**Sara C. Mills**

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**EDUCATION**

**University of Florida,** Gainesville, FL (anticipated) August 2021

Ph.D. in Materials Science and Engineering

Advisor: Dr. Jennifer Andrew

**University of Florida,** Gainesville, FL May 2018

Master of Science in Materials Science and Engineering

**Mercyhurst University**, Erie, PA May 2016

Bachelor of Science in Chemistry

Minor in Physics

GPA: 3.9/4.0

**RESEARCH EXPERIENCE**

**Andrew Research Group,** University of Florida August 2017 – Present

* Synthesizing magnetic nanoparticles via co-precipitation to be used with electrophoretic deposition for soft magnetic nanocomposite fabrication for on-chip power components
* Developing chelating agents for enhanced adhesion and deposition to encourage thick film deposition using electrophoretic deposition
* Maintaining the Fourier transform-infrared (FTIR) spectroscopy instrument and training outside users

**Webb Research Group,** University of Florida August 2016 – August 2017

* Used electrospinning to form a poly(lactic acid) fiber matrix that was thermally crosslinked with poly(octanediol-co-citrate) for a coronary stent application

**Jones Research Group,** Mercyhurst University January 2013 – May 2016

* Developed GC-MS methods to:
  + Accurately and precisely separate caffeine from green tea
  + Use various solid phase extraction mediums as sample preparation to analyze the biological molecules of green tea

**Yang Research Group,** University of Pittsburgh May 2015- August 2015

* NSF Research Experience for Undergraduates (REU) Fellow
* Investigated the valence state of bimetallic nanoparticles under oxidation/reduction conditions

**Liotta Research Group,** The Georgia Institute of Technology May 2014- August 2014

* NSF Research Experience for Undergraduates (REU) Fellow
* Studied the mechanism for prebiotic molecule formation under relevant environmental conditions (high pressure and metallic ion content)

**SKILLS**

* **Characterization techniques:** X-ray diffraction, scanning electron microscopy, energy dispersive X-ray spectroscopy, Fourier transform infrared spectroscopy, vibrating sample magnetometry, X-ray photoelectron spectroscopy, dynamic light scattering, zeta potential analysis, light microscopy, Raman spectroscopy, high performance liquid chromatography, gas chromatography-mass spectrometry
* **Computational experience** **with**: Mathematica, Microsoft Office, ImageJ, Origin

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| **PUBLICATIONS** |

S. Arash, B.L. Chavez, **S.C. Mills**, M.J. Bauer, J.S. Andrew, T.M. Crawford, Y. Wu. Memory-dependent evolution in multiferroic cobalt ferrite/barium titanate Janus nanofibers (In preparation).

**S.C. Mills,** C.S. Smith, D.P. Arnold, J.S. Andrew. Thick, multilayered nickel/iron oxide magnetic nanocomposites for improved magnetic power handling components, *Journal of Magnetism and Magnetic Materials* (Submitted)

**S.C. Mills**, N.E. Starr, N.J. Bohannon, J.S. Andrew. Substrate functionalization using chelating agents to achieve thick and stable nanoparticle films via electrophoretic deposition, *Frontiers in Chemistry* 9, 703528, 2021.

C.S. Smith, K. Sondhi, **S.C. Mills**, J.S. Andrew, H.Z. Fan, T. Nishida, D.P. Arnold. Screen-printable and stretchable hard magnetic ink formulated from barium hexaferrite nanoparticles, *J. Mater. Chem. C* **8**, 12133-12139, 2020.

A.M. Uhl, **S.C. Mills**, J.S. Andrew. Synthesis of cobalt ferrite nanoparticles via electrospraying into a liquid collector, *J. Mater. Research* 35 (8), 864-871, 2020.

**S.C. Mills**, C.S. Smith, D.P. Arnold, J.S. Andrew. Electrophoretic deposition of iron oxide nanoparticles to achieve thick nickel/iron oxide magnetic nanocomposite films, *AIP Advances* **10**, 015308, 2020.

C.S. Smith, **S.C. Mills**, S. Savliwala, C. Rinaldi, J.S. Andrew, D.P. Arnold. Nanostructural evaluation of 0-3 magnetic nanocomposites fabricated by electro-infiltration, *AIP Advances* **9**, 125028, 2019.

C.S. Smith, S. Savliwala, **S.C. Mills**, J.S. Andrew, C. Rinaldi, D.P. Arnold. Electro-infiltrated nickel/iron-oxide and permalloy/iron-oxide nanocomposites for integrated power inductors, *Journal of Magnetism and Magnetic Materials* **493**, 165718, 2019.

**PRESENTATIONS (\* indicates an oral presentation)**

**\*S.C. Mills**, Fabrication of Thick and Stable Nanoparticle Films via Electrophoretic Deposition on Substrates Functionalized with Chelating Agents, Magnetism and Magnetic Materials, November 2-6, 2020 (Virtual).

**S.C. Mills**, Electrophoretic Deposition of Iron-Oxide Nanoparticles to Achieve Thick Nickel/Iron-Oxide Magnetic Nanocomposite Films, Magnetism and Magnetic Materials, Las Vegas, NV, November 4-8, 2019.

**LEADERSHIP**

**User Advisory Committee (UF Research Service Centers)** January 2020 – Present

* Served as lab group representative to provide feedback to Research Service Center staff
* Attended monthly meetings to keep fellow group members up to date on new protocols, etc.

**Engineering Safety Committee,** University of Florida January 2018- December 2020

* Materials Science and Engineering Department Representative (August 2019-August 2020)
* Directed monthly meetings for departmental safety committee

**Lab Safety Manager,** University of Florida August 2018 – December 2020

* Maintained the safety of lab members through training and consistent lab upkeep
* Managed the accumulation and minimization of hazardous waste
* Pioneered the implementation of updated SOPs, lab signage, and 5S organization

**Society for Biomaterials**, University of Florida August 2017 – May 2018

* Served on the executive board as the webmaster

**Graduate Christian Fellowship,** University of Florida May 2017 – June 2020

* Served as club president and leader of small group book and bible studies once a week
* Helped develop and successfully execute a plan to increase membership numbers

**PROFESSIONAL MEMBERSHIPS**

American Chemical Society (ACS), **Member** 2012 – Present

Alpha Chi Sigma (AXS), **Brother** May 2019 – Present

* Graduate Advisor (August 2019-August 2020)

Campus Safety, Health, and Environmental Management Association

(CSHEMA), **Member** July 2019 – Present

**PROFESSIONAL DEVELOPMENT**

* Attended ASQ 7 hour workshop on 5S and the Lean Manufacturing method October 2018

**Partners in Academic Laboratory Safety (PALS) Workshop** June 2019

* Hosted by ExxonMobil in Baytown, TX

**TEACHING EXPERIENCE**

**Teaching Assistant,** University of Florida Fall 2017- Spring 2018

* EMA3010 – Introduction to Materials Science and Engineering (2 semesters)
* Held office hours to aid students with homework and proctored exams

**Teaching Assistant,** Mercyhurst University Fall 2013 – Spring 2016

* CHEM122/132 – General Chemistry I/II Lab
* CHEM241/243 – Organic Chemistry I/II Lab
* Developed a lab protocol now used regularly in CHEM231 - Quantitative Analysis Lab curriculum

**ADDITIONAL EXPERIENCE**

**Intern,** II-VI Incorporated (Saxonburg, PA) June 2011 – August 2016

* Quality Assurance and Document Control (QA/DC)
  + Entered customer part specifications for part engineering, working in tandem with the Sales and Drafting departments
* Systems, Applications, and Products (SAP) implementation
  + Aided in training temporary employees in data migration
  + Created cost-time analyses for five departments to determine the effect of SAP implementation