

Joshua Caleb Arp

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My research interests include multiscale modeling for critical infrastructure material optimization

Education

Doctor of Philosophy in Chemical Engineering, August 2017 - Present

Clemson University, Clemson, SC
GAANN Fellow, January 2018 - Present

Master of Science in Chemical Engineering, May 2017

North Carolina State University, Raleigh, NC

Bachelor of Science in Chemistry, May 2015

The Citadel, The Military College of South Carolina, Charleston, SC
Cumulative GPA 3.86

Semester Abroad, Fall, 2012

University of Wollongong, Australia

Research Experience

Symrise, Inc. Goose Creek, SC

Summer 2016

Process Engineering Intern

- Conducted an independently led investigation into the abnormal generation of total organic carbon (TOC) loads in the waste process water from the Menthol Plant
- Developed analytical methods to test key areas for high TOC
- Proposed and tested a cross-linked polymer gel that would facilitate methanol separation from wastewater
- By analyzing trends in vacuum pressures, a malfunctioning control valve was optimized, saving the company approx. \$44,000 per year in methanol losses
- Prepared a formal report and presented the findings of the investigation along with the recommended improvements to the process to the plant executives

Goulston Technologies, Inc. Monroe, NC

Summer 2014

Research and Development Intern

- Developed a new antistatic agent to add in spandex spin finishes for commercial use
- Tested spandex rheological properties, coefficients of friction, yield stresses, and unwinding tensions
- Developed logical and analytical approaches to problems while leading two research projects
- Prepared a report on the data collected and methods used
- Presented my finalized research to coworkers and top leaders in the company
- Learned invaluable information about how scientific research is conducted in an industrial setting

The Citadel, The Military College of South Carolina Charleston, SC

2014 - 2015

Research Assistant

- Tested a possible reaction that explains the absence of amino acids on Mars
- Focused on the photocatalytic degradation of phenylalanine on the surface of solid titanium dioxide
- Synthesized the heterogeneous mixture and developed testing procedures
- Analyzed data using proton NMR, fluorescence spectrophotometry, and absorbance spectrophotometry
- Wrote and defended senior thesis

Leadership Experience

The Citadel, The Military College of South Carolina Charleston, SC

2014 - 2015

Battalion Provost Marshal

- Served as a Cadet Captain S-2 officer for a battalion in the South Carolina Corps of Cadets which consisted of approximately 500 cadets
- Primary Staff Officer responsible for good military order and discipline, physical security, and crime prevention
- Coordinated with Regimental Provost Marshal to assist in the enforcement of traffic control and cadet parking
- Operated as the unit Fire Marshal
- Also, served as Company Honor Representative

Skills Summary

Analysis
Problem Solving

Critical Reviewing
Oral and Written Communication

Independent Research
Innovation

Leadership
Laboratory Proficiency

Presentations

Arp, Joshua C. and Molnar, Brian.; Non-Aqueous Photodecomposition of Phenylalanine on the Surface of Titanium Dioxide: Exploring a Potential Sink for Amino Acids on Mars, ACS 249th National Meeting, March, 2015

Awards/Achievements

- Graduate Assistance in Areas of National Need (GAANN) Fellowship
- ACS Analytical Award
- Honors Program Gold Seal
- Gold Stars and Dean's List each semester attending The Citadel
- Selected for Who's Who Among Students in American Universities and Colleges
- Star of the West Graduate Scholarship
- Star of the West Undergraduate Scholarship- The Citadel's most prestigious scholarship given to one incoming freshman
- Citadel Scholar Recipient

Professional Memberships/Affiliations

Member, American Chemical Society (ACS), 2011-2015

Member, Phi Kappa Phi Honor Society, 2013-2015

Laboratory Equipment and Technical Skills

Abaqus Unified FEA, Matlab, Polymath, Siemens SIMATIC PCS 7, SigmaPlot, Gaussian, ICP-OES, GC-MS, Proton NMR, UV-Vis, FT-IR, Fluorescence Spectrophotometry, MS Word, MS Excel