

CURRICULUM VITAE

Scott Burdick
Assistant Professor
Department of Geology
Wayne State University
Detroit, MI 48202
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EDUCATION: Massachusetts Institute of Technology, Cambridge MA

Ph.D., Geophysics, 2014

Advisor: Robert D. van der Hilst

Purdue University, West Lafayette, IN

B.S., Applied Physics in Geophysics, *magna cum laude*, 2006

B.S., Mathematics, 2006

PROFESSIONAL APPOINTMENTS:

- 9/06 – 12/13 Research Assistant, Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA
- 9/08 – 12/08 Research Intern, Total E&P USA, Houston, TX
- 12/13 – 7/14 Postdoctoral Researcher, Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA
- 9/14 – 9/17 Postdoctoral Fellow, Department of Geology, University of Maryland, College Park, MD
- 9/17 – Assistant Professor, Department of Geology, Wayne State University, Detroit, MI

PUBLICATIONS IN REFEREED JOURNALS (H-index: 8):

- Burdick, S., V. Lekic (2017) Transdimensional hierarchical Bayesian travel time tomography beneath North America. *Geophysics Journal International*, doi: 10.1093/gji/ggx091.
- Burdick, S., F.L. Vernon, V. Martynov, T. Cox, J. Eakins, T. Cox, J. Tytell, T. Mulder, M.C. White, L. Astiz, G.L. Pavlis, R.D. van der Hilst (2017) Model Update May 2016: Upper - Mantle Heterogeneity beneath North America from Travel - Time Tomography with Global and USArray Data. *Seismological Research Letters*, 88, 319-325.
- Montgomery, L., Schmerr, N., Burdick, S., Forster, R.R., Koenig, L., Legchenko, A., Ligtenberg, S., Mieke, C., Miller, O.L., Solomon, D.K (2017) Active Source Seismic Investigation of Firn Aquifer Structure in Southeastern Greenland. *Frontiers in Earth Science*, 5, doi: 10.3389/feart.2017.00010.
- Burdick, S., M.V. de Hoop, S. Wang, R.D. van der Hilst (2014) RTM-based reflection tomography using teleseismic free surface multiple phases. *Geophysical Journal International*, 196(2), 996-1017.
- Burdick, S., R.D. van der Hilst, F.L. Vernon, V. Martynov, T. Cox, J. Eakins, G.H. Karasu,

J. Tylell, L. Astiz, G.L. Pavlis (2013) Model Update January 2013: Upper mantle heterogeneity beneath North America from travel time tomography with global and USArray Transportable Array Data. *Seismological Research Letters*. 85, 77-81.

Burdick, S., R.D. van der Hilst, F.L. Vernon, V. Martynov, T. Cox, J. Eakins, G.H. Karasu, J. Tylell, L. Astiz, G.L. Pavlis (2012) Model Update March 2011: Upper mantle heterogeneity beneath North America from travel time tomography with global and USArray Transportable Array Data. *Seismological Research Letters* 83, 23-28.

Pavlis, G.L., K. Sigloch, S. Burdick, M.J. Fouch, F.L. Vernon (2012). Unraveling the geometry of the Farallon plate: Synthesis of three-dimensional imaging results from USArray. *Tectonophysics* 532, 82-102.

Burdick, S., R.D. van der Hilst, F.L. Vernon, V. Martynov, T. Cox, J. Eakins, G.H. Karasu, J. Tylell, L. Astiz, G.L. Pavlis (2010). Model Update January 2010: Upper mantle heterogeneity beneath North America from travel time tomography with global and USArray Transportable Array Data. *Seismological Research Letters* 81, 689-693.

Burdick, S., R.D. van der Hilst, F.L. Vernon, V. Martynov, T. Cox, J. Eakins, T. Mulder, L. Astiz, and G.L. Pavlis (2009). Model Update December 2008: Upper Mantle Heterogeneity beneath North America from P-wave Travel Time Tomography with Global and USArray Transportable Array Data. *Seismological Research Letters* 80, 638-645.

Burdick, S., C. Li, V. Martynov, T. Cox, J. Eakins, T. Mulder, L. Astiz, F.L. Vernon, G.L. Pavlis, and R.D. van der Hilst (2008). Upper mantle heterogeneity beneath North America from travel time tomography with global and USArray Transportable Array data. *Seismological Research Letters* 79, 384-390.

Li, C., R.D. van der Hilst, E.R. Engdahl, S. and Burdick (2008). A new global model for 3-D variations of P-wave velocity in the Earth's mantle. *Geochemistry Geophysics Geosystems* 9, Q05018.

PUBLICATIONS IN PREPARATION:

Burdick, S., M.V. de Hoop, R.D. van der Hilst, Smooth and discontinuous structure beneath Tibet from teleseismic reflection tomography. *In preparation*.

Burdick, S., L. Waszek, and V. Lekic, Transdimensional tomography of the inner core. *In preparation*.

INVITED AND PLENARY TALKS:

2016 – Geological Society of Washington, Washington, DC

2016 – IRIS Workshop, Vancouver, Washington

2016 – Lamont Doherty Earth Observatory, Nyack, New York

2016 – Wayne State University, Detroit, Michigan

2015 – University of Arizona, Tucson, Arizona

2015 – Earthscope National Meeting, Stowe, Vermont

2014 – University of Maryland, College Park, Maryland

2014 – Princeton University, Princeton, New Jersey

2013 – USArray Transportable Array Symposium, Woods Hole, Massachusetts

2011 – Chinese Earthquake Administration, Beijing, China

2010 – INRIA, Paris, France

INVITED CONFERENCE ABSTRACTS

Burdick S., V. Lekic (2015), Investigating the Farallon Slab with Probabilistic Traveltime Tomography, 2015 AGU Fall Meeting, San Francisco, Calif., 14-18 Dec.

Burdick, S. (2014), Wave Equation Migration Velocity Analysis with Global Teleseismic Wavefield, AGU/SEG Joint Summer Research Workshop, Vancouver, B.C., 21-24 July.

Burdick, S., R.D. van der Hilst, F.L. Vernon, G.L. Pavlis (2008), Upper Mantle P-Wave Tomography beneath the Western United States from USArray and Global Data, 2008 Joint Meeting of The GSA, Houston, Texas, 5-9 Oct.

Burdick, S., C. Li, V. Martynov, T. Cox, J. Eakins, L. Astiz, F.L. Vernon, G.L. Pavlis, R.D. van der Hilst (2007), Community Models of Mantle P-wave Heterogeneity Beneath North America From Multiscale Travel-time Tomography Using Transportable Array Data, 2007 AGU Fall Meeting, San Francisco, Calif., 10-14 Dec.

SELECTED CONFERENCE ABSTRACTS

Burdick, S., Moulik, P., Waszek, L., Lekic, V., (2016), Whole Earth P-wave Structure from Transdimensional Tomography. 2016 AGU Fall Meeting, San Francisco, Calif. 12-16 Dec.

Lekic, V., Burdick, S., Olugboji, T., Cunningham, E., Gao, C. (2016), Earthscope-enabled insights into the North American Crust and Upper Mantle, 2016 GSA Meeting, Denver, Colo. 25-28 Sept.

Olugboji, T., *et al.* (2016), Multi-scale probabilistic seismic imaging with the USArray. 2016 AGU Fall Meeting, San Francisco, Calif. 12-16 Dec.

Schmerr, N. *et al.* (2016), Active Source Seismic Investigation of Firn Aquifer Structure in Southeastern Greenland. 2016 AGU Fall Meeting, San Francisco, Calif. 12-16 Dec.

Golos, E., H. Yao, H. Zhang, H. Fang, S. Burdick, A. Schaeffer, F.L. Vernon, S. Lebedev, R.D. van der Hilst (2015), Seismic Tomography of the Continental United States from a Joint Inversion of Surface Waves and Body Waves, 2015 AGU Fall Meeting, San Francisco, Calif., 14-18 Dec.

Guandique, J., S. Burdick, V. Lekic (2015), Characterizing waveform uncertainty due to ambient noise for the Global Seismic Network, 2015 AGU Fall Meeting, San Francisco, Calif., 14-18 Dec.

Lekic, V., C. Gao, T. Olugboji, S. Burdick (2015), Quantifying Uncertainty Across an Array of Seismic Applications, 2015 AGU Fall Meeting, San Francisco, Calif., 14-18 Dec.

Burdick, S., T. Olugboji, V. Lekic (2015), Investigating continental rifting in the Western US with seismic methods, 2015 GSA Meeting, Baltimore, Md. 1-4 Nov.

Burdick, S., M.V. de Hoop, R.D. van der Hilst (2013), RTM-based Teleseismic Reflection Tomography with Free Surface Multiples, 2013 AGU Fall Meeting, San Francisco, Calif. 9-13 Dec.

Burdick, S., M.V. de Hoop, R.D. van der Hilst (2012), Teleseismic Wave-Equation Reflection Tomography with an Image Correlation Power Criterium, 2012 Fall AGU Meeting, San Francisco, Calif., 3-7 Dec.

Burdick, S., M.V. de Hoop, R.D. van der Hilst (2012), Teleseismic migration velocity analysis using an image crosscorrelation criterium, SEG/EAGE Summer Research Workshop, Charleston, S.C., 13-17 Aug.

Burdick, S., M.V. de Hoop, S. Wang, R.D. van der Hilst (2011), Source-indexed Teleseismic Migration Velocity Analysis with Image Continuation, 2011 AGU Fall Meeting, San Francisco, Calif., 5-9 Dec.

Burdick, S., M.V. de Hoop, R.D. van der Hilst (2010), Teleseismic Migration Velocity Analysis Using an Image Cross-Correlation Criterium, 2010 AGU Fall Meeting, San Francisco, Calif., 13-17 Dec.

Burdick, S., M.V. de Hoop, R.D. van der Hilst (2009), Reflection tomography with teleseismic free-surface multiples, 2009 AGU Fall Meeting, San Francisco, Calif., 14-18 Dec.

Blackburn, T., S. Bowring, K. Mahan, S. Burdick (2008), Geochronology and Thermochronology of Lower Crustal Xenoliths: Creating a Temporal Record of North American Lithosphere Thermal Evolution, 2008 Joint Meeting of The GSA, Houston, Texas, 5-9 Oct.

Burdick, S., M.V. de Hoop, R.D. van der Hilst (2007), Fréchet kernels for wave equation reflection tomography on curvilinear coordinates, 2007 AGU Fall Meeting, San Francisco, Calif., 10-14 Dec.

Burdick, S., C. Li, V. Martynov, T. Cox, J. Eakins, L. Astiz, F.L. Vernon, R.D. van der Hilst (2007), Travel time tomography with USArray data, 2007 Earthscope National Meeting, Monterrey, Calif, 20-23 Mar.

Burdick, S., G. Zandt, H. Gilbert, C. Jones, T. Owens (2005), Moho Structure of the Central Sierra Nevada From an EarthScope Flex Array Deployment, 2005 AGU Fall Meeting, San Francisco, Calif., 5-9 Dec.

REVIEWING ACTIVITIES:

Journals: *Bulletin of the Seismological Society of America*, *Earth and Planetary Science Letters*, *Geophysical Journal International*, *Journal of Geophysical Research*, *Transactions on Computational Imaging*

Agencies & Programs: *National Science Foundation*, *Division of Earth Sciences (EAR)*, *EarthScope program*, *National Science Foundation*, *EAR Postdoctoral Fellowship*

FELLOWSHIPS, PRIZES, AND AWARDS

2014-2016 National Science Foundation Postdoctoral Fellowship
2006-2007 Presidential Fellowship, MIT
2005-2006 Phi Beta Kappa, Purdue University
2002-2006 School of Science Distinguished Scholar, Purdue University

GRANTS FUNDED

9/14 – 9/16 NSF Grant EAR-PF 1349771. Constraining continental rifting using a novel seismic imaging approach.

STUDENTS ADVISED

2015 Jonathan Guandique (Undergraduate IRIS Intern)

TEACHING

2016 Guest Lecturer, Geol 200, Earth's Fury, Department of Geology, University of Maryland
2015-2017 Guest Lecturer, Geol 457, Seismology, Department of Geology, University of Maryland
2015 Co-Instructor, Geol 789E, Inverse Theory Seminar, Department of Geology, University of Maryland
2014 Developed Seismology lab unit, Geol 110, Physical Geology, Department of Geology, University of Maryland
2009-2010 Teaching Assistant, Introduction to Seismology, Department of Earth, Atmospheric and Planetary Sciences, MIT
2007, 2009 Teaching Assistant, Essentials of Geophysics, Department of Earth, Atmospheric and Planetary Sciences, MIT
2004 Undergraduate Grader, Math 111, Algebra, Department of Mathematics, Purdue University
2003-2006 Teaching Assistant, Physics 162 and 163, Mechanics for Physics Majors, Department of Physics, Purdue University

OTHER PROFESSIONAL ACTIVITIES

2017 Program Chair, Geological Society of Washington
2016-2017 Program Committee, 2017 Earthscope National Meeting
2016 Search Committee Postdoc Chair, University of Maryland
2016 IRIS Internship Selection Committee
2015 Session convener, AGU Fall Meeting, San Francisco, CA
2015 OSPA judge, AGU Fall Meeting, San Francisco, CA

FIELD EXPERIENCE

2011 Field assistant and instrument coordinator, Reykjanes Seismic Array, Reykjanes Peninsula, Iceland.
2006-2007 Field assistant, Cascadia Arrays for Earthscope (CAFÉ), Washington, USA.
2005 IRIS intern/field assistant, Sierra Nevada Earthscope Project (SNEP), California.