# Dr. Joshua B. Russell

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## APPOINTMENTS

Assistant Professor — 2023–Present
*Dept. of Earth and Environmental Sciences, Syracuse University*

NSF EAR Postdoctoral Research Fellow — 2021–2022
*Dept. of Earth, Environmental and Planetary Sciences, Brown University*

Graduate Research Fellow — 2015–2021
*Dept. of Earth and Environmental Sciences, Columbia University*

## EDUCATION

Columbia University, Graduate School of Arts and Sciences, New York, NY — 2015–2021
*Ph.D., Seismology, 2021* (Thesis advisor: James B. Gaherty)
Structure and Evolution of the Oceanic Lithosphere-Asthenosphere System from High-Resolution Surface-Wave Imaging
*M.Phil., Seismology, 2019*
*M.A., Seismology*, *2017*

University of Missouri, College of Arts and Sciences, Columbia, MO — 2011–2015
*B.S., Physics, 2015 summa cum laude* (minor: Mathematics)

## AWARDS AND FELLOWSHIPS

National Science Foundation EAR Postdoctoral Fellowship — 2021–2022
AGU Outstanding Student Presentation Award — 2019
National Science Foundation Graduate Research Fellowship — 2015–2018
Dean's Diversity Fellowship, Columbia University — 2015
Award for Academic Distinction, University of Missouri — 2014
On To the Future (OTF) GSA travel grant — 2014
Newell S. Gingrich Physics Scholarship — 2013

## FUNDING

- *National Science Foundation* – OCE #2409161, "Collaborative Research: A seismic experiment to investigate mantle dynamics during the early stages of seafloor spreading in the Atlantic", *$277,048* (11/24 – 10/27)
- *National Science Foundation* – PHY #2308989, "Collaborative Research: Identifying and Evaluating Sites for Cosmic Explorer", *$362,159* (8/23 – 7/26)
- *National Science Foundation* – EAR #1952702, "EAR-PF Discerning the nature of the oceanic lithosphere-asthenosphere boundary through integration of seismological-scale and laboratory-scale observations", *$174,000* (Science mentor: Colleen Dalton, Brown University, 1/21 – 12/22)
- *Seismological Society of America & LDEO* – Seismology Student Workshop (SSW), Co-organizer *$17,200* (2019, 2020)
- *LDEO* – Research as Art at the Lamont-Doherty Earth Observatory, Co-organizer *$500* (2016, 2017, 2018)
- *National Science Foundation* – DGE #16-44869, Graduate Research Fellowship (8/15 – 8/18)

**PUBLICATIONS**

18. Hariharan, A., Z. Eilon, J. Gaherty, **J.B. Russell**, J. Phillips, D.W. Forsyth (2025). New Observations of Small-Scale Heterogeneity in the Oceanic Upper Mantle Beneath Old Oceanic Lithosphere. *Journal of Geophysical Research – Solid Earth*, (Submitted).

17. Dannberg, J., Z. Eilon, **J.B. Russell**, R. Gassmöller (2025). Understanding Sub-Lithospheric Small-Scale Convection By Linking Models of Grain Size Evolution, Mantle Convection and Seismic Tomography. *Geochemistry, Geophysics, Geosystems*, 26, e2025GC012289. PDF

16. Janiszewski, H., **J.B. Russell** (2025). Ambient Noise Analyses at Broadband Ocean Bottom Seismometers: Data Quality and Transfer Function Corrections. *Seismological Research Letters*, 1–19, doi: 10.1785/0220250106. PDF

15. Daniel, K.J. , J.R. Smith, S. Ballmer, W. Bristol, J.C. Driggers, A. Effler, M. Evans, J. Hoover, K. Kuns, M. Landry, G. Lovelace, C. Lukinbeal, V. Mandic, K. Pham, J. Read, **J.B. Russell**, F. Schiettekatte, R. Schofield, C. Scholz, D. Shoemaker, P. Sledge, A. Strunk (2025). Criteria for identifying and evaluating locations that could potentially host the Cosmic Explorer observatories. *Review of Scientific Instruments*, 96(1). PDF

14. Adimah, N.I., Y.J. Tan, **J.B. Russell** (2024). Shear-wave velocity structure of the Blanco oceanic transform fault zone. *Geophysical Journal International*, 239, 1287–1312. PDF

13. Lee, M., Y.J. Tan, **J.B. Russell**, M. Tolstoy, F. Waldhauser (2024). Relative seismic velocity variations at Axial Seamount observed with ambient seismic noise capture transition point in volcanic inflation. *Geophysical Research Letters,* 51, e2024GL108883. PDF

12. Janiszewski, H.A., Z.C. Eilon, **J.B. Russell**, B. Brunsvik, J.B. Gaherty, S. Mosher, W. Hawley, S. Coats (2023). Broadband Ocean Bottom Seismometer Noise Properties. *Geophysical Journal International*, 233, 297–315. PDF

11. **Russell, J.B.**, C.A. Dalton (2022). Rayleigh wave attenuation and amplification measured at ocean-bottom seismometer arrays using Helmholtz tomography. *Journal of Geophysical Research – Solid Earth*, 127, e2022JB025174. PDF

10. **Russell, J.B.**, J.B. Gaherty, H.F. Mark, G. Hirth, L. Hansen, D. Lizarralde, J.A. Collins, R.L. Evans (2022). Seismological evidence for girdled olivine lattice-preferred orientation in oceanic lithosphere and implications for mantle deformation processes during seafloor spreading. *Geochemistry, Geophysics, Geosystems*, 23, e2022GC010542. PDF

9. Eilon, Z.C., L. Zhang, J.B. Gaherty, D.W. Forsyth, **J.B. Russell** (2022). Sub-Lithospheric Small-Scale Convection Tomographically Imaged Beneath the Pacific Plate. *Geophysical Research Letters*, 49, e2022GL100351. PDF

8. **Russell, J.B.**, J.B. Gaherty (2021). Lithosphere structure and seismic anisotropy offshore eastern North America: Implications for continental breakup and ultra-slow spreading dynamics. *Journal of Geophysical Research – Solid Earth*, 126, e2021JB022955. PDF

7. Eilon, Z.C., J.B. Gaherty, L. Zhang, **J.B. Russell**, S. McPeak, J. Phillips, D. W. Forsyth, G. Ekström (2021). The Pacific OBS Research into Convecting Asthenosphere (ORCA) Experiment. *Seismological Research Letters*, 93, 477–493. PDF

6. Maurer, J.M., J.M. Schaefer, **J.B. Russell**, S. Rupper, N. Wangdi, A. Putnam, N. Young (2020). Seismic observations, numerical modeling, and geomorphic analysis of a glacier lake outburst flood in the Himalayas. *Science Advances*, 6 (38), eaba3645. PDF

5. N.J. Accardo, J.B. Gaherty, D.J. Shillington, E. Hopper, A.A. Nyblade, C.J. Ebinger, C.A. Scholz, P. Chindindali, R. Wambura-Ferdinand, G. Mbgoni, **J.B. Russell**, B.K. Holtzman, C. Havlin, C. Class (2020). Thermo-chemical modification of the Upper Mantle beneath the Northern Malawi Rift Constrained from Shear Velocity Imaging. *Geochemistry, Geophysics, Geosystems*, 21, e2019GC008843. PDF

4. Menke, W. **J.B. Russell** (2020). Non-Double-Couple Components of the Moment Tensor in a Transversely Isotropic Medium. *Bulletin of the Seismological Society of America*, 110 (3), 1125-1133. PDF

3. Ma, Z., C.A. Dalton, **J.B. Russell**, J.B. Gaherty, G. Hirth, D.W. Forsyth (2020). Shear attenuation and anelastic mechanisms in the central Pacific upper mantle. *Earth & Planetary Science Letters*, 536, 116148. PDF

2. **Russell, J.B.**, Z. Eilon, S. Mosher (2019). OBSrange: A new tool for the precise remote location of ocean-bottom seismometers. *Seismological Research Letters*, 90 (4), 1627-1641. PDF

1. **Russell, J.B.**, J.B. Gaherty, P.-Y. Lin, D. Lizarralde, J.A. Collins, G. Hirth, R.L. Evans (2019). High-resolution constraints on Pacific upper mantle petrofabric inferred from surface-wave anisotropy. *Journal of Geophysical Research - Solid Earth*, 124, 631–657. PDF

Manuscripts In Preparation

**Russell, J.B.**, C.A. Dalton, C. Havlin, B. Holtzman, Z. Eilon, J.B. Gaherty, J. Phillips, A. Hariharan, D.W. Forsyth. Rheological heterogeneity and dynamics of oceanic asthenosphere from seismic attenuation. (in prep for Nature)

**Russell, J.B.**, Carchedi, C. Estimating Great Lakes Ice Cover from Seismic Noise Observations. (in prep for GRL)

Phillips, J., **J.B. Russell**, J.B. Gaherty, Z. Eilon, D.W. Forsyth, G. Ekström. Spatial Variation in Anisotropic Shear Velocity of Oceanic Lithosphere-Asthenosphere in the Pacific. (in prep for JGR)

Lee, M., Y.J. Tan, **J.B. Russell**, M. Tolstoy, F. Waldhauser. Observations of apparent annual seismic velocity variation at Axial Seamount driven by variation in ambient noise source (In Preparation for GRL)

Arya, L., S.-H. Hung, **J.B. Russell**. Charactering Microseismic Noise Sources in the Central Pacific Ocean: Insights from the NoMelt Ocean Bottom Seismometer Experiment. (in prep)

## INVITED SEMINARS AND TALKS

(Upcoming) AGU Fall Meeting 2025, New Orleans, LA, 12/15/25
University of Pittsburgh, DGES Colloquium, 3/27/25
University of Utah, Seismo Tea, 2/18/25
University of Rochester, Department Colloquium, 2/14/25
WashU in St. Louis, EEPS Colloquium, 11/21/24
VBRc Virtual Workshop, 7/16/24
LDEO Columbia University, MPG/SGT Seminar, 4/17/24
SUNY Binghamton, Department Colloquium, 4/12/24
2023 MSROC Early Career Workshop, San Francisco, CA, 12/9/23
Interior of the Earth – GRC 2023, Mount Holyoke, MA, 6/19/23
Princeton University, Solid Earth Brown Bag Seminar, Princeton, NJ, 2/9/23
AGU Fall Meeting 2022 (x2), Chicago, IL, 12/12/22
University of Rhode Island GSO, Marine Geology & Geophysics Lecture Series, 9/30/22
Brown University, Geophysics Seminar, 5/17/22
Syracuse University, Department Seminar, 2/15/22
Brown University, Department Colloquium, 9/23/21
Brown University, Geophysics Seminar, 3/30/21
University of Texas Institute for Geophysics, Department Seminar, 3/2/21
LDEO Columbia University, Public Thesis Defense, 12/3/20
Rutgers University - Newark, IRIS Recruitment Lecture Series, 10/30/19
NYC College of Technology, IRIS Recruitment Lecture Series, 10/18/18

## TEACHING EXPERIENCE

*Syracuse University, Dept. of Earth and Environmental Sciences*

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|---|---|
| EAR 105: Earth Sciences (~300 students) | Spring 2025 |
| EAR 201: Introduction to Data Analysis (~20 students) | Spring 2024 |
| EAR 431/631: Plate Tectonics (~10 students) | Fall 2024 |
| EAR 435/635: Geophysics (~15 students) | Spring 2024 |
| EAR 600: Foundations of Geoscience (~10 students) | Fall 2024 |

*Columbia University, Dept. of Earth & Environmental Sciences – Teaching Assistant*

EESC 4949: Introduction to Seismology (undergraduate and graduate) Spring 2019
EESC 6908: Quantitative Methods of Data Analysis (graduate) Fall 2017

## UNIVERSITY SERVICE

*Committee Member*, EES Analytical Facilities 2023–Present
*Committee Member*, EES Critical Minerals Search Committee 2025–2026
*Committee Member*, EES Cryosphere Search Committee 2023–2024
*Committee Member*, EES System Admin & Field Support Search Committee 2023–2024
*Committee Member*, EES Visioning Committee 2023

## PROFESSIONAL SERVICE

*Committee Member,* Marine Seismic Research Operations Committee 2024–2027
*Plenary Session Co-chair,* NSF GAGE/SAGE Community Science Workshop
- Geophysics in the Global Oceans: Big Experiments, Big Data, Collaborative Science 2025

*Session Co-convener,* Seismological Society of America (SSA) Annual Meeting
- Seismology in the Oceans: Pacific Hemisphere and Beyond – Anchorage, AK 2024
- Frontiers in Marine Seismology – Bellevue, WA 2022

*Organizing Committee*, Pacific Array Workshop (Virtual) 2021
*Organizing Committee*, Seismology Student Workshop – Lamont-Doherty Earth Observatory 2019–2021
*Session Convener,* American Geophysical Union (AGU) Fall Meeting
- Geophysics in the Oceans: Observations, Modeling, and New Frontiers – New Orleans, LA 2025
- Bridging the Observational Gap: Integrating Laboratory, Field, and Geophysical Data Sets to Quantify Mantle Properties and Processes – Chicago, IL 2022
- Interdisciplinary Studies of the Lithosphere-Asthenosphere System – New Orleans, LA 2021
- Formation, Evolution, and Destruction of the Oceanic Lithosphere – San Francisco, CA 2019

*Proposal Referee*, NSF OCE – Marine Geology & Geophysics; NSF EAR – Geophysics; NERC
*Journal Referee*, Science Advances; Nature Geoscience; Geophysical Journal International; Journal of Geophysical Research; Bulletin of the Seismological Society of America; Seismological Research Letters; Geochemistry, Geophysics, Geosystems; Earth and Planetary Science Letters; Seismica

## OUTREACH AND LEADERSHIP

*Activities Promoting Diversity, Equity, and Inclusion*

*Volunteer*, DEEPS CORES (Career Opportunities and Research in Earth Sciences) 2021–2022
*Alumni Speaker*, IRIS Diversity Recruitment Lecture Series 2018–2019
*Instructor*, "Coding Quakes" for girls in STEM Brown Scholars, AMNH, NYC 2017–2020
*Volunteer*, Girls' Science Day at Columbia University 2015

*Education Outreach and Science Communication*

*Speaker*, EI LIVE K-12: A Deep Dive into Earthquake Sonification (Grades 10-12) 2020
*Speaker*, EI LIVE K-12: Data Storytelling in Python (Grades 10-12) 2020
*Volunteer*, Lamont Open House, LDEO 2017–2019
*Organizing Committee*, Research as Art at the Lamont-Doherty Earth Observatory 2016–2018
*Volunteer/Contributor*, Seismic Sound Lab, LDEO 2016–2020
*Co-organizer*, New Student Orientation Camping Trip, Columbia University 2016

## FIELD EXPERIENCE

(Upcoming) Co-Chief: Active Source and SPOBS, *R/V Marcus G. Langseth*, Western Atlantic Fall 2026 (5 weeks)
Chief Scientist: Galapagos Triple Junction, *R/V Marcus G. Langseth*, Eastern Pacific Fall 2025 (4 weeks)
Old Pacific ORCA OBS Deployment, *R/V Kilo Moana*, Southwest Pacific Nov. 2019 (3 weeks)
Young Pacific ORCA OBS Deployment, *R/V Kilo Moana*, South-central Pacific Apr. 2018 (4 weeks)
CD-CAT Broadband Seismology Experiment, Central Anatolia, Turkey June 2015 (2 weeks)
OIINK Broadband Seismology Experiment, Western Kentucky July 2013 (2 weeks)
IRIS-PASSCAL Instrumentation Short Course, Socorro, NM May 2013 (1 week)

**SELECTED CONFERENCE PROCEEDINGS (§ = student, * = talk, † = invited)**

27.*† **Russell, J.B.**, C.A. Dalton, C. Havlin, B. Holtzman, Z.C. Eilon, J.B. Gaherty, J. Phillips, A. Hariharan, D. Forsyth (2025). Rheological Heterogeneity and Dynamics of Oceanic Asthenosphere from Seismic Attenuation. *AGU Fall Meeting 2025*, New Orleans, LA.

26. § Rotimi, B.I., **J.B. Russell**, A. García-Jerez (2024). Toward combining microtremor HVSR, Rayleigh wave ellipticity, and multimode phase velocities to constrain Atlantic Coastal Plain sediment structure. *AGU Fall Meeting 2024*, Washington, D.C.

25. § Rameez, S., **J.B. Russell** (2024). Ambient noise Rayleigh wave phase velocity and coda-Q imaging of the Yellowstone region. *AGU Fall Meeting 2024*, Washington, D.C.

24. * **Russell, J.B.**, C. Carchedi (2024). Great Lakes Microseism: Toward Estimating Lake Ice Cover from Seismic Noise Observations. *AGU Fall Meeting 2024*, Washington, D.C.

23. **Russell, J.B.**, C.A. Dalton, C. Havlin, B. Holtzman, Z.C. Eilon, J.B. Gaherty, D. Forsyth (2024). Reduced Grain Size in Oceanic Asthenosphere and Implications for Mantle Dynamics. *AGU Fall Meeting 2024*, Washington, D.C.

22.*† **Russell, J.B.**, C.A. Dalton, C. Havlin, B. Holtzman, Z.C. Eilon, J.B. Gaherty (2023). Anelasticity and thermodynamic state of oceanic asthenosphere: New insights from ocean-bottom seismology. *Interior of the Earth GRC 2023*, Mount Holyoke College.

21.*† **Russell, J.B.**, J.B. Gaherty, H.F. Mark, G. Hirth, L. Hansen, D. Lizarralde, J.A. Collins, R.L. Evans (2022). Seismological Evidence for Girdled Olivine Fabric in Oceanic Lithosphere and Implications for Mantle Deformation Processes During Seafloor Spreading. *AGU Fall Meeting 2022*, Chicago, IL.

20.*† **Russell, J.B.**, J.B. Gaherty (2022). Continental Breakup and Incipient Seafloor Spreading Dynamics in the Atlantic: Insights from Lithospheric Structure Offshore Eastern North America. *AGU Fall Meeting 2022*, Chicago, IL.

19. **Russell, J.B.**, C.A. Dalton, C. Havlin, B. Holtzman (2022). Quantifying Asthenospheric Temperature and Partial Melt in the Pacific using Ocean-Bottom Observations of Shear Attenuation and Velocity. *AGU Fall Meeting 2022*, Chicago, IL.

18. **Russell, J.B.**, C.A. Dalton (2022). Pacific upper-mantle shear attenuation and velocity from ocean-bottom observations and implications for asthenospheric temperature and melt. *SAGE/GAGE 2022*, Pittsburgh, PA.

17. **Russell, J.B.**, C.A. Dalton (2022). Upper-mantle shear attenuation and velocity from ocean-bottom observations in the Pacific. *SSA Annual Meeting 2022*, Bellevue, WA.

16. **Russell, J.B.**, J.B. Gaherty, Z. Eilon, D.W. Forsyth, G. Ekström (2021). Heterogeneous Mantle Flow and Deviations from Half-Space Cooling Observed Beneath the Central Pacific. *AGU Fall Meeting 2021*, New Orleans, LA.

15.* **Russell, J.B.**, C.A. Dalton, A. Hariharan (2021). Array-Based Observations of Rayleigh-Wave Attenuation in the Pacific. *AGU Fall Meeting 2021*, New Orleans, LA.

14. **Russell, J.B.**, J.B. Gaherty (2021). Lithospheric structure and anisotropy of the Eastern North American Margin. *GAGE/SAGE 2021*, Virtual.

13. **Russell, J.B.**, J.B. Gaherty, Z. Eilon, D.W. Forsyth, G. Ekström (2021). Age dependence of mantle shear velocity and anisotropy in the central Pacific: Implications for thermal evolution of the lithosphere and small-scale convection. *Marine Seismology Symposium 2021*, Virtual.

12. **Russell, J.B.**, H.F. Mark, J.B. Gaherty, P.-Y. Lin, D. Lizarralde, J.A. Collins, G. Hirth, R.L. Evans (2020). Anisotropy across length scales: Reconciling seismic constraints with natural and laboratory petrofabrics. *International Conference on Ophiolites and the Oceanic Lithosphere 2020*, Muscat, Oman.

11. **Russell, J.B.**, J.B. Gaherty, Z. Eilon, D.W. Forsyth, G. Ekström (2019). Surface-wave constraints on upper mantle petrofabric and flow beneath ~40 Ma seafloor in the south Pacific. *AGU Fall Meeting 2019*, San Francisco, CA.

10. Holtzman, B.K., C. Havlin, E. Hopper, C. Bellis, **J.B. Russell**, H.C.P. Lau, P.Y. Lin (2019). The Very Broadband Rheology Calculator: a tool for inference of thermodynamic state of the upper mantle from frequency-dependent mechanical behavior. *AGU Fall Meeting 2019*, San Francisco, CA.

9. **Russell, J.B.**, H.F. Mark, J.B. Gaherty, P.-Y. Lin, D. Lizarralde, J.A. Collins, G. Hirth, R.L. Evans (2019). Anisotropy across length scales: Reconciling seismic constraints with natural and laboratory petrofabrics. *Interior of the Earth GRC 2019*, Mount Holyoke College.

8. **Russell, J.B.**, J.B. Gaherty (2019). Surface-wave anisotropy of the Eastern North American Margin (ENAM). *GeoPRISMS TEI 2019*, San Antonio, TX.

7. *** Russell, J.B.**, H.F. Mark, J.B. Gaherty, P.-Y. Lin, D. Lizarralde, J.A. Collins, G. Hirth, R.L. Evans (2018). Comprehensive *in situ* constraints on LPO fabric of fast-spreading oceanic lithosphere from seismic anisotropy. *AGU Fall Meeting 2018*, Washington, D.C.

6. **Russell, J.B.**, J.B. Gaherty, P.-Y. Lin, D. Lizarralde, J.A. Collins, G. Hirth, R.L. Evans (2017). NoMelt Experiment: High-resolution constraints on Pacific upper mantle fabric inferred from radial and azimuthal anisotropy. *AGU Fall Meeting 2017*, New Orleans, LA. Poster Abstract: DI43B-0361.

5. Rabinowitz, H.S., A. Barth, J.B. Russell, K. Frischkorn, M. Yehudai (2017). Research as Art: Using figures to make science approachable. *AGU Fall Meeting 2017*, New Orleans, LA. Poster Abstract: ED11C-0140.

4. *** Russell, J.B.**, J.B. Gaherty, P.-Y. Lin, M. Zebker (2016). Constraints on radial anisotropy in the central Pacific upper mantle from the NoMelt OBS array. *AGU Fall Meeting 2016*, Abstract: S14A-05.

3. **Russell, J.B.**, S.L. Beck, N. Turkelli, D. Kalafat, A.A. Ozacar, E.A. Sandvol (2014). Earthquake detection near the Central Anatolian Fault Zone using continuous data from the CDCAT experiment. *AGU Fall Meeting 2014*, Poster Abstract: S13D-4492.

2. **Russell, J.B.**, J.J. Braun, G.S. Mattioli (2014). Using GPS signal-to-noise ratio (SNR) observations to detect and characterize the volcanic plume associated with the 2003 SoufriÃÍre Hills Volcano dome collapse. *2014 GSA Annual Meeting*, Vancouver BC, Canada, Poster Abstract: T233.

1. **Russell, J.B.**, H.J. Gilbert, G. Pavlis (2013). Crustal Structure Beneath the Ozark Plateau and Illinois Basin using the OIINK Flexible Array. *AGU Fall Meeting 2013*, Poster Abstract: T23B-2582.