

JOSEPH JACKSON MEDLEY

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EDUCATION

M.A., German, Expected Graduation of May 2024

The University of Illinois, Urbana-Champaign IL

B.A., German and French, May 2019

The University of New Mexico, Albuquerque NM

Honors: *summa cum laude* (departmental, German) and *cum laude* (baccalaureate)

Bachelorarbeit: "Es ist erreicht: Heinrich Manns *Der Untertan* und die DEFA Verfilmung im Zusammenhang mit Konventionalismus und Untertänigkeit."

Advisor: Dr. Katrin Schröter

B.S., Biology and Chemistry, May 2019

The University of New Mexico, Albuquerque NM

Honors: *magna cum laude* (departmental, biology) and *cum laude* (baccalaureate)

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

Advisor: Dr. Diana Northup

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

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

Regionally accredited associate in statistical analyses, special studies, & database management.

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.; Boston, P.J.; Northup, D.E. (2023). Microbes masquerading as minerals: bacterial life in speleothems and cave features in Hawaiian and New Mexican lava caves. *Astrobiology*.

PRESENTATIONS

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).

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 (oral).

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

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 , University of New Mexico	\$800
2018	Maurice L. Hughes Scholarship , University of New Mexico	\$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 THESES & 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. Additional experience as a statistical analyst on a National Parks Service investigation of White-Nose Syndrome in bats, as well as an electron microscopist for the NASA BRAILLE project.

PROFESSIONAL & TEACHING EXPERIENCE

Northup Lab, University of New Mexico, Albuquerque, NM

Research Assistant, May 2017 – Present

- Utilize high-throughput gene sequencing, geochemistry, statistics, and scanning-electron microscopy to analyze the astrobiological implications of the microbial ecology of caves.
- 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 (PE0170), fall and spring semesters.
- Instructor for Intermediate Taekwondo and Hapkido (PE0270), 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 MEMBERSHIP

The Illinois State Museum Society, 2021

The National Speleological Society, NSS #71802, 2022

The Near-Normal Grotto, 2022

LEADERSHIP & COMMUNITY INVOLVEMENT

The Near-Normal Grotto, Chapter of the NSS, Normal, IL

Member and Volunteer, 2022-Present

The Illinois State Museum, Springfield, IL

Geology Volunteer, 2021-Present

UNM German Club, Albuquerque, NM

President, 2015-2019

58 Maintenance Operations 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.

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.

GenBank, experience submitting genetic sequences to the NCBI's GenBank.

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

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

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

Caving, six years professional experience as a cave researcher under Diana Northup.