton, P. Pratt, and R. Shandas. "Conjugation Efficiency Of Functionalized Microbubbles For Targeted Ultrasound-Based Molecular Imaging", in Proceedings of the 2005 Summer Bioengineering Conference, abstract 376789, Vail, CO, June 22 - 26, 2005.
9. Weber, M.W., A. Barker, C. Stoldt, and R. Shandas. "Initial Study To Simulate Microbubble Fabrication Using Microfluidics For Application As Ultrasound Contrast Agent", in Proceedings of the 2005 Summer Bioengineering Conference, abstract 243562, Vail, CO, June 22-26, 2005.
10. D. Miller, K. Gall, and C. Stoldt, "Galvanic Cell Formation During MEMS Release Processes: Implications for Sub-Micron Device Fabrication", Proc. IMECE '04, ASME Internat'l Mech. Eng. Congress, Anaheim CA, 2004.
11. David C. Miller, C. Herrmann, Hans J. Maier, Steve George, Conrad Stoldt, and Ken Gall. "Multilayer Au/Cr/Si Thin Films Subject to Annealing". Proc. Mat. Res. Soc. Symp., Fall 2004. (peer-reviewed)
12. D. Miller, C. Stoldt, D. Finch, and K. Gall (2004) Thermomechanical Behavior and Reliability of Au/Si MEMS Structures, Proc. IEEE Inter. Rel. Phys. Symp., Phoenix, AZ. 2004, pp. 633-634.
13. A.R. Layson, K.J. Caspersen, C.R. Stoldt, P.A. Thiel, and J.W. Evans, "Mound Formation and Evolution during Ag/Ag(100) Homoepitaxy: Analysis of Ultra-Rough Growth in a Prototypical "Smooth Growth Regime", Mater. Res. Soc. Proc., Vol. 859E, 2004. (peer-reviewed)
14. M.B.J. Wijesundara, D.C. Walther, C.R. Stoldt, K. Fu, D. Gao, C. Carraro, A.P. Pisano, and R. Maboudian, "Low Temperature CVD SiC coated Si Microcomponents for Reduced Scale Engines," Proc. IMECE '03, ASME Internat'l Mech. Eng. Congress, Wash. DC, 2003, #41696.
15. C.R. Stoldt, C. Carraro, W.R. Ashurst, M.C. Fritz, D. Gao, and R. Maboudian, 2001. "Novel Low-Temperature CVD Process for Silicon Carbide MEMS." Proceedings Transducers '01 / Eurosensors XV, Munich, Germany, June 10-14: 984-987. (peer-reviewed)
16. J. Evans, C. Stoldt, K. Caspersen, M. Bartelt, T. Layson, P. Thiel. "Morphological evolution during multilayer growth of metal films: Simulation and experiment," Proc. American Chemical Society, August 2000.

## **INVITED UNIVERSITY AND INDUSTRY PRESENTATIONS**

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1. Next Generation Energy Storage: All Solid-State Rechargeable Batteries, Rocky Mountain MRS Industry Seminar Series, November 2015.
2. Nanostructured Iron Pyrite (FeS<sub>2</sub>) for Next Generation Energy Storage, Sandia National Laboratory, Albuquerque NM, April 2014.
3. New Developments in Nanostructured Iron Pyrite (FeS<sub>2</sub>) for Energy Conversion and Storage, Dept. of Chemical Engineering, Colorado School of Mines, January 2013.
4. Galvanic Porous Silicon: From Microsystems Reliability to Nano-Energetics, Sensors and Electron Devices Directorate, Army Research Laboratory, February 2012.
5. On-chip Nanoenergetic Porous Silicon, Sandia National Labs, Albuquerque NM, August 2011.
6. Silicon and Germanium Nanocrystals for Next-Generation Photovoltaics, Center for Revolutionary Solar Photovoltaics, National Renewable Energy Laboratory, Golden CO, June 2011.
7. Porous Silicon: From Microsystems Reliability to Nano-Energetics, Dept. of Mechanical Engineering, University of Colorado at Boulder, October 2010.
8. Galvanic Corrosion in Silicon Microsystems: Impact on Material Properties and Device Performance, Dept. of Chemical and Nuclear Engineering, University of Missouri at Columbia, November 2009.
9. Mechanical and Morphological Effects of Galvanic Corrosion on Structural Polysilicon, Dept. of Chemical Engineering, Auburn University, March 2007.
10. Mechanical and Morphological Effects of Galvanic Corrosion on Structural Polysilicon, Dept. of Mechanical Engineering, Iowa State University, November 2006.
11. Nanomaterials Development for Molecular Imaging Applications, Chemistry Department, Iowa State University, November 17, 2006.
12. Mechanical and Morphological Effects of Galvanic Corrosion on Structural Polysilicon, Dept. of Mechanical Engineering, Berkeley Sensor and Actuator Center, University of California at Berkeley, November 1, 2006.
13. Nanomaterials Development for Molecular Imaging of Ovarian Cancer, University of Colorado Cancer Center Symposium Series, UCHSC, October 17, 2006.
14. Galvanic Corrosion during MEMS Release Processing, September 2005, Department of Mechanical Engineering, University of Colorado, Boulder, CO.
15. Paramagnetic Nanoparticles for Molecular Imaging Applications, 2004, Energy and the Environment Seminar Series, University of Colorado, Boulder, CO.
16. Low Dimensional Group IV Alloys derived from Single Source Precursors, 2004, Saginaw Valley State University, Saginaw, MI.
17. Cluster-Step and Cluster-Cluster Coalescence: Post-Deposition Dynamics in Submonolayer Ag/Ag(100) Homoepitaxy, 1998, Union Carbide Corporation, Charleston, WV.

## **CONFERENCE ORAL AND POSTER PRESENTATIONS**

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1. Oral: I. Lisenker and C. Stoldt, "Grain Boundary Engineering in Solid-State Ionic Conductors," submitted to the 18<sup>th</sup> International Meeting on Lithium Batteries, Chicago IL, June 19-24, 2016.
2. Oral: I. Lisenker and C. Stoldt, "Grain Boundary Engineering in Solid-State Ionic Conductors," submitted to the 229<sup>th</sup> Meeting of the Electrochemical Society, San Diego CA, May 29-June 3, 2016.
3. Oral: J. Coyle, C. Apblett, and C. Stoldt, "Composition and Structure of Lithium Silicate Thin Film Electrolytes Deposited by Radio Frequency Magnetron Sputtering," submitted to the 229<sup>th</sup> Meeting of the Electrochemical Society, San Diego CA, May 29-June 3, 2016.
4. Poster: Conrad R. Stoldt, "Structure, Composition, and Processing of Solid-Phase Lithium Ion Conducting Electrolytes", 2016 *Gordon Research Conference* on Batteries, Ventura CA, February 21-26, 2016.

5. Oral: L. Shulte, J. Pellegrino, and C. Stoldt, "Precision H<sub>2</sub> Delivery Via a Ceramic Membrane Contactor to Continuously Manufacture Ag Nanoparticles," AIChE Annual Meeting, November 8-13, 2015.
6. Oral: J. Coyle, C. Apblett, and C. Stoldt, "Li ion Mobility in Sputtered LGPS-type Solid-State Electrolytes," 2015 MRS Spring Meeting, San Francisco CA, April 6-10, 2015.
7. Oral: C.R. Stoldt, "Resonant Light Scattering in Iron Pyrite Colloidal Solutions," Workshop on Nanomaterials: Computation, Theory, and Experiment, Telluride Science Research Center, June 29-July 3, 2015 (Invited Speaker).
8. Poster: B. Francisco and C.R. Stoldt, "Structure and Energetics of NASICON type Solid Phase Electrolytes," Beyond Lithium Ion VIII, Oak Ridge National Laboratory, June 2-4, 2015.
9. Oral: C.R. Stoldt, "Toward All-Solid-State Thin Film Batteries," NATBATT Annual Meeting and Conference, Phoenix AZ, February 16-19, 2015.
10. Oral: C.R. Stoldt, "All-Solid-State Lithium Metal Batteries for Next Generation Energy Storage," The 17th International Conf. on Solid-State Sensors, Actuators and Microsystems (Transducers 2013 and Eurosensors XVII) Barcelona, Spain, June 16-20, 2013.
11. Poster: H.A. Macpherson and C.R. Stoldt, "Iron Pyrite Nanocubes: Surface Consideration for Photovoltaic Application," Materials Research Society Spring 2013 Meeting, San Francisco, CA, April, 2013.
12. Oral: H.A. Macpherson and C.R. Stoldt, "Iron Pyrite Nanocubes: Surface Consideration for Photovoltaic Application," Center for Revolutionary Solar Photoconversion, 2013 Annual Meeting, March 2013.
13. Oral: B. Francisco and C.R. Stoldt, "Nanostructured All-Solid-State Supercapacitor based upon the Li<sub>2</sub>S-P<sub>2</sub>S<sub>5</sub> Solid Electrolyte," 221<sup>st</sup> Meeting of the Electrochemical Society, May 6-10, 2012, Seattle WA.
14. Poster: H.A. Macpherson and C.R. Stoldt, "Iron Pyrite (FeS<sub>2</sub>) Nanocubes: Maintaining Semiconducting Properties," Materials Research Society Spring 2012 Meeting, San Francisco, CA, April, 2012.
15. Poster: B. Francisco and C.R. Stoldt, "Nanostructured All-Solid-State Supercapacitor based on the Li<sub>2</sub>S-P<sub>2</sub>S<sub>5</sub> Glass-Ceramic Electrolyte," Materials Research Society Spring 2012 Meeting, San Francisco, CA, April, 2012.
16. Oral: Collin R. Becker, Luke Currano, Wayne Churaman, Christopher Morris, and Conrad R. Stoldt, "Galvanic Etching to Realize on-Chip Nanoporous Silicon Energetic Composites," Materials Research Society Fall Meeting, Boston, MA, November 2011.
17. Oral: Collin Becker, Luke Currano, Christopher Morris, Conrad Stoldt, and Wayne Churaman, "Flame Propagation Rates and Thermal Analysis of Nanoenergetic Porous Silicon," 39<sup>th</sup> North American Thermal Analysis Society (NATAS), Des Moines IA, 2011.
18. Oral: C.R. Stoldt, "Development of Nanostructured Composite Electrodes for All Solid-State Lithium Ion Batteries," Invited presentation at MS&T 2011 Fall Meeting, Columbus, OH.
19. Oral: J.E. Trevey, C.R. Stoldt, S.-H. Lee, "Advances in All-Solid-State Rechargeable Lithium-ion Battery Research", 217th Meeting of The Electrochemical Society Fall Meeting, Vancouver, BC, Canada, April, 2010.
20. Oral: J.E. Trevey, C.R. Stoldt, S.-H. Lee, "Advances in All-Solid-State Rechargeable Lithium-ion Battery Research", Materials Research Society Spring 2010 Meeting, San Francisco, CA, April, 2010.
21. Wayne A. Churaman, Collin R. Becker, Grace D. Metcalfe, Brendan M. Hanrahan, Luke J. Currano, and Conrad R. Stoldt, "Optical initiation of nanoporous energetic silicon for safing and arming technologies," Proceedings of SPIE: Optical Technologies for arming, safing, and fuzing VI., San Diego, CA, August 2010 (Invited Talk).
22. Oral: J.E. Trevey, C.R. Stoldt, S.-H. Lee, "Effect of Native Oxide Layer on the First Cycle Coulombic Efficiency of Solid State Nanosilicon Based Anodes for Lithium Batteries", 218th Meeting of the Electrochemical Society Fall 2010 Meeting, Las Vegas, NV, October, 2010.

23. Oral: J.E. Trevey, C.R. Stoldt, S.-H. Lee, "TiS<sub>2</sub>/S Composite Materials for All-Solid-State Lithium Batteries", 218th Meeting of the Electrochemical Society Fall 2010 Meeting, Las Vegas, NV, October, 2010.
24. Poster: Becker CR, Apperson S, Currano L, Churaman W, Morris C, Stoldt CR., "Characterization and On-Chip Device Intergration of Energetic Porous Silicon", Gordon Research Conference on Energetic Materials, 2010.
25. Oral: Becker CR, Currano L, Churaman W, Stoldt CR., "Characterization and On-Chip Device Integration of Energetic Porous Silicon" ECS Spring 2010 Meeting, Vancouver B.C.
26. Oral: Becker CR, Currano L, Churaman W, Stoldt CR., "Fundamental Studies and On-Chip Integration of Nanoporous Energetic Silicon" TMS Conference, Spring 2010.
27. Oral: Becker CR, Miller DC, Stoldt CR., "Finite Element Simulation Of Galvanic Corrosion In Silicon Microsystems", TMS Conference, Spring 2010.
28. Oral: Molecular Imaging Using USPIO Nanoparticles for Non-Invasive Detection of Renal Inflammation, Internat'l Soc. for Magnetic Resonance in Medicine, 17<sup>th</sup> Scientific Meeting and Exhibition, Honolulu, HA, April 18-24, 2009.
29. Poster: Characterization and Simulation of MEMS Silicon Corrosion By Electrochemical Analysis and Finite Element Method, Annual MRS Fall Meeting, Boston, MA, December 2008.
30. Oral: Preparation of Freestanding Si and Ge Nanocrystals by Ultrasonic Aerosol Pyrolysis for Next Generation Solar Conversion and Energy Storage Applications, Annual MRS Fall Meeting, Boston, MA, December 2008.
31. Oral: Immune Tolerance Induction Using Superparamagnetic Iron Oxide Nanoparticles, Annual MRS Fall Meeting, Boston, MA, December 2008.
32. Oral: Si nanoparticles as negative-electrode materials for solid-state lithium-ion batteries, PRIME 2008: Pacific Rim Meeting on Electrochemical and Solid-State Science, 214<sup>th</sup> Meeting of the Electrochemical Society, Honolulu, HA, September 2008.
33. Oral: David Miller, Collin Becker, Brad Boyce, and Conrad R. Stoldt, "A Comparison of the Strength of Poly- and Single-Crystalline Silicon Subject to Galvanic Corrosion in Hydrofluoric Acid", Materials Research Society Symposium, Fall 2007, DD2.4.
34. Oral: A Comparison of the Strength of Poly- and Single-Crystalline Silicon Subject to Galvanic Corrosion in Hydrofluoric Acid, November 2007, ASME Internat'l Mech. Eng. Congress, Seattle, WA.
35. Oral: A Novel Protein Assay Capable of Single Molecule Detection using Total Internal Reflection Fluorecence (TIRF) Microscopy, September 2007, Joint Molecular Imaging Conference, Providence, Rhode Island.
36. Poster: The Effects of Super Paramagnetic Iron Oxide Nanoparticle PEGylation on Spin-Spin (T<sub>2</sub>) Proton Relaxation, September 2007, Joint Molecular Imaging Conference, Providence, Rhode Island.
37. Poster: Micellar multi-SPIO Molecular MRI Agents: Synthesis and Characterization of a Novel SPIO aggregate for in vivo Ovarian Cancer Imaging, September 2007, Joint Molecular Imaging Conference, Providence, Rhode Island.
38. Poster: Phospholipid Encapsulation And Surface Functionalization Of Superparamagnetic Iron Oxide Nanoparticles For Molecular Magnetic Resonance Imaging: Effects On Spin-Spin Proton Relaxation, June 2007, ASME Summer Bioengineering Conference, Keystone, CO.
39. Poster: Molecular magnetic resonance imaging (MRI) of surface-epithelial-derived protein CA125 in human ovarian carcinoma cells using superparamagnetic immunomicelles, May 2007, Joint Annual Meeting, International Society Magnetic Resonance in Medicine, Berlin, Germany.
40. Oral: Surface Chemistry and Aggregation Effects of Super-Paramagnetic Iron Oxide Nanoparticles for Molecular Magnetic Resonance Imaging, April 2007, Annual Spring MRS Meeting, San Francisco, CA.
41. Poster: Galvanic Corrosion of Polysilcon Thin Films, April 2007, Annual Spring MRS Meeting, San Francisco, CA.

42. Oral: Controlling Nanoparticle Aggregation in Colloidal Microwave Absorbers via Interface Chemistry, March 2007, SPIE Smart Structures and Materials 14<sup>th</sup> Annual International Symposium, San Diego, CA.
43. Poster: Molecular magnetic resonance imaging (MRI) of epidermal growth factor receptor(EGFR) in human carcinoma cells using superparamagnetic immunomicelles, Signaling Transduction Modulators in Cancer Therapy Symposium, University of Colorado Health Sciences Center, December 7, 2006.
44. Poster: Molecular magnetic resonance imaging of human ovarian carcinoma cells using superparamagnetic immunomicelles, 5th Annual Meeting of the Society for Molecular Imaging, Waikaloa, HA, August 30-September 6, 2006.
45. Oral: Mechanical Effects of Galvanic Corrosion of Thin Film Polysilicon, 2005, ASME Internat'l Mech. Eng. Congress, Orlando, FL.
46. Oral: Tailored Nanoscale Contrast Agents for Magnetic Resonance Imaging, 2005, ASME Internat'l Mech. Eng. Congress, Orlando, FL.
47. Poster: Conjugation Efficiency Of Functionalized Microbubbles For Targeted Ultrasound-Based Molecular Imaging, 2005, in Proceedings of the 2005 Summer Bioengineering Conference, Vail, CO, June 22 - 26.
48. Poster: Initial Study To Simulate Microbubble Fabrication Using Microfluidics For Application As Ultrasound Contrast Agents, 2005, in Proceedings of the 2005 Summer Bioengineering Conference, Vail, CO, June 22-26.
49. Oral: Galvanic Cell Formation During MEMS Release Processes: Implications for Sub-Micron Device Fabrication, 2004, ASME Internat'l Mech. Eng. Congress, Anaheim, CA.
50. Oral: Multilayer Au/Cr/Si Thin Films Subject to Annealing, 2004, Mat. Res. Soc. Symp., Boston, MA.
51. Oral: Thermomechanical Behavior and Reliability of Au/Si MEMS Structures, 2004, IEEE Inter. Rel. Phys. Symp., Phoenix, AZ.
52. Oral: Low Temperature CVD SiC coated Si Microcomponents for Reduced Scale Engines, 2003, ASME Internat'l Mech. Eng. Congress, Wash. DC.
53. Oral: New Low-Temperature CVD Process for Silicon Carbide MEMS, 2001, Annual Meeting of the American Institute of Chemical Engineers, Reno, NV.
54. Oral: Novel Low-Temperature CVD Process for Silicon Carbide MEMS, 2001, Transducers '01 / Eurosensors XV, Munich, Germany.
55. Oral: Deuterium Etching of the Si-rich SiC(0001) (3x3) Surface Reconstruction, 2000, 47<sup>th</sup> American Vacuum Society International Symposium, Boston, MD.
56. Oral: Evolution of Two-Dimensional Clusters with Exotic Shapes, 2000, Meeting of the American Physical Society (March 2000).
57. Oral: Modeling of Metal(100) Homoepitaxial Film Growth at Very Low Temperatures, 2000, Meeting of the American Physical Society (March 2000).
58. Oral: Kinetic Roughening During Ag/Ag(100) Homoepitaxy Between 190 K and 260 K, 2000, Meeting of the American Physical Society (March 2000).
59. Poster: Relaxation of Exotic Nanostructures in Ag/Ag(100) Adlayers, 1999, Gordon Conference on Chemical Reactions at Surfaces (March 1999).
60. Oral: Novel Temperature Dependence of the Morphology of Deposited Multilayer Ag/Ag(100) Films, 1999, 46<sup>th</sup> American Vacuum Society International Symposium, Seattle, WA.
61. Oral: Restructuring of Non-Square Vacancy and Adatom Clusters and of Indentations and Protrusions at Step Edges for Ag/Ag(100), 1998, 45<sup>th</sup> American Vacuum Society International Symposium, Baltimore, MD.
62. Oral: Cluster-step and cluster-cluster coalescence: Post-deposition dynamics in Ag/Ag(100) adlayers, 1998, Meeting of the American Physical Society, Los Angeles, CA (March 1998).
63. Oral: Estimation of the Terrace Diffusion Barrier in Submonolayer Ag/Ag(100) Homoepitaxy using HRLEED and VTSTM, 1998, 31<sup>st</sup> American Chemical Society Great Lakes Regional Meeting, Milwaukee, WI.

64. Oral: Cluster-step and cluster-cluster coalescence: Post-deposition dynamics in Ag/Ag(100) adlayers, 1997, 44th National Symposium of the American Vacuum Society, San Jose, CA (October 1997).
65. Poster: Submonolayer nucleation and growth of 2D islands and multilayer kinetic roughening during Ag/Ag(100) homoepitaxy, 1996, 10th Am. Conference on Crystal Growth & Ninth International Conference on Vapor Growth & Epitaxy, Boulder, Colorado (August 1996).

## UNIVERSITY TEACHING AND ADVISING

### TEACHING ASSESSMENT: Faculty Course Questionnaire (FCQ) Results

Year	Semester	Course		Student Ratings	
				Instructor	Course
2002	Fall	GEEN 1400	Freshman Design Projects	A	B+
2003	Spring	MCEN 5022	Thermodynamics	A	B+
2003	Fall	GEEN 1400	Freshman Design Projects	A	A-
2004	Spring	MCEN 5022	Thermodynamics	B+	B
2004	Spring	MCEN 4228	MicroNanoBio Eng.	B	B+
2004	Fall	GEEN 1400	Freshman Design Projects	A	A
2005	Spring	MCEN 4228	MicroNanoBio Eng.	B+	B
2005	Fall	GEEN 1400	Freshman Design Projects	A	A
2006	Spring	MCEN 5022	Thermodynamics	B	B-
2006	Spring	MCEN 4228	MicroNanoBio Eng.	Not reported.	

After Spring '06, ratings are based on a scale of 1-6 where scale = 1 (low), 6 (high).

2006	Fall	MCEN 4228	Measurements Laboratory	3.1	2.3
2007	Spring	MCEN 5022	Thermodynamics	5.3	4.5
2007	Fall	MCEN 4228	Measurements Laboratory	4.8	3.0
2008	Spring	MCEN 4228	Senior Laboratory	5.1	3.8
2008	Fall	MCEN 5228	Materials Chem. & Struct.	5.2	4.8
2009	Spring	MCEN 2024	Materials Science	4.9	4.3
2009	Spring	MCEN 4047	M.E. Laboratory	5.3	4.5
2009	Fall	MCEN 5228	Materials Chem. & Struct.	4.5	4.2
2009	Fall	MCEN 1000	Intro to Mech. Eng.	4.6	4.5
2010	Spring		<i>Sabbatical</i>		
2010	Fall		<i>Parental Leave</i>		
2011	Spring	MCEN 2024	Materials Science	5.3	4.5
2011	Fall	MCEN 5228	Materials Chem. & Struct.	5.1	4.7
2012	Spring	MCEN 2024	Materials Science	4.5	4.6
2012	Fall	MCEN 5228	Materials Chem. & Struct.	5.2	4.7
2012	Fall	MCEN 1208	Chemistry for Mech. Eng.	5.3	4.7
2013	Fall	MCEN 1208	Chemistry for Mech. Eng.	5.3	4.8
2014	Spring	MCEN 1208	Chemistry for Mech. Eng.	5.0	4.9
2014	Spring	MCEN 3037	Data Analysis	5.1	3.5
2014	Fall	MCEN 2014	Materials Science	4.8	4.5
2015	Spring	MCEN 5034	Mat'ls Thermo & Kinetics	5.4	4.6
2016	Fall	MCEN 2024	Materials Science	5.2	4.8
2017	Spring	MCEN1024	Chemistry for Mech. Eng.	5.0	4.5
2018	Spring	MCEN 4085	Senior Design Mentor	n/a	n/a
2018	Spring	MCEN 2024	Materials Science	4.6	4.2
2018	Fall	MCEN 5024	Materials Chem. Properties	4.9	4.6
2018	Fall	CHEM 5251	Materials Chem. Properties	5.6	5.6
2019	Spring	MCEN 2024	Materials Science	4.9	4.5
2019	Fall	MCEN 5024	Materials Chem. Properties	5.8	6.0
<i>Average FCQ Score since 2009</i>				5.1	4.9

### GRADUATE STUDENT THESES ADVISED

- David C. Miller, PhD Graduate, 2003-2007 (primary advisor)

- Thesis title: “Galvanic Corrosion Induced Damage of Miniaturized Silicon Structures”
- Brian A. Larsen, PhD Candidate, 2004-2008 (primary advisor)  
Thesis title: “Bioengineered Nanoparticles: Applications for Molecular Imaging”
- Collin Becker, PhD Candidate, 2006-2010 (primary advisor)  
Thesis title: “Galvanic Porous Silicon: Processing and Characterization for Nanoenergetics”
- Hector Alexander MacPherson, PhD Candidate, 2008-2013 (primary advisor)  
Thesis title: “On the Chemical Synthesis and Physical Properties of Iron Pyrite, Especially the (100) Surface”
- Brian Francisco, PhD Candidate, 2009-2014 (primary advisor)  
Thesis title: “From Material Design to Device: Structural and Thermodynamic Considerations for Solid-Phase Lithium-Ion Electrolytes”
- Ilya Lisenker, PhD Candidate in ME, 2012-present (primary advisor)  
Thesis title: “Radio Frequency Sintering of Li-ion Conducting Solids”
- Jaclyn Coyle, PhD Candidate in ME, 2013-2018 (primary advisor)  
Thesis title: “Magnetron Sputtering of Solid Phase Electrolyte Thin Films”
- Dennice Roberts, PhD Candidate in ME, 2014-present (primary advisor)  
Thesis title: “Nothing of consequence”

*POSTDOCTORAL RESEARCH ASSOCIATES ADVISED*

- Lauryn Baranowski, January 2016 – present (primary advisor).
- Leslie Schulte, May 2015 – present (co-advised).
- Brian Francisco, January 2015 – August 2015 (primary advisor).
- Fusheng Xu, January 2008 – December 2008 (primary advisor).

*UNDERGRADUATE RESEARCH ASSISTANTS ADVISED*

- Jessica Mello Kalbermatter, summer 2015, Brazil Scientific Mobility Program
- Michael Holt, summer 2014, UROP fellowship
- Taylor White, summer 2013, UROP fellowship
- Ben Krempansky, summer 2012, UROP fellowship
- Patrick Cotter, summer and fall 2011.
- Ben Healy, summer-fall, 2010.
- Christina Jones, spring-fall, 2010.
- Joseph Duggan, UROP fellowship, summer 2008.
- Rajeev K.C., BURST award & Butcher Biosciences Fellowship, 2006-2007
- Shivonne Haniff, Discover Learning Apprenticeship Program, fall, 2006
- Bob Lee, (Carnegie Mellon Univ.) summer, 2005
- William Brinser, 2004-2005
- Robert McMillen, UROP fellowship, spring-summer, 2004

**DEPARTMENTAL SERVICE**

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- Associate Chair for Undergraduate Programs, Department of Mechanical Engineering, 2013-2017
- Associate Chair, Department of Mechanical Engineering, 2015-2017
- Associate Chair for Undergraduate Programs, Department of Mechanical Engineering, 2013-2015
- Member, Department Personnel Committee, 2010-2015
- Member, Department of Mechanical Engineering Executive Committee, 2013-present



- Member, Department Graduate Committee, 2010-2012
- Member, Department Undergraduate Committee, 2006-2010
- Member, Department Faculty Search Committee, 2006-2007
- Member, Department Graduate Committee, 2004-2005
- Member, Department Industrial Advisory Committee, 2003-2004
- Member, Department Space Committee, 2002-2003

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#### **COLLEGE AND UNIVERSITY SERVICE**

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- Member, Administrator Appraisal Committee (AAC), Boulder Faculty Assembly, 2013-2015
- Member, CEAS Research Advisory Committee, 2014-2015
- Member, CU-Boulder Office for Industry Collaboration steering committee, 2013-2015
- Member, CEAS Undergraduate Education Committee, 2013-2015
- Chair, Student Affairs Committee, Boulder Faculty Assembly, 2009-2011
- Member, Executive Committee, Boulder Faculty Assembly, 2009-2010
- Member, Thesis Award Review Committee (CEAS), 2008

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#### **PROFESSIONAL SERVICE AND OUTREACH ACTIVITIES**

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##### *EDITORIAL ACTIVITIES*

- Editorial Board, *Nature Scientific Reports*  
2013 - present

##### *CONFERENCES AND WORKSHOPS*

- Co-creator and Vice President, Rocky Mountain Section of the Materials Research Society.  
*Drafted organizational documents, planned meetings, public relations, fund raising.*
- Symposium co-organizer and session chair, 2007 MRS Fall Meeting, Boston, MA.  
*Co-developed theme, scope, and specific subsections of the symposium entitled "Solids at the Biological Interface". Reviewed abstracts and selected speakers, chaired individual sessions, reviewed conference proceedings.*
- Program Committee Member, MEMS Sub-Division, IMECE '05, ASME Internat'l Mech. Eng. Congress, Orlando FL, 2005.  
*Reviewed abstracts and selected speakers, co-organized symposium schedule, chaired individual sessions, reviewed conference proceedings.*
- Program Committee Member, MEMS/MOEMS Technologies and Applications Sub-Division, SPIE Photonics Asia, Beijing, China, 2004.  
*Reviewed abstracts and co-organized symposium schedule.*
- Organizer and Faculty Host, NSF Nanotechnology in Undergraduate Education Participant Two-Day Workshop, Boulder, CO, 2004.
- Session Chair, MEMS Sub-Division, IMECE '04, ASME Internat'l Mech. Eng. Congress, Wash. DC, 2004.  
*Reviewed abstracts and selected speakers, co-organized symposium schedule, chaired individual sessions, reviewed conference proceedings.*

##### *SCIENTIFIC AND ENGINEERING SOCIETY MEMBERSHIP*

- Member, The American Chemical Society (ACS)
- Member, The Electrochemical Society (ECS)
- Member, Materials Research Society (MRS)
- Member, Cancer Center, University of Colorado Health Sciences Center
- Member, Society for Molecular Imaging, 2008
- Member, American Society of Mechanical Engineers (ASME), 2002-2005

*JOURNAL PEER REVIEW*

- Nature Scientific Reports
- ACS Nano Letters
- ACS Nano
- ACS Journal of Physical Chemistry C
- ACS Chemistry of Materials
- Applied Physics Letters
- ASME Journal of Electronic Packaging
- IEEE Sensors Journal
- Journal of Applied Physics
- Journal of Micromechanics and Microengineering
- Journal of Physical Chemistry B
- Journal of Physics D: Applied Physics
- Journal of Solid State Electrochemistry
- Langmuir
- Nanotechnology
- Semiconductor Science & Technology
- Sensors and Actuators A, Physical

*K-12 OUTREACH ACTIVITIES*

- Guest Lecturer, Angevine Middle School, Lafayette, CO, October 2007
- Presenter, CEAS Engineering Day, summer 2007
- Presenter, High School Honors Initiative (HSHI), summer 2003 & 2004

*OTHER PROFESSIONAL OUTREACH ACTIVITIES AND COMMUNITY SERVICE*

- Panelist, Nanotechnology Roundtable, CSHEMA-PRIZIM Regional EH&S Seminar, Boulder, CO (September, 2007)
- Member, Rocky Flats Citizens Advisory Board, 2003