**Jonathan P. Wheeler**

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# Education

2021-Present North Carolina State University (GPA: 3.778)

Ph.D. Chemistry (2025 Expected)

Doctoral Advisor: Dr. Felix N. Castellano

2017-2021 Florida State University (GPA 3.205)

B.S. Chemistry (2021)

B.S. Applied Mathematics (2021)

Minor: Physics

Research Advisor: Dr. Kenneth Hanson

# Publications

1. D. Beery, A. Arcidiacono, J.P. Wheeler, J. Chen, K. Hanson\*. *Harnessing Near-Infrared Light via S0 to T1 Sensitizer Excitation in a Molecular Photon Upconversion Solar Cell*. **Journal of Materials Chemistry C.** Submitted. **2021**, XX, XX, XXXX-XXXX.
2. D. Beery, J.P. Wheeler, A. Arcidiacono, K. Hanson\*. *CdSe Quantum Dot Sensitized Molecular Photon Upconversion Solar Cells.* **ACS Applied Energy Materials. 2020**, 3, 1, 29-37.

DOI: 10.1021/acsaem.9b01765.

# Work Experience

2021-Present The Castellano Research Group

North Carolina State University Department of Chemistry

Graduate Research Assistant

July 2021-Dec. 2021 The Castellano Research Group

North Carolina State University Department of Chemistry

Graduate Teaching Assistant

2019-2021 The Hanson Research Group

FSU Department of Chemistry and Biochemistry

Undergraduate Research Assistant

# Teaching Experience

2021 CHM 2211L (Organic 2 Laboratory) Florida State University - Spring 2021

CH 222 (Organic 1 Laboratory) North Carolina State University - Fall 2021

# Research Experience and Projects

July 2021-Present Photosensitizer Designs Enabling Solar Photochemistry

Synthesis and characterization of Cr(iii) complexes using extended phenanthroline

π-systems as ligands. This increases oscillator strength and red-shifts absorption.

These compounds have shown promise as potential catalysts due to their high

molar absorptivity and promising photoredox properties.

October 2021-Present CHASE Solar Hub

Began working as a member of the CHASE Solar Hub collaboration between a

number of different universities. In particular, I investigated surface attachment

motifs wherein a silatrane was employed to bind a Rhenium complex to a surface.

A number of novel synthetic techniques were published as a result of this work.

Nov. 2019-May 2021 NIR Upconversion Solar Devices

I began work on a NIR to green upconversion system which I sought to then use to create a functional solar cell. This work saw use of a novel Osmium complex as the sensitizer and an acetylated variant of DPA as an acceptor. The final devices produced 5x the photocurrent of their constituent compounds indicating proof of NIR upconversion in a solar device.

Apr. 2019-Nov. 2019 Quantum Dot (CdSe) sensitized bilayer solar devices

Functionalized solar devices using a self-assembled bilayer strategy. CdSe quantum

dots were used as a sensitizer and a DPA derivative as an acceptor. The devices

generated photocurrent 1.4 times the sum of its parts indicating successful triplet

sensitization of a solar device with CdSe for the first time.

# Honors and Awards

2022-Present Research Assistantship through CHASE Solar Hub

2021-Present North Carolina State Graduate School Scholarship (Covered Full Tuition)

2017-2021 Florida Bright Futures (full tuition scholarship)

2020 iREU program through Syracuse University

# Certifications

2019-Present NMR Certified through FSU and NCSU

2021-Present Class 3B and 4 Laser certified through NC State University