Alexander YarKhan

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Education

08/20 - 05/24

B.A. Vanderbilt University, Nashville, TN - *GPA 3.51/4.0 - May 2024*

Recipient of Nicholas S. Zeppos Merit Scholarship. Majors in Chemistry and Earth and Environmental Science and minor in German Studies.

Research and Professional Experience

03/25 - Present: 40 hrs/week

Research Technician - University of Tennessee Knoxville - *Ecosystems & Networks Integrated with Genes & Molecular Assemblies (ENIGMA) Project*

Hazen Lab group.

Responsible for maintenance and sample collection from groundwater wells on the Oak Ridge Reservation, focusing on research to understand how microbial communities respond to chemical changes in the subsurface environment.

05/23 - 07/23: 40 hrs/week

Student Intern - Oak Ridge National Laboratory - *ORNL Undergraduate Research Student Internships (URSI)*

Geochemical and Interfacial Sciences Division at ORNL. Mentor: Ke Yuan.

Studied the effects of salt ions on barite crystal nucleation at water-mineral interfaces through experimental work. Co-authored research poster to be presented at ACS Spring 2023 Meeting.

01/23 - 05/23: 8 hrs/week

Student Lab Worker - Vanderbilt University - *Department of Earth and Environmental Sciences, Ayers Lab*

Responsible for safe disposal of materials, maintenance of lab inventories, fabrication of parts for experiments, and monitoring of running experiments, as needed in a geochemistry lab.

06/22 - 08/22: 40 hrs/week

Student Intern - Oak Ridge National Laboratory - *DOE Science Undergraduate Laboratory Internships (SULI)*

Geochemical and Interfacial Sciences Division at ORNL. Mentor: Ke Yuan.

Studied calcite crystal nucleation at water-mineral interfaces through experimental work and crystal structure modeling.

06/21 - 08/21: 40 hrs/week

Student Intern - Oak Ridge National Laboratory - *ORNL Undergraduate Student Opportunities Program*

Material Science Division at ORNL. Mentor: Patxi Fernandez-Zelaia.

Developed Python scripts to analyze and visualize grain structures in microscope images of nickel-based superalloy crystals fabricated by electron-beam melting.

Skills and Experience

- Experience with data analysis
- Adept in image processing software, such ImageJ
- Basic Python scripting
- Analytical chemistry techniques
- Material surface analysis techniques, notably atomic force microscopy
- Design and manufacture of 3D printed parts for experiments
- Geology sample prep through mounting and polishing
- Geologic field sampling and measurement
- Proficiency in German language

Presentations

March 2024

American Chemical Society Spring Meeting - *Undergraduate Student Poster Presentations*

A YarKhan, K Yuan, V Starchenko, J Weber, N Lavrik, and A Stack. Nucleation at Mineral-Water Interfaces: Effects of Solution Salinity on $BaSO_4$ Nucleation, March 2024 Accepted.

July 2023

Oak Ridge Summer Undergraduate Symposium - *Poster Presentation*

A YarKhan, K Yuan, V Starchenko, J Weber, N Lavrik, and A Stack. Nucleation at Mineral-Water Interfaces: Effects of Solution Salinity on $BaSO_4$ Nucleation, July 2023.

August 2022

Oak Ridge Summer Undergraduate Symposium - *Poster Presentation*

A YarKhan, K Yuan, J Weber, and A Stack. Crystal Nucleation at Mineral-Water Interfaces: Effects of Surface Steps on $CaCO_3$ Nucleation, August 2022.

Activities, Honors, and Awards

2023 - 2024

Vanderbilt Wilderness Skills Outdoors Club - *Instructor*

Planned and led outdoor weekend trips for undergraduate students.

2013 - 2021

Boy Scouts of America - *Eagle Scout*

Eagle Scout, Boy Scout Troop 46, Knoxville, TN (2019). Great Smoky Mountain Council Boy Scout of the Year (2019). National Advanced Youth Leadership Experience (2017-2021).