

David O Zakharov

Curriculum vitae

Languages: English (fluent), Russian (native), French (B1)

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RESEARCH INTERESTS

Isotope geochemistry, $\Delta^{17}\text{O}$ in terrestrial systems, crustal evolution, water-rock interaction, Precambrian surface conditions

EDUCATION

1. University of Oregon, Eugene, OR 06/2014-09/2019
PhD
Advisor: Ilya Bindeman
2. Russian State Geological Prospecting University, Moscow 09/2008-07/2013
A specialist degree in mineralogy, petrology and applied geochemistry

EMPLOYMENT

1. University of Lausanne, Switzerland 01/2020-present
Postdoctoral researcher
2. University of Oregon 06/2014-12/2019
Graduate student/research associate
3. University of Manitoba 09/2013-05/2014
Research and Teaching Assistant
4. University of Illinois, Urbana-Champaign 06/2013-09/2013
Research Assistant
5. Vernadsky Institute of Geochemistry, Moscow 04/2012-05/2013
Research Assistant

PUBLISHED, ACCEPTED AND SUBMITTED PAPERS

1. Zakharov D.O., Zozulya D.R. and Rubatto, D. Low $\delta^{18}\text{O}$ Neoproterozoic precipitation recorded in a 2.67 Ga magmatic-hydrothermal system of the Keivy granitic complex, Russia. *Earth and Planetary Science Letters* **578**, 117322. <https://doi.org/10.1016/j.epsl.2021.117322>
2. Zakharov D.O., Tanaka R, Butterfield D.A. and Nakamura E (2021) A New Insight into Seawater-Basalt Exchange Reactions Based on Combined $\delta^{18}\text{O}$ — $\Delta^{17}\text{O}$ — $^{87}\text{Sr}/^{86}\text{Sr}$ Values of Hydrothermal Fluids From the Axial Seamount Volcano, Pacific Ocean. *Frontiers in Earth Sciences* **9**, 691699. <https://doi.org/10.3389/feart.2021.691699>
3. Zakharov D.O., Lundstrom C.C., Laurent O., Reed M.H., and Bindeman I.N. (2021) Influence of high marine Ca/SO₄ ratio on alteration of submarine basalts at 2.41 Ga documented by triple O and Sr isotopes of epidote. *Precambrian Research* **358**, 106164, <https://doi.org/10.1016/j.precamres.2021.106164>

4. Zakharov D.O., Marin-Carbonne J., Alleon J. and Bindeman I.N. (2021) Temporal triple oxygen isotope trend recorded by Precambrian cherts: A perspective from combined bulk and in situ secondary ion probe measurements. *Reviews in Mineralogy & Geochemistry*, vol. **86**, 323-365, <http://dx.doi.org/10.2138/rmg.2021.86.10>
5. Waterton P., Hyde W.R., Tusch J., Hollis J.A., Kirkland C.L., Kinney C., Yakymchuk C., Gardiner N.J., Zakharov D., Olierook H.K.H., Münker C., Lightfoot P.C. and Szilas K. Geodynamic implications of synchronous norite and TTG formation in the 3 Ga Maniitsoq Norite Belt, West Greenland. *Frontiers in Earth Sciences* **8**, 562062, <https://doi.org/10.3389/feart.2020.562062>
6. Zakharov D.O., Bindeman I.N., Tanaka R., Fridleifsson G.O., Reed M.H. and Hampton R.L. (2019) Triple oxygen isotope systematics as a tracer of fluids in the crust: A study from modern geothermal systems of Iceland. *Chemical Geology* **530**, 119312, <https://doi.org/10.1016/j.chemgeo.2019.119312>
7. Zakharov D.O., Bindeman I.N., Serebryakov N.S., Prave A.R., Azimov P.Ya. and Babarina I.I. (2019) Low $\delta^{18}\text{O}$ rocks in the Belomorian belt, NW Russia and Scourie dikes, NW Scotland: A record of ancient meteoric water captured by the early Paleoproterozoic global magmatic magmatism. *Precambrian Research* **333**, 105431, <https://doi.org/10.1016/j.precamres.2019.105431>
8. Zakharov D.O. and Bindeman I.N. (2019) Triple oxygen and hydrogen isotopic study of hydrothermally altered rocks from the 2.43-2.41 Ga Vetreny belt, Russia: An insight into the early Paleoproterozoic seawater. *Geochimica Cosmochimica Acta* **248**, 185-209, <https://doi.org/10.1016/j.gca.2019.01.014>
9. Bindeman I.N., Zakharov D.O., Palandri J., Greber N.D., Retallack G.J., Hofmann A., Dauphas N., Lackey J.S. and Bekker, A. (2018) Rapid growth of subaerial crust and the onset of a modern hydrologic cycle at the Archean-Proterozoic transition. *Nature* **557**, 545-548, <https://doi.org/10.1038/s41586-018-0131-1>
10. Avice, G., Marty, B., Burgess, R., Hofmann, A., Philippot, P., Zahnle, K., and Zakharov, D. (2018) Evolution of atmospheric xenon and other noble gases inferred from Archean to Paleoproterozoic rocks. *Geochimica Cosmochimica Acta* **232**, 82-100, <https://doi.org/10.1016/j.gca.2018.04.018>
11. Zakharov D.O., Bindeman I.N., Slabunov A.I., Ovtcharova M., Coble M.A., Serebryakov N. S. and Schaltegger U. (2017) Dating the Paleoproterozoic snowball Earth glaciations using contemporaneous subglacial hydrothermal systems. *Geology* **45**, 5–8, <https://doi.org/10.1130/G38759.1>
12. Bindeman I.N., Bekker, A. and Zakharov D.O. (2016) Oxygen isotope perspective on crustal evolution on early Earth: A record of Precambrian shales with emphasis on Paleoproterozoic glaciations and Great Oxygenation Event. *Earth Planet. Sci. Lett.* **437**, 101-113, <https://doi.org/10.1016/j.epsl.2015.12.029>
13. Khisamutdinova A.I., Zakharov D.O. and Soloviev A.V. (2015) The Western Kamchatka sedimentary basins: origin, age and composition of basal conglomerates. *Russian Journal of Pacific Geology*, **34**, 78-92.
14. Onikienko L.D., Uganov, S.S., Zakharov D.O. and Ivanov, M.A. (2012) Geology, mineralogy and formation conditions “Oskolskiy” gold-bearing conglomerates from Kursk Magnetic Anomaly. *Razvedka i Ohrana Nedr (Prospect and Protection of Mineral Resources; in Russian)* **12**, 3-7, <https://elibrary.ru/item.asp?id=18208329>

SELECTED ORAL PRESENTATIONS

1. Environmental and diagenetic signals recorded in cherts from the Archean to Cenozoic: combining in situ $\delta^{18}\text{O}$ and high-precision $\Delta^{17}\text{O}$ measurements (virtual). Goldschmidt 4-9 June 2021.
2. Triple oxygen isotope trend recorded by Precambrian Cherts. Seminar. CNRS-CRPG, Nancy, France, May 2021

3. Temporal triple oxygen isotope trend recorded by Precambrian certs: A perspective from combined bulk and in situ secondary ion probe measurements. Mineralogical Society of America workshop (virtual), December 2020.
4. Hydrothermal seawater-basalt exchange reactions traced by triple oxygen and strontium isotope values of fluids and epidotes, EGU 2020.
5. Modern and ancient hydrosphere-rock interactions constrained from triple oxygen isotope and in situ measurements, Goldschmidt 2020, invited.
6. The effect of low sulfate in the Precambrian oceans on seawater-basalt reaction traced by triple oxygen and strontium isotopes. AGU 2019.
7. Triple Oxygen and Hydrogen Isotopes in Syn-glacial Hydrothermally Altered Rocks: Comparison Between Modern Rocks of Iceland and Snowball Earth Age Rocks from the Baltic Shield , GSA 2017.

AWARDS AND INDEPENDENT FUNDING

- Russian Federal Agency of Mineral Resources award for undergraduate research
- Manitoba Province Graduate Scholarship
- GSA Student Research Grant 2017 (\$1265)
- National Geographic Young Explorer Grant 2017 (\$4620)
- Evolving Earth Foundation Grant 2018 (\$2780)

EXPERIENCE AS A TEACHING ASSISTANT

At University of Manitoba:

- Mineralogy (GEOL2500 Fall 2013; Instructor: Anton Chakhmouradian)
- Igneous and Metamorphic Petrology (GEOL2520 Winter 2014; Instructor: Anton Chakhmouradian)

At University of Oregon:

- Introduction to Geology (GEOL101 Fall 2014; Instructor: Dana Johnston)
- Volcanoes and Earthquakes (GEOL306 Winter 2015; Instructor: Ilya Bindman)
- Earth Materials (GEOL311 Spring 2015 & Spring 2016 Instructor: James Watkins)
- Mineralogy (GEOL331 Fall 2015; Instructor: David Blackwell)
- Isotope Geochemistry (GEOL 473/573 Winter 2016; Instructor: Ilya Bindman)
- Introduction to Petrology (GEOL332 Winter 2017 & Winter 2018; Instructor: Ilya Bindman)
- Evolving Earth (GEOL203 Spring 2017; Instructor: Gregory Retallack)
- Paleopedology (GEOL435 Spring 2017; Instructor: Gregory Retallack)
- Earth Recourses (GEOL310, Fall 2017; Instructor: David Blackwell)
- Earth and Environmental Data Analysis (GEOL418/518 Winter 2019; Instructor: Edward Davis)
- Exploring Earth History (GEOL103 Spring 2019; Instructor: Mary Baxter)

At University of Lausanne:

- Metamorphic Petrology (Fall 2020; Instructor: Lukas Baumgartner)
- Isotope Geochemistry Master Course (Spring 2021; Instruction: Johanna Marin-Carbonne)

OUTREACH AND INVOLVEMENT IN THE COMMUNITY

- Co-organizer and chair of the sessions:
 “Triple isotopes of oxygen and sulfur in terrestrial systems” at AGU 2018, Washington DC, USA

“Small big deltas constrain the chemistry of earth's oceans and atmospheres: fifteen years of carbonate clumped isotope and triple oxygen isotope advances” at Goldschmidt 2021, Lyon, France

- Invited lectures and lab tours for geology-major undergraduate and master students: Oxygen isotopes and paleoclimate for Earth Materials (geology department, UO), Stable Isotope Lab (geology department, UO), Oxygen (chemistry department, UO), Early Earth (geology department, UO), Triple Isotope Fractionations (geology department, Uni.Lausanne)
- Volunteer for science fair middle-school students from Western and Central Oregon (Central Western Oregon Science Expo, CWOSE)
- Founder of Curiosity: community science project: <http://blogs.uoregon.edu/curiosity/>
- Reviewer for: Lithos, Geochimica Cosmochimica Acta, Contributions to Mineralogy and Petrology, Nature Geoscience, Geology, Reviews in Mineralogy and Geochemistry, American Journal of Science, American Mineralogist, International Geology, New Zealand Journal of Geology and Geophysics.

ADVISING AND GUIDANCE OF UNDERGRADUATE STUDENTS

- Charlotte Honait (Spring 2016; University of Oregon)
- Wesala Basri (Winter 2017; University of Oregon)
- Nicole Russo (University of Lausanne bachelor project on O-isotopes in Cenozoic cherts; Winter-Summer 2021, now a Master student at ETH Zürich)