ALEC A. BEATON

Ph.D. Candidate

aabeaton@syr.edu | 315-558-4829 | Syracuse, NY, USA | aabeaton.github.io
@AlecABeaton | alecbeaton | aabeaton

RESEARCH EXPERIENCE

Graduate Researcher

Syracuse University

August 2017 – Ongoing | Syracuse, New York, USA

Principal Investigator: John Franck

- Built 15 MHz NMR spectrometer
- Implemented advanced liquid state NMR and EPR experiments
- Developed algorithms for processing low- and high-field relaxometry data
- Studied quenching of translational motion in confined environments
- Performed basic cell culture techniques for exploring in-cell ODNP
- Conducted rudimentary MD simulations of materials systems

Graduate Researcher

New York University

August 2016 – May 2017 | New York, New York, USA

Principal Investigator: Tianning Diao

- Carried out DFT calculations on organometallic complexes in collaboration with Yingkai Zhang Lab

Undergraduate Research Assistant

Syracuse University

September 2015 – August 2016 | Syracuse, New York, USA

Principal Investigator: Bruce Hudson

- Synthesized deuterated cycloalkanes for NMR experiments on isotope shifts
- Carried out DFT calculations on cycloalkanes using Gaussian software

DAAD RISE Summer Research Assistant

Universität Paderborn

June 2015 – August 2015 | Paderborn, Germany

Principal Investigator: Dirk Kuckling

- Synthesized green catalysts for polymerization reactions

Undergraduate Research Assistant

Syracuse University

June 2014 – May 2015 | Syracuse, New York, USA

Principal Investigator: Daniel Clark

- Synthesized precursors for Ruthenium-based catalysis utilizing Schlenk technique
- Performed ^{1}H and ^{13}C NMR characterization of products

EDUCATION

Ph.D. in Physical Chemistry

Syracuse University

Aug 2017 – Dec 2022 [anticipated]

Supervisor: John Franck

B.Sc. in Chemistry

Syracuse University

Sept 2013 – May 2016

with Renée Crown University Honors
GPA: 4.00/4.00

PROGRAMMING SKILLS

TECHNICAL SKILLS

Liquid state NMR and EPR
Bruker Spectrometer pulse and AU programming
Low Field NMR Hardware
Rf circuit design
NMR Data Processing
MD Simulations
Serial and API programming of instruments

AFFILIATIONS

- International EPR (ESR) Society
- International Society of Magnetic Resonance
- Phi Beta Kappa Honors Society
- Alpha Chi Sigma, Professional Chemistry Fraternity
- American Chemical Society

HONORS AND AWARDS

- 2022, Graduate School Summer Dissertation Fellowship, Syracuse University, College of Arts and Sciences
- 2022, Student Travel Stipend, 63rd Experimental NMR Conference (ENC)
- 2021, Graduate Student Summer Fellowship, Syracuse University, College of Arts and Sciences
- 2020, Student Travel Stipend, 61st Experimental NMR Conference
- 2019, Student Travel Stipend, Rocky Mountain Conference on Magnetic Resonance
- 2016, Overall Excellence in Chemistry, Undergraduate Major Award, Syracuse University
- 2015, DAAD RISE Internship in Science and Engineering
- 2015, Willem Prins Award for Exceptional Performance in Physical Chemistry, Syracuse University
- 2014, George Wiley Award for Exceptional Performance in Organic Chemistry, Syracuse University

PUBLICATIONS

1. **Beaton, A.A.**; Guinness, A.; Franck, J.M. "A Robust, Modern Strategy for Treating Coherence Pathways in Unstable and Inhomogeneous Magnetic Resonance Experiments" *Submitted.* arXiv:2202.03313, 2022.
2. **Beaton, A.A.**; Guinness, A.; Betts, S.M.; Franck, J.M. "A Roadmap for Modular NMR Spectrometer Design." *In Preparation*, 2022.
3. **Beaton, A.A.**; Guinness, A.; Franck, J.M. "A Technique for Rapidly Screening Rotational Mobility and Hydrogen Bonding Strength of Reverse Micellar Water Pools." *In Preparation*, 2022.

RESEARCH PRESENTATIONS

1. **Beaton, A.A.**; Guinness, A.; Franck, J.M. "The Inside Story: Characterizing Water Pools within Reverse Micelles Using Relaxometry Techniques" *63rd Experimental NMR Conference, Orlando, FL.* **Apr. 26, 2022. Oral Presentation.**
2. **Beaton, A.A.**; Guinness, A.; Franck, J.M. "A New View on Coherence Pathways" *63rd Experimental NMR Conference, Orlando, FL.* **Apr. 25-28, 2022. Poster Presentation.**
3. **Beaton, A.A.**; Guinness, A.; Ackerman, K.; Rhodes, S.; Sahagian, M.; Franck, J.M. "Overcoming Obstacles in ODNP: Studying Hydration Water of New Chemical System *via* an Adaptable NMR Spectrometer" *Syracuse University Chemistry Department Admitted Graduate Student Visitation Day, Syracuse, NY.* **Mar. 20, 2021. Poster Presentation, virtual.**
4. **Beaton, A.A.**; Franck, J.M. "Overcoming Obstacles in ODNP: Studying Hydration Water of New Chemical System *via* an Adaptable NMR Spectrometer" *61st Experimental NMR Conference, Baltimore, MD.* **Mar. 11, 2020. Oral Presentation.**
5. **Beaton, A.A.**; Guinness, A.; Ackerman, K.; Rhodes, S.; Sahagian, M.; Franck, J.M. "Overcoming Obstacles in ODNP: Studying Hydration Water of New Chemical System *via* an Adaptable NMR Spectrometer" *61st Experimental NMR Conference, Baltimore, MD.* **Mar. 9-13, 2020. Poster Presentation.**

TEACHING EXPERIENCE

Physical Chemistry I (Lecture and Lab), Teaching Assistant (Syracuse University)
Aug 2021 - Dec 2021, Aug 2020 - Dec 2020
- *Designed experiments* for upper-level undergraduates focused on thermodynamic applications
- Led laboratory sections of 10-20 students to carry out experiments
- Graded lab reports, proctored exams, held office hours
- Adapted lab course content for remote learning during 2020 semester

Physical Chemistry II (Lecture and Lab), Teaching Assistant (Syracuse University)
Jan 2021 - May 2021, Jan 2020 - May 2020, Jan 2018 - May 2018
- *Designed experiments* for upper-level undergraduates focused on applications to quantum mechanics and spectroscopy
- Supervised laboratory sections of approximately 7 students to carry out experiments
- Graded lab reports and held office hours
- Adapted lab course content for remote learning during 2020 semester

General Chemistry I & II (Lecture), Teaching Assistant (Syracuse University)
Aug 2019 - Dec 2019, Jan 2019 - May 2019, Aug 2018 - Dec 2018, Aug 2017 - Dec 2017
- Led recitations (15-30 students) and held office hours
- Co-proctored large (200 student) exam sections and graded exams

Chemistry in the Environment Lab and Lecture, Teaching Assistant (New York University)
Jan 2017 - May 2017
- Supervised laboratory sections (10-15 students)
- Co-proctored large (200 student) exam sections and graded exams

Physical Chemistry Lab, Teaching Assistant (New York University)
Jan 2017 - May 2017
- Supervised laboratory sections (10-15 students) and graded lab reports

6. **Beaton, A.A.**; Ackerman, K.; Rhodes, S.; Sahagian, M.; Franck, J.M. “A Closer Look at Confined Water: Use of Overhauser Dynamic Nuclear Polarization to Study Nanoscale Water Dynamics in Aerosol-OT Reverse Micelle Model Systems” *Rocky Mountain Conference on Magnetic Resonance, Denver, CO.* **July 22-25, 2019. Poster Presentation.**
7. **Beaton, A.A.**; Rhodes, S.; Sahagian, M.; Franck, J.M. “Investigating Interfacial Water in AOT Reverse Micelles *via* Overhauser Dynamic Nuclear Polarization” *Syracuse University Chemistry Department Admitted Graduate Student Visitation Day, Syracuse, NY.* **Mar. 16, 2019. Poster Presentation.**
8. **Beaton, A.A.**; Franck, J.M. “A Nuts and Bolts Approach to NMR: Design and Theory” *Syracuse University Chemistry Department Admitted Graduate Student Visitation Day, Syracuse, NY.* **Mar. 3, 2018. Poster Presentation.**

MENTORING EXPERIENCE

Warren Kincaid *Nov. 2021 - present*
Graduate student, Franck Lab
Dr. Farhana Syed *Sep. 2019 - present*
Post-doc, Franck Lab
Alexandria Guinness *Jan. 2019 - present*
Graduate student, Franck Lab
Katie Ackerman *June - Aug. 2019*
Summer Research Undergraduate, Franck Lab
Michelle Sahagian *Sep. 2018 - May 2019*
Undergraduate Researcher, Franck Lab
Soliloquy Rhodes *Sep. 2018 - May 2019*
Undergraduate Researcher, Franck Lab

SERVICE

- American Chemical Society
  - Secretary (CNY Section), 2022-Ongoing
  - Delegate (CNY Section), 2014-2021
- Alpha Chi Sigma, Professional Chemistry Fraternity
  - President (Pi chapter), 2015-2016
  - Service Chair (Pi chapter), 2014-2016
  - Webmaster (Pi chpater), 2014-2015