

Curriculum Vitae

Dr. Nicolas M. Roberts

Department of Geosciences

Hamilton College

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EDUCATION

Ph.D. Geoscience, University of Wisconsin–Madison (2020)

B.A. Geology, Carleton College (2013)

PROFESSIONAL EXPERIENCE

Positions

Visiting Associate Researcher, Lamont-Doherty Earth Observatory, Columbia University (Sabbatical Leave Appointment, July 2025-July 2026)

Assistant Professor of Geosciences, Hamilton College (July 2022-present)

Postdoctoral Researcher, University of Wisconsin–Madison (August 2020-June 2022)

Graduate Student, University of Wisconsin–Madison (2014-2020)

Laboratory Assistant, Dr. Umberto Cordani, University of São Paulo, Brazil (2014)

Undergraduate Researcher, Keck Geology Consortium, Carleton College (2012)

Research Intern, Lamont-Doherty Earth Observatory, Columbia University (2011)

Teaching Appointments

Assistant Professor Hamilton College (Fall 2022-present)

Co-instructor, Advanced Structural Geology, UW–Madison (Fall 2019)

Visiting Instructor, Structural Geology, Colorado College (Spring 2019)

Teaching Assistant, Mineralogy, UW–Madison (Fall 2018)

Teaching Assistant, Structural Geology, UW–Madison (Spring 2015, 2017, 2018)

Teaching Intern, Geology in New Zealand Seminar Study Abroad, Carleton College (Spring 2016)

Teaching Assistant, Ways of Knowing in the Sciences, UW–Madison (Fall 2014)

Undergraduate Teaching Assistant, Intro Chemistry, Intro Geology, Tectonics, Petrology, Carleton College (2011-2013)

Courses Taught at Hamilton College

GEOSC-105 Principles of Geoscience: Our Interconnected Earth (2022,2023, 2024)

GEOSC-230 Structural Geology and Tectonics (2023,2024,2025)

GEOSC-314 Experiences in Geophysics (2023)

GEOSC-510/511 Senior Thesis (2022-23, 2023-24, 2024-25, 2025-26 10 total)

GEOSC-551/552 SSIH Senior Seminar (2022-23, 2023-24)

GEOSC-399/499 Independent Study (2022-present, 6 total)

GEOSC-250 Seminar on Geology of the Desert Southwest (2024)

GEOSC-291 Field studies of the Desert Southwest (2025)

Curriculum Vitae

Invited Talks

- Columbia University's Lamont Doherty Earth Observatory Seismology, Geophysics, and Tectonics Seminar** (Fall 2025)
- Colby College Department Seminar** (Fall 2025)
- Harvard Earth and Planetary Sciences Department Colloquium** (Fall 2024)
- Virtual Seminar on Precambrian Geology Lecture Series** (Spring 2024)
- Colgate University** (Fall 2023)
- University of Massachusetts Amherst** (Spring 2023)

Grants Submitted (Pending)

- Lead PI**, NSF EAR Structure and Physics of the Solid Earth grant (\$369,0000 for Hamilton, ~1 million for 4 PIs) (2025)

Grants Submitted (Awarded)

- Author**, Hamilton College Christian A. Johnson Fund for Enhanced International Understanding (\$4,900) (Summer 2023)
- Author**, Hamilton College Class of 1966 Career Development Award (\$3,500) (Summer 2023)
- Coauthor**, NSF EAR grant (\$600,000, PIs: Basil Tikoff, Jeffery Vervoort) for work in Western Australia (Start Date: Jan 1, 2020)
- Coauthor**, NSF EarthCube grant (\$2,000,000, PIs: Basil Tikoff, Julie Newman, Doug Walker) for StraboSpot data system (Start Date: August 1, 2019)
- Coauthor**, Wisconsin Alumni Research Foundation grant for fieldwork (\$21,000, PI: Tikoff) (2018)
- Author**, Geological Society of America Research Grant (\$2,500) (2016)
- Author**, Geological Society of America Research Grant (\$1,875) (2015)

Grants Submitted (Not Awarded)

- Co-PI**, NSF EAR Major Research Instrumentation grant (\$284,000 for 4 PIs) (2024)
- Co-PI**, NSF FRES grant (\$3,000,000 for 5 co-PIs) (2023)
- Co-PI**, NSF FRES grant (\$3,000,000 for 6 co-PIs) (2022)

Awards and Honors

- Class of 1963 Excellence in Teaching Award** (2025)
- Dean L. Morgan Award**, Distinguished Graduate Fellowship, UW–Madison (2019)
- Thomas E. Berg Award**, Excellence in Teaching, UW–Madison (2019)
- Outstanding Paper Award**, UW–Madison (2019)
- Outstanding Mention**, Geological Society of America Research Grant (2016)
- NSF Graduate Research Fellowship Program**, Honorable Mention (2013, 2015, 2016)
- Awarded Distinction on senior thesis**, Carleton College (2013)
- Phi Beta Kappa**, Carleton College (2013)
- Duncan Stewart Fellowship**, excellence in Geology, Carleton College (2012)

Curriculum Vitae

PUBLICATIONS

(Color indicates publications during Hamilton appointment)

Roberts, N.M., Condit, C., (*In Review*), Transient strain rate acceleration and strengthening driven by coaxial narrowing in shear zones. *Submitted to Geology*.

Villa, A., Hupp, B.N., **Roberts, N.M.**, Callahan, E., Krishnan, A., Parrish, E., and Honig, S. (2025). Building community: A sustainable framework for DEI working groups in geo-science departments. *Earth Science, Systems and Society*, v. 0, p. esss2024- 011, doi:10.1144/esss2024-011. (Accepted)

Yao, J. T., Castro, A. E., **Roberts, N. M.**, Wolfe, O. M., Brunet, I. M., & Vasey, D. A. (2023). Phase Equilibria Evidence for Intermediate P/T Metamorphism in the Nashoba Terrane and Implications for Acadian Tectonics in Ganderia. *Lithosphere*, 2023(1), lithosphere_2023_105.

Salerno, R., **Roberts, N. M.**, Vervoort, J., & Tikoff, B. (2023). Constraints on the age of dome-and-keel structures in the Pilbara Craton through integrated garnet geochronology and microstructural analyses. *Precambrian Research*, 394, 107108.

Roberts, N. M., Tikoff, B., & Salerno, R. A. (2022). Greenstone-up shear sense at the margin of the Mt Edgar dome, East Pilbara Terrane: Implications for dome and keel formation in the early Earth. *Tectonics*, 41, e2021TC007042.

Roberts, N. M., and Tikoff, B. (2021). Internal structure of the Paleoarchean Mt Edgar dome, Pilbara Craton, Western Australia. *Precambrian Research*, 358, 106163.

Salerno, R., Vervoort, J., Fisher, C., Kemp, A., and **Roberts, N. M.** (2021). The coupled Hf-Nd isotope record of the early Earth in the Pilbara Craton. *Earth and Planetary Science Letters*, 572, 117139.

Duncan, C. J., Chan, M. A., Hajek, E., Kamola, D., **Roberts, N. M.**, Tikoff, B., Walker, J. D., Bringing Sedimentology and Stratigraphy into the StraboSpot Data Management System. *Geosphere*, *in press*.

Roberts, N. M., Tikoff, B., Davis, J. R. and Stetson-Lee, T. (2019), The utility of statistical analysis in structural geology. *Journal of Structural Geology*, 125, 64-73.

Tikoff, B., Newman, J., Chatzaras, V., and **Roberts, N. M.** (2019), Big data in microstructure analysis: Building a universal orientation system for thin sections. *Journal of Structural Geology*, 125, 226-234.

CONFERENCE PUBLICATIONS

(Color indicates publications during Hamilton appointment, °indicates undergraduate mentee)

Roberts N.M., °Contreras Joya, Y., (2025). A record of transient (200-300 year) quartz-vein induced weakening and non-steady state strength recovery, 96 Mile Shear Zone, Grand Canyon. *American Geophysical Union Fall Meeting* [Poster].

Roberts N.M. (2025). Why do some shear zones shut down or jump around? Shear zone strength cycling due to geometrically necessary strain rate acceleration. *Geological Society of America Abstracts* (Vol. 57, No. 6) [Oral].

Roberts N.M., °Seixas, V., °Schlemmer, X. (2024). Investigating Archean Dome Formation via Integrated Anisotropy of Magnetic Susceptibility and Electron Backscatter Diffraction: a Case Study from the MT Edgar Dome, Western Australia. *Geological Society of America Abstracts* (Vol. 56, p. 403925) [Oral].

°Contreras-Joya, Y., **Roberts, N.**, Condit C. (2024). Rheological Constraints on the 96-mile Shear Zone, Grand Canyon USA. *Geological Society of America Abstracts* (Vol. 56, p. 403360) [Oral].

Curriculum Vitae

^oSchlemmer X, **Roberts N**, and ^oSeixas V. (2024). Anisotropy of Magnetic Susceptibility (AMS) of the Northeast Margin of the Paleoarchean Shaw Dome, East Pilbara Terrane, Western Australia. *Geological Society of America Abstracts* (Vol. 56, p. 403617) [Oral].

Roberts, N.M., (2024). Combining AMS and EBSD to unravel the kinematic history of granitic plutons. *Structural Geology and Tectonics Forum* [Oral].

Roberts, N.M., ^oSeixas, V.H. (2024). Distinguishing distinct deformation domains within a granitic structural dome using EBSD-derived crystallographic vorticity axis (CVA) analysis. *Geological Society of America Northeast Sectional Meeting* [Oral].

Ibrahim, Y., Newman, J., Tikoff, B., Walker, D., Ash, J., Phillips, N., Nelson, E., Lusk, A.D., **Roberts, N.** and Martin, C. (2024). The Strabospot Ecosystem: Digital Data Collection Tools and Database for Field and Thin-Section Data. In *Geological Society of America Abstracts* (Vol. 56, p. 404370).

Newman, J., Tikoff, B., Walker, J.D., Davidson, D., Shipley, T., Nelson, E., Lusk, A., Ash, J., Phillips, N. and **Roberts, N.** (2024). Strabospot Database and Applications: Community-Driven and Value-Added. In *Geological Society of America Abstracts* (Vol. 56, p. 405214).

Newman, J., Walker, J.D., Tikoff, B., Nelson, E., Williams, R., Phillips, N., Lusk, A.D. and **Roberts, N.** (2024). Digital Data Collection and Database for Field and Thin-Section Data Using the Strabospot System. In *Geological Society of America Abstracts* (Vol. 56, p. 398604).

Trevino, S.F., Morgan, S., Student, J. and **Roberts, N.** (2024). The Mechanical Behavior of Naturally Deformed Quartz in the Folded Contact Aureole of the Eureka Valley–Joshua Flat–Beer Creek (ejb) Composite Pluton. In *Geological Society of America Abstracts* (Vol. 56, p. 404168).

Roberts, N.M., Tikoff, B., Salerno, R.A., Vervoort, J.D. (2023). Internal structures and flow patterns of the Mt Edgar dome, East Pilbara Terrane using anisotropy of magnetic susceptibility. *6th International Archean Symposium* [Oral].

Salerno, R., **Roberts, N.M.**, Vervoort, J., Tikoff, B., & Hammerli, J. (2023). Interrogating the Hf-Nd isotope compositions of Paleoarchean rocks in the Pilbara Craton by integrating whole rock and in situ datasets. *Goldschmidt 2023 Conference* [Oral].

Yao, J., Castro, A. Brunet, I., **Roberts, N. M.**, Wolfe, O. M., Kuiper, Y. D., and Hepburn, J. C. (2022). “Barrovian” Metamorphism in the Nashoba Terrane: Evidence from Combined Phase Equilibria Modeling, Geothermobarometry, and Petrographic Analysis. *Geological Society of America Abstracts with Programs 2022* [Poster].

Roberts, N.M., Williams, M. L., Condit, C., Aikin, N., Karlstrom, K., Heizler, M. T. (2022). Flattening strains and complex kinematics of the 96-Mile ultramylonite, Grand Canyon basement. *Geological Society of America Abstracts with Programs 2022* [Poster].

Condit, C., Bonamici, C., Guevara, V., Karlstrom, K., Aikin, N., Regan, S., **Roberts, N.** (2022). How to build the mid-crustal strength beam: The role of melt emplacement in the upper granite gorge, Grand Canyon. *Geological Society of America Abstracts with Programs 2022* [Oral].

Karlstrom, K., Haizler, M. T., Williams, M. L., Hillenbrand, I., **Roberts, N.**, and Condit, C. (2022). Demise of Grand Canyon’s Vishnu mountains and formation of the Great Unconformity; Data from 40A/39Ar and U-Th-Pb xenotime dating. *Geological Society of America Abstracts with Programs 2022* [Invited oral presentation]

Roberts, N. M., Trevino, S., Morgan, S., and Student, J. (2022). Changing Quartz Microstructures associated with pluton emplacement across the aureole of the EJB pluton, White Inyo Mountains. *Geological Society of America Abstracts with Programs 2022* [Poster]

Curriculum Vitae

Salerno, R., Roberts, N. M., Vervoort, J., and Tikoff, B. (2022). The formation of dome-and-keel structures at 3.32 Ga in the Pilbara Craton. *2022 Goldschmidt Conference* [Oral].

Roberts, N. M., Tikoff, B., Salerno, R. A., and Vervoort, J. D. (2021). Structural evidence that the East Pilbara Terrane formed by diapiric processes in a static or contracting crust. *American Geophysical Union Fall Meeting 2021* [Poster].

Newman, J., Williams, R. T., **Roberts, N. M.**, Phillips, N. J., Lusk, A. D., Ash, J., and Tikoff, B. (2021). An application for sharing and contextualizing micro-scale geologic data. *American Geophysical Union Fall Meeting 2021* [Poster].

Salerno, R. A., Vervoort, J. D., Fisher, C. M., **Roberts, N. M.**, Kemp, A. I., and Tikoff, B. (2021). The Hf-Nd isotope record of the early Earth in the Pilbara Craton. *American Geophysical Union Fall Meeting 2021* [Poster].

°Murphy, T. R., Nachlas, W. O., **Roberts, N. M.**, and Tikoff, B. (2021). Primary P-fracture arrays in the cathedral peak granodiorite, Sierra Nevada Batholith, California. *Geological Society of America, Cordilleran Section Meeting 2021* [Poster].

Roberts, N. M. and Tikoff, B. (2020). Using orientation statistics to test shear zone models: an example from the margin of the Paleoarchean Mt Edgar granitic dome, Western Australia. *Geological Society of America Abstracts with Programs 2020* [Poster].

Roberts, N. M., Tikoff, B., Salerno, R., and Vervoort, J. (2019). Understanding A TTG Structural Dome Using Anisotropy of Magnetic Susceptibility (AMS): Revealing Solid State Flow Patterns Within The 3.5-3.2 Ga Mt Edgar Dome, East Pilbara. *Geological Society of America Abstracts with Programs*. Vol. 51, No. 5 [Oral].

°Idzikowski, C., **Roberts, N. M.**, °Key, R., and Tikoff, B. (2019). Structural mapping and EBSD of folded chert beds in the Paleoarchean Warrawoona Greenstone Belt, East Pilbara Craton. *Geological Society of America Abstracts with Programs*. Vol. 51, No. 5 [Poster].

Tikoff, B., Walker, J. D., Newman, J., Williams, R. T., Ash, J., Good, J., Novak, N., Bunse, E. G., Chatzaras, V., Duncan, C. J., Cunningham, H., Kahn, M., **Roberts, N. M.**, Snell, A. K.³, Chan, M. A., Kamola, D. L., Glazner, A., Schoene, B., Spear, F. S., and Skemer, P. (2019). The StraboSpot digital system for geological field-based (structural geology, sedimentology, petrology), microstructural, and experimental deformation data. *Geological Society of America Abstracts with Programs*. Vol. 50, No. 6 [Oral].

Salerno, R., Vervoort, J., Fisher, C., **Roberts, N. M.**, Tikoff, B., and Kemp, A. (2019). Magmatism and deformation in the Mt. Edgar granitic complex at ~3.3 Ga, Pilbara Craton. *Goldschmidt Abstracts*, 2019 2936 [Oral].

Villa, A. V., Mixon, E., Bate, C. E., Callahan, E. H., Honig, S., Hupp, B. N., Parrish, E., **Roberts, N. M.**, Krishnan, A. (2019). Invigorating the geoscience community: Graduate student-led efforts in creating inclusive, equal, and diverse science and community at the University of Wisconsin–Madison. In *American Geophysical Union, Fall Meeting 2019*, Abstract #ED31C-0980 [Poster].

Roberts, N. M., °Idzikowski, C., °Key, R., and Tikoff, B. (2018). A Kinematic Record of Progressive Emplacement of the 3.47-3.23 Ga Mt Edgar Granitic Complex, East Pilbara Craton, Western Australia. In *American Geophysical Union, Fall Meeting 2018*, Abstract #DI33C-0057 [Poster].

Roberts, N. M., and Tikoff, B. (2017). Dome-side-down sense of shear and uniform magnetic fabrics in the Mt Edgar dome, East Pilbara craton, Western Australia, *The specialist group in tectonics and structural geology biannual workshop, Denmark, Australia*. [Oral].

Roberts, N. M., Cunningham, H., Snell, A., Newman, J., Tikoff, B., Chatzaras, V., Walker, J.D., and Williams, R. T. (2017). Importing, Working With, and Sharing Microstructural Data in the StraboSpot Digital Data System, Including an Example Dataset from the Pilbara

Curriculum Vitae

Craton, Western Australia. In *American Geophysical Union, Fall Meeting 2017*, Abstract #MR41D-0444 [Poster].

Tikoff, B., **Roberts, N. M.**, Chatzaras, V., Newman, J., Walker, J. D., and Williams, R. (2017), The StraboSpot digital data system for field and microstructural data: Application to the Mt Edgar dome, Pilbara Craton, *Poster, The specialist group in tectonics and structural geology biannual workshop, Denmark, Australia* [Poster].

Roberts, N. M., Davis, J. R., Titus, S. J., and Tikoff, B. (2015), Harnessing Multivariate Statistics for Ellipsoidal Data in Structural Geology, in *American Geophysical Union, Fall Meeting 2015*, Abstract #T41C-2920 [Poster].

Davidson, C., Garver, J., and **Roberts, N. M.** (2013), Hf isotope signatures of detrital Precambrian zircon suggest a southern Laurentian source for the Upper Cretaceous flysch of the Chugach-Prince William terrane, Alaska (2013). *Geological Society of America Abstracts with Programs*, Vol. 45, No. 7 [Poster].

Roberts, N. M., C. Davidson, J. Garver (2013). Provenance of the Chugach-Prince William Terrain, Alaska using U-Pb and Hf isotopes, *North American Cordillera Workshop, Kingston, Canada* [Oral].

SERVICE ACTIVITIES

(Color indicates service during Hamilton appointment)

Geosciences Department

Search Committee Member, VAP for Structural Geology Hire (Spring 2025)

Search Committee Member, Climate Records hire (Fall 2024)

Search Committee Member and Inclusion Specialist, Solid Earth hire (Fall 2023)

Search Committee Member, Hydrogeology hire (Fall 2022)

Weekly Department Meetings, 1-2 hours each week (Fall 2022-Present)

Academic Advisor, 22 Students including 10 Geosciences concentrators (Fall 2024)

Academic Advisor, 9 Students including 6 Geosciences concentrators (2023-2024)

College-Level Service

Committee Member, Advisory Committee on Academic Planning (Fall 2024- present)

Committee Member, Hamilton College Experimental Forest committee (Fall 2023- present)

Discussion leader and participant, Experiential Learning lunchtime discussion series sponsored by Office of Experiential Learning (Fall 2023)

Discussion Participant, Sustainability Committee lunchtime discussion

Monthly Faculty Meetings, Attended nearly all factually meetings (Fall 2022-present)

Outside Hamilton College

K-12 School Outreach in NYC, Taught middle and high schoolers about the geology of New York City parks in Cortona Park, Bronx on two Saturdays, in partnership with the non-profit Christodora (Fall 2024)

Workshop leader, StraboSpot digital data system community workshop on group workflows, Santa Catalina Island (Fall 2024)

Session Convener, From Micro to Macro, Northeast GSA Sectional Meeting (Spring 2024)

Journal Referee,

- Geosphere (2024)
- Precambrian Research (2023)

Curriculum Vitae

Session Convener, Recent Advances in Structural Geology and Tectonics, GSA Connects (2022)

Service Prior to Hamilton College

Review Panel Member, Kay Fowler Billings proposals for promoting diversity, equity and inclusion, UW–Madison Geoscience Department (2021)

Community Discovery Advisor, Compass program at Science Education Resource Center (SERC) (2021)

Session Convener, Approaches for Extracting Shear Zone History from the Ductile Rock Record: Probing Their Initiation, Evolution, and Reactivation. GSA Connects Online (2020)

Leader/Organizer, Diversity and Inclusion Committee in the Geoscience Department (2020)

Organizer/Presenter, Four virtual community engagement workshops for StraboSpot (2020-2021)

User interface designer, StraboSpot2 field data collection iOS application (2020)

Reviewer, *Tectonics* (2020), *Geological Society of America Bulletin* (2019), *Journal of Structural Geology* (two articles, 2018)

Organizer, StraboSpot field trip for sedimentologists, Book Cliffs, UT (2019)

Co-leader/Member, GeoPath Peer-to-Peer Mentorship Initiative, UW–Madison (2018-2020)

Professional Development Coordinator, UW–Madison Geoscience Graduate Student Association (2017-2019)

Organizer, Planned and organized UW–Madison Geoscience Graduate Student Association Graduate Student Retreat (2017-2018)

Organizer, Geoscience Department Research Symposium, UW–Madison (2018, 2019)

Organizer, StraboSpot digital data system pre-conference workshop, AGU Fall Meeting (2019)

Organizer/Co-leader, Short course on statistics for structural geologists, Structural Geology and Tectonics Workshop, Sonoma State University (2016)

SIGNIFICANT FIELD EXPERIENCES

(Color indicates field activities during Hamilton appointment, ^oindicates undergraduate mentee)

^o**Field studies in the Desert Southwest**, 2 week field course with 18 Hamilton Students (January 2025)

^o**Northeast Intercollegiate Geological Conference Field Trip**, 16 Hamilton students (Fall 2024)

^o**Field Research**, 2 weeks of field mapping in south central Maine with four Hamilton students (Summer 2024)

^o**Northeast Intercollegiate Geological Conference Field Trip**, 7 Hamilton students (Fall 2023)

^o**Field Research**, 5 weeks of field research in Western Australia, including 3 weeks with two Hamilton students (Summer 2023)

^o**Field Research**, 6 days of field research in central Arizona with one Hamilton student (Spring 2023)

^o**Northeast Intercollegiate Geological Conference Field Trip**, 8 Hamilton students (Fall 2022)

Field Trip Participant, 3-day Pictures Orogeny field trip as part of GSA 2022 (Fall 2022)

Field Trip Participant, 11-day Precambrian geology professional field trip rafting through the Grand Canyon, Arizona (2021)

Field Trip Instructor, 5-day field trip to the Rio Grande Rift, Colorado College (2019)

Curriculum Vitae

***Field Research**, 3.5-month field season in Western Australia, including 6 weeks collecting structural data with two UW–Madison undergraduate students and mentoring them in field mapping (2018)

Field Trip Participant, 19-day UW–Madison graduate student field trip, *Volcanology, Sedimentology, and Structures of the Andes*, Chile and Argentina (2017)

Field Trip Participant, 7-day Specialist Group in Tectonics and Structural Geology pre-conference field trip, *A transect through the Albany-Fraser orogen*, in Western Australia (2017)

***Field Research**, 2.5-month field season in Western Australia, including 4 weeks collecting samples with an undergraduate mentee from Carleton College (2016)

Field Research, 2-month field season in Western Australia (2015)

Fieldwork Participant, 12-day graduate student field trip, *Structural Geology of the Aegean Islands*, Greece (2015)

Field Research Assistant, 1 week as Field Assistant for a PhD structural geology student studying shear zones in the Sierra Nevada (2014)

Fieldwork Participant, 1-week UW–Madison graduate student field trip, *Accretionary Wedge Processes*, San Juan Islands, WA and Victoria Island, BC (led by Profs. Laurel Goodwin and Harold Tobin) (2014)

Field Research, Keck Geology Consortium project in SW Alaska (2012)