David J. Thorne

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Objective

I am an undergraduate student with extensive research experience in experimental condensed matter and materials physics, looking to enter a graduate program in experimental condensed matter physics so that I may pursue exciting developments in quantum information, nano-scale, superconductor and other promising technologies.

Education

- Central Connecticut State University, New Britain, CT 06053
- Graduating this winter 2019
- Bachelor of Science in Physics, Bachelors of Arts in Mathematics.
- 3.69 GPA/4.0 Scale

Technical Skills

- Complex Experimental vacuum systems designed for mass flow under high vacuum conditions. Working knowledge of corresponding temperature and pressure sensory equipment and flow controllers.
- Various synthesis methods to synthesize nanoparticle materials
- Various characterization techniques including x-ray diffraction, differential scanning calorimetry, UV - Visible spectroscopy, and electrochemical methods like cyclic voltammetry.
- Installing and learning to operate technical equipment including a mass spectrometer.
- Data analysis and interpretation of data obtained from the above equipment, including but not limited to identifying crystal structure from XRD peaks, identifying phase changes from DSC curves, calculating band gap from UV-visible plots, identifying and quantifying species and reaction mechanisms from mass spectrometry peaks.
- Technical writing, oral presentations in the form of a poster or PowerPoint.

- Entry level programming knowledge, and proficiency in all Microsoft Office applications, LabView, Matlab, Minitab, ANSYS, and CAD software package Siemens NX.

Experience

Student Independent Research (August 2015-November 2015)

- I performed research on campus which involved the synthesis and characterization of a cathode of unique chemical composition that would provide batteries with longer life.

Volunteer for Mechanical Engineering Senior Project (February 2015- April 2015)

- I assisted a team of students who utilized CAD software and our university's machine shop to design and assemble a human-powered rover. This rover was used to compete in the NASA Rover Challenge.

REU Intern (June 2016-August 2016)

- Participated in a paid Research Experience for Undergraduates (REU) program at SRI International Laboratories in Menlo Park, California, where I operated complex experimental vacuum systems designed for mass flow and performed analyses on the resulting data for SRI/NASA/Uni. of Kentucky collaborative research on ablative heat shield materials.

Paid Assistant Researcher (June 2017- October 2017)

- Performed research on campus under the Mechanical Engineering department involving XRD, hardness and surface characterization of powder metals.

Student Independent Research (September 2017- November 2018)

- Performed research on campus in which I synthesized nanoparticle supercapacitor electrode materials, using various synthesis methods, and then employed structural, thermal and electrochemical characterizations.

Publications/Presentations

- R. Singhal, D. Thorne, P. Lemaire, X. Martinez, C. Zequine, R. Gupta, D. Uhl, E. Scanley, and C. Broadbridge. Nanocomposites of Copper Sulphide and Graphene Oxide for High-Performance Supercapacitors. Poster presented at: 235th ECS Meeting, Batteries and Energy Storage; 2019 May 26-31; Dallas, Texas (Forthcoming)

- David Thorne, David Uhl2, Peter K. LeMaire, Ellen Scanley, Christine C. Broadbridge, Rahul Singhal. Synthesis and physical characterization of CuS-graphene oxide nanocomposite materials. Poster presented at: APS Fall New England Section; 2018 Nov 2-3; Dartmouth, MA

- Singhal, Rahul; Fagnoni, Justin; Thorne, David; LeMaire, Peter; Martinez, Xavier; Zhao, Chen; Gupta, R.; Uhl, David; Scanley, Ellen; Broadbridge, Christine; Manivannan, Mani; Pandey, Rishikesh; "Study of MnO2-Graphene Oxide nanocomposites for supercapacitor applications" *MRS Advances* MRSAdv-2018-3036511.R1 (Forthcoming)

Honors and Memberships

- Member of the honor society for physics students Sigma Pi Sigma
- Member of the national honor society Alpha Lambda Delta
- Member of Golden Key International Honor Society
- Member of the mathematics honor society Kappa Mu Epsilon
- Volunteer physics tutor for two years
- Member of the American Society of Mechanical Engineers
- Member of APS
- Cum Laude