

# SOFIA SHUBERT-ZULETA

sofiashubert@utexas.com  
682-583-4431

## Education

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### University of Texas at Austin

Graduate Student, Department of Chemistry

Fall 2019 - present

### University of Texas at Austin

Bachelor of Science, Chemistry

Elements of Computer Programming Certificate

Spring 2019

## Research Experience

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### Milliron Research Group

Dr. Delia Milliron, University of Texas

Fall 2019 - present

- Studying post-synthetic modulation of localized surface plasmon resonance (LSPR) in metal oxide nanocrystals
- Investigating oxidative titration and LSPR peak fitting as complementary methods to probe trap states in metal oxide nanocrystals

### Rose Research Group

Dr. Michael Rose, University of Texas

Feb. 2017- May 2019

- Synthesis and design of stibine ligands and subsequent coordination with transition metals to form complexes with tunable luminescent capabilities as well as possible catalytic ability
- Use Density Functionalization Theory (DFT) to simulate theoretical electronic and structural properties

### Department of Energy, Science Undergraduate Research Internship

Dr. Ashley Gaulding, National Renewable Energy Laboratory

Summer 2018

- Characterization of perovskite-quantum dot matrices fabricated into thin films
- Varying composition of perovskite material in order to observe changes in optics and charge transport capabilities

## Publications

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4. Tandon, B.\*; **Shubert-Zuleta, S. A.\***; Milliron, D. J. Investigating the Role of Surface Depletion in Governing Electron-Transfer Events in Colloidal Plasmonic Nanocrystals. *Chem. Mater.* **2021**, *2022* (1).
3. Jhong, H. R.; Nwabara, U. O.; **Shubert-Zuleta, S.A.**; Grundish, N. S.; Tandon, B.; Reimnitz, L. C.; Staller, C. M.; Ong, G. K.; Saez Cabezas, C. A.; Goodenough, J. B.; Kenis, P. J. A.; Milliron, D. J. Efficient Aqueous Electroreduction of CO<sub>2</sub> to Formate at Low Overpotential on Indium Tin Oxide Nanocrystals. *Chem. Mater.* **2021**, *33* (19).
2. Taylor, W. V.; Cammack, C. X.; **Shubert, S. A.**; Rose, M. J. Thermoluminescent Antimony-Supported Copper-Iodo Cuboids: Approaching NIR Emission via High Crystallographic Symmetry. *Inorg. Chem.* **2019**.
1. Taylor, W. V.; Xie, Z.-L.; Cool, N. I.; **Shubert, S. A.**; Rose, M. J. Syntheses, Structures, and Characterization of Nickel(II) Stibines: Steric and Electronic Rationale for Metal Deposition. *Inorg. Chem.* **2018**, *57* (16).

## Industry experience

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### Dispersol Technologies

Supervisor: Dr. Daniel Ellenberger

Summer 2019

- Responsible for lab technician duties – day to day upkeep of analytical labs
- Compiled patent data and market research for potential new drug development projects
- HPLC – RI method development

## Awards

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- National Science Foundation (NSF) Graduate Research Fellow 2020-present
- Chemistry Department Research Fellowship 2019
- American Chemical Society Scholars Fellow 2018-2019
- Undergraduate Research Distinction award from UT College of Natural Sciences 2019
- Outstanding Senior award from Central Texas ACS chapter

## Leadership

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- NSF MRSEC – student leadership council, social chair 2021-present
- American Chemical Society UT Student Affiliates, President 2017-2019
- American Chemical Society UT Student Affiliates, Outreach Officer 2016-2017
- Teaching assistant, Physical Chemistry I laboratory 2019-2020
- Teaching assistant, Physical Chemistry I lecture Spring 2019

## Selected presentations

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- NSF MRSEC Industry Day poster presentations 2022
- Poster presentation in American Chemical Society national conference 2018

## Skills

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- Milliron Lab safety officer – managed chemical database, worked with university EH&S, organized lab cleanup days, handled waste disposal, advocated for safe practices in and out of the lab
- Proficient in air-free chemistry techniques such as Schlenk line and glovebox usage
- Experienced with materials characterization techniques such as Fourier transform infrared spectroscopy, UV-vis spectroscopy, air-free *in situ* extinction spectroscopy, scanning transmission electron microscopy, powder X-ray diffraction, inductively-coupled plasma optical emission spectrometry, nuclear magnetic resonance
- Worked extensively in colloidal nanocrystal synthesis and handling techniques, specifically metal oxide materials
- Experienced in fitting experimental data with Matlab code
- Proficient in analyzing and plotting large datasets with Igor Pro
- Competent with organometallic purification techniques such as column chromatography, distillations, extraction, recrystallization and reflux
- Performed Density Functionalization Theory (DFT) calculations using Firefly, Spartan and Gaussian computation software
- Proficient in common chemistry software with purposes including chemical illustration, (Chemdraw), NMR analysis (MestReNova) and literature searching software (Scifinder, Mendeley)