

Ryan A. Beck

POSTDOCTORAL RESEARCHER

Seattle, WA

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Education

University of Washington

Seattle, WA

PH.D. IN CHEMISTRY

Sept. 2016 - Aug. 2021

ADVISOR: PROF. XIAOSONG LI

GPA: 3.54 / 4.0

York College of Pennsylvania

York, PA

B.S. IN CHEMISTRY, *Magna Cum Laude*. MINORS IN COMPUTER SCIENCE AND MATHEMATICS

Aug. 2012 - May 2016

GPA: 3.89 / 4.0

Experience

University of Washington

Seattle, WA

POSTDOCTORAL RESEARCHER

Sept. 2021 - Current

- Computational chemistry researcher with the Molecular Engineering Materials Center
- Familiarity with common electronic-structure software packages (Gaussian, VASP, Quantum Espresso)

University of Washington

Seattle, WA

DIRECT TRAINEE

Mar. - June 2019

- Machine-learning collaboration with Maria Chan at Argonne national lab investigating material properties given geometric and elemental properties
- Used python ML packages to attempt to refine search for important descriptors

York College of Pennsylvania

Seattle, WA

ORGANIC AND PHYSICAL CHEMISTRY LABORATORY PREPARATION

Aug. 2014 to May 2016

- Responsibilities include preparing and monitoring chemicals and supplies used during labs.

York College of Pennsylvania

Seattle, WA

LAB ASSISTANT

Jan. 2013 to May 2016

- Responsibilities include monitoring students to ensure safe and time efficient behaviors.

Honors & Awards

2019 - 2020 **Graduate Student Merit Fellowship**, University of Washington

Seattle, WA

2018 - 2019 **Data Intensive Research Enabling Clean Technologies (DIRECT) Fellowship**, University of Washington

Seattle, WA

2016 **Excellence in Chemistry Graduate Fellowship Award**, University of Washington

Seattle, WA

2016 **South Eastern Pennsylvania Section of the American Chemical Society Outstanding Chemist**, York College of Pennsylvania

York, PA

2015 - 2016 **Alpha Chi Honor Society**, Pennsylvania Delta Chapter

York, PA

2012 - 2016 **Dean's List**, York College of Pennsylvania

York, PA

2012 **Eagle Scout**, Boy Scouts of America Troop 26

Wrightsville, PA

Publications

12. Eagle, F. W.; Harvey, S.; **Beck, R. A.**; Li, X.; Gamelin, D. R.; Cossairt, B. M. Enhanced Charge Transfer from Coinage Metal Doped InP Quantum Dots *ACS Nanosci. Au*, **2023**, XX, XXXX-XXXX. DOI: 10.1021/acsnanoscienceau.3c00029.

11. Park, N.; **Beck, R. A.**; Hoang, K. K.; Ladd, D. M.; Abramson, J. E.; Rivera-Maldonado, R. A.; Nguyen, H. A.; Monahan, M.; Seidler, G. T.; Toney, M. F.; Li, X.; Cossairt, B. M. Colloidal, Room-Temperature Growth of Metal Oxide Shells on InP Quantum Dots. *Inorg. Chem.*, **2023**, 62, 6674-6687. DOI: 10.1021/acs.inorgchem.3c00161.
10. **Beck, R. A.***; Huang, Y.*; Petrone, A.; Abbott, J. W.; Pauzauskie, P. J.; Li, X. Electronic Structures and Spectroscopic Signatures of Noble-Gas-Doped Nanodiamonds. *ACS Phys. Chem. Au.*, **2023**, 3, 299-310. DOI: 10.1021/acspchemau.2c00072.
9. **Beck, R. A.**; Sun, S.; Xu, X.; Gamelin, D. R.; Cao, T.; Li, X., Understanding External Pressure Effects and Interlayer Orbital Exchange Pathways in the Two-Dimensional Magnet-Chromium Triiodide. *J. Phys. Chem.*, **2022**, 126, 19327-19335. DOI: 10.1021/acs.jpcc.2c03884.
8. Park, N.; Eagle, F. W.; DeLarme, A. J.; Monahan, M.; LoCurto, T.; **Beck, R. A.**; Li, X.; Cossairt, B. M., Tuning the Interfacial Stoichiometry of InP Core and InP/ZnSe Core/Shell Quantum Dots. *J. Chem. Phys.*, **2021**, 155, 084701. DOI: 10.1063/5.0060462.
7. **Beck, R.A.**; Lu, L.; Sushko, P. V.; Xu, X.; Li, X., Defect-Induced Magnetic Skyrmion in a Two-Dimensional Chromium Triiodide Monolayer. *JACS Au.*, **2021**. DOI: 10.1021/jacsau.1c00142.
6. **Beck, R.A.**; Lu, L.; Petrone, A.; Ong, A.C.; Pauzauskie, P.; Li, X., Spectroscopic Signatures of the B and H₄ Polyatomic Nitrogen Aggregates in Nanodiamond. *J. Phys. Chem. C*, **2020**, 124, 18275-18283. DOI: 10.1021/acs.jpcc.0c03106.
5. Sun, S.; **Beck, R.A.**; Williams-Young, D.B.; Li, X., Simulating Magnetic Circular Dichroism Spectra with Real-Time Time-Dependent Density Functional Theory in Gauge Including Atomic Orbitals. *J. Chem. Theory Comput.*, **2019**, 15, 6824-6831. DOI: 10.1021/acs.jctc.9b00632.
4. Crane, M.; Petrone, A.; **Beck, R.A.**; Lim, M.; Zhou, X.; Li, X.; Stroud, R.M.; Pauzauskie, P., High Pressure, High Temperature Molecular Doping of Nanodiamond. *Sci. Adv.*, **2019**, 5, eaau6073. DOI: 10.1126/sciadv.aau6073.
3. Leger, J.; Friedfeld, M.; **Beck, R.A.**; Gaynor, J.; Petrone, A.; Li, X.; Cossairt, B.; Khalil, M., Carboxylate Anchors Act as Exciton Reporters in 1.3 nm Indium Phosphide Nanoclusters. *Phys. Chem. Lett.*, **2019**, 10, 1833-1839. DOI: 10.1021/acs.jpcllett.9b00602.
2. Petrone, A.*; **Beck, R.A.***; Kasper, J.M.; Huang, Y.; Crane, M.; Pauzauskie, P.; Li, X., Electronic Structures and Spectroscopic Signatures of Silicon-Vacancy Containing Nanodiamonds. *Phys. Rev. B*, **2018**, 98, 205405. DOI: 10.1103/PhysRevB.98.205405.
1. **Beck, R.A.***; Petrone, A.*; Kasper, J.M.; Crane, M.; Pauzauskie, P.; Li, X., Effect of Surface Passivation on Nanodiamond Crystallinity. *J. Phys. Chem. C.*, **2018**, 122, 8573-8580. DOI: 10.1021/acs.jpcc.8b00354.

*Co-First Authors

Presentations

September 2023	Beck, R.A. ; Li, X., <i>Structural Modification of Electronic and Magnetic Properties.</i> (Oral Presentation) Quantum Information Science Center.	Georgia Institute of Technology
July 2023	Beck, R.A. ; Shumilov, K.; Snoeren, T.; Gamelin, D.R.; Li, X., <i>Covalency of Yb-X in Yb³⁺:CrX₃.</i> (Poster) Materials Research Science and Engineering Center.	University of Washington
June 2023	Beck, R.A. ; Li, X., <i>Computational Study of Nanodiamond Defects Influencing Experimental Design.</i> (Oral Presentation) Nanomaterials: Computation, Theory, Machine Learning and Experiment	Telluride, CO
Aug. 2020	Beck, R.A. ; Sushko, P.; Xu, X; Li, X., <i>Investigation of Chromium Iodide Skyrmionic Structures.</i> (Oral Presentation) Materials Research Science and Engineering Center.	University of Washington
Oct. 2019	Beck, R.A. ; Sun, S.; Liu, H.; Li, X., <i>Investigation of Layered Chromium Iodide Structures.</i> (Oral Presentation) Materials Research Science and Engineering Center.	University of Washington
Sept. 2019	Beck, R.A. ; Lu, L.; Petrone, A.; Ong, A.C.; Pauzauskie, P.; Li, X., <i>Spectroscopic Signatures of the Nitrogen B and H₄ Aggregates in Nanodiamonds.</i> (Poster) European Summerschool in Quantum Chemistry.	Sicily, Italy
June 2019	Beck, R.A. ; Sun, S.; Liu, H.; Li, X., <i>Investigation of Magnetic Properties of a Two-Dimensional Chromium Iodide Material.</i> (Oral Presentation) Northwest Theoretical Chemistry Conference.	Pullman, WA
Sept. 2018	Beck, R.A. ; Petrone, A.; Li, X., <i>Examination of Spectroscopic Signatures of Nanodiamond Defects.</i> (Oral Presentation) Materials Research Science and Engineering Center.	University of Washington

- Oct. 2017 **Beck, R.A.**; Petrone, A.; Li, X., *Spectroscopic Response to the Loss of Nanodiamond Surface Crystallinity*. (Poster) Northwest Theoretical Chemistry Conference *Richland, WA*
- Oct. 2017 **Beck, R.A.**; Petrone, A.; Li, X., *Spectroscopic Signatures of Surface Reconstructions of Nanodiamond*. (Oral Presentation) Materials Research Science and Engineering Center. *University of Washington*
- Mar. 2016 Esmeralda, L.; **Beck, R.A.**; Halligan, K., *Crosslinking of the Antibody Anti-Human IL-13R Alpha 2 Peptide IgY to FITC via PDPH*. (Poster) 251st ACS National Meeting *San Diego, CA*

Extracurricular Activity

REU Graduate Student Mentor

University of Washington

- Mentorship for recent high-school graduates (UW ALVA) and for current undergraduate (MEM-C REU) students.
- Have mentored eight students in computational chemistry applications from 2017-2020.
- Introduce REU students to using high-performance computing
- Introduce students to electronic structure methods and semiconducting nanomaterials

Clean Energy Institute Ambassadors

University of Washington

- Solar cell demonstration at MESA Day
- Solar car derby at Thorton Creek Elementary
- Solar car derby at Engineering Discovery Days

York College Chemistry Society

York College of Pennsylvania

- Chemistry Society secretary (2015-2016)
- Organization and facilitation of chemistry demonstrations to York Suburban High School
- Organization and facilitation of chemistry demonstrations for "Perspective Student" and "New Student" activities