

PERSONAL INFORMATION

James C. Schwabacher | Chicago, IL | schwabacher@u.northwestern.edu | www.schwabacher.me

EDUCATION

Doctor of Philosophy: Northwestern University, *expected August 2020*, Chemistry

Bachelor of Science: American University, May 2015, Chemistry

RESEARCH EXPERIENCE

National Science Foundation Graduate Research Fellow & Ph.D. Candidate December 2015 – Present
Dr. Emily A. Weiss

Northwestern University, Evanston, IL

- Synthesis, functionalization, and characterization of semiconductor nanocrystals
- Investigating the spectroscopic properties of quantum dot assemblies
- Systematically studying the effects of surface composition on nanocrystal properties

Immunological Research Intern June 2015 – August 2015

Dr. Alexandra Zanin-Zhorov

Kadmon Pharmaceuticals, New York, NY

- Processed and isolated peripheral blood mononuclear blood cells for storage
- Performed enzyme-linked immunosorbent assays, protein assays and Western blots
- Compiled data and results into easy-to-read reports

Researcher: Protein-Templated Quantum Dots August 2014 – May 2015

Dr. Matthew Hartings

American University, Chemistry Department, Washington, DC

- Investigated the optimal experimental conditions for quantum dot synthesis
- Synthesized BSA-templated HgS quantum dots in an aqueous environment
- Characterized nanoparticles via UV-Vis and fluorescence spectroscopy

Researcher: Experimental Chemistry I & II August 2014 – May 2015

Dr. Matthew Hartings

American University, Biomaterials Design Lab, Washington, DC

- Synthesized poly-vinyl alcohol films (with & without sodium montmorillonite) for water filtration systems
- Measured polymer film efficacy using UV-Vis
- Characterized films through FTIR, DSC, and powder XRD

DAAD RISE: German Academic Exchange Service, Research Internship May 2014 – August 2014

Prof. Dr. Katharina Landfester, Dr. Kristin Mohr & Svenja Winzen

Max Plank Institute for Polymer Research, Mainz, Germany

- Characterized protein adsorption on polystyrene and hydroxyethyl starch nanoparticles via ITC
- Compared the thermodynamic effects of sodium dodecyl sulfate and lutensol surfactants
- Synthesized, purified and spectroscopically analyzed fluorescently-labeled proteins
- Further analysis conducted with Dynamic Light Scattering

Researcher: Experimental Biological Chemistry I & II August 2013 – May 2014

Dr. Matthew Hartings

American University, Biomaterials Design Lab, Washington, DC

- Synthesized gold nanoparticles via protein-directed green chemistry
- Characterized the synthesized colloidal nanoparticles and fibers using UV-Vis and AAS
- Investigated the size and shape control of aqueous protein-directed ZnS:Mn quantum dots

Organic Chemistry Laboratory Assistant

October 2012 – May 2014

Dr. Monika Konaklieva

American University, Chemistry Department, Washington, DC

- Synthesized antimicrobial compounds by changing the tails attached to a beta-lactam starting material
- Conducted analysis of compounds via Nuclear Magnetic Resonance Spectroscopy and Mass Spectrometry
- Purified compounds through filtration, chromatography and recrystallization techniques

Researcher: LA-SiGMA Research Experience for Undergraduates

May 2013 - August 2013

Dr. Scott M. Grayson

Tulane University, Chemistry Department, New Orleans, LA

- Synthesized novel macromonomers via lactam ring openings
- Gained substantial operational knowledge of Nuclear Magnetic Resonance Spectroscopy
- Researched polymers, dendrimers, and their applications

PUBLICATIONS

4. Origin of the pH-Dependence of Emission of Aqueous Dihydrolipoic Acid-Capped PbS Quantum Dots; **James C. Schwabacher**, M.S. Kodaimati, E.A. Weiss; *The Journal of Physical Chemistry C*, Just Accepted Manuscript, DOI: 10.1021/acs.jpcc.9b03619

3. On the mechanism of protein-templated gold nanoparticle synthesis: Protein organization, controlled gold sequestration, and unexpected reaction products; Cassidy Hart, Nouf Abuladel, Madeleine Bee, Megan Channell, Alexander CVitan, Moira M Esson, Andrew Farag, Trisha Ibeh, Eleni Kalivas, Daniel-Mario Larco, Andrew Long, Loukas Lymperopoulos, Zachary Mendel, Nancy Miles, Carly Montanero, **James Schwabacher**, Helen Slucher, Javier Vinals, John Heddleston, Wenyue Li, Douglas M. Fox and Matthew R Hartings; *Dalton Transactions*, 2017, DOI: 10.1039/C7DT03275G

2. An introduction to ratchets in chemistry and biology; Bryan Lau, Ofer Kedem, **James Schwabacher**, Daniel Kwasnieski, Emily A. Weiss; *Materials Horizons*, 2017 4 (3), 310-318, DOI: 10.1039/C7MH00062F

1. Small Surfactant Concentration Differences Influence Adsorption of Human Serum Albumin on Polystyrene Nanoparticles; Svenja Winzen, **James C. Schwabacher**, Julius Müller, Katharina Landfester, and Kristin Mohr; *Biomacromolecules*, 2016 17 (11), 3845-3851, DOI: 10.1021/acs.biomac.6b01503

CONFERENCE PRESENTATIONS

The effect of temporal focus on students' motivation to learn science (Update 2019); TEACHx at Northwestern (Evanston, IL), Poster, May 23, 2019

Investigating the effects of phase transfer procedures on the photoluminescence of aqueous quantum dots; American Chemical Society Great Lakes Regional Meeting (Lisle, IL), Oral, May 3, 2019 & *American Chemical Society National Conference* (Orlando, FL), Oral, April 2, 2019

Collaboratively designing teaching assistant training programs to address institution-specific needs; American Chemical Society National Conference (Orlando, FL), Oral, April 1, 2019

The effect of temporal focus on students' motivation to learn science; Searle Teaching-As-Research Poster Session (Evanston, IL), Poster, June 13, 2018

Aqueous synthesis of polyvinyl alcohol-alginate-montmorillonite nanocomposite beads for applications in wastewater purification; American Chemical Society National Conference (Boston, MA), Poster, August 18, 2015

Nanoparticles Trapped in the Fibers of Unfolded Proteins; Discover the Sciences @AU (American University, Washington, DC), Poster, October 17, 2014

Synthesizing novel macromonomers via lactam-ring opening; NSF EPSCoR Research Infrastructure Improvement Symposium (Baton Rouge, Louisiana), Poster, July 29, 2013

ATTENDED CONFERENCES

TEACHx at Northwestern (Evanston, IL), May 23, 2019

Knowledge, Trust, and the Future of Democracy: Transatlantic Perspectives on the Role of Scholarship and Science in Society (Atlanta, Georgia), German Academic Exchange Service & Alexander von Humboldt Foundation, October 5, 2018

ComSciCon Chicago (Chicago, IL), August 25, 2018

TEACHx at Northwestern (Evanston, IL), May 19, 2017

AWARDS, FELLOWSHIPS & GRANTS

September 2015-August 2020, **National Science Foundation Graduate Research Fellowship (NSF GRF)**, Proposed project: Electrostatically-Controlled Self-Assembly and Purification of Microgel-Latex Core-Satellite Colloids with Defined Geometries

June 2017, **Robert L. Burwell, Jr. Summer Scholar**, awarded for excellence in physical chemistry at Northwestern University

August 2015, **ACS Undergraduate Award in Inorganic Chemistry**, awarded for excellence in inorganic chemistry at American University

HONORS, DISTINCTIONS

March 2019; Chemistry Department: Student Spotlight; Northwestern University

March 2013; Early Identification Program: Top 10% of Class; American University

August 2012; National Society of Collegiate Scholars; American University

PROFESSIONAL SOCIETY MEMBERSHIPS

July 2017; Phi Lambda Upsilon Honorary Chemical Society

May 2015; Phi Beta Kappa

October 2013; American Chemical Society

PROFESSIONAL TEACHING DEVELOPMENT

Center for the Integration of Research, Teaching, & Learning

Scholar Certification

June 2018 — June 2019

- Completed the highest certification awarded through the CIRTl network
- Continued and updated my teaching-as-research project
- Presented research findings and suggestions at the TEACHx education conference

STAR Practitioner Certification

January 2017 — June 2018

- Completed Teaching-As-Research workshop series
- Conducted a teaching-as-research project
- Presented research project findings to the campus community

Associate Certification

December 2017

- Completed STEM Teaching for Undergraduates course and learning community
- Completed *Writing an Effective Teaching Statement* workshop

COLLEGIATE TEACHING EXPERIENCE

June 2018—December 2018, An Introduction to Evidence-Based Undergraduate STEM Teaching, **Learning Community Leader**, Northwestern University, 2 hours/week

September 2016, 2017 & 2018, New Chemistry Graduate TA Workshop, **Workshop Leader**, Northwestern University

April—June 2017, Advanced Chemistry Laboratory, **Lead Teaching Assistant**, Northwestern University, 15 hours/week

April—June 2016, Advanced Chemistry Laboratory, **Secondary Teaching Assistant**, Northwestern University, 15 hours/week

April—June 2016, General Chemistry 3, **Teaching Assistant**, Northwestern University, 15 hours/week

January—March 2016, General Chemistry 2, **Teaching Assistant**, Northwestern University, 15 hours/week

September—December 2015, General Chemistry 1, **Teaching Assistant**, Northwestern University, 15 hours/week

PROFESSIONAL SERVICE

Treasurer: Graduate Liaison Committee August 2018 — Present

- Created funding requests totaling over \$20,000 for 5 organizations that were successfully funded
- Oversee committee budget to ensure proper allocation for planned events and initiatives
- Organize and lead meetings between multiple organizations and department stakeholders
- Design and implement communication protocols between organizations
- Develop an organizational constitution/mission statement
- Collect, analyze, and disseminate department survey data
- Present survey conclusions, and advocate for departmental policy changes, to faculty on behalf of the student body
- Plan and host professional development and community-building events

Co-Founder: Chemistry Graduate Student Teachers January 2018 — Present

- Founded a teaching community within the Northwestern University Chemistry Department
- Organize lunch discussions of STEM education literature
- Build connections between students, faculty, and staff to improve undergraduate education

Chemistry Teaching Assistant Training Program May 2016 — Present

- Organize and facilitate graduate student volunteer for multi-week TA training program
- Collaborate with department faculty and education experts to design effective training workshops
- Implement changes to the training program based on quantitative and qualitative data from past participants

COMMUNITY ENGAGEMENT/VOLUNTEER SERVICE

Northwestern SPLASH February 2018 — April 2019

- Developed and facilitated a 50-minute discussion-based lecture on the impacts of scientific research on society for thirty visiting high school students from diverse backgrounds

American Chemical Society Story Jam with C&En: Adventures in Outreach April 2019

- Performed live storytelling (Title: *The Long Pause*) to recounts lessons learned in science engagement

National Science Foundation Graduate Fellowship Networking Reception October 2018

- Presented a lightning talk on experimenting with science communication as a researcher

Chicago Council for Science and Technology: Science Riot March — June 2018

- Performed a science-based stand-up comedy routine for adult audiences

Science in Society: Junior Science Club September 2016 — June 2017

- Taught engineering and scientific concepts to elementary school students through Evanston's Youth and Opportunity United (Y.O.U) afterschool programming
- Mentored groups of 4-5 students conducting hands-on experiments for conceptual reinforcement

Lincolnwood Elementary Science Partnership October — December 2015 & 2016

- Facilitated the partnership between Lincolnwood Elementary and Northwestern University
- Demonstrated science-fair experiments to a classroom of twenty students in preparation for their personal science projects

Science in the Classroom: ETOPIA Production November 2015

The Engineering Transdisciplinary Outreach Project in the Arts (ETOPiA)

- Conducted exciting chemistry experiments for over 70 middle school students
- Reinforced classroom concepts through practical applications
- Discussed my role as a scientist and my personal career decisions

Westbrook Elementary National Chemistry Week Demonstrations October 2014

- Performed coffee filter-marker chromatography for kindergarten through 4th grade students

American University Physics Department's Haunted House October 2014

- Repeatedly demonstrated an orange-to-black clock reaction for over 200 students in 3 hours
- Assisted with chemiluminescent peroxide-luminol and edible sodium-alginate reactions

Ulman Cancer Fund for Young Adults: 4K for Cancer May 2012 -- August 2012

- Cycled over 4,000 miles from Baltimore, MD to Seattle, WA in 70 days to raise cancer awareness
- Successfully raised \$5,500 independently while the program raised nearly \$500,000
- Effectively coordinated cooperation among a team under challenging circumstances

PROFESSIONAL EXPERIENCE

Budget and Administration Assistant February 2013 – May 2015

Chemistry Department Office Assistant

August 2011 – February 2013

Alyssa Röhricht

American University, College of Arts and Sciences, Washington, DC

- Performed office tasks while facilitating interdepartmental communication
- Collected and presented critical data, such as course enrollment and evaluations
- Assisted in budgeting and accounting for the College of Arts and Sciences

Physical Sciences Tutor December 2010 – May 2015

Staten Island, NY & Washington, DC

- Met with high school students for one hour per week to strengthen their chemistry/physics skills
- Helped one student successfully raise her average a total of 9 points
- Provided additional honors chemistry and Advanced Placement chemistry instruction