

Jamison Ward – Curriculum Vitae

jamison.ward@proton.me • (763) 482-2118 • www.linkedin.com/in/jamisonward

OBJECTIVE

Obtain a Ph.D. in Geobiology or a related field and conduct exploratory scientific research with applications to environmental protection/restoration, climate solutions, or bioremediation.

EDUCATION

B.S. Earth Sciences September 2020 – May 2024
College of Science and Engineering, University of Minnesota-Twin Cities, Minneapolis, MN
Honors: Summa Cum Laude, with High Distinction
Microbiology Minor, Astrophysics Minor

High School Diploma September 2016 – June 2020
Zimmerman High School, Zimmerman, MN

RESEARCH INTERESTS

Geomicrobiology, Geochemistry, Microbial Physiology, Bioenergetics, Astrobiology

EMPLOYMENT

Postbaccalaureate Researcher/Lab Manager June 2024 – Present
Church Lab Group, Flathead Lake Biological Station, University of Montana, Polson, MT

Undergraduate Researcher September 2022 – May 2024
Bailey Geobiology Research Group, Department of Earth and Environmental Sciences,
University of Minnesota-Twin Cities, Minneapolis, MN

NASA Summer Undergraduate Program for Planetary Research (SUPPR) Intern June – August 2022
Gazel Research Group, Department of Earth and Atmospheric Sciences, Cornell University,
Ithaca, NY

Undergraduate Researcher January – September 2021
Small Satellite Research Laboratory, School of Physics and Astronomy, University of
Minnesota-Twin Cities, Minneapolis, MN

Home Maintenance Worker Summers 2019 – 2021
Lynda Bouley, Zimmerman, MN

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RESEARCH EXPERIENCE

Postbaccalaureate Researcher/Lab Manager

June 2024 – Present

Church Lab Group, Flathead Lake Biological Station, University of Montana

Subtropical Underwater Biogeochemistry and Subsurface Export Alliance (SUBSEA)

Simons Collaboration on Ocean Processes and Ecology (SCOPE)

Methane Cycling in Flathead Lake

Undergraduate Researcher

September 2022 – May 2024

Bailey Geobiology Research Group, Department of Earth and Environmental Sciences,
University of Minnesota-Twin Cities

Lead Detoxification in Priestia megaterium

Culture bacteria in a defined Pb-containing minimal salts medium and acquire sample aliquots for chemical analyses using colorimetric assays and ICP-MS. Prepare cell samples for epifluorescence microscopy to visualize polyphosphate granules using DAPI and tetracycline fluorophores. Prepare cell samples for STEM-EDS analyses to assess cellular morphology and elemental distribution.

- Prepared summary of research activities for reporting to the National Science Foundation.

Calcium Storage in Polyphosphate as a Mechanism for Tooth Enamel Dissolution

Cultivate and prepare polyphosphate-accumulating bacterial samples for epifluorescence and electron microscopy analyses. Utilize STEM-EDS to image polyphosphate granules and map the spatial distribution of metal cations therein. Interpret results of experiments to elucidate how calcium ion storage in polyphosphate granules may contribute to tooth enamel dissolution by creating undersaturated conditions in the human oral cavity.

- Prepared summary of research activities for reporting to the National Science Foundation.

NASA Summer Undergraduate Program for Planetary Research (SUPPR) Intern

June – August 2022

Gazel Research Group, Department of Earth and Atmospheric Sciences, Cornell University

Raman and Infrared Spectroscopy of Martian Meteorite Northwest Africa 2737

Performed Raman spectroscopy experiments to characterize and interpret the presence of olivine melt and fluid inclusion phases in a thick section sample of a Martian meteorite. Employed a combination of FTIR and Raman spectroscopy to rapidly quantify the modal composition of the meteorite thick section. Synthesized insights from primary literature and results from experiments to evaluate and circumvent fluorescence issues in Raman spectroscopy experiments.

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Deep Magma Storage during the 2021 La Palma Eruption

Exercised technical skills including grain picking, polishing, and mounting to prepare single crystals of olivine and pyroxene for fluid inclusion analysis. Identified and cataloged CO₂ fluid inclusions in crystals using a petrographic microscope. Utilized Raman spectroscopy to quantitatively evaluate CO₂ fluid density and subsequently employed computer algorithms to determine CO₂ inclusion pressures, thereby constraining CO₂ entrapment depths.

Undergraduate Researcher

January – September 2021

Small Satellite Research Laboratory, School of Physics and Astronomy, University of Minnesota-Twin Cities

Calibrating a Solar X-Ray Detector Using Radioactive Sources with Discrete Spectra

Planned and conducted experiments using radioactive sources to calibrate a CubeSat scintillation x-ray detector. Created and implemented computer programs employing principles from atomic physics such as radioactive emission and attenuation to analyze, interpret, and present experimental data. Developed a calibration curve to quantify detector response to varying incident photon energies for data processing while in flight.

PUBLICATIONS

J. M. Ward, K. Dayton, E. Gazel, “Raman and Infrared Spectroscopy of Martian Meteorite Northwest Africa 2737” (Lunar and Planetary Institute, Houston, 2023; Abstract #1002). <https://www.hou.usra.edu/meetings/lpsc2023/pdf/1002.pdf>

K. Dayton, E. Gazel, P. Wieser, V. R. Troll, J. C. Carracedo, H. La Madrid, D. C. Roman, **J. M. Ward**, M. Aulinas, H. Geiger, F. M. Deegan, G. Gisbert, F. J. Perez-Torrado, Deep magma storage during the 2021 La Palma eruption. *Science Advances* **9**, eade7641 (2023). <https://www.science.org/doi/abs/10.1126/sciadv.ade7641>

J. M. Ward, W. Setterberg, L. Clemmer, L. Glesener, Calibrating a Solar X-Ray Detector Using Radioactive Sources with Discrete Spectra. *University of Minnesota Digital Conservancy* (2021). <https://hdl.handle.net/11299/223274>

SCIENTIFIC PRESENTATIONS

J. M. Ward, B. E. Flood, C. M. Santelli, M. Odlyzko, C. Zweifel, J. V. Bailey. Lead Detoxification in *Priestia megaterium*. Undergraduate Honors Thesis Defense, University of Minnesota-Twin Cities, Minneapolis, MN, May 10, 2024. (oral presentation)

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J. M. Ward, B. E. Flood, C. M. Santelli, J. V. Bailey. Investigating Lead Resistance and Sequestration in *Bacillus megaterium*. UMN Earth Student Research Symposium, University of Minnesota-Twin Cities, Minneapolis, MN, April 5, 2024. (oral presentation)

- Won “best talk” award (undergraduate student)

J. M. Ward, B. E. Flood, C. M. Santelli, J. V. Bailey. Investigating Lead Resistance and Sequestration in the Soil Bacterium *Bacillus megaterium*. 2023 Midwest Geobiology Symposium, University of Minnesota-Twin Cities, Minneapolis, MN, September 22-23, 2023. (poster presentation)

J. M. Ward, K. Dayton, E. Gazel. Raman and Infrared Spectroscopy of Martian Meteorite Northwest Africa 2737. UMN Earth Student Research Symposium, University of Minnesota-Twin Cities, Minneapolis, MN, March 31, 2023. (poster presentation)

J. M. Ward, K. Dayton, E. Gazel. Raman and Infrared Spectroscopy of Martian Meteorite Northwest Africa 2737. 54th Lunar and Planetary Science Conference, The Woodlands, TX/virtual, March 15, 2023. (virtual poster presentation)

J. M. Ward, W. Setterberg, L. Clemmer, L. Glesener. Calibrating a Solar X-Ray Detector Using Radioactive Sources with Discrete Spectra. Fall 2021 Undergraduate Research Symposium, University of Minnesota-Twin Cities, Minneapolis, MN, December 10, 2021. (virtual poster presentation)

PROFESSIONAL AND RESEARCH SKILLS

Hardware

Thermo Fisher Scientific Talos F200X G2 Transmission Electron Microscope
Thermo Fisher Scientific iCAP TQ Inductively Coupled Plasma Mass Spectrometer
Olympus BX61 Light and Epifluorescence Microscope
WITec alpha300 R Raman Imaging Microscope
Thermo Fisher Scientific Nicolet iN10 MX Infrared Imaging Microscope
Leica Microsystems DM 2700 Petrographic Microscope
SiPM-3000 Scintillation X-Ray Detector

Software

The Geochemist’s Workbench
Olympus cellSens – Light and epifluorescence microscopy image acquisition and analysis
WITec Suite FIVE – Raman spectra acquisition and analysis
WITec TrueMatch – Raman spectral database management
Thermo Scientific OMNIC Series Software – Infrared spectra acquisition and analysis
Microsoft Office Suite – Word, Excel, PowerPoint, Publisher

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Inkscape
Audacity
DaVinci Resolve

Programming

Python 3 – IDLE, Spyder

Laboratory Procedures and Practices

Fluorescence microscopy sample preparation and analysis
ICP-MS sample preparation and analysis
STEM-EDS sample preparation and analysis
Wet chemical colorimetric assays
Microbial sample culturing, harvesting, fixation, spectrophotometry
Microbiology laboratory aseptic technique
Mineral fluid and melt inclusion identification and analysis
Single crystal picking, polishing, and mounting
Handling and storage of meteorite samples and radioactive materials

Field Skills

Geologic mapping of structures, stratigraphy, and lithologies
Hydrogeological pumping tests, surveying, and data analysis

Foreign Language Skills

German – 2 years of university-level study

TEACHING AND LEADERSHIP EXPERIENCE

Aqueous Geochemistry Peer Tutor

January – May 2024

University of Minnesota-Twin Cities

Assist upper-level undergraduate and graduate students with course topics in aqueous geochemistry, quantitative problem-solving, and using The Geochemist's Workbench

Astronomy Club President

June 2022 – May 2024

University of Minnesota-Twin Cities

Plan and administer general club meetings and monthly stargazing trips
Delegate administrative, financial, and outreach duties to fellow club officers and assist in their implementation
Create informative presentations about space science and exploration for club meetings

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University Honors Program Mentor

September – December 2023

University of Minnesota-Twin Cities

Advise freshman honors program students on University resources, major and career exploration, research opportunities, internships, extracurricular engagement, etc.

First Year Leadership Institute

January – April 2021

University of Minnesota-Twin Cities

Developed individual leadership ideology and assessed personal conflict resolution style

Academic Peer Tutor

September 2019 – June 2020

Zimmerman High School

High school chemistry, physics, and Advanced Placement calculus AB

Team Captain

October 2018 – June 2020

Zimmerman High School

Served as a multi-year team captain on high school track & field, soccer, and knowledge bowl teams

VOLUNTEER WORK

Sirius Girls Astronomy Club Outreach

November 2023 – May 2024

Discuss astronomy-related topics with the Sirius Girls local Girl Scout troop during monthly Zoom meetings

Bell Museum Space Fest

February 4, 2023

Staffed the UMN Earth Sciences Department's interactive crater exhibit for kids

Zimmerman Wild West 5K

May 29, 2021

Set up parking space, racing flags, and concession stands for event; served as a pacesetter

Zimmerman Youth Track & Field Camp

June – July 2019

Organized and taught events such as sprints, jumps, and distance running to local youth; assisted in the administration of the youth track meets

National Honor Society

March 2018 – June 2020

Create posters for school charity events such as change wars; staff lunchtime event tables

HONORS AND AWARDS

2023 Barry Goldwater Scholar

Barry Goldwater Scholarship and Excellence in Education Foundation

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2022 **NASA Summer Undergraduate Program for Planetary Research (SUPPR) Intern**
Lunar and Planetary Institute

2020 **National Merit Scholar**
National Merit Scholarship Corporation

2020 **National AP Scholar**
College Board

GRANTS AND SCHOLARSHIPS

2024 **AIPG MN Section Student Grant, \$1,000**
American Institute of Professional Geologists

2024 **L. Thomas and Margaret Aldrich Award, \$2,000**
Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

2024 **MURAJ In Action Research Grant, \$1,000**
Minnesota Undergraduate Research & Academic Journal, University of Minnesota

2023 **Undergraduate Research Opportunities Program Materials Grant + Stipend, \$1,950**
Office of Undergraduate Research, University of Minnesota-Twin Cities

2023 **CSE Alumni Scholarship, \$5,000**
College of Science and Engineering, University of Minnesota-Twin Cities

2023 **Field Course Expense Scholarship, \$1,040**
Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

2023 **Ralph & Jayne McMillen Scholarship, \$5,000**
Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

2023 **Barry Goldwater Scholarship, \$7,182**
Barry Goldwater Scholarship and Excellence in Education Foundation

2023 **54th Lunar and Planetary Science Conference Registration Grant, \$290**
Lunar and Planetary Institute

2022 **NASA SUPPR Internship Stipend, \$7,300**
Lunar and Planetary Institute

2022 **Conrad Haase Scholarship, \$4,500**
College of Science and Engineering, University of Minnesota-Twin Cities

2022 **Robert R. Berg Scholarship, \$4,000**

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Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

- 2021 **Marshall J. Graney Scholarship**, \$2,000
School of Physics and Astronomy, University of Minnesota-Twin Cities
- 2021 **Undergraduate Research Opportunities Program Stipend**, \$1,500
Office of Undergraduate Research, University of Minnesota-Twin Cities
- 2020 **Gold Scholar Award**, \$40,000
Office of Admissions, University of Minnesota-Twin Cities
- 2020 **Presidential Scholarship**, \$8,000
Office of Admissions, University of Minnesota-Twin Cities
- 2020 **National Merit University of Minnesota Scholarship**, \$4,000
National Merit Scholarship Corporation
- 2020 **Laurie Kerr Memorial Scholarship**, \$2,000
Zimmerman High School
- 2020 **Three Rivers Community Foundation Scholarship**, \$1,000
Zimmerman High School

REFERENCES AND PREVIOUS ADVISORS

Matt Church (matt.church@flbs.umt.edu) June 2024 – Present
Professor, Church Lab Group, Flathead Lake Biological Station, University of Montana

Lauren Manck (lauren.manck@flbs.umt.edu) June 2024 – Present
Postdoctoral Researcher, Church Lab Group, Flathead Lake Biological Station, University of Montana

Jake Bailey (baileyj@umn.edu) September 2022 – May 2024
Professor, Bailey Geobiology Research Group, Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

Beverly Flood (beflood@umn.edu) September 2022 – May 2024
Research Associate, Bailey Geobiology Research Group, Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

Cara Santelli (santelli@umn.edu) September 2023 – May 2024
Associate Professor, Santelli Geomicrobiology and Bioremediation Research Group, Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

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William Seyfried Jr. (wes@umn.edu)

September 2023 – May 2024

Professor, Aqueous Geochemistry Research Group, Department of Earth and Environmental Sciences, University of Minnesota-Twin Cities

Michael Odlyzko (odlyz003@umn.edu)

September 2023 – May 2024

Transmission Electron Microscopy Scientist, University of Minnesota Characterization Facility, University of Minnesota-Twin Cities

Esteban Gazel (egazel@cornell.edu)

June – August 2022

Charles N. Mellows Professor in Engineering, Gazel Research Group, Department of Earth and Atmospheric Sciences, Cornell University

Lindsay Glesener (glesener@umn.edu)

January – September 2021

Associate Professor, Small Satellite Research Laboratory, School of Physics and Astronomy, University of Minnesota-Twin Cities