

JOSEPH JACKSON MEDLEY

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EDUCATION

The University of Illinois, Urbana-Champaign, IL

M.A., German Studies, expected graduation of May 2024

The University of New Mexico, Albuquerque, NM

B.A., German and French, honors: *summa cum laude & cum laude*, May 2019

Bachelorarbeit: *Es ist erreicht: Heinrich Manns Der Untertan und die DEFA-Verfilmung.*

B.S., Biology and Chemistry, honors: *magna cum laude & cum laude*, May 2019

Thesis: *Microbes that Masquerade as Minerals: Subsurface Life Detection on Other Planets.*

The Community College of the Air Force, Maxwell Air Force Base, Montgomery, AL

A.A.S., Maintenance Production Management, June 2012

PUBLICATIONS

Kögel, M.; Pflitsch, A.; Northup, D.E.; Carsten, D.; **Medley, J.J.**; Mansheim, T.; Killing, T.; Buschbacher, M.; Angerer, H.; Falkner, J.; Kynatidis, A.; Ott, V.; Regler, S. (2022). Combination of close-range and aerial photogrammetry with terrestrial laser scanning to answer microbiological and climatological questions in connection with lava caves. *Applied Geomatics*. <https://doi.org/10.1007/s12518-022-00459-7>

Prescott, R.D.; Zamkovaya, T.; Donachie, S.P.; Northup, D.E.; **Medley, J.J.**; Monslave, N.; Saw, J.H.; Chain, P.S.G.; Decho, A.W.; Boston, P.J. (2022). Islands within islands: bacterial phylogenetic structure and consortia in Hawaiian lava caves and fumaroles. *Frontiers in Microbiology, Extreme Microbiology Section*. <https://doi.org/10.3389/fmicb.2022.934708>

MANUSCRIPTS IN PREP

Medley, J.J.; Spilde, M.N.; Hathaway, J.J.M.; Boston, P.J.; Northup, D.E. (2023). Expanding Studies of Microbial Communities in Lava Caves Across a Range of Mineral and Microbial Features: Implications for Geomicrobiology of Lava Caves. *Applied Sciences*.

PRESENTATIONS

Medley, J.J.; Pittis, A.; Hathaway, J.J.M.; and Northup, D.E. (2023). An Introduction to Cave Science: S.L.I.M.E. Team Projects. *The Windy City Grotto*; Chicago, IL (oral presentation).

Medley, J.J.; Webster, C.R. (2023). Wisconsin Deutsch: Deutsche Immigration und Dialekte in der 2. Hälfte des 19. Jahrhunderts. *Die deutsche Sommerschule von New Mexico: Grundkursvortrag*, The University of New Mexico, Kingston, NM (lecture).

Medley, J.J.; Northup, D.E.; Spilde, M.N. (2019). Microbes Masquerading as Minerals in Lava Caves: Implications for Life-Detection on Other Planets. *Department of Biology: Research Day*, The University of New Mexico, Albuquerque, NM (poster).

Medley, J.J.; Northup, D.E.; Spilde, M.N. (2018). Microbes Masquerading as Minerals: The Interface Between Geology and Biology. *Southwestern Region of the National Speleological Society Winter Technical Meeting Hosted by the Sandia Grotto*, The University of New Mexico, Albuquerque, NM (oral presentation).

Medley, J.J.; Northup, D.E.; Spilde, M.N. (2018). Microbes Masquerading as Minerals. *Department of Biology Research Day*, University of New Mexico, Albuquerque, NM (poster).

CONTRIBUTED TALKS AND EXTENDED ABSTRACTS

Northup, D.E.; **Medley, J.J.;** Hathaway, J.J.M.; Kulkarni, H.V.; and Datta, S. (2022). The Effects of Surface Wildfires on Microbial Communities in Lava Caves. *Southwestern Region of the National Speleological Society Winter Technical Meeting Hosted by the Sandia Grotto*, The University of New Mexico, Albuquerque, NM.

Hollan, S.; Kulkarni, H.V.; **Medley, J.J.;** Hathaway, J.J.M.; Phillips-Lander, C.; Northup, D.E.; and Datta, S. (2022). Impacts of Wildfire on Volcanic (Lava Tube) Cave Water Chemistry. *Geological Society of America Abstracts with Programs*, v. 50, no. 5, <https://doi.org/10.1130/abs/2018RM-314044>.

Spilde, M.N.; **Medley, J.J.;** Northup, D.E.; Boston, P.J. (2020). Mineral Biomarkers for Extraterrestrial Caves. *3rd International Planetary Caves Conference*, NASA Lunar and Planetary Institute Contribution No. 2179. Abstract #1071, San Antonio, TX. 21 February.

Spilde, M.N.; **Medley, J.J.;** Northup, D.E.; Boston, P.J. (2019). Biomarkers in Lava Caves: An Analog for the Search for Life on Mars. *Mars Extant Life: What's Next?* NASA Lunar and Planetary Institute Contribution No. 2108. Abstract #5036, Carlsbad, NM. 05 November.

SCHOLARSHIPS, GRANTS, & FELLOWSHIPS

2022	Distinguished Graduate Fellowship in the Humanities , University of Illinois	\$75,000
2022	German Summer School of New Mexico 1954 Scholarship , UNM German	\$2,500
2018	Cearley Undergraduate Grant-In-Aid Award , New Mexico Geological Society	\$2,500
2018	German Summer School of New Mexico 1954 Scholarship , UNM German	\$2,000
2018	Rosemary Miller née Gonzalez Scholarship , UNM Department of Biology	\$800
2018	Maurice L. Hughes Scholarship , UNM Department of Biology	\$200
2017	New Mexico Space Grant Consortium Undergraduate Scholarship , NASA	\$5,000
2017	German Summer School of New Mexico 1954 Scholarship , UNM German	\$1,400

AWARDS AND RECOGNITION

2019	Undergraduate Commencement Speaker , UNM Foreign Languages & Literatures
2019	Excellence in German Studies Book Award , UNM Foreign Languages & Literatures
2014	U.S. Air Force Commendation Medal , meritorious service, 58 Maintenance Group
2013	Airman of the Quarter , flight-level award, 58 Maintenance Operations Flight
2012	Senior Airman Below-the-Zone , competitive early promotion, 58 Maintenance Group
2011	Airman of the Year , group-level award, 58th Maintenance Group
2011	Airman of the Year , squadron-level award, 58th Maintenance Operations Squadron
2011	Airman of the Quarter , squadron-level award, 58 Maintenance Operations Squadron
2011	Air Force Matériel Command Marathon Team , member, half-marathon, U.S. Air Force
2006	Black Belt Leadership Award , Husky Taekwondo, Michigan Technological University

UNDERGRADUATE RESEARCH EXPERIENCE

German Program, University of New Mexico, Albuquerque, NM

Independent honors research under Dr. Katrin Schröter, May 2017 – May 2019

Research analyzing authoritarian conformity and subservience in early 20th-century German culture; specifically, Heinrich Mann's book, *Der Untertan* (1914), serialized prior to World War I, and Wolfgang Staudte's East German film adaptation thereof (1951), released in the aftermath of the Second World War.

Northup Lab, University of New Mexico, Albuquerque, NM

Independent honors research under Dr. Diana Northup, May 2017 – May 2019

Research into the astrobiological implications of "Microbes that Masquerade as Minerals," in terrestrial lava caves, focused on the microbial ecology of secondary mineral deposits, as biomarkers to guide life detection on Mars.

PROFESSIONAL & TEACHING EXPERIENCE

The University of Illinois, Urbana–Champaign, IL

Instructor of Record, Department of Germanic Languages and Literatures, August 2023 – Present

- Instructor for Beginning German I (GER 101), an introductory course focusing on listening comprehension, oral skills, reading, writing, and culture, fall semester, 2023.

Northup Lab, University of New Mexico, Albuquerque, NM

Research Assistant, May 2017 – Present

- Utilize high-throughput sequencing, geochemistry, statistics, and scanning-electron microscopy to analyze the astrobiological implications of the microbial ecology of caves.
- Provide expertise on a National Science Foundation RAPID grant analyzing the effects of forest fires on cave ecologies in Lava Beds National Monument, CA.
- Collaborate on a National Parks System grant, analyzing White-Nose Syndrome (*Pseudogymnoascus destructans*), a fungal disease in bats, in the southwestern United States.

United States Air Force, Kirtland Air Force Base in Albuquerque, NM

Maintenance Management Analyst, Staff Sergeant (Non-Commissioned Officer), May 2010 – May 2015

- Advised senior leadership with analysis of logistics metrics in assessing health of the fleet.
- Performed advanced statistical studies on weapon systems, fleets, and databases.

Michigan Technological University, Houghton, MI

Instructor of Record, Taekwondo Physical-Education, January 2005 – May 2009

- Instructor for Beginning Taekwondo and Hapkido (PE 0170), fall and spring semesters.
- Instructor for Intermediate Taekwondo and Hapkido (PE 0270), fall and spring semesters.

FasTrak Softworks, Inc., Milwaukee, WI

Assistant to the Software Engineers, June 2001 – August 2006

- Assisted in development of the Siemens S5 Simulator via documentation and testing.
- Developed custom functions for customers by translating legacy-C code to ladder logic.

PROFESSIONAL MEMBERSHIPS

German Studies Association, 2023

American Association of Teachers of German, 2023

Southeastern Cave Conservancy, 2023

Near-Normal Grotto, 2022

National Speleological Society, NSS #71802, 2022

Illinois State Museum Society, 2021

American Society for Microbiology, 2018

American Chemical Society, 2018

Veterans of Foreign Wars, 2013

Air Force Sergeants Association, 2013

LEADERSHIP & COMMUNITY INVOLVEMENT

Near-Normal Grotto, NSS Chapter, Normal, IL
President, December 2023-Present
Member and Volunteer, 2022-Present

Karst Conservancy of Illinois, Bloomington, IL
Volunteer, 2023-Present

Illinois State Museum, Springfield, IL
Geology Volunteer, 2021-Present

UNM German Club, Albuquerque, NM
President, 2015-2019
Member 2014-2019

58 Maintenance Ops Flight, Albuquerque, NM
Physical Training Leader, 2011-2015
58 MOF Booster Club Volunteer, 2011-2015

Husky Taekwondo, Houghton, MI
Black Belt Instructor, 2004-2009
Vice President, 2005-2006
Treasurer, 2004-2005

ACADEMIC & PROFESSIONAL SKILLS

German language, Goethe-Zertifikat C1 (advanced).

French language, intermediate/~B2.

Data mining, especially Monarch Modeler; five years of industry experience.

Database management, five years industry experience (Integrated Maintenance Data System).

Microsoft Excel, expert working knowledge; over 20 years of industry and research experience.

R Programming Language, ecological analyses, data visualization, & C++ integration.

Statistical analyses, five years' industry experience and six years in a research setting.

Supercomputer/cluster resource management, especially SLURM and BASH scripting.

16S rRNA gene analysis, especially using tools such as QIIME2, DADA2, R, and some Python.

Analytical instrumentation, fluorometry, spectroscopy, & chromatography (HPLC & GC/MS).

DNA extractions, Qiagen PowerSoil kit, polymerase chain reactions, gel electrophoresis.

Image analyses, especially using ImageJ; six years' experience.

Scanning-Electron Microscopy, six years' experience with a TESCAN VEGA2.

Martial arts instruction, 20+ years' expertise; 3rd Dan (black belt).

Caving, six years professional experience, vertical caving (SRT), squeeze-box record: 7.5 in.