WILLIAM BRACKETT

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Currently pursuing PhD in chemical engineering in the Milliron and Truskett labs at the University of Texas at Austin. Undergraduate research experience studying dynamics of ionic soft materials. Ambition to understand molecular scale interactions and their correlations to useful macroscale properties. Currently interested in researching fundamental questions pertaining to colloidal nanocrystals and dynamic assembly.

EDUCATION

PhD Student   **Aug 2023 – Present**
University of Texas, Austin – Chemical Engineering

Bachelor of Science   **May 2023**
University of Tennessee, Knoxville – Chemical Engineering
Cook Grand Challenge Honors Scholar
GPA: 3.87 on 4.0 scale

RESEARCH EXPERIENCE

University of Tennessee, Knoxville, TN   **2022 – 2023**
Position: Part-time Undergraduate Research Assistant
Supervisor: Dr Catalin Gainaru, Dr. Alexei Sokolov, Dr. Ivan Popov
- Characterized ionic copolymers for applications to solid state lithium-ion batteries
- Built laboratory hardware and operational software for custom Raman spectroscopy experiments

Oak Ridge National Laboratory, Oak Ridge, TN   **Summer 2022**
Position: Full-time Summer Undergraduate Researcher
Supervisor: Dr. Catalin Gainaru, Dr. Alexei Sokolov
- Characterized in-situ synthesized copolymers for solid state lithium-ion batteries
- Studied fundamental CO_2 absorption mechanisms in polymerized deep eutectic solvents
- Coded python programs to improve data analysis workflow and enable faster analysis of large datasets
- Prepared figures for publication

University of Tennessee, Knoxville, TN   **2021 – 2022**
Position: Part-time Undergraduate Research Assistant
Supervisor: Dr. Joshua Sangoro
- Synthesized and characterized deep eutectic solvents at and around eutectic composition using DSC
- Designed and implemented attachment for small wafer polymer spin coating

WORK EXPERIENCE

SkyNano Technologies, Knoxville, TN   **Summer 2023**
Position: Full-time research intern
Supervisor: Dr. Anna Douglas, Dr. David Wood

- Designed and executed protocol regarding high temperature electrochemistry experiments for process diagnostics
- Addressed hazardous solid particulate handling by designing fully enclosed and automated system
- Led efforts to integrate CO_2 derived carbon nanotubes into 3D printing filaments

TEACHING EXPERIENCE

University of Tennessee, Knoxville, TN   **Spring 2022**
Undergraduate Teaching Assistant, Chemical and Biomolecular Engineering

- Served as a grader and TA for Fluid Flow and Heat Transfer, a 200-level course comprised of over 70 students and covering macroscopic mass and heat transport
- Constructed grading rubrics for assignments and comprehensive design projects with other TA

PUBLICATIONS

Spittle, S.; Alfurayj, I.; Hansen, B. B.; Glynn, K.; Brackett, W.; Pandian, R.; Burda, C.; Sangoro, J. Enhanced Dynamics and Charge Transport at the Eutectic Point: A New Paradigm for the Use of Deep Eutectic Solvent Systems. *JACS Au* **2023**, 3 (11), 3024–3030. https://doi.org/10.1021/jacsau.3c00420**.**

PRESENTATIONS

Brackett, W.,Rahman, A., Sokolov, A., Gainaru, C.“In-situ synthesized copolymer lithium-ion conducting electrolytes for solid state batteries,”
Oak Ridge National Laboratory Summer Undergraduate Laboratory Internship presentation, August 2022

Brackett, W., Spittle, S., Hansen, B., Sangoro, J. "The effect of composition on dynamics and properties of deep eutectic solvents," *UTK EURēCA poster competition,* April 2022

Brackett, W., Spittle, S., Hansen, B., Sangoro, J. "The effect of composition on dynamics and properties of deep eutectic solvents," *UTK Chemical Engineering poster competition,* April 2022

Brackett, W., Spittle, S., Hansen, B., Sangoro, J. "The effect of composition on dynamics and properties of deep eutectic solvents*," Spring American Physical Society Conference,* March 2022

HONORS AND AWARDS

Cook Grand Challenge Honors Scholar, University of Tennessee   **2023**

2nd Place Poster Presentation, UTK dept of Chemical Engineering   **2022**

Top Presentation Distinguishment, American Physical Society   **2022**

UT-Battelle Scholar, UT-Battelle and Oak Ridge National Laboratory   **2019**

SKILLS

- Experience with material characterization techniques such as broadband dielectric spectroscopy, UV-Vis spectroscopy, Raman spectroscopy, dynamic light scattering, differential scanning calorimetry, and rheology
- Industrially implemented electrochemical characterization techniques including cyclic voltammetry, impedance spectroscopy, chronopotentiometry, chronoamperometry, and step voltammetry variations in high temperature environments
- Competent in handling hygroscopic materials, unbound nanoparticle mixtures, molten salts, cryogenics, compressed gasses, and strong acids
- Proficient in data analysis using software including OriginPro, Python, and MATLAB
- Designed lab-scale mechanical systems and user control software for various applications
- Proficient in Aspen and HYSYS process engineering software