Al Zukowski
PhD Student, Department of Geosciences
University of Arizona, Tucson
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Research Interests

Experimental Petrology, Instrument Work, Scientific Education

Education

Geosciences (BS), University of Iowa, 2025
Geosciences (PhD), University of Arizona, Current
Completed 6-week field course: Geological Field Methods & Geological Field Analysis

Abstracts

A. R. Zukowski, V. Payré, *55th Lunar and Planetary Science Conference (2024), Abstract #1331,* Mid-Infrared Signals of Shock Polymorphs from the Manson Impact Structure, Iowa USA

A. Zukowski, V. Payré, *56th Lunar and Planetary Science Conference (2025), Abstract #1650,* Mid-Infrared Signal Alteration of Plagioclase from the Manson Impact Structure, Iowa USA

G. Mottal, A.M. Ostwald, S. Ramsey, A. Udry, J.M.D Day, G. R. Osinski, **A. Zukowski**, V. Payré, M. Ferrell, *56th Lunar and Planetary Science Conference (2025), Abstract #1544,* Unique Shock Textures in Depleted Basaltic Shergotite Northwest Africa 15917

Research

Curiosity Float Analysis Fall 2022 - Spring 2022

- Performed visual analysis and categorization using ChemCam and MAHLI images from the Curiosity Rover of float rocks in Gale Crater on Mars
- Conducted elemental analysis and categorization using chemical data collected by Curiosity's Alpha Particle X-ray Spectrometer (APXS)
- Modeled bulk chemical compositions with Total Alkali-Silica (TAS) diagrams

Impact Phase Spectroscopy Spring 2022 - July 2025

- Identified using petrographic microscope minerals exhibiting shock defects and alteration, using thin sections made from the core samples taken from the Manson Impact Structure in Northwest Iowa

- Performed elemental analysis of specific grains via EDS and mineralogical analysis via RAMAN spectroscopy to determine chemical composition and crystal structure, respectively
- Mid-infrared spectroscopy of grains using FTIR to determine how shock deformation has altered MIR signal for particular minerals, comparing back to terrestrial analogs
- Modeled difference in deconvoluted data in shocked versus unshocked polymorphs to improve models used to analyze the mineralogy of planetary surfaces from orbital observation
- Presented findings at LPSC

Work Experience

Undergraduate Researcher, Planetary Exploration Group August 2022 - July 2025

- Built essential research skills such as literature comprehension, workflow design, scientific and grant writing, and experimentation with a myriad of analytical equipment
- Conducted both short-term and multi-year studies in the planetary science field

Tutoring Assistant, Student-Athlete Academic Services August 2023 - May 2025

- Assisted undergraduate student-athletes from a wide variety of socioeconomic backgrounds enrolled in introductory geology-related courses, facilitating their academic success and building their interest in the world of Earth science
- Developed education strategies for students with learning disabilities

Facilities Maintenance Intern, Iowa Materials Analysis, Testing, and Fabrication (MATFab) facility September 2024 - June 2025

- Tasked with lab maintenance tasks such as upkeep of high-vacuum systems, clean room upkeep, gas cylinder replacement, instrument troubleshooting, and repair
- Managed electron beam deposition system of a Physical Vapor Deposition instrument (PVD) by calibrating quartz crystal monitors (QCM) for nanometer-scale accuracy and precision
- Learned the process of manufacturing optical gratings for use on satellites through the use of Electron Beam Lithography (EBL) using a cutting-edge RAITH VOYAGER system

Graduate Associate, University of Arizona Geosciences Department August 2025 - Present

Skills

Trained and experienced in: Microsoft suite, OMNIC software, petrographic microscope, FTIR spectrometer, RAMAN spectrometer, scanning electron microscope, energy-dispersive X-ray spectroscopy, optical profilometer, Physical Vapor Deposition (PVD), ellipsometer