

Rachel Sarah Selinsky

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EDUCATION:

- 2006 – 2012 *Ph.D.* Chemistry; University of Wisconsin-Madison
Advisor: Professor Song Jin
Title: “Synthesis and Characterization of Inorganic Semiconducting Nanocrystals for Solar and Spintronics Applications”
- 2002 – 2006 *B.A.* Chemistry, *B.A.* Studio Art with honors; Williams College

AWARDS AND HONORS:

- 2011 Leah Cohodas Berk Award for Excellence in Chemistry Research
- 2009 UW Madison Chemistry Department Undergraduate Research Mentor Award
- Fall 2008 National School on Neutron and X-ray Scattering
- 2006 Richard K. Meyers '44 Texaco Scholarship

RESEARCH EXPERIENCE:

- 2006 – present *Graduate Research Assistant*, University of Wisconsin-Madison
Advisor: Professor Song Jin, Department of Chemistry
Dissertation title- Chalcogenide nanocrystals and nanoscale heterostructures for spintronics and photovoltaics: synthetic development, physical property modification, and characterization
- 2005 – 2006 *Undergraduate Research Assistant*, Williams College
Advisor: Professor Lee Park, Department of Chemistry
Worked on synthesizing molecular wires formed by the alignment of liquid crystalline molecules in anodized alumina pore systems
- Summer 2003 *Undergraduate Research Assistant*, Williams College
Advisor: Professor Lawrence Kaplan, Department of Chemistry
Developed laboratory experiments for an undergraduate course in biophysical chemistry
- Summers 2002, 2001 *Student Researcher*, Drexel School of Medicine
Advisor: Professor Jonathan Nissanov, Department of Neuroanatomy
Digital image modification for a brain mapping project

SKILLS AND PROFESSIONAL AFFILIATIONS:

- 2004 – 2005, 2008 – 2009 American Chemical Society
- 2008 – present Neutron Scattering Society
- Summer 2006 Artist in residence at the Contemporary Artists Center in North Adams, MA (now the Contemporary Artists Center at Woodside in Troy, NY)
- Instrumental experience:* Transmission electron microscopy, scanning transmission electron microscopy, scanning electron microscopy, energy dispersive spectroscopy and mapping, vibrating sample magnetometry, X-ray magnetic circular dichroism, X-ray tomography, powder X-ray diffraction, UV-vis spectroscopy, Fourier transform infrared spectroscopy, inductively coupled plasma atomic emission spectroscopy, thermogravimetric analysis, nuclear magnetic resonance, dry air techniques with extensive experience in colloidal nanocrystal synthesis and sample preparation

Relevant skills: Wrote funded proposals for Argonne National Laboratory user facilities, scientific and artistic glassblowing (>250 hrs), proficient in digital photography, digital image/graphics creation and manipulation (Adobe Photoshop, Adobe Illustrator), web design (Adobe Dreamweaver), design and repair of electronic equipment, MIG welding, object construction (from a background in metal sculpture)

PUBLICATIONS:

1. Selinsky, R.S.; Ding, Q.; Faber, M.S.; Wright, J.C.; Jin, S.; "Quantum Dot Nanoscale Heterostructures for Solar Energy Conversion" *Chem. Soc. Rev.* (2013) DOI: 10.1039/C2CS35374A.
2. Block, S.; Yurs, L.; Pakoulev, A.; Selinsky, R.S.; Jin, S.; Wright, J.; "Multiresonant Multidimensional Spectroscopy of Surface-Trapped Excitons in PbSe Quantum Dots" *J. Phys. Chem. Lett.* 3 (2012) 2707-2712.
3. Selinsky, R.S.; Lukowski, M.; Sanghun, S.; Johns, R.; Jin, S.; "Epitaxial Heterostructures of Lead Selenide Quantum Dots on Hematite" *J. Phys. Chem. Lett.* 3 (2012) 1649-1656.
4. Yurs, L.; Block, S.; Pakoulev, A.; Selinsky, R.S.; Jin, S.; Wright, J.; "Spectral Isolation and Measurement of Surface-Trapped State Multidimensional Nonlinear Susceptibility in Colloidal Quantum Dots" *J. Phys. Chem. C.* 116 (2012) 5546-5553.
5. DeGrave, J.P.; Schmitt, A.L.; Selinsky, R.S.; Higgins, J.; Keavney, David J.; Jin, S.; "Spin Polarization Measurement of Homogeneously Doped Fe_{1-x}Co_xSi Nanowires by Andreev Reflection Spectroscopy" *Nano. Lett.* 11 (2011) 4431-4437.
6. Yurs, L.; Block, S.; Pakoulev, A.; Selinsky, R.S.; Jin, S.; Wright, J.; "Multiresonant Coherent Multidimensional Electronic Spectroscopy of Colloidal PbSe Quantum Dots" *J. Phys. Chem. C.* 115 (2011) 22833-22844.
7. Selinsky, R.S.; Han, J.H.; Morales Perez, E.A.; Guzei, I.A.; Jin, S.; "Synthesis and Magnetic Properties of Gd Doped EuS Nanocrystals with Enhanced Curie Temperatures," *J. Am. Chem. Soc.* 132 (2010) 15997-16005.
8. Selinsky, R.S.; Bierman, M.; Keavney, D.; Jin, S.; "Element-specific magnetometry of EuS nanocrystals using XMCD," *Appl. Phys. Lett.* 95 (2009) 202501.

PRESENTATIONS:

1. Clusters, Nanocrystals & Nanostructures. "Nanocrystal heterostructures for solar energy conversion and Gd doped EuS magnetic nanocrystals", Selinsky, R.S.; Lukowski, M.; Keavney, D.; Shin, S.; Johns, R.; Han, J.H.; Jin, S.; Mount Holyoke, MA, July 2011 (poster)
2. 237th ACS National Meeting "Synthesis and magnetic properties of doped and ligand-exchanged EuS nanocrystals", INOR 288, Selinsky, R.S.; Jin, S.; Salt Lake City, UT, March 2009 (oral)
3. 237th ACS National Meeting "'Nano boot camp' for high school students", CHED 50, Jin, S.; Selinsky, R.S.; Morin, S.A.; Rajkumar, J.; Salt Lake City, UT, March 2009 (oral, presented for S. Jin)

GROUP EXHIBITIONS:

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| 2006 | <i>Made in NA, MA.</i> Gallery 51 – North Adams, MA |
| 2006 | <i>All You Can Eat.</i> Williams College Museum of Art – Williamstown, MA |
| 2005 | <i>Forcefield.</i> Contemporary Artists Center – North Adams, MA |

TEACHING EXPERIENCE:*Faculty Assistant*, University of Wisconsin-Madison

Summer 2012 Fundamentals of Analytical Science (Chem 327)

Teaching Assistant, University of Wisconsin-Madison

Spring 2012, Fall 2007 Fundamentals of Analytical Science (Chem 329)

Spring 2007

Fall 2010, Fall 2008

Chemistry of Inorganic Materials (Chem 630)

Supervised a class of graduate students in a graduate level chemistry lab

Developed a laboratory experiment "Magnetic Characterization of Europium Sulfide Nanocrystals". Worked on development of experiments using the Hall Effect measurements and making solar cells.

Fall 2006

General Chemistry (Chem 103)

Mentoring undergraduate student researchers, University of Wisconsin-Madison

Spring 2011-Summer 2012

Sanghun Shin

Summer 2011

Robert Johns

Summers 2009, 2010

Elvin Morales

Summer 2008-Spring 2009

Jae Hyo Han

Spring 2008

Sarah Brendzel

Chemistry Tutor

Fall 2012 – Present General and analytical chemistry

Fall 2005 – Spring 2006 General and organic chemistry (through the Office of the Dean, Williams College)

Undergraduate Teaching Assistant, Williams College

Fall 2004

Concepts of Chemistry: Advanced Section (Chem 153)

Assisted with classes of undergraduate students in an advanced general chemistry lab

Fall 2003

Current Topics in Chemistry (Chem 155)

Assisted with classes undergraduate students in an advanced freshman chemistry lab

CURRICULUM DEVELOPMENT AND EDUCATIONAL OUTREACH:

2010

Developed and implemented a laboratory experiment component on measuring the Hall Effect in conductive polymer films for Chemistry of Inorganic Materials

2009

Traveled to University of Puerto Rico-Cayey to teach a laboratory experiment to undergraduate students to promote graduate study in chemistry and recruit potential students

2008 – 2009

Participated in student panels discussions for undergraduates about graduate school for UW-Madison Student Affiliates of the American Chemical Society (Apr 2009), UW-Madison Phi Beta Kappa (Nov 2008), Nano Bootcamp (Feb 2009, Jan 2008)

2009, 2008

A coordinator for Discovering Nanoscience ("Nano Bootcamp") Workshop for high school students from Conserve School (contributed to writing the laboratory manual, teaching the laboratory component, and implementing the workshop)

2008

Developed and implemented a laboratory experiment "Magnetic Characterization of Europium Sulfide Nanocrystals" for Chemistry of Inorganic Materials

LEADERSHIP AND COMMUNITY ACTIVITIES:

- Fall 2009 – Spring 2011 Materials Division Steering Committee, Department of Chemistry, University of Wisconsin Madison. Worked on issues related to the Materials Division of the Chemistry Department. (Member)
- 2007 – 2009 Graduate Student-Faculty Liaison Committee, Department of Chemistry, University of Wisconsin Madison. This committee's purpose is to facilitate discussion between students and faculty, voice graduate student concerns, foster a sense of community through departmental events, distribute travel grants, and catalyze change within the department. (Co-chair 2008-2009, Materials Division Representative 2007-2009)
- 2007 – 2009 Volunteered for Dane County Rape Crisis Center. I answered calls for their crisis line.
- 2004 – 2006 Volunteered for Williams College Rape and Sexual Assault Network. I answered calls for their crisis line.
- Fall 2005 – Spring 2006 Housing Coordinator through the Office of Campus Life at Williams College where I coordinated communication between the college and students, planned events, and managed funds for 40+ residential students.
- Fall 2005 – Spring 2006 1960's Scholar in Chemistry and 1960's Scholar in Art, These committees facilitate student-professional interactions outside the classroom by organizing guest lecturers. (Member)