CURRICULUM VITAE

Sidney Starr

Chemistry PhD student, University of Chicago. Electrochemistry, spectroscopy, instrument design and machine learning for experiments.

Online version: https://sidneystarr.com/cv/

EDUCATION

PhD, Chemistry
Expected June 2027

University of Chicago
Hsu Group. Admitted to candidacy, December 2023.

MS, Chemistry
2023 (conferred 2025)

University of Chicago

BS, Chemistry, magna cum laude
May 2022

Loyola Marymount University, Los Angeles

RESEARCH EXPERIENCE

Graduate Research Assistant
April 2023 – present

Hsu Group, University of Chicago

- Investigating the mechanisms of reversible epitaxial zinc electrodeposition, to reduce dendrite formation in aqueous zinc batteries, using operando Raman spectroscopy and SHINERS.
- Designed and built a custom in-situ Raman electrochemical cell from scratch, 3D-printed in PETG, to eliminate leaks and contamination during measurements.
- Leading development of an AI-driven experimental optimization platform to accelerate materials discovery; benchmarking ridge regression, random forests and neural networks with Yuxin Chen's group, with active learning next.
- Wrote the proposal for, and won, a traineeship in the NSF AI-Enabled Materials program (NRT-AIMEMS).
- Present weekly to an interdisciplinary research group, turning findings into changes in experimental design.

Undergraduate Research Assistant

Aug 2021 – May 2022

Department of Chemistry and Biochemistry, Loyola Marymount University

- Studied the energetics of mononuclear photocatalysts with computational methods (DFT, Gaussian).

PUBLICATIONS & PRESENTATIONS

Thesis publications in preparation.

- **Starr, S.** "Investigating proposed novel mononuclear first-row transition metal catalysts for photooxidation of water." Poster, ACS Spring Meeting, San Diego, CA, March 2022.

  In plain terms: computer simulations of cheap-metal catalysts that could help use sunlight to split water.

HONORS & AWARDS

NSF Research Traineeship, AI-Enabled Materials (NRT-AIMEMS)	Fall 2025 – Fall 2026
AIC Overall Best Graduating Senior in Chemistry	2022
Magna cum laude, Loyola Marymount University	2022
CRC Press Freshman Chemistry Achievement Award	2019
Arrupe Scholarship, Loyola Marymount University	2018 – 2022

TEACHING & PROFESSIONAL EXPERIENCE

Teaching Assistant

Sept 2022 – June 2024

Department of Chemistry, University of Chicago

- Taught and graded honors general chemistry I–III for 100+ students per quarter; led recitations, exam reviews, office hours and lab sections.

Geochemistry Analyst

Nov 2020 – May 2021

ACS Laboratories, Steamboat Springs, CO

- Analyzed geochemical samples under standard operating procedures; supported day-to-day lab operations and sample management.

Teaching Assistant and Chemistry Tutor

Sept 2019 – May 2022

Loyola Marymount University

- Taught and graded general chemistry I–II and physical chemistry I; prepared physical chemistry labs; tutored through the Academic Resource Center.

OUTREACH & LEADERSHIP

Table Lead, Department of Molecular Engineering
Aug 2024 – present

South Side Science Festival, University of Chicago

Design and run a hands-on materials demonstration for festival visitors (4,300+ attendees).

Youth Group Advisor
Aug 2025 – present

BBYO, Chicago

Mentor a group of 30+ teens.

Captain, Division I Rowing
Aug 2018 – May 2022

Loyola Marymount University

Elected captain for the 2020–21 and 2021–22 seasons.

SKILLS

Spectroscopy	Operando Raman spectroscopy, SHINERS
Electrochemistry	Aqueous zinc-ion batteries, zinc electrodeposition `TODO(Sidney): techniques, e.g. CV, galvanostatic cycling`
Instrumentation	CAD, 3D printing (PETG, Bambu Lab X2D), custom spectroelectrochemical cells
Computation & ML	Python, machine-learning pipelines (regression, random forests, neural networks), DFT (Gaussian), Swift/SwiftUI
Communication	Technical translation for non-experts, grant writing, project management, team leadership and mentoring

SELECTED GRADUATE COURSEWORK

Electrochemical Principles and Methods · Wave Mechanics and Spectroscopy · Solids, Materials, Surfaces · Statistical Thermodynamics · AI, Automation, and Autonomous Experimentation for Materials Discovery (audited)