RICHARD M. GASCHNIG

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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

- 2016-present – 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

- 2020 – Earth History (undergraduate level), University of Massachusetts Lowell
- 2019 – Exploring the Solar System (graduate level), University of Massachusetts Lowell
- 2019 – Isotopes in Environmental and Earth Sciences (graduate level), University of Massachusetts Lowell
- 2019 – Earth Materials II (undergraduate level), University of Massachusetts Lowell
- 2018 – Lecturer, Environmental Geochemistry (undergraduate level), University of Massachusetts Lowell
- 2017 - Lecturer, Environmental Geochemistry (undergraduate level), University of Massachusetts Lowell
- 2017 – Lecturer, Geology for Engineers (undergraduate level), University of Massachusetts Lowell
- 2017 – Lecturer, Isotopes in Environmental and Earth Sciences (graduate level), 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 - $222,600 – "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.

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 or revision

Gaschnig, R.M., Reinhard, C.T., Owens, J., Planavsky, N., Wang, X., Asael, D., Greaney, A., Rader, S., Helz, R. (in revision) Behavior of the Mo, Tl, and U isotope systems during 1 differentiation in the Kilauea Iki lava lake. *Geochimica et Cosmochimica Acta.*

Kelso, P., Tikoff, B., Fayon, A.K., **Gaschnig, R.M.**, Vervoort, J., Stetson-Lee, T., Byerly, A., Jicha, B., Kahn, M.J. (in revision) The role of inherited rifted lithospheric structure on middle Cretaceous orogeny and current geodetic motions of the U.S. Cordillera: *Geosphere*

2020

*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.

2019

Chen, K., Wang, Z., Tang, M., Rudnick, R.L., **Gaschnig, R.M.**, Zou, Z., He, T., Hu, Z., Liu, Y. (in press) How mafic was the Archean upper continental crust? Insights from Cu and Ag in ancient glacial diamictites: *Geochimica et Cosmochimica Acta.*

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.

*Li, S., Junkin, W., **Gaschnig, R.M.**, Ash, R.D., Piccoli, P., Candela, C., Rudnick, R.L. (in press) 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.*

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.

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.

Mundl, A., Walker, R.J., Reimink, J.R., Rudnick, R.L., **Gaschnig, R.M.** (2018) Temporal evolution of ^{182}W in the upper continental crust: *Chemical Geology*, v. 494, p. 144-152.

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

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.

*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.

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.

*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.

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.

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.

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.

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.

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.

*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.

* - student collaborator/mentee

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.

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.

*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.

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.

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.

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.

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 (NH_4F) in open vessels at an elevated digestion temperature: *Chemical Geology*, v. 355, p. 144-152.

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.

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.

*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.

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.

Zhang, W., Hu, Z., Liu, Y., Chen, H., Gao, S., and **Gaschnig, R.M.** (2012) Total rock dissolution using ammonium bifluoride (NH_4HF_2) in screw-top Teflon vials: a new development in open vessel digestion: *Analytical Chemistry*, v. 84, p. 10686−10693.

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.

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.

PEER-REVIEWED ARTICLES IN PREPARATION

*Chen, K., Rudnick, R.L., **Gaschnig, R.M.**, Tang, M., and Hu, Z. (in preparation) Gold abundance in the upper continental crust and its secular change: to be submitted to *Geochimica et Cosmochimica Acta.*

Gaschnig, R.M., Lewis, R.S., Vervoort, J.D., and Burmester, R. (in preparation) Geochronology and geochemistry of the Kaniksu batholith, southern Omineca Belt: to be submitted to *GSA Bulletin*.

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

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.

* - student collaborator/mentee

Sherwin, J., Younggren, E.B., Link, P.K., and **Gaschnig, R.M.**, (in press) Geologic map of the Coyote Creek 7.5' quadrangle, southwest Montana: *Montana Bureau of Mines and Geology GM Map*.

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

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).*

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).*

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.*

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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.

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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.

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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.

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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.

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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.

ANALYTICAL SKILLS

- Lu-Hf, Sm-Nd, Rb-Sr, U-Pb, Cr, Mo, Fe, and Tl chromatographic separation
- Inductively-coupled plasma mass spectrometry, including solution and laser ablation uses
- Thermal ionization mass spectrometry
- Electron microprobe analysis
- Scanning electron microscopy

SCHOLARSHIPS, AWARDS, AND HONORS

- 2019 – Department of Environmental, Earth and Atmospheric Sciences Teaching Award, University of Massaschusetts Lowell
- 2017 - Recognition for greatest number of publications in Kennedy College of Sciences in previous academic year, University of Massaschusetts Lowell
- 2010 - LeClerc Graduate Fellowship, Washington State University
- 2008 - Tobacco Root Geological Society scholarship
- 2007-2009 - Praetorius-Exxon Graduate Fellowship, Washington State University
- 2007 - Geological Society of America Graduate Research Grant
- 2004 - Martin-McCarthy Fund grant, University of North Carolina
- 2004 - White Mountain Research Station minigrant
- 2002 - Alumni Enrichment Award, University of Delaware
- 2000 - First year Honors Certificate, University of Delaware
- 1999-2003 - Alison Scholar, University of Delaware

PROFESSIONAL ACTIVITIES, SERVICE, AND OUTREACH

- Reviewer for NSF EAR Tectonics, Petrology and Geochemistry, 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, Lithos, Lithosphere, and Nature Geoscience*
- Goldschmidt Conference, session convener (2018)
- 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)
- Donated fossils and related educational material for exhibit at Davidson County Public Library, Lexington, NC (2015)
- 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)
- Guest lecture at Sterling High School, NJ on radiometric dating (2008)

INVITED TALKS

- 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

STUDENT RESEARCH/THESIS ADVISING

M.S. students

Richard Butts (University of Massachusetts Lowell, in progress)

Charl Du Toit (University of Massachusetts Lowell, in progress)

B.S. students

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

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

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)

POSTDOCTORAL RESEARCHER ADVISING

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

GRADUATE STUDENT COMMITTEE MEMBERSHIP

Kristy Long (University of Maryland, M.S., 2013)

STUDENT MENTORING

Ph.D. students

- Kang Chen (University of Maryland and China University of Geosciences, Ph.D., in progress)
  – co-supervised research project, aided in geological interpretations, coauthored manuscript
- Allison Greaney (University of Maryland/UCSB, Ph.D., in progress)
  – co-supervised research project, aided in geological interpretations, coauthored manuscript

- Su Li (University of Maryland and China University of Petroleum, Ph.D., 2016)
  – co-supervised research project, aided in geological interpretations, coauthored manuscript
- Keith Gray (Washington State University, Ph.D., 2012)
  – trained in analytical methods, aided in geological interpretations, coauthored paper

M.S. students

- Josh Stanford (Georgia Institute of Technology, M.S., 2017)
  – trained in analytical methods
- Vince Isakson (Washington State University, M.S., 2012)
  – trained in analytical methods, aided in geological interpretations
- Andy Jansen (Washington State University, M.S., 2012)
  – trained in analytical methods, aided in geological interpretations
- Diane Wilford (Washington State University, M.S., 2012)
  – trained in analytical methods, aided in geological interpretations
- Eric Baar (Washington State University, M.S., 2009)
  – trained in analytical methods, aided in geological interpretations
- James Glover (Washington State University, M.S., 2009)
  – trained in analytical methods, aided in geological interpretations

B.S. students

- Will Junkin (University of Maryland, B.S., 2014)
  – co-supervised research project
- Mike Ream (University of Maryland, B.S., 2014)
  – trained in analytical methods