Joshua B. Russell

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RESEARCH APPOINTMENTS

NSF EAR Postdoctoral Research Fellow 2021–Present
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

Structure and Evolution of the Oceanic Lithosphere-Asthenosphere System from High-Resolution Surface-Wave Imaging

Advisor: James B. Gaherty

M.Phil., Seismology 2019

M.A., Seismology 2017

University of Missouri, College of Arts and Sciences Columbia, MO, 2011–2015

B.S. Physics *summa cum laude* (minor Mathematics)

FUNDING

- *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)

TEACHING EXPERIENCE

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

Introduction to Seismology (undergraduate and graduate) Spring 2019

Quantitative Methods of Data Analysis (graduate) Fall 2017

The Earth Institute at Columbia University, EI LIVE K-12 (virtual)

Part 1: Data Storytelling in Python (Grades 10-12) 2020

Part 2: A Deep Dive into Earthquake Sonification (Grades 10-12) 2020

- Developed two interactive and data-driven modules on introductory Python and how it can be used to visualize data in the geosciences

American Museum of Natural History, BidgeUP: STEM Program

"Coding Quakes" (Grades 9-10) 2017–2019

- Co-developed a lesson plan for introducing seismological data and basic data processing via Python Jupyter Notebooks
- Lesson culminated in exploratory student projects focused on data sonification

PEER-REVIEWED PUBLICATIONS

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*, (In Press)
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

PENDING MANUSCRIPTS

In Review:

- **Russell, J.B.**, J.B. Gaherty, H.F. Mark, G. Hirth, L. Hansen, D. Lizarralde, J.A. Collins, R.L. Evans. Seismological evidence for grain-size sensitive olivine deformation during mid-ocean ridge spreading. (*Submitted to G-Cubed*)

- **Russell, J.B.**, J.B. Gaherty. Lithosphere structure and seismic anisotropy offshore eastern North America: Implications for continental breakup and ultra-slow spreading dynamics. (*Submitted to JGR*)

In Prep:

- **Russell, J.B.**, J.B. Gaherty, Z. Eilon, D.W. Forsyth, G. Ekström. Surface-wave constraints on upper mantle petrofabric and flow beneath ∼43 Ma seafloor in the south Pacific.

SELECTED CONFERENCE PROCEEDINGS (* = talk)

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 CD-CAT 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.

SEMINARS AND TALKS

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

AWARDS AND FELLOWSHIPS

National Science Foundation EAR Postdoctoral Fellowship	2021
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) 2014 GSA travel grant	2014
Newell S. Gingrich Physics Scholarship	2013

PROFESSIONAL SERVICE

Organizing Committee, Pacific Array Workshop (Virtual) 2021
Organizing Committee, Seismology Student Workshop, LDEO 2019, 2020
Session Convener, AGU Fall Meeting
- *Interdisciplinary Studies of the Lithosphere-Asthenosphere System* 2021
- *Formation, Evolution, and Destruction of the Oceanic Lithosphere* 2019

Proposal Referee, NSF OCE: Marine Geology & Geophysics
Journal Referee,
Geophysical Journal International; Journal of Geophysical Research; Bulletin of the Seismological Society of America; Seismological Research Letters; Geochemistry, Geophysics, Geosystems

OUTREACH AND LEADERSHIP

Activities Promoting Diversity, Equity, and Inclusion

Volunteer, DEEPS CORES (Career Opportunities and Research in Earth Sciences) 2021

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 2016–2019

Co-organizer, New Student Orientation Camping Trip, Columbia University 2016

FIELD EXPERIENCE

Old Pacific ORCA OBS Deployment, South-west Pacific November 2019 (3 weeks)

Young Pacific ORCA OBS Deployment, South-central Pacific April 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)