

RICHARD M. GASCHNIG

Department of Environmental, Earth and Atmospheric Sciences
University of Massachusetts Lowell
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EDUCATION

- 2010 - Ph.D. Geology, Washington State University (advisor: Jeffrey Vervoort)
Dissertation: “The age and petrogenesis of the Idaho batholith and implications for the basement architecture in the northern Rockies”
- 2005 - M.S. Geology, University of North Carolina at Chapel Hill (advisor: Allen Glazner)
Thesis: “Cause, timing, and significance of brittle deformation in Little Lakes Valley, eastern Sierra Nevada, California”
- 2003 - B.S. Geology, University of Delaware (advisor: Peter Leavens)
Undergraduate research: investigation of the geochemistry of a suite of sodalite minerals from the Sar-e-Sang mine in Afghanistan using an electron microprobe and X-ray diffractometer
- Minors in Music and History

POSITIONS

- 2023 – Visiting Scholar (sabbatical), Scripps Institution of Oceanography
- 2022-present – Associate Professor, University of Massachusetts Lowell
- 2016-2022 – Assistant Professor, University of Massachusetts Lowell
- 2015-2016 - Post-Doctoral Research Associate, Georgia Institute of Technology
(advisor: Chris Reinhard)
Project: Using U and Mo isotopes in basalts to understand redox transfers between the atmosphere, oceans, and mantle
- 2011-2015 - Post-Doctoral Research Associate, University of Maryland
(advisor: Roberta Rudnick)
Project: Geochemistry of glacial tillites through the Earth’s history as a proxy of the composition and evolution of the upper continental crust
- 2010-2011 - Post-Doctoral Research Associate, Washington State University
(advisor: Jeffrey Vervoort)
Project: Insights from geochemistry and geochronology on crustal architecture along the Earthscope Oregon-Idaho Seismic Experiment line
- 2007-2010 - Research Assistant, Washington State University
(advisor: Jeff Vervoort)
Project: U-Pb zircon geochronology

- 2006 - Research Assistant, University of North Carolina at Chapel Hill
(advisor: Drew Coleman)
Project: U-Pb zircon geochronology
- 2005-2006 - Research Assistant, University of North Carolina at Chapel Hill
(advisor: Allen Glazner)
Project: Data compilation for NAVDAT database

RESEARCH INTERESTS

Isotope geochemistry; geochronology; igneous petrology; sedimentary geology; crustal evolution; tectonics; Precambrian geology

TEACHING EXPERIENCE

- 2024 - GEOL.5310. Isotopes in Environmental and Earth Sciences, University of Massachusetts Lowell
- 2023 - GEOL.5310. Isotopes in Environmental and Earth Sciences, University of Massachusetts Lowell
- 2023 - GEOL.3310. Earth History, University of Massachusetts Lowell
- 2022 – GEOL.3400/3420L. Geology of North America, University of Massachusetts Lowell.
- 2022 – GEOL.4130/5130. Exploring the Solar System, University of Massachusetts Lowell.
- 2021 – GEOL.5310. Isotopes in Environmental and Earth Sciences, University of Massachusetts Lowell
- 2020 – GEOL.1010. General Geology, University of Massachusetts Lowell
- 2020 – GEOL.3310. Earth History, University of Massachusetts Lowell
- 2019 – GEOL.4130/5130. Exploring the Solar System, University of Massachusetts Lowell
- 2019 – GEOL.5310. Isotopes in Environmental and Earth Sciences, University of Massachusetts Lowell
- 2019 – GEOL.3080. Earth Materials II, University of Massachusetts Lowell
- 2018 – GEOL.3150. Environmental Geochemistry, University of Massachusetts Lowell
- 2017 – GEOL.3150. Environmental Geochemistry, University of Massachusetts Lowell
- 2017 – GEOL.3250. Geology for Engineers, University of Massachusetts Lowell
- 2017 – GEOL.5310. Isotopes in Environmental and Earth Sciences, University of Massachusetts Lowell
- 2015 - Lecturer, Igneous and Metamorphic Petrology (undergraduate level, igneous portion of class), University of Maryland
- 2011 - Guest lecturer, Geochemistry (undergraduate level), University of Maryland
- 2011 - Guest lecturer, Geochemistry (graduate level), Washington State University
- 2006-2008 - Teaching Assistant, Introductory Geology, Washington State University,
- 2005 - Chief Teaching Assistant, Introductory Geology, University of North Carolina
- 2003-2005 - Teaching Assistant, Introductory Geology, University of North Carolina
- 2003 - Lecture Assistant, Introductory Geology, University of North Carolina

GRANTS

- 2020-2023 - \$284,610 total with \$222,600 to UML – “Collaborative Research: Tracking novel metal isotope signatures during subduction metamorphism”; **PI – Richard Gaschnig**, co-PI – Shelby Rader; NSF Petrology and Geochemistry
- 2020-2023 - \$229,677 – “Resolving Mesoproterozoic supercontinent configuration with an integrated multi-tool approach to sedimentary provenance analysis”; **PI – Richard Gaschnig**; NSF Tectonics.
- 2020-2023 - \$244,457 – “Creating the next generation offshore wind workforce: teaming with industry to fill skills gaps of MA workforce”; PI - Christopher Hansen, Co-PIs - Christopher Niezrecki, **Richard Gaschnig**, Chi Zhang, and Siavash Pakdelian; Massachusetts Clean Energy Technology Center.
- 2013-2015 - \$226,004 - “Constraining the secular compositional evolution of the upper continental crust using ancient glacial deposits and creation of an upper crustal reference suite”; PI – Roberta Rudnick, **co-PI – Richard Gaschnig**, co-PI – William McDonough; NSF Petrology and Geochemistry EAR-1321954

PUBLISHED PEER-REVIEWED ARTICLES

In review/revision

- Adams, J., Rader, S., **Gaschnig, R.M.**, Bebout, G. (in revision) Behavior of thallium during HP/UHP subduction zone devolatilization in Western Alps HP/UHP metasedimentary rocks: the role of phengite: *American Mineralogist*
- *Marshall, S., **Gaschnig, R.M.**, Rader, S.T., *Mirakian, M., Bebout, G. (in review) All mixed up: disentangling the effects of protolith heterogeneity and metamorphism on Mo isotope compositions of high-P/T metasedimentary rocks: *Geochimica et Cosmochimica Acta*.
- Nelson, E., Ruggles, C., Tikoff, B., Pazke, M., Surpless, K., Vervoort, J., **Gaschnig, R.** (in revision) Formation and extent of the Cretaceous West Mountains plutonic complex in *Jurassic-Paleogene tectonic evolution of the North America Cordillera: GSA Special Paper*.

2025

- *Boudreau, E., **Gaschnig, R.**, Vervoort, J., Schwartz, J., Housen, B., Tikoff, B. (2015) Heavy mineral provenance and paleomagnetic studies of Mesozoic rocks in the Gold Beach terrane: *GSA Bulletin*.
- Gaschnig, R.M.**, *Mato, K., *Leonard, A., Lewis, R.S., Vervoort, J.D. (2025) New insight on Mesoproterozoic paleogeography from the age and geochemistry of detrital minerals in the Belt Supergroup, USA: *GSA Bulletin*
- *Stegner, C., **Gaschnig, R.M.**, *Marshall, S., Rader, S., Bebout, G., Penniston-Dorland, S. (2025) Molybdenum isotope behavior during subduction zone metamorphism in the Catalina Schist, California: *Geochimica et Cosmochimica Acta*, v. 388, p. 294-306.

2024

- Bindeman, I., Rudnick, R., **Gaschnig, R.**, Hofmann, A. (2024) Triple oxygen and hydrogen isotope investigation of glacial diamictites through time: *Chemical Geology*, v. 670, 122458.
- Gaschnig, R.M.**, Lewis, R.S., Buddington, A., Mato, K. (2024) Basement, Belt, and batholith: bedrock geology of the Idaho Panhandle in McFadden, M.D., Pritchard, C.J., eds., Proterozoic Nuna to Pleistocene Megafloods: Sharing Geology of the Inland Northwest: *GSA Field Guide* 69, p. 1-25.
- Mazza S.E., **Gaschnig, R.M.**, Rudnick, R.L., Kleine, T. (2024) Tungsten stable isotope composition of the upper continental crust: *Geochimica et Cosmochimica Acta*, v. 370, p. 161-172.
- Eseller, K.E., Safi, A., Adler, H.G., Conboy, L., **Gaschnig, R.M.**, Melikechi, N. (2024) Assessment of acupuncture's effectiveness in treating Gulf War Illness using Laser Induced Breakdown Spectroscopy and Induced Coupled-Mass Spectrometry: *Spectrochimica Acta Part B: Atomic Spectroscopy*, v. 222., 107076.
- Safi, A., Melikechi, N., Esseler, K.E., **Gaschnig, R.M.**, Xia, W. (2024) Label free, machine learning informed plasma-based elemental biomarkers of Alzheimer's disease: *Journal of Analytical Atomic Spectrometry*, v. 39, p. 1961-1970.

2023

- Gaschnig, R.M.**, Lewis, R.S., Vervoort, J.D. (2023) Age and origin of Early Cretaceous magmatism in the southernmost Omineca Belt, northern U.S. Cordillera: *GSA Bulletin*. <https://doi.org/10.1130/B36845.1>
- Han, P.-Y., Rudnick, R. L., He, T., Marks, M. A. W., Wang, S.-J., **Gaschnig, R. M.**, and Hu, Z.-C., 2023, Halogen (F, Cl, Br, and I) concentrations of the upper continental crust through time as recorded in ancient glacial diamictite composites: *Geochimica et Cosmochimica Acta*, v. 341, p. 28-45.
- Li, W., Nakada, R., Takahashi, Y., **Gaschnig, R.M.**, Hu, Y., Shakouri, M., Liu, X-M. (2023) Cerium geochemical composition in the upper continental crust through time: Implications for tracing past redox environment: *Geochimica et Cosmochimica Acta*, v. 359, p. 20-29.
- Tian, S., Ding, X., Qi, Y., Wu, F., Yue, C., **Gaschnig, R.M.**, Xiao, Z., Lv, W., Rudnick, R.L., Huang, F. (2023) Vanadium isotope evidence for emergence of felsic crust after 3 billion years: *Proceedings of the National Academy of Sciences*, v. 121, no. 11, e2220563120. <https://doi.org/10.1073/pnas.2220563120>

2022

- Gaschnig, R.M.**, Horan, M., Rudnick, R.L., Vervoort, J.D., Fisher, C.M. (2022) History of crustal growth in Africa and the Americas from detrital zircon and Nd isotopes in glacial diamictites: *Precambrian Research*, v. 373, 106641. <https://doi.org/10.1016/j.precamres.2022.106641>

- Liu, X-M., **Gaschnig, R.M.**, Rudnick, R.L., Hazen, R.M., Shahar, A. (2022) Tracing the secular evolution of the upper continental crust using iron isotopes in glacial diamictites: *Geochemical Perspectives Letters*, v. 22, p. 16-19.
<https://doi.org/10.7185/geochemlet.2221>
- Murphy, M.E., Savage, P.S., Gardiner, N.J., Prave, A.R., Rudnick, R.L., **Gaschnig, R.M.** (2022) Homogenizing the upper continental crust: the Si isotope evolution of the crust recorded by ancient glacial diamictites: *Earth and Planetary Science Letters*, v. 591, 1176. <https://doi.org/10.1016/j.epsl.2022.117620>
- Tikoff, B., Kelso, P., Fayon, A.K., **Gaschnig, R.M.**, Russo, R.M., Vervoort, J., Jicha, B., Kahn, M.J. (2022) The jagged western edge of Laurentia: The role of inherited rifted lithospheric structure in subsequent tectonism in the Pacific Northwest, in Whitmeyer, S.J., Williams, M.L., Kellett, D.A., Tikoff, B., eds, *Laurentia: Turning Points in the Evolution of a Continent*: GSA Memoir 220.

2021

- Gaschnig, R.M.**, Rader, S., Reinhard, C.T., Owens, J., Planavsky, N., Wang, X., Asael, D., Greaney, A., Helz, R. (2021) Behavior of the Mo, Tl, and U isotope systems during 1 differentiation in the Kilauea Iki lava lake. *Chemical Geology*, v. 574, 12039.
<https://doi.org/10.1016/j.chemgeo.2021.120239>
- Gaschnig, R.M.**, Reinhard, C.T., Planavsky, N., Wang, X., Asael, D., Jackson, M. (2021) The impact of primary processes and secondary alteration on the stable isotope composition of ocean island basalts: *Chemical Geology*, v. 81, 120416.
<https://doi.org/10.1016/j.chemgeo.2021.120416>
- Rader, S.T., **Gaschnig, R.M.**, Newby, S.M., Bebout, G.E., Mirakian, M.J., Owens, J.D. (2021) Thallium behavior during high-pressure metamorphism in the western Alps, Europe: *Chemical Geology*, v. 579, 120349
<https://doi.org/10.1016/j.chemgeo.2021.120349>
- Tian, S., Moynier, F., Inglis, E.C., Rudnick, R.L., Huang, F., Chauvel, C., Creech, J.B., **Gaschnig, R.M.**, Wang, Z., Guo, J.-L., 2021. Zirconium isotopic composition of the upper continental crust through time. *Earth and Planetary Science Letters*, 572: 117086.
<https://doi.org/10.1016/j.epsl.2021.117086>

2020

- Chen, K., Wang, Z., Tang, M., Rudnick, R.L., **Gaschnig, R.M.**, Zou, Z., He, T., Hu, Z., Liu, Y. (2020) How mafic was the Archean upper continental crust? Insights from Cu and Ag in ancient glacial diamictites: *Geochimica et Cosmochimica Acta*, v. 278, p. 16-29.
<https://doi.org/10.1016/j.gca.2019.08.002>
- Greaney, A.T., Rudnick, R.L., Romaniello, S.J., Johnson, A.C., **Gaschnig, R.M.**, Anbar, A. (2020) Molybdenum isotope fractionation in glacial diamictites tracks onset of oxidative weathering of the continental crust: *Earth and Planetary Science Letters*, v. 534, 116083. <https://doi.org/10.1016/j.epsl.2020.116083>

- Li, S., Junkin, W., **Gaschnig, R.M.**, Ash, R.D., Piccoli, P., Candela, P., Rudnick, R.L. (2020) Molybdenum contents of sulfides in ancient glacial diamictites: implications for molybdenum delivery to the oceans prior to the Great Oxidation Event: *Geochimica et Cosmochimica Acta*, v. 278, p. 30-50. <https://doi.org/10.1016/j.gca.2019.09.011>

2019

- Gaschnig, R.M.** (2019) Benefits of a multi-proxy approach to detrital mineral provenance analysis: an example from New England: *Geochemistry, Geophysics, and Geosystems*, v. 20, no. 3, p. 1557-1573. <https://doi.org/10.1029/2018gc008005>
- Wang, S-J., Rudnick R.L., **Gaschnig, R.M.**, Wang, H., Wasylenki, L.E. (2019) Sulfide Weathering sustained methanogenesis during the Great Oxidation Event: *Nature Geoscience*, v. 12, no. 4, p. 296-300. <https://doi.org/10.1038/s41561-019-0320-z>

2018

- Greaney, A.T., Rudnick, R.L., **Gaschnig, R.M.**, Whalen, J., Luais, B., and Clemens, J.D. (2018) Crustal residence of molybdenum: *Geochimica et Cosmochimica Acta*, v. 238, p. 36-54. <https://doi.org/10.1016/j.gca.2018.06.039>
- Mundl, A., Walker, R.J., Reimink, J.R., Rudnick, R.L., **Gaschnig, R.M.** (2018) Temporal evolution of ¹⁸²W in the upper continental crust: *Chemical Geology*, v. 494, p. 144-152. <https://doi.org/10.1016/j.chemgeo.2018.07.036>
- Nan, X-Y., Yu, H-M., Rudnick, R.L., **Gaschnig, R.M.**, Xu, J., Li, W-Y., Zhang, Q., Jin, Z-D., Li, X-H., Huang, F. (2018) Barium isotopic composition of the upper continental crust: *Geochimica et Cosmochimica Acta*, v. 233, p. 33-49. <https://doi.org/10.1016/j.gca.2018.05.004>

2017

- Byerly, A., Tikoff, B., Kahn, M., Jicha, B., **Gaschnig, R.M.**, and Fayon, A.K. (2017) Internal fabrics of the Idaho batholith: *Lithosphere*, v. 9, p. 283-298. <https://doi.org/10.1130/L551.1>
- Braudy, N., **Gaschnig, R.M.**, Wilford, D., Vervoort, J.D., Nelson, C.L., Davidson, C., Kahn, M.J., and Tikoff, B. (2017) Timing and deformation conditions of the western Idaho shear zone, West Mountain, west-central Idaho: *Lithosphere*, v. 9, p. 157-183. <https://doi.org/10.1130/L519.1>
- Fayon, A.K., Tikoff, B., Kahn, M., and **Gaschnig, R.M.** (2017) Cooling and exhumation of the Idaho batholith: *Lithosphere*, v. 9, p. 299-314. <https://doi.org/10.1130/L565.1>
- Greaney, A., Rudnick, R.L., Helz, R.T., **Gaschnig, R.M.**, Piccoli, P.M., and Ash, R.D. (2017) The behavior of chalcophile elements during magmatic differentiation as observed in Kilauea Iki Lava Lake, Hawaii: *Geochimica et Cosmochimica Acta*, v. 210, p. 71-96. <https://doi.org/10.1016/j.gca.2017.04.033>
- Gaschnig, R. M.**, Macho, A. S., Fayon, A., Schmitz, M., Ware, B. D., Vervoort, J. D., Kelso, P., LaMaskin, T. A., Kahn, M. J., and Tikoff, B. (2017) Intrusive and depositional constraints on the Cretaceous tectonic history of the southern Blue Mountains, eastern Oregon: *Lithosphere*, v. 9, no. 2, p. 265-282. <https://doi.org/10.1130/L554.1>

- Gaschnig, R.M.**, Reinhard, C., Planavsky, N., Wang, X., Asael, D., and Chauvel, C. (2017) Mo isotopes as a tracer of slab input in subduction zones: an example from Martinique, Lesser Antilles arc: *Geochemistry, Geophysics, and Geosystems*, v. 18, no. 12, p. 4674-4689. <https://doi.org/10.1002/2017GC007085>
- Gaschnig, R.M.**, Vervoort, J.D., Tikoff, B., and Lewis, R.S. (2017) Construction and preservation of batholiths in the northern U.S. Cordillera: *Lithosphere*, v. 9, no. 2, p. 315-324. <https://doi.org/10.1130/L497.1>

2016

- Chen, K., Rudnick, R.L., Gao, S., Walker, R.J., **Gaschnig, R.M.**, Puchtel, I.S., Tang, M., and Hu, Z. (2016) Platinum-group element abundances and Re-Os isotopic systematics of the upper continental crust: evidence from glacial diamictites: *Geochimica et Cosmochimica Acta*, v. 191, p. 1-16. <http://dx.doi.org/10.1016/j.gca.2016.07.004>
- Gaschnig, R.M.**, Rudnick, R.L., McDonough, W.F., Kaufman, A.J., Valley, J.W., Hu, Z., Gao, S., and Beck, M.L. (2016) Compositional evolution of the upper continental crust, as constrained by ancient glacial diamictites: *Geochimica et Cosmochimica Acta*, v. 186, p. 316-343. <http://dx.doi.org/10.1016/j.gca.2016.03.020>
- Li, S., **Gaschnig, R.M.**, and Rudnick, R.L. (2016) Origin of the chemical weathering signature in ancient glacial diamictite and the weathering signature of the upper continental crust: *Geochimica et Cosmochimica Acta*, v. 176, p. 96-117. <http://dx.doi.org/10.1016/j.gca.2015.12.012>
- Vervoort, J.D., Lewis, R.S., Fisher, C., **Gaschnig, R.M.**, Jansen, A.C., and Brewer, R.A. (2016) Neoproterozoic and Paleoproterozoic crystalline basement rocks of north-central Idaho: constraints on the formation of western Laurentia: *GSA Bulletin*, v. 128, p. 94-109. <http://doi.org/10.1130/b31150.1>

2015

- Gaschnig, R.M.**, Rudnick, R.L., and McDonough, W.F. (2015) Determination of Ga, Ge, Mo, Ag, Cd, In, Sn, Sb, W, Tl, and Bi in USGS whole-rock reference materials by standard addition ICP-MS: *Geostandards and Geoanalytical Research*, v. 39, p. 371-379. <http://dx.doi.org/10.1111/j.1751-908X.2014.00330.x>
- Tang, M., Rudnick, R.L., McDonough, W.F., **Gaschnig, R.M.**, and Huang, Y. (2015) Europium anomalies constrain the mass of recycled lower continental crust: *Geology*, v. 43, p. 703-706. <http://doi.org/10.1130/g36641.1>

2014

- Gaschnig, R.M.**, Rudnick, R.L., McDonough, W.F., Kaufman, A.J., Hu, Z., and Gao, S., (2014) Onset of oxidative continental weathering recorded by transition metal concentrations in ancient tillites: *Earth and Planetary Science Letters*, v. 408, p. 87-99. <http://dx.doi.org/10.1016/j.epsl.2014.10.002>

2013

- Dahlquist, J.A., Pankhurst, R.J., **Gaschnig, R.M.**, Rapela, C.W., Casquet, C., Alasino, P.H., Galindo, C., and Baldo, E.A. (2013) Hf and Nd isotopes in Early Ordovician to Early Carboniferous granites as monitors of crustal growth in the Proto-Andean margin of Gondwana: *Gondwana Research*, v. 23, p. 1617-1630.
<https://doi.org/10.1016/j.gr.2012.08.013>
- Gaschnig, R.M.**, Vervoort, J.D., Lewis, R.S., and Tikoff, B. (2013) Probing for Proterozoic and Archean crust in the northern U.S. Cordillera with inherited zircons from the Idaho batholith: *GSA Bulletin*, v. 125, p. 73-88. <https://doi.org/10.1130/b30583.1>
- Hu, Z., Zhang, W., Liu, Y., Chen, H., **Gaschnig, R.M.**, Zong, K., Li, M., Gao, S., and Hu, S. (2013) Rapid bulk rock decomposition by ammonium fluoride (NH₄F) in open vessels at an elevated digestion temperature: *Chemical Geology*, v. 355, p. 144-152.
<https://doi.org/10.1016/j.chemgeo.2013.06.024>

2012

- Anfinson, O.A., Leier, A.L., **Gaschnig, R.M.**, Embry, A.F., and Dewing, K. (2012) U-Pb and Hf isotopic data from Franklinian Basin strata: insights into the nature of Crockerland and the timing of accretion, Canadian Arctic Islands: *Canadian Journal of Earth Sciences*, v. 49, p. 1316-1328. <https://doi.org/10.1139/e2012-067>
- Davis, J.W., Coleman, D.S., Gracely, J.T., **Gaschnig, R.M.**, and Stearns, M., (2012) Crystallization, thermochronology, and magma fluxes from plutons of the Sierra Nevada batholith, CA: *Contributions to Mineralogy and Petrology*, v. 163, no. 3, p. 449-465. <http://dx.doi.org/10.1007/s00410-011-0683-7>
- Gray, K.D., Watkinson, A.J., **Gaschnig, R.M.**, and Isakson, V.H. (2012) Age and structure of the Crevice pluton: overlapping orogens in west-central Idaho?: *Canadian Journal of Earth Sciences*, v. 49, p. 709-731. <https://doi.org/10.1139/e2012-016>
- Wang, X., Shu, X., Xu, X., Tang, M., and **Gaschnig, R.M.** (2012) Petrogenesis of the Early Cretaceous adakites-like porphyries and associated basaltic andesites in the eastern Jiangnan orogen, southern China: *Journal of Asian Earth Sciences*, v. 61, p. 243-256.
<https://doi.org/10.1016/j.jseaes.2012.10.017>
- Zhang, W., Hu, Z., Liu, Y., Chen, H., Gao, S., and **Gaschnig, R.M.** (2012) Total rock dissolution using ammonium bifluoride (NH₄HF₂) in screw-top Teflon vials: a new development in open vessel digestion: *Analytical Chemistry*, v. 84, p. 10686-10693.
<http://dx.doi.org/10.1021/ac302327g>

2011

- Gaschnig, R.M.**, Vervoort, J.D., Lewis, R.S., and Tikoff, B. (2011) Isotopic evolution of the Idaho batholith and Challis intrusive province, northern U.S. Cordillera: *Journal of Petrology*, v. 52, p. 2397-2429. <https://doi.org/10.1093/petrology/egr050>

2010

- Gaschnig, R.M.**, Vervoort, J.D., Lewis, R.S., and McClelland, W.C. (2010) Migrating

magmatism in the northern U.S. Cordillera: in situ U-Pb geochronology of the Idaho batholith: *Contributions to Mineralogy and Petrology*, v. 159, p. 863-883. <https://doi.org/10.1007/s00410-009-0459-5>

PEER-REVIEWED ARTICLES IN PREPARATION

Gaschnig, R.M., Lewis, R.S., Vervoort, J.D. (in preparation – **invited review article**) Origin of the Challis magmatic province: to be submitted to *Lithos*.

OTHER PUBLICATIONS

- Buddington, A.M., Steven, C.J., Tikoff, B., and **Gaschnig, R.M.** (2021) Lamprophyre dikes of northern Idaho and northeastern Washington: *Idaho Geological Survey Technical Report T-21-01*.
- Burmester, R. F., Steven, C. J., Schmidt, K. L., Lewis, R. S., **Gaschnig, R. M.**, and Murchland, M., 2023, Return to the River of No Return corridor: new insights from Mesoproterozoic rock along the Salmon River from North Fork to Corn Creek, east-central Idaho: *Northwest Geology*, v. 52, p. 149-157.
- Gaschnig, R.M.**, Vervoort, J.D., Lewis, R.S., and Dufrane, S.A. (2008) Utilizing U-Pb geochronology of inherited zircon in the Atlanta lobe of the Idaho batholith as a probe of the deep crust in southern Idaho: a progress report: *Northwest Geology*, v. 37, p. 101-110.
- Lewis, R.S., Schmidt, K.L., **Gaschnig, R.M.**, LaMaskin, T.A., Lund, K., Gray, K.D., Tikoff, B., Stetson-Lee, T., and Moore, N., (2014) Hells Canyon to the Bitterroot front: a transect from the accretionary margin eastward across the Idaho batholith *in* Shaw, C.A., and Tikoff, B. (eds) *Exploring the northern Rocky Mountains: GSA Field Guide*, v. 37, p. 1-50.
- Sherwin, J., Younggren, E.B., Link, P.K., and **Gaschnig, R.M.**, (2007) Geologic map of the Coyote Creek 7.5' quadrangle, southwest Montana: *Montana Bureau of Mines and Geology Geologic Map 67*.
- Tikoff, B., Kahn, M.J., **Gaschnig, R.M.**, Michaels, Z.D., Davenport, K., Hole, J.A., Stanciu, A.C., Fayon, A.K., and Kruckenberg, S.C. (2017) Exploring the western Idaho shear zone using the StraboSpot data system *in* Haugerud, R.A., Kelsey, H.M. (eds) *From the Puget Lowland to East of the Cascade Range: Geologic Excursions in the Pacific Northwest: Geological Society of America Field Guide 49*, p. 229-254.
- Tikoff, B., Vervoort, J.D., Hole, J., Russo, R., **Gaschnig, R.M.**, and Fayon, A. (2017) Introduction: EarthScope IDOR project (deformation and magmatic modification of a steep continental margin, western Idaho–eastern Oregon) themed issue: *Lithosphere*, v. 9, 151-156.

CONFERENCE ABSTRACTS

2025

- Addis, I., Rizo, H., Codillo, E., **Gaschnig, R.M.** (2025) Tungsten fluid mobility in subduction zones investigated in samples from the Voltri Massif, Italy: *GAC-MAC Annual Meeting*.
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2024

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PROFESSIONAL ACTIVITIES, SERVICE, AND OUTREACH

- Field trip organizer and leader, GSA Cordilleran/Rocky Mountain Joint Section Meeting, 2024
- Reviewer for NSF EAR Tectonics, Petrology and Geochemistry, GeoPRISMS, and Frontiers in Earth Systems Dynamics programs
- Reviewer for *American Journal of Science*, *American Mineralogist*, *Chemical Geology*, *Earth and Planetary Science Letters*, *Earth-Science Reviews*, *Geochemistry*, *Geophysics*, and *Geosystems*, *Geological Society of America Bulletin*, *Geology*, *Geosphere*, *Geostandards and Geoanalytical Research*, *Island Arc*, *Journal of Asian Earth Sciences*, *Journal of Volcanology and Geothermal Research*, *Lithos*, *Lithosphere*, *Minerals*, *Nature Geoscience*, and *Sedimentary Geology*
- Contributor and collaborator for Sedimentary Geochemistry and Paleoenvironments Project (<https://sgp.stanford.edu/>)

- Interviewed along with Ph.D. student Ericka Boudreau for Nick Zentner's YouTube series in 2023 and 2024
<https://www.youtube.com/live/fzV5mNdto44?si=ApKcG3FQ6ia3eUK3>
<https://www.youtube.com/live/2ZooZU-rrE?si=bbzBHcV-9of8-sPm>
- Judge at UML Student Research Symposium (2022)
- Talk on 2021 Iceland eruption to UML Learning in Retirement Association (2022)
- Goldschmidt Conference, session convener (2018, 2021)
- Public lecture on age dating in geology, Chelmsford Public Library, MA (2017)
- AGU Fall Meeting, OPSA judge (2014, 2015)
- AGU Fall Meeting, session convener (2014, 2015, 2019, 2020, 2022)
- GSA Cordillera-Rocky Mountain Joint Section Meeting, session convener (2014)
- GSA Cordillera-Rocky Mountain Joint Section Meeting, field trip leader (2014)
- Judge, Prince George's County Science Fair (2014)
- Collaborative Institute for Dynamic Earth Research (CIDER) Summer Program, junior participant (2013)
- Organizer for University of Maryland Geochemistry Seminar Series (2012-2013)
- GSA Annual Meeting, session co-convener (2011, 2021)
- Guest lecture at Sterling High School, NJ on radiometric dating (2008)

INVITED TALKS

- Scripps Institution of Oceanography (2024)
- University of Massachusetts Lowell – Physics Department (2023)
- Queens University (2021, virtual talk)
- Stanford University (2021, virtual talk)
- Washington State University (2020, virtual talk)
- Boston College (2019)
- University of Massachusetts Amherst (2019)
- Massachusetts Institute of Technology (2018)
- Salem State University (2017)
- University of Alabama (2016)
- University of Massachusetts - Lowell (2016)
- University of North Carolina at Wilmington (2016)
- University of Queensland (2015)
- Louisiana State University (2015)
- AGU Fall Meeting (2014)
- Carnegie Institution for Science, Department of Terrestrial Magnetism (2014)
- Laurentian University (2014)
- American Museum of Natural History (2013)
- Geological Society of Washington (2013)
- University of Arkansas (2013)
- China University of Geosciences, Wuhan (2012)
- University of Alabama (2012)

PROFESSIONAL MEMBERSHIPS

- American Geophysical Union
- Geochemical Society
- Geological Society of America
- International Association of Geoanalysts

POSTDOCTORAL RESEARCH ADVISING

Shelby Rader (University of Massachusetts Lowell, 2018-2019; now assistant professor at Indiana University - Bloomington)

STUDENT RESEARCH/THESIS ADVISING

Ph.D. students

Ericka Boudreau (University of Massachusetts Lowell, in progress)

M.S. students

Ericka Boudreau (University of Massachusetts Lowell, 2022)

Briana Bowlby (University of Massachusetts Lowell, in progress)

Richard Butts (University of Massachusetts Lowell, 2020)

Charl Du Toit (University of Massachusetts Lowell, 2020)

Kellie Gunning (University of Massachusetts Lowell, 2022)

Sam Marshall (University of Massachusetts Lowell, 2022)

Klementina Mato (University of Massachusetts Lowell, 2022)

Cassidy Stegnor (University of Massachusetts Lowell, 2022)

B.S. students

Seven Greer (University of Massachusetts Lowell, 2022-2023)

Ryan Benner (University of Massachusetts Lowell, 2024-2025)

Alexis Bilas-Imperial (University of Massachusetts Lowell, 2020)

Ericka Boudreau (University of Massachusetts Lowell, 2019-2020)

Thomas Furtado (University of Massachusetts Lowell, 2020-2021)

Aaron Leonard (University of Massachusetts Lowell, 2018-2019)

Alexsia Khim (University of Massachusetts Lowell, 2020)

Mike Mirakian (University of Massachusetts Lowell, 2018-2019)

Mike Spaulding (University of Massachusetts Lowell, 2018)