

AVITAL R. ISAKOV

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EDUCATION

Washington University in St. Louis

St. Louis, MO

Bachelor of Arts, Majors: Chemistry | Anthropology

Date of Graduation: December 2023, Magna Cum Laude

RESEARCH EXPERIENCE

Wexler Lab

St. Louis, MO

August 2022— June 2024

Undergraduate Research Assistant

- Used computational methods to explore trends in oxygen vacancy formation energies in metal-oxides focusing on potential candidates for Solar Thermochemical Hydrogen Splitting.
- Employed Bash Scripting and Python to perform Density Functional Theory (DFT) calculations and analyze their outputs and larger DFT datasets.
- Utilized Machine Learning packages to produce a generalized linear regression model for materials design specifically modeling how crystal features can predict oxygen vacancy formation enthalpies in metal oxides.
- Established skills in academic writing and communication via proposals, posters, and presentations.

Noked Lab

Ramat Gan, Israel

June 2022— August 2022

Research Intern

- Utilized Atomic Layer Deposition for optimization experiments of thin films on Lithium-ion batteries.
- Prepared both battery cells and computational representations of electrodes to further understand the effects of nanolayer thin films on Li-ion batteries.

PROFESSIONAL EXPERIENCE

National Renewable Energy Laboratory

Golden, CO

June 2023— August 2023

Science Undergraduate Laboratory Internship

- Enhanced Bash Scripting abilities to optimize workflows for surface calculations of ionomers on IrO₂ to optimize electrolysis for hydrogen fuel production.
- Utilized DFT, Jmol and other programs to produce and analyze DFT calculations of energetic interfaces of catalytic surfaces and ionomers.

GRANTS, AWARDS, HONORS

American Chemical Society Undergraduate Award in Inorganic Chemistry

St. Louis, MO

2024— present

- Departmental Award

Astronaut Foundation Scholarship

Orlando, FL

2023— present

Scholarship recipient

- Scholarship recipients required internal institutional nomination from a professor and an internal application. The following competitive external application involved proof of significant STEM research and display of long term goals which further the United States' scientific prowess.
- Prepared a research presentation on Solar Thermochemical Hydrogen Splitting for astronauts, scholars, and industry leaders.
- Participated in the foundation's mentorship program under Andrew Jones founder of Carba.

Udall Scholarship

Tucson, AZ

2023— present

Honorable Mention

- To receive this scholarship, applicants need to pass an internal and external application process and provide evidence that they were involved in leadership, public service, and had a strong commitment to preserving native lands or the environment.

Lambda Sigma

St. Louis, MO

VP Outreach for Sophomore Honorary Society

August 2021— September 2022

- Members were selected from first-year students who showed exemplary work in academics and a strong commitment to community service within the St. Louis area.
- Coordinated service events on Washington University's campus to benefit multiple service groups in St. Louis financially and through volunteering.
- Maintained a relationship with the Lambda Sigma National organization as well as recruit the following classes of honorary members.

TEACHING EXPERIENCE

University of California, Los Angeles

Los Angeles, CA

September 2024— present

Teaching Assistant

- Teaching Assistant for CHEM20A and CHEM20B, general Chemistry for Engineering and Physical Science Students.

Washington University in St. Louis

St. Louis, MO

Peer Learning Team Leader

September 2021— December 2023

- Prepared chemistry content for students in introductory chemistry courses to benefit learning.
- Facilitated group learning and promote deeper conceptual understanding of material for over 50 students.
- Introduced team building and group learning mentalities to foster teamwork and strong group mentalities.

Partners in East St. Louis PESTL

St. Louis, MO

2021— December 2023

French Language Tutor

- Taught French language and francophone culture to children in after school care programs to prepare them for an abroad experience once they complete their High School studies of French.
- Prepared materials for a weekly meeting building the foundational knowledge necessary for successful study of the French language in Middle School, High School, and beyond.

PRESENTATIONS

Isakov, Avital. "Regressor modeling DFT calculated oxygen vacancy formation energies on oxides for high-throughput materials design." Midstates Consortium for Physical Sciences. Chicago, IL November 2023

Isakov, Avital. "DFT calculations for STC Hydrogen fuel production". ASF scholar technical conference. Orlando, FL.

August 2023

Isakov, Avital. "Investigation of the catalytic IrO₂ surface and the ionomer interface for electrolysis." SULI poster session. Golden, CO.

August 2023

ABSTRACTS

MA Ha, O Leitner, A Isakov, RE Larsen, EK Volk, H González, SM Alia, "Investigating Ionomer Interaction on the Catalytic Interface of Model Catalysts (NiO₃, IrO₂)." Electrochemical Society Meeting, May 2024. San Francisco, CA. doi: 10.1149/MA2024-02432882mtgabs