

Ondřej Šrámek

Geophysicist

Charles University in Prague, Faculty of Mathematics and Physics, Department of Geophysics

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Researcher ID: [B-7276-2008](https://orcid.org/0000-0001-7276-2008)

Google Scholar: scholar.google.com/citations?user=2chwJdwAAAAJ

Research Interests

Neutrino geoscience, geodynamics, Earth and planetary science

Education

Ph.D., Geophysics, December 2007

École Normale Supérieure de Lyon (France) & Charles University in Prague (Czech Republic)

M.Phil., Geophysics, May 2006

Yale University, New Haven, Connecticut (USA)

M.S. equivalent, Geophysics, June 2002

Charles University in Prague (Czech Republic)

B.S. equivalent, Physics, June 2000

Charles University in Prague (Czech Republic)

Professional Experience

Charles University in Prague, Department of Geophysics

Assistant Professor (since 2016)

2014–present

University of Maryland, Department of Geology

Research Associate

2011–2013

University of Colorado Boulder, Department of Physics

Research Associate

2008–2011

Charles University in Prague, Department of Geophysics

Postdoctoral Scholar

2008

Teaching Experience

Teaching

undergraduate and graduate courses
Charles University

2016–present

Mentoring

undergraduate and graduate students
Charles University; University of Maryland

2008–present

Teaching Fellow

Yale University, Department of Geology & Geophysics

2005–2006

High-School Physics Teacher

curriculum development and teaching
Gymnasium Františka Palackého, Neratovice (Czech Republic)

2001

Service and Outreach

Physics instruction at Montessori middle school in Kladno (Czech Republic), since 2015

Organizer of the [Neutrino Geoscience 2019](#) meeting in Prague

Lecturer at ISAPP Summer Institute “Using Particle Physics To Understand And Image the Earth” at University of Ferrara, Italy in July 2018, and at Gran Sasso Science Institute, l’Aquila, Italy in July 2016.

Various **public presentations** about my research for popular audiences

Education outreach program participant, University of Colorado Boulder (JILA PFC PISEC), 2011

Started and compiled a **Wikipedia entry** on [Geoneutrinos](#)

Co-convener of session “Two-phase dynamics of mid-ocean ridges and other systems: theory and observation” at EGU General Assembly 2010

Co-organizer of the “8th European Workshop on Numerical Modeling of Mantle Convection and Lithospheric Dynamics,” Hrubá Skála, Czech Republic, 2003

Reviewer for geoscience journals: Earth and Planetary Science Letters; Geochemistry, Geophysics, Geosystems; Geophysical Journal International; Icarus; Journal of Geophysical Research; Journal of Petrology

Funded Grants

“Constraining Earth’s radiogenic heat production using particle geoscience: geoneutrinos and noble gases” Czech Grant Agency project GAČR 17-01464S (2017–2019).

Publications

21. O. Šrámek (2020): “Geoneutrinos: Seeing the Earth with Particle Physics.” *Encyclopedia of Geology, 2nd edition*, doi:[10.1016/B978-0-08-102908-4.00161-2](https://doi.org/10.1016/B978-0-08-102908-4.00161-2).
20. A. Pastorek, M. Ferus, V. Čuba, O. Šrámek, O. Ivanek, and S. Civiš (2020): “Primordial radioactivity and prebiotic chemical evolution: Effect of γ radiation on formamide-based synthesis.” *J. Phys. Chem. B* 124 (41), 8951–8959, doi:[10.1021/acs.jpcc.0c05233](https://doi.org/10.1021/acs.jpcc.0c05233), [PDF](#).
19. W. F. McDonough, O. Šrámek, and S. A. Wipperfurth (2020): “Radiogenic power and geoneutrino luminosity of the Earth and other terrestrial bodies through time.” *Geochem. Geophys. Geosyst.* 21 (7), e2019GC008865, doi:[10.1029/2019GC008865](https://doi.org/10.1029/2019GC008865), [PDF](#) ([arXiv:1912.04655](https://arxiv.org/abs/1912.04655)).
18. V. Patočka, O. Šrámek, and N. Tosi (2020): “Minimum heat flow from the core and thermal evolution of the Earth.” *Phys. Earth Planet. Int.* 305, 106457, doi:[10.1016/j.pepi.2020.106457](https://doi.org/10.1016/j.pepi.2020.106457), [PDF](#).
17. S. A. Wipperfurth, O. Šrámek, and W. F. McDonough (2020): “Reference Models for Lithospheric Geoneutrino Signal.” *J. Geophys. Res.* 125, e2019JB018433, doi:[10.1029/2019JB018433](https://doi.org/10.1029/2019JB018433), [PDF](#) ([arXiv:1907.12184](https://arxiv.org/abs/1907.12184)).
16. S. A. Wipperfurth, M. Guo, O. Šrámek, and W. F. McDonough (2018): “Earth’s chondritic Th/U: Negligible fractionation during accretion, core formation, and crust–mantle differentiation.” *Earth Planet. Sci. Lett.* 498: 196–202, doi:[10.1016/j.epsl.2018.06.029](https://doi.org/10.1016/j.epsl.2018.06.029), [PDF](#) ([arXiv:1801.05473](https://arxiv.org/abs/1801.05473)).
15. J. F. Beacom et al. [40 coauthors] (2017): “Physics prospects of the Jinping neutrino experiment.” *Chin. Phys. C* 41, no. 2: eid:23002, doi:[10.1088/1674-1137/41/2/023002](https://doi.org/10.1088/1674-1137/41/2/023002), [PDF](#).
14. O. Šrámek, L. Stevens, W. F. McDonough, S. Mukhopadhyay, and J. Peterson (2017): “Subterranean production of neutrons, ^{39}Ar and ^{21}Ne : Rates and uncertainties.” *Geochim. Cosmochim. Acta* 196: 370–387, doi:[10.1016/j.gca.2016.09.040](https://doi.org/10.1016/j.gca.2016.09.040), [PDF](#) ([arXiv:1509.07436](https://arxiv.org/abs/1509.07436)).

13. O. Šrámek, B. Roskovec, S. A. Wipperfurth, Y. Xi, and W. F. McDonough (2016): “Revealing the Earth’s mantle from the tallest mountains using the Jinping Neutrino Experiment.” *Scientific Reports* 6: Article number 33034, doi:[10.1038/srep33034](https://doi.org/10.1038/srep33034), [PDF](#).
12. S. T. Dye, Y. Huang, V. Lekić, W. F. McDonough, and O. Šrámek (2015): “Geo-neutrinos and Earth models.” *Physics Procedia* 61: 310–318, doi:[10.1016/j.phpro.2014.12.050](https://doi.org/10.1016/j.phpro.2014.12.050), [PDF](#) ([arXiv:1405.0192](https://arxiv.org/abs/1405.0192)).
11. W. F. McDonough, and O. Šrámek (2014): “Neutrino geoscience, news in brief.” *Environmental Earth Sciences.*, 71, no. 8: 3787–3791, doi:[10.1007/s12665-014-3133-9](https://doi.org/10.1007/s12665-014-3133-9), [PDF](#).
10. O. Šrámek, W. F. McDonough, E. S. Kite, V. Lekić, S. T. Dye, and S.J. Zhong (2013): “Geophysical and geochemical constraints on geoneutrino fluxes from Earth’s mantle.” *Earth and Planetary Science Letters* 361: 356–366, doi:[10.1016/j.epsl.2012.11.001](https://doi.org/10.1016/j.epsl.2012.11.001), [PDF](#) ([arXiv:1207.0853](https://arxiv.org/abs/1207.0853)).
9. O. Šrámek, W. F. McDonough, and J. G. Learned (2012): “Geoneutrinos.” *Advances in High Energy Physics* vol. 2012, Special Issue on Neutrino Physics, Article ID 235686, doi:[10.1155/2012/235686](https://doi.org/10.1155/2012/235686), [PDF](#).
8. O. Šrámek, and S.J. Zhong (2012): “Martian crustal dichotomy and Tharsis formation by partial melting coupled to early plume migration.” *Journal of Geophysical Research* 117, no. E1: E01005, doi:[10.1029/2011JE003867](https://doi.org/10.1029/2011JE003867), [PDF](#).
7. O. Šrámek, L. Milelli, Y. Ricard, and S. Labrosse (2012): “Thermal evolution and differentiation of planetesimals and planetary embryos.” *Icarus* 217, no. 1: 339–354, doi:[10.1016/j.icarus.2011.11.021](https://doi.org/10.1016/j.icarus.2011.11.021), [PDF](#).
6. M. Ulvrová, N. Coltice, Y. Ricard, S. Labrosse, F. Dubuffet, J. Velínský, and O. Šrámek (2011): “Compositional and thermal equilibration of particles, drops and diapirs in geophysical flows.” *Geochemistry, Geophysics, Geosystems* 12, no. 10: Q10014, doi:[10.1029/2011GC003757](https://doi.org/10.1029/2011GC003757), [PDF](#).
5. B. M. Hynek, S. J. Robbins, O. Šrámek, and S.J. Zhong (2011): “Geological evidence for a migrating Tharsis plume on early Mars.” *Earth and Planetary Science Letters* 310, no. 3-4: 327–333, doi:[10.1016/j.epsl.2011.08.020](https://doi.org/10.1016/j.epsl.2011.08.020), [PDF](#).
4. O. Šrámek, and S.J. Zhong (2010): “Long-wavelength stagnant-lid convection with hemispheric variation in lithospheric thickness: link between Martian crustal dichotomy and Tharsis?” *Journal of Geophysical Research* 115: E09010, doi:[10.1029/2010JE003597](https://doi.org/10.1029/2010JE003597), [PDF](#).
3. O. Šrámek, Y. Ricard, and F. Dubuffet (2010): “A multiphase model of core formation.” *Geophysical Journal International* 181, no. 1: 198–220, doi:[10.1111/j.1365-246X.2010.04528.x](https://doi.org/10.1111/j.1365-246X.2010.04528.x), [PDF](#).
2. Y. Ricard, O. Šrámek, and F. Dubuffet (2009): “A multi-phase model of runaway core–mantle segregation in planetary embryos.” *Earth and Planetary Science Letters* 284, no. 1-2: 144–150, doi:[10.1016/j.epsl.2009.04.021](https://doi.org/10.1016/j.epsl.2009.04.021), [PDF](#).
1. O. Šrámek, Y. Ricard and D. Bercovici (2007): “Simultaneous melting and compaction in deformable two-phase media.” *Geophysical Journal International* 168, no. 3: 964–982, doi:[10.1111/j.1365-246X.2006.03269.x](https://doi.org/10.1111/j.1365-246X.2006.03269.x), [PDF](#).

Invited Talks

“Geoneutrinos and radiogenic power in the Earth: recent advances and future prospects.” Talk presented at International Symposium “Geoneutrinos and Quantitative Geochemical Modeling” held in Makuhari, Japan on May 25, 2019.

“Geoneutrinos and radiogenic power in the Earth: recent advances and future prospects.” Talk presented at the Joint symposium of Misasa 2019 & Core-Mantle Coevolution “Origin, Evolution & Dynamics of the Earth & Planetary Interiors” held at Brancart Misasa, Japan on 18–21 March 2019.

“Subterranean production of ³⁹Ar and implications for Doe Canyon well gas.” Talk presented at the Low-Radioactivity Underground Argon workshop at Pacific Northwest National Laboratory in Richland, Washington USA on 19–20 March 2018, doi:[10.5281/zenodo.1239072](https://doi.org/10.5281/zenodo.1239072)

“Geological models for geoneutrino prediction at JUNO: uncertainties and weak points.” Talk presented at Continental margin in South China: Multidisciplinary frontiers in neutrino geoscience at Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China on 21–23 July 2017.

“Geoneutrinos at Jinping and beyond.” Talk presented at Workshop of Jinping Neutrino Experiment 2017 on 15–16 July 2017 at University of Chinese Academy of Sciences (Yanqihu Campus), Beijing, China.

“How geoneutrinos define the radiogenic power driving the Earth’s engine.” Talk presented at Geophysical Colloquium at Institute of Geophysics, ETH Zürich, Switzerland on 31 March 2017.

“Revealing the Earth’s mantle from the tallest mountains using the Jinping Neutrino Experiment.” Talk presented at International Workshop: Neutrino Research and Thermal Evolution of the Earth, Tohoku Forum for Creativity, Tohoku University, Sendai, Japan, on 26 October 2016.

“Geoneutrinos – a new tool to study Earth’s interior.” Seminar presented at Institute of Theoretical Physics, Charles University in Prague, on April 12, 2016.

“Modeling Mars’ early internal dynamics.” Talk presented at Nečas seminar on continuum mechanics, Mathematical Institute of the Charles University in Prague, on January 6, 2014.

“Calculating subsurface nucleonic production of noble gas nuclides: Implications on crustal and mantle K, Th, U abundances.” Seminar presented at Department of Geophysics, Charles University in Prague on December 18, 2013.

“Neutrino tomography of Earth’s mantle.” Colloquium presented at Department of Earth, Ocean and Atmospheric Sciences, University of British Columbia on October 24, 2013.

“Geoneutrino perspective on Earth’s heat budget and mantle structure.” Colloquium presented at Southwest Research Institute in Boulder, Colorado on July 25, 2013.

“Earth models and primordial heat and geoneutrino emission from deep mantle piles.” Talk presented at Neutrino Geoscience 2013, Takayama (Japan), 21–23 March.

“Geoneutrinos and the heat budget of the Earth.” Seminar presented at Department of Geophysics, Charles University in Prague on November 14, 2012.

“Modeling of two-phase flow in geophysics: compaction, differentiation, partial melting, and melt migration.” Talk presented at BIRS workshop “Model reduction in continuum thermodynamics: Modeling, analysis and computation”, Banff, Canada, September 16–21, 2012.

“Thermal Evolution And Core Formation In Planetesimals And Planetary Embryos.” Abstract D141B-04 presented at AGU 2011 Fall Meeting, San Francisco, 5–9 December (with S. Labrosse, Y. Ricard, and L. Milelli).

“Modeling of two-phase flow in geophysics: compaction, differentiation and partial melting.” Talk presented at Nečas seminar on continuum mechanics, Mathematical Institute of the Charles University in Prague, on April 18, 2011.

Other Presentations

Please refer to www.ondrejsramek.net/publications/

Personal Information

Citizen of the Czech Republic

Fluent in Czech, English, and French; basic knowledge of Spanish

Other interests: music (double bass), mountain trail running