**Richard M. Gaschnig**

Department of Environmental, Earth and Atmospheric Sciences (856)-261-8595

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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**

* 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**

Bindeman, I., Rudnick, R., **Gaschnig, R.**, Hofmann, A. (in revision) Triple oxygen and

hydrogen isotope investigation of glacial diamictites through time: *Chemical Geology*.

\*Boudreau, E., **Gaschnig, R.**, Vervoort, J., Schwartz, J., Housen, B., Tikoff, B. (in review)

Heavy mineral provenance and paleomagnetic studies of Mesozoic rocks in the Gold Beach terrane: *GSA Bulletin*.

Melikechi, N.*,* Kemal, E.E., Safi, A., Helmar, G.A., Conboy, L., **Gaschnig, R.** (in review)

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*

Nelson, E., Ruggles, C., Tikoff, B., Pazke, M., Surpless, K., Vervoort, J., **Gaschnig, R.** (in

review) The Cretaceous West Mountain arc, western Idaho *in* *Jurassic-Paleogene*

*tectonic evolution of the North America Cordillera: GSA Special Paper*.

\*Stegner, C., **Gaschnig, R.M.**, \*Marshall, S., Rader, S., Bebout, G., Penniston-Dorland, S.

(in review) Molybdenum isotope behavior during subduction zone metamorphism in the Catalina Schist, California: *Geochimica et Cosmochimica Acta*.

**2024**

**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.

Safi, A., Melikechi, N., Esseler, K.E., **Gaschnig, R.M.**, Xia, W. (in press) Label free,

machine learning informed plasma-based elemental biomarkers of Alzheimer’s disease: *Journal of Analytical Atomic Spectrometry.*

**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](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 Cosmochimca 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 Cosmochimca 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) Neoarchean 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, JA., 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**

**2024**

Boudreau, E., **Gaschnig, R.M.** (2024) Decoupling of zircon-whole rock trace element

systematics in the Idaho batholith and Challis magmatic suite: *GSA Abstracts with Programs*.

**Gaschnig, R.M.**, Marshall, S., Stegner, S., Mirakian, M., Rader, S., Bebout, G., Penniston-

Dorland, S. (2024) KEYNOTE - Contrasting molybdenum isotope behavior in two HPLT terranes: *Mineralogical Magazine (Goldschmidt Meeting).*

**Gaschnig, R.M.**, Vervoort, J.D. (2024) Challis alkali basalts in western Idaho: *GSA*

*Abstracts with Programs*.

Madonna, A., Du Toit, C., **Gaschnig R.M.** (2024) The floor of the Idaho batholith: U-Pb of

gneissic rocks from the upper Selway River along the boundary of the Bitterroot lobe: *GSA Abstracts with Programs*.

Nelson, E., Ruggles, C., Tikoff, B., Patzke, M., Surpless, K., Vervoort, J., **Gaschnig, R.**

(2024) The Jurassic-Cretaceous Hazard Creek arc, western Idaho: *GSA Abstracts with Programs*.

Nelson, E., Tikoff, B., Ruggles, C., Patzke, M., Surpless, K., **Gaschnig, R.M.** (2024) The

West Mountain arc: early-middle Cretaceous magmatism in the northwest U.S. Cordillera: *GSA Abstracts with Programs*.

Smith, M., Prichard, C., **Gaschnig, R.M.** (2024) Refining ages of granitic rocks at the

intersection of the Sevier orogeny and Priest River core complex in the Spokane area: *GSA Abstracts with Programs*.

**2023**

Adams, C., Rader, S.T., **Gaschnig, R.M.**, Bebout, G.E. (2023) Constraints on the

remobilization of thallium and fluid-mineral interactions during high-pressure metamorphism: *GSA Abstracts with Programs*.

Boudreau, E.M., **Gaschnig R.M.**, Schwartz, J., Vervoort J.D., Housen, B. (2023) Heavy

mineral provenance and paleomagnetic studies of Mesozoic rocks in the Gold Beach terrane: *GSA Abstracts with Programs*, v. 55, no. 4.

Boudreau, E. M., **Gaschnig, R. M.**, Lewis, R. S., du Toit, C., Greer, S., and Barlow, M.,

(2023) Geochemically "fingerprinting" the Idaho batholith; machine-learning applications in provenance research: *GSA Abstracts with Programs*. Vol. 55, No. 6.

**Gaschnig, R.M.**, Boudreau, E.M., Greer, S. (2023) Accessory mineral geochemistry of the

Idaho batholith: *10th Hutton Symposium*.

**Gaschnig, R.M.**, Mato, K., Leonard, A., Lewis, R.S. (2023) Clues to the provenance and

later metamorphic history of the Belt Supergroup from monazite petrochronology: *Northwest Geology (Tobacco Root Geological Society/Belt Symposium).*

**Gaschnig, R.M.**, Nelson, E., Tikoff, B. (2023) New constraints on the southern extent of the

western Idaho shear zone and magmatism and metamorphism therein: *GSA Abstracts with Programs,* v. 55, no. 4.

Huang, T., Teng, F.-Z., Rudnick, R.L., **Gaschnig, R.M.** (2023) Temporal evolution of the

upper continental crust revealed by potassium isotope geochemistry of glacial diamictites: *EOS, Transactions, American Geophysical Union.*

Rader, S.T., Adams, C., **Gaschnig, R.M.**, Bebout, G.E. (2023) Constraints on fluid-mineral

partitioning of thallium during high-pressure metamorphism: *Mineralogical Magazine (Goldschmidt Meeting).*

Savage, P.S., **Gaschnig, R.M.**, Rudnick, R.L. (2023) The copper isotope composition and

evolution of the continental crust as revealed by glacial diamictite composites: *Mineralogical Magazine (Goldschmidt Meeting).*

Teng, F.-Z., Huang, T.-Y., Rudnick, R.L., **Gaschnig, R.M.** (2023) Temporal evolution of the

continental crust revealed by potassium isotope geochemistry of glacial diamictites: *Mineralogical Magazine (Goldschmidt Meeting).*

**2022**

\*Boudreau, E., **Gaschnig, R.M.**, Souders, A.K., Sylvester, P. (2022) Pb isotopes in detrital

feldspars reveal unlikely relationships between southern and northern Cordilleran terranes: *GSA Abstracts with Programs*.

**Gaschnig, R.M.**, \*Boudreau, E., Johnston, S. (2022) Testing trace element discriminants for

magmatic versus metamorphic monazite: *EOS, Transactions, American Geophysical Union.*

**Gaschnig, R.M.**, \*Mato, K., \*Gunning, K., Souders, A.K., Sylvester, P., Doe, M.F. (2022)

Detrital feldspar Pb isotope perspectives on the provenance of the Mesoproterozoic Hess Canyon Group and Belt Supergroup, western U.S.A.: *GSA Abstracts with Programs*.

Han, P., Rudnick, R.L., He, T., Marks, M.A.W., Wang, S., **Gaschnig, R.M.**, Hu, Z. (2022)

The role of continental crust in the global halogen cycle: insights from halogen concentrations (F, Cl, Br, and I) of ancient glacial deposits: *Mineralogical Magazine (Goldschmidt Meeting).*

Murphy, M.E., Savage, P.S., Gardiner, N.J, Prave, A.R., **Gaschnig, R.M.**, Rudnick, R.L.

(2022) The Si isotope evolution of the crust recorded by ancient glacial diamictites: *Mineralogical Magazine (Goldschmidt Meeting).*

Rader, S.T., **Gaschnig, R.M.**, Penniston-Dorland, S.C., Bebout, G.E. (2022) Thallium

behavior within subduction zone metamorphism and related metasomatic processes: *Mineralogical Magazine (Goldschmidt Meeting).*

**2021**

\*Boudreau, E., **Gaschnig, R.M.**, Schwartz, J., and Vervoort, J.D. (2021) Detrital mineral

constraints reflecting northward translation of the Gold Beach terrane, Oregon: *GSA Abstracts with Programs*.

**Gaschnig, R.M.**, \*Chan, N., and Vervoort, J.D. (2021) Zircon and monazite petrochronology

of the Coolwater culmination, Idaho: *GSA Abstracts with Programs.*

*\**Gunning, K., **Gaschnig, R.M.**, Doe, M., and Goodge, J. (2021) Resolving supercontinent

models with multi-mineral provenance studies of Proterozoic sedimentary rocks in the southwest US and East Antarctica: *GSA Abstracts with Programs.*

Li, S., Rudnick, R.L., Qiu, L., Zurkowski, C., **Gaschnig, R.M.**, Valley, J.W., Guy, B.M., and

Beukes, N.J. (2021) Lithium and oxygen isotopic compositions of ancient shales trace chemical weathering across the Archean-Proterozoic boundary: *GSA Abstracts with Programs*.

\*Mato, K., and **Gaschnig, R.M.** (2021) Reconstructing a Mesoproterozoic tectonic puzzle by

revisiting the provenance of the Belt Supergroup in the western U.S.: *GSA Abstracts with Programs.*

\*Marshall, S.J., **Gaschnig, R.M.**, \*Stegnor, S.J., Rader, S.T., and Bebout, G.E. (2021)

Molybdenum isotope systematics in the high-P/T Schistes Lustrés and at Lago di Cignana: investigation of partitioning and isotopic fractionation during subduction zone metamorphism: *Mineralogical Magazine (Goldschmidt Meeting).*

\*Stegnor, S.J., \*Marshall, S.J., **Gaschnig, R.M.**, Rader, S.T., and Bebout, G.E. (2021)

Molybdenum behavior during subduction zone metamorphism in the Catalina Schist: *Mineralogical Magazine (Goldschmidt Meeting).*

Tian, S., Moynier, F., Inglis, E., Rudnick, R.L., Huang, F., Chauvel, C., **Gaschnig, R.M.**,

Creech, J., Puchtel, I.S. (2021) The zirconium isotope composition of the mantle and upper continental crust through time: *Mineralogical Magazine (Goldschmidt Meeting).*

Tikoff, B., Fayon, A.K., Kelso, P.R.,and **Gaschnig, R.M.** (2021) Crustal thickening caused

by the clockwise rotation of the central Idaho block: role of the Lewis and Clark line and implications for tectonics of Montana: *GSA Abstracts with Programs*.

**2020**

**Gaschnig, R.M.**, Reinhard, C.T., Planavsky, N., Wang, X., Asael, D., and Jackson, M.

(2020) The potential role of later alteration on the inferred Mo and U isotope compositions of mantle reservoirs derived from OIB lavas: *Mineralogical Magazine (Goldschmidt Meeting).*

Hole, J.A., **Gaschnig, R.M.**, Davenport, K.K., Stanciu, A.C., Byerly, D., Bremner, P.,

Tikoff, B., Vervoort, J.D., Russo, R.M., and Fayon, A.K. (2020) Evolution of the northern U.S. Cordillera: results from the IDOR Earth Project: *GSA Abstracts with Programs*.

Rader, S.T., **Gaschnig, R.M.**, Bebout, G.E., Romaniello, S.J., Ostrander, C.M., and Anbar,

A.D. (2020) Molybdenum behavior during high pressure metamorphism: *Mineralogical Magazine (Goldschmidt Meeting).*

Tikoff, B., Kelso, P.R., Fayon, A.K., Gaschnig, R.M., and Vervoort, J.D. (2020)

Reconstructing the western margin of Precambrian Laurentia in the Pacific Northwest: removing the effects of Late Cretaceous-Paleogene rotation: *GSA Abstracts with Programs*.

**2019**

\*Du Toit, C.D., **Gaschnig, R.M.**, Lewis, R.S., and Schmidt, K.L. (2019) In situ U-Pb zircon

geochronology of deformed granitoids and orthogneisses in the Main Salmon gneiss complex, Idaho: *GSA Abstracts with Programs*.

**Gaschnig, R.M.**, \*Rader, S.T., \*Mirakian, M., Bebout, G.E. (2019) Distribution and

redistribution of Mo and Tl in high pressure-low temperature metamorphic rocks: *EOS, Transactions, American Geophysical Union.*

Horan, M.F., Rudnick, R.L., Carlson, R.W., **Gaschnig, R.M.** (2019) Evolution of upper

continental crust from 142-Nd in glacial diamictites: *Mineralogical Magazine (Goldschmidt Meeting).*

\*Leonard, A., **Gaschnig, R.M.**, and Lewis, R.S. (2019) Revisiting the provenance of the Belt

Supergroup with an expanded detrital mineral toolkit: *GSA Abstracts with Programs*.

\*Rader, S.T., **Gaschnig, R.M.**, Owens, J.D., Bebout, G.E. (2019) Thallium variations during

high pressure metamorphism: *Mineralogical Magazine (Goldschmidt Meeting).*

Saji, N.S., **Gaschnig, R.M.**, Rudnick, R.L., Millet, M. (2019) Upper continetal crust

compositional evolution as constrained by Ti isotopes in diamictites. *Mineralogical Magazine (Goldschmidt Meeting).*

**2018**

**Gaschnig, R.M.** (2018) Expanding the provenance toolkit beyond detrital zircon dating: a

test case from the Merrimack River: *GSA Abstracts with Programs*, v. 50, no. 2.

**Gaschnig, R.M.**, Owens, J., Newby, S., Reinhard, C., Wang, X., Asael, D., Planavsky, N.,

and Rudnick, R. (2018) The Tl and Cr isotope composition of the upper continental crust from Archean to present: *Mineralogical Magazine (Goldschmidt Meeting).*

Wasylenki, L., Wang, S., Rudnick, R.L., **Gaschnig, R.M.**, and Wang, H. (2018) Sulfide

weathering may have sustained methanogenesis across the Great Oxidation Event: *Mineralogical Magazine (Goldschmidt Meeting).*

**2017**

**Gaschnig, R.M.**, Reinhard, C., Owens, J., Planavsky, N., Wang, X., Asael, D., Greaney, A.,

and Helz, R. (2017) Behavior of Mo, U, and Tl isotopes during differentiation in the Kilauea Iki system: *Mineralogical Magazine (Goldschmidt Meeting).*

Gaschnig, R.M., Vervoort, J.D., and Lewis, R.S. (2017) The Challis magmatic province in

Idaho: a review: *GSA Abstracts with Programs.*

Greaney, A.T., Rudnick, R.L., Romaniello, S.J., Johnson, A.C., **Gaschnig, R.M.**, and Anbar,

A.D. (2017) Mo isotopes reveal oxidation of Earth’s continental crust during the 2.4 Ga Great Oxidation Event: *EOS, Transactions, American Geophysical Union.*

Mundil, A., Walker, R.J., Reimink, J.R., Rudnick, R.L., and **Gaschnig, R.M.** (2017)

Compositional changes in the UCC through time revealed by tungsten isotopes: *EOS, Transactions, American Geophysical Union.*

Tikoff, B., Kahn, M., Fayon, A., Schmidt, K.L, Kelso, P., **Gaschnig, R.M.**, Vervoort, J., and

Hole, J.A. (2017) An integrated tectonic and magmatic history of the interior region of the Pacific Northwest: the significance of the Syringa Embayment: *GSA Abstracts with Programs.*

Wang, S., Wasylenki, L., Rudnick, R., and **Gaschnig, R.M.** (2017) Ni isotopic composition

of the upper continental crust through time: *Mineralogical Magazine (Goldschmidt Meeting****).***

**2016**

Fayon, A.K., Kahn, M., Tikoff, B., and **Gaschnig, R.M.** (2016) Exhumation histories Across

an ancient arc-craton boundary, northern North American Cordillera: *EOS,*

*Transactions, American Geophysical Union.*

**Gaschnig, R.M.**, Reinhard, C.T., Planavsky, N.J., Wang, X., Asael, D., and Chauvel, C.

(2016) Mo and U isotope behavior in the Lesser Antilles subduction system: Mineralogical Magazine (Goldschmidt Meeting), 908.

Greaney, A.T., Rudnick, R.L., and **Gaschnig, R.M.** (2016) Crustal sources of molybdenum:

Mineralogical Magazine (Goldschmidt Meeting), 982.

Hole, J.A., **Gaschnig, R.M.**, Byerly, A., Davenport, K.K., Stanciu, A.C., Vervoort, J.D.,

Fayon, A.K., Tikoff, B., Russo, R.M., and Foster, D.A. (2016) The post-85 Ma Idaho

batholith represents melting in thickened continental crust, not arc magmatism: *EOS,*

*Transactions, American Geophysical Union.*

Vervoort, J.D., Fisher, C.M., Lewis, R.S., Baldwin, J.A., Wang, D., Jansen, A.C., Nesheim,

T.O., Zirakparvar, N.A., McDonie, C., and **Gaschnig, R.M.** (2016) Evidence for Neoarchean to Paleoproterozoic crustal formation and modification in the northern U.S. Cordillera: *GSA Abstracts with Programs.*

**2015**

**Gaschnig, R.M.**, Rudnick, R.L., McDonough, W.F., Kaufman, A.J., Vervoort, J.D., and

Fisher, C.M. (2015) Insights on crustal growth from detrital zircons in ancient glacial deposits: *EOS, Transactions, American Geophysical Union.*

Greaney, A.T., Rudnick, R.L., Helz, R.T., **Gaschnig, R.M.**, Ash, R.D., and Piccoli, P.M.

(2015) The behavior of chalcophile and siderophile elements during magmatic differentiation as observed in Kilauea Iki lava lake, Hawaii: *GSA Abstracts with Programs*

Liu, X-M., **Gaschnig, R.M.**, Rudnick, R.L., Hazen, R., Shahar, A. (2015) Tracing the secular

evolution of the UCC using the iron isotope composition of ancient glacial diamictites: *EOS, Transactions, American Geophysical Union.*

**2014**

Fisher, C., Vervoort, J.D., Lewis, R.S., **Gaschnig, R.M.**, and Goodge, J.W., Jansen, J.C., and

Wang, D. (2014) A bimodal belt of ~1.86 to 2.66 Ga tonalitic gneisses in northwest Laurentia: U-Pb and Lu-Hf constraints on the evolution of North America: *GSA Abstracts with Programs,* v. 46, no. 5, p. 19.

**Gaschnig, R.M.**, Lewis, R.S., Burmester, R., McFaddan, M.D., and Vervoort, J.D. (2014)

Ordovician magmatism and orphaned Mesozoic accreted crust? Strange bedfellows along the Salmon River west of Shoup, Idaho: *GSA Abstracts with Programs*, v. 46, no. 5, p. 15.

**Gaschnig, R.M.**, Rudnick, R.L., McDonough, W.F., Kaufman, A.J., Valley, J.W., Hu, Z.,

and Gao, S. (2014) Using ancient glacial diamictites to track the compositional evolution of the upper continental crust: *EOS, Transactions, American Geophysical Union.*

**Gaschnig, R.M.**, Vervoort, J.D., and Tikoff, B. (2014) Mesozoic terrane accretion and

formation of the Idaho batholith: *EOS, Transactions, American Geophysical Union.*

Macho, A.S., **Gaschnig, R.M.**, Kelso, P., Albee, R.D., Fayon, A., Vervoort, J.D., Schmitz,

M., and Tikoff, B. (2014) Tonalitic magmatism, exhumation, and rotation along the Baker-Olds Ferry terrane boundary, Blue Mountains, eastern Oregon: *GSA Abstracts with Programs*, v. 46, no. 5, p. 15.

Rudnick, R.L., **Gaschnig, R.M.**, Li, S., Tang, M., Qiu, L., Valley, J.W., Zurkowski, C., and

McDonough, W.F. (2014) Temporal evolution of the upper continental crust: implications for the mode of crustal growth and the evolution of the hydrosphere: *EOS, Transactions, American Geophysical Union.*

Sherwin, J., Younggren, E.B., Link, P.K., and **Gaschnig, R.M.**, (2014) Proterozoic and

Tertiary rocks of the Coyote Creek 7.5’ quadrangle, southwestern Montana: *GSA Abstracts with Programs*, v. 46, no. 5, p. 33.

Tikoff, B., Kelso, P., Stetson-Lee, T., Byerly, A., **Gaschnig, R.M.**, Vervoort, J.D., and

Rinna, A.P. (2014) The role of the Precambrian rifted margin on Cretaceous-aged deformation: *GSA Abstracts with Programs*, v. 46, no. 5, p. 18.

Vervoort, J.D., Lewis, R.S., Fisher, C.M., **Gaschnig, R.M.**, Jansen, A.C., and Wang, D.

(2014) The Clearwater complex: uncovering the Neoarchean and Paleoproterozoic basement of north central Idaho: *GSA Abstracts with Programs*, v. 46, no. 5, p. 20.

**2013**

Fayon, A.K., Tikoff, B., Kahn, M.J., **Gaschnig, R.M.**, and Vervoort, J.D. (2013) Preliminary

low-temperature thermochronology of western Idaho shear zone and Atlanta lobe, Idaho batholith: *GSA Abstracts with Programs*, v. 45, no. 7, p. 58.

Fisher, C., Vervoort, J.D., Jansen, J.C., Lewis, R.S., **Gaschnig, R.M.**, and Goodge, J.W.

(2013) Precambrian crystalline basement rocks of northwest Laurentia: constraining the formation and evolution of North America: *GSA Abstracts with Programs,* v. 45, no. 7, p.310.

**Gaschnig, R.M.**, Rudnick, R., and McDonough, W.F. (2013) How great was the Great

Oxidation Event? Observations from the behavior of redox-sensitive elements in Precambrian glacial tillites: *EOS, Transactions, American Geophysical Union.*

**Gaschnig, R.M.**, Rudnick, R., and McDonough, W.F. (2013) Molybdenum in ancient glacial

tillites of different ages and its bearing on atmospheric oxygenation: Mineralogical Magazine (Goldschmidt Meeting), v. **77, p.** 1145.

Hu, Z., Zhang, W. Ni, Q., Liu, Y., **Gaschnig, R.M.**, Zhou, L., and Zhao, L. (2013) Rapid

bulk rock decomposition by ammonium fluoride (NH4F) in open-vessels by an elevated digestion temperature: Mineralogical Magazine (Goldschmidt Meeting), v. **77, p.** 1335.

Lee, C.-T., Chin, E.J., Erdman, M., **Gaschnig, R.M.**, Lederer, G.W., Savage, P.S., Zhong, S.,

Zincone, S. (2013) How to make a craton: *EOS, Transactions, American Geophysical Union.*

Montz, W.J., Kedenburg, M., Tikoff, B., Giorgis, S.D., Vervoort, J.D., **Gaschnig, R.M.**,

and Byerly, A., (2013) The Deadwood deformation zone, central Idaho: constraints on timing and fabric development: *GSA Abstracts with Programs*, v. 45, no. 7, p. 813.

Rudnick,  R., **Gaschnig, R.M.**, and McDonough, W.F. (2013) Glacial tillites reveal temporal

evolution of upper continental crust: Mineralogical Magazine (Goldschmidt Meeting), **v. 77, p.** 2096.

Zhang, W., Hu, Z., Liu, Y., Chen, H., Gao, S. and **Gaschnig, R.M.** (2013) NH4HF2–assisted

digestion of silicate rocks for multi-element analysis by ICP-MS: a new development in open vessel digestion: Mineralogical Magazine (Goldschmidt Meeting), v. **77, p.** 2594.

**2012**

**Gaschnig, R.M.**, Rudnick, R., McDonough, W.F., Gao, S., Hu, Z., Zhou, L. (2012)

Geochemistry of Snowball Earth glacial tillites from China and North America: implications for the bulk composition of the Neoproterozoic upper crust: *EOS, Transactions, American Geophysical Union.*

**Gaschnig, R.M.**, Vervoort, J., Lewis, R. (2012) The Kaniksu and Idaho batholiths, northern

U.S. Cordillera: close relatives or a case of mistaken identity? *GSA Abstracts with Programs*, v. 44, no. 7, p. 383.

**2011**

Braudy, N., Tikoff, B., **Gaschnig, R.**, and Vervoort, J. (2011) The western Idaho shear zone,

West Mountains, Idaho: preliminary structural geology results of IDOR project: *GSA Abstracts with Programs*, v. 43, No. 5, p. 647.

Braudy, N., Tikoff, B., **Gaschnig, R.**, and Vervoort, J. (2011) The western Idaho shear zone,

West Mountains, Idaho: characterizing deformation through a seismic transect: *Abstracts from Earthscope National Meeting*.

Burmester, R., Lonn, J.D., Lewis, R.S., McFaddan, M.D., and **Gaschnig, R.M.** (2011) The

Beaverhead Divide fault on the Idaho-Montana border – Cretaceous contraction, Eocene extension, but not a terrane boundary: *GSA Abstracts with Programs*, v. 43, No. 4, p. 50.

**Gaschnig, R.**, Vervoort, J., Tikoff, B., and Lewis, R. (2011) Plutons for every occasion in

the northern U.S. Cordillera: *EOS, Transactions, American Geophysical Union*

**Gaschnig, R.**, Vervoort, J., Tikoff, B., Lewis, R.S. (2011) The many (and sometimes lost)

arcs of Idaho: *GSA Abstracts with Programs*, v. 43, No. 5, p. 647.

**Gaschnig, R.**, Vervoort, J., Tikoff, B., and Lewis, R. (2011) Origin of the southern half of

the Idaho batholith and its role as a window into the deep crust: providing the temporal components of IDOR: *Abstracts from Earthscope National Meeting.*

Tikoff, B., Braudy, N., **Gaschnig, R.M.**, Vervoort, J., Lewis, R.S., Russo, R.M., Hole, J.A.,

Davenport, K., Mocanu, V. (2011) Tectonic and magmatic evolution of central Idaho: preliminary results of the IDOR project: *GSA Abstracts with Programs*, v. 43, No. 5, p. 362.

Tikoff, B., Braudy, N., **Gaschnig, R.**, Vervoort, J., Russo, R., Hole, J., Davenport, K., and

Mocanu, V.I. (2011) The western Idaho shear zone and collision of the Insular Terrane: tectonic interpretations of ongoing results of the IDOR project: *Abstracts from Earthscope National Meeting*.

**2010**

**Gaschnig, R.M.**, Tikoff, B., Vervoort, J.D., Housen, B.A., and Dorsey, R.J., (2010) U-Pb

geochronology and Hf isotope geochemistry of detrital zircons from Late Cretaceous sedimentary rocks in eastern Oregon: *GSA Abstracts with Programs*, v. 42, No. 5, p. 127.

**Gaschnig, R.M.**, Vervoort, J.D., Lewis, R.S., and Tikoff, B. (2010) Perspectives on

Precambrian basement architecture in the northern Rocky Mountains from inherited zircon in the Idaho batholith: *EOS, Transactions, American Geophysical Union*.

Tikoff, B., Giorgis, S., **Gaschnig, R.M.**, and Vervoort, J.D. (2010) Transpressional zones

and lithospheric-scale strain localization: an example from the western Idaho shear zone: *GSA Abstracts with Programs*, v. 42, No. 5, p. 183.

Tikoff, B., Hole, J., Russo, R., Vervoort, J., Braudy, N., **Gaschnig, R.**, and Mocanu, V.

(2010) IDOR (Idaho-Oregon) Earthscope Project: deformation and modification of a steep continental boundary: *EOS, Transactions, American Geophysical Union.*

**2009**

**Gaschnig, R.M.**, Vervoort, J.D., and Lewis, R.S. (2009) Crustal growth and recycling and

links to tectonism in the Idaho batholith and Challis inrusive province: *GSA Abstracts with Programs*, v. 41, no. 7, p. 589.

Schmidt, K.L., Lewis, R.S., **Gaschnig, R.M.**, and Vervoort, J.D. (2009) Testing hypotheses

on the origin of the Syringa embayment in the Salmon River suture zone, western Idaho: *GSA Abstracts with Programs*, v. 41, no. 7, p. 223.

**2008**

Brewer, R. A., Vervoort, J. D., Lewis, R. S., **Gaschnig, R. M.**, and Hart, G. L., (2008) New

constraints on the extent of Paleoproterozoic and Archean basement in the northwest U.S. Cordilllera: *EOS, Transactions, American Geophysical Union, Fall Meeting Supplement*, v. 89, no. 53, Abstract T23C-2066.

Coleman, D.S., Gracely, J.T., **Gaschnig, R.M.**, Glazner, A.F., and Bartley, J.M., (2008)

Rethinking how we map and date plutons: John Muir Intrusive Suite of the Sierra Nevada batholith: *GSA Abstracts with Programs*, v. 40, no. 1, p. 62.

**Gaschnig, R. M.**, Vervoort, J. D., Lewis, R. S., Valley, J. W., King, E. M., Kozdon, R.,

Ushikubo, T., Dufrane, S. A., Hart, G., Knaack, C., and McClelland, W. (2008) Coupled Hf-O isotopic perspective on 50 million years of magmatism in the Idaho batholith: *EOS, Transactions, American Geophysical Union, Fall Meeting Supplement*, v. 89, no. 53, Abstract V21C-2119.

**2007**

**Gaschnig, R.M.**, Vervoort, J.D., Lewis, R.S., and Dufrane, S.A. (2007) Evolution of a long-

lived magmatic center in Idaho: *EOS, Transactions, American Geophysical Union, Fall Meeting Supplement*, v. 88, p. 52.

**Gaschnig, R.M.**, Vervoort, J.D., Lewis, R.S., King, E., and King, V. (2007) Multiple

punctuated pulses of voluminous silicic magmatism in Idaho: in situ geochronology and isotope geochemistry of the Idaho batholith: *GSA Abstracts with Programs*, v. 39, no. 6, p. 608.

Coleman, D.S., Bartley, J.M., Glazner, A.F., Gracely, J.T., Johnson, B.R., and **Gaschnig, R.M.**

(2007) The pluton’s perspective of the volcano-pluton connection: *Abstract, State of the Arc 2007 Meeting, Termas de Puyehue, Chile.*

**2006**

**Gaschnig, R.M.**, Coleman, D.S., and Glazner, A.F. (2006) Twin of the Tuolumne: new

geochronology from the Mono Pass intrusive suite: *GSA Abstracts with Programs*, v. 38, no. 7, p. 559.

**2005**

**Gaschnig, R.M.**, Glazner, A.F., and Coleman, D.S. (2005) Fractures in the Cretaceous

plutons of Little Lakes Valley, eastern Sierra Nevada: cooling structures or the result of regional tectonic stress? *GSA Abstracts with Programs*, v. 37, no. 4, p. 72.

**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 Baja BC A to Z YouTube series (2023; https://www.youtube.com/live/fzV5mNdto44?si=ApKcG3FQ6ia3eUK3)
* 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 RESEARCHER 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)

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)