
CURRICULUM VITAE

MATTHEW J. FOUCH

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PROFESSIONAL PREPARATION

| | | | |
|------------------------------------|------------|-------|-----------|
| Carnegie Institution of Washington | Seismology | | 1999-2000 |
| Brown University | Geophysics | Ph.D. | 1999 |
| Brown University | Geophysics | Sc.M. | 1996 |
| Pomona College | Geology | B.A. | 1993 |

PROFESSIONAL APPOINTMENTS

08/2009-present Associate Director for Graduate Education
School of Earth and Space Exploration, Arizona State University, Tempe, Arizona

07/2007-present Associate Professor
School of Earth and Space Exploration, Arizona State University, Tempe, Arizona

07/2001-present Visiting Investigator
Dept. of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, D.C.

07/2006-06/2007 Assistant Professor
School of Earth and Space Exploration, Arizona State University, Tempe, Arizona

01/2001-06/2006 Assistant Professor
Dept. of Geological Sciences, Arizona State University, Tempe, Arizona

01/1999-12/2000 Harry Oscar Wood Postdoctoral Research Fellow
Dept. of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, D.C.

01/1999-02/2001 Visiting Scholar
Dept. of Geological Sciences, Brown University, Providence, Rhode Island

01/1994-12/1998 Graduate Research and Teaching Assistant
Dept. of Geological Sciences, Brown University, Providence, Rhode Island

RESEARCH INTERESTS

- Seismology of Earth and the Moon
- Structure and dynamics of the lithosphere and sublithospheric mantle
- Array-based broadband seismic studies

FIELD EXPERIENCE

2005-2009 Co-leader, High Lava Plains Continental Dynamics seismic experiment (HLP)

2005-2007 EarthScope/USArray Transportable Array Arizona Siting Coordinator

2002-2007 Co-leader, Consortium for Arizona Regional Seismic Experiment (COARSE)

1999 Kaapvaal Seismic Array, southern Africa

1998 Side Edge of Kamchatka Slab (SEKS) deployment, Kamchatka, Russia
(assisted Yale University as PASSCAL field engineer)

1997-1999 North American Mantle Anisotropy and Discontinuity experiment (NOMAD)

1994-1996 Massachusetts to Missouri broadband seismometer array (MOMA)

1993 Total station surveys of crustal strain in Hawai'i

SERVICE TO THE PROFESSION

Associate Editor *J. Geophys. Res.*

Peer referee *Bull. Seismo. Soc. Am., Earth Planet. Sci. Lett., Geology, Geophys. J. Int., Geophys. Res. Lett., J. Geophys. Res., Phys. Earth Planet. Int., Science*

Peer reviewer NSF panels, NSF-Geophysics, NSF-MG&G, NSF-Polar Programs, NSF-IF, NSF-ITR, NSF-MARGINS, NSF-CD, NSF-CSEDI, NASA-PGG, CRDF, NERC, CFI

PROFESSIONAL AFFILIATIONS

- American Geophysical Union
- Geological Society of America
- Seismological Society of America
- South African Geophysical Association

HONORS AND AWARDS

- 2007-2009 EarthScope Speaker Series lecturer
2007 Presidential Earth Career Award for Scientists and Engineers (PECASE)
2006 Faculty Early Career Development Award (CAREER), National Science Foundation
2005 Woodford-Eckis Lectureship, Pomona College
1999 Brown University Outstanding Thesis Award (Honorable Mention)
1999 Sigma Xi Outstanding Graduate Student Award
1997 Outstanding Student Presentation Award, Seismology section, American Geophysical Union
1995 Best Student Paper Award, Seismological Society of America, Eastern section annual meeting
1993 Hill/McIntyre Geology Prize, Pomona College

COURSES TAUGHT

| | | |
|------------|----------------------------------|-----------------------------|
| GLG101 | Introduction to Physical Geology | Spring 2002, 2003 |
| GLG400/500 | Geology Colloquium | Fall 2004, Spring 2009 |
| GLG410/598 | Computers in ESE (w/ Arrowsmith) | Spring 2009 |
| GLG412/598 | Geotectonics | Spring 2001, 2004, 2006 |
| GLG418/598 | Geophysics | Fall 2001, 2003, 2005, 2006 |
| GLG419/598 | Geodynamics | Fall 2002, 2004 |
| GLG598 | Subduction Zones (w/ Peacock) | Fall 2003 |
| GLG598 | EarthScope Seminar | Spring 2007 |
| GLG490/598 | Advanced Seismology (w/ Garnero) | Fall 2008 |

POSTDOCTORAL RESEARCHER MENTORING

Caroline Beghein, 2006-2007 (currently in tenure-track faculty position at UCLA)

GRADUATE STUDENT MENTORING

Kevin Eagar, Ph.D., primary advisor, anticipated completion Spring 2010
John West, M.S., primary advisor, anticipated completion Spring 2010
Angela Magee, M.S., co-advisor (w/ Clarke), anticipated completion Spring 2010
Jeff Lockridge, M.S., co-advisor (w/ Arrowsmith), entered program Fall 2009
Jeff Roth, Ph.D., primary advisor, (left program for position at ExxonMobil)
Jeff Roth, M.S., primary advisor, graduated Fall 2006
Shaji Nair, Ph.D., primary advisor, (left program to switch occupations)
Teresa Lassak, M.S., primary advisor (transferred to Ph.D. program Fall 2004)
Karen Anglin, M.S., primary advisor, graduated Spring 2005
Jesse Yoburn, M.S., primary advisor, graduated Spring 2005

UNDERGRADUATE STUDENT MENTORING

Eun-Sun (Jeni) Chong, undergraduate research advisor, 2009-present
Lauren Mattatall, undergraduate research advisor, 2006-2007
Ken Jones, undergraduate research advisor, 2005
Christine Bernot Smith, Honors Thesis advisor, graduated Spring 2004
Kelly Hermanson, undergraduate research advisor, 2004
Jeff Lockridge, undergraduate research advisor, 2003
Aubrey Watson, undergraduate research advisor, 2002
Christine Bernot, undergraduate research advisor, 2001-2004

STUDENT HONORS

2007 Kevin Eagar Best Student Paper Award, Fall AGU Meeting (Seismology section)
2007 Lauren Mattatall Best Student Paper Award, EarthScope National Meeting
2005 Teresa Lassak Best Student Paper Award, Fall AGU Meeting (Tectonophysics section)

PUBLICATIONS

* denotes ASU student author; ^ denotes non-ASU student author

34. Beghein, C., J.A. Snoke, and **M.J. Fouch**, Depth constraints on azimuthal anisotropy in the Great Basin from Rayleigh wave phase velocity maps, in press, *Earth Planet. Sci. Lett.*, 2009.
33. Long, M.D., H. Gao, A. Klaus, L.S. Wagner, **M.J. Fouch**, D.E. James, and E. Humphreys, Shear wave splitting and the pattern of mantle flow beneath eastern Oregon, in press, *Earth Planet. Sci. Lett.*, 2009.
32. West*, J.D., **M.J. Fouch**, J.B. Roth*, and L. Elkins-Tanton, Vertical mantle flow associated with a lithospheric drip beneath the Great Basin, *Nature Geoscience*, 2, doi:10.1038/NGEO526, 2009.
31. Roth*, J.B., **M.J. Fouch**, D.E. James, and R.W. Carlson, Three-dimensional seismic velocity structure of the northwestern United States, *Geophys. Res. Lett.*, 35, L15304, doi:10.1029/2008GL03466, 2008.
30. Eagar*, K.C., and **M.J. Fouch**, Detection of a unique earthquake swarm in eastern Arizona, *Arizona Geology*, 37, 1-5, 2007.
29. Semken, S., **M.J. Fouch**, E.J. Garnero, P. Zah, and D. Lippert, EarthScope's USArray engages American Indian stakeholders, *EOS Trans. AGU*, 88, pp. 309-316, 2007.
28. **Fouch, M.J.**, Imaging continental deformation: EarthScope in the field and the classroom, IRIS Newsletter, issue 3, 8-9, 2006. (invited)
27. **Fouch, M.J.**, and S. Rondenay, Seismic anisotropy of stable continental interiors, Continental Anisotropy special issue of *Phys. Earth Planet. Int.*, (D. Eaton and A. Jones, eds.), 158, 292-320, doi:10.1016/j.pepi.2006.03.024, 2006.
26. Frassetto^, A., H. Gilbert, G. Zandt, S. Beck, and **M.J. Fouch**, Support of high topography in the southern Basin and Range based on composition and architecture of the crust in the Basin and Range and Colorado Plateau, *Earth Planet. Sci. Lett.*, 249, pp. 62-73, doi:10.1016/j.epsl.2006.06.040, 2006.
25. Lassak*, T.M., **M.J. Fouch**, C.E. Hall, and E. Kaminski, Seismic characterization of mantle flow in subduction systems: Can we resolve a hydrated mantle wedge?, *Earth Planet. Sci. Lett.*, 243, pp. 632-649, doi:10.1016/j.epsl.2006.01.022, 2006.
24. Yoburn*, J.B., **M.J. Fouch**, J.R. Arrowsmith, and G.R. Keller, A new GIS-driven geophysical database for the southwestern United States, in Sinha, A.K., ed., *Geoinformatics: Data to Knowledge: Geological Society of America Special Paper 397*, pp. 249-267, doi: 10.1130/2006.2397(20), 2006.
23. Stern, R.J., E. Kohut, S.H. Bloomer, M. Leybourne, **M.J. Fouch**, and J. Vervoort, Depth profiling outputs of the subduction factory: The Guguan cross-chain, *Contrib. Min. Pet.*, doi: 10.1007/s00410-005-0055-2, 2006.
22. Aster, R., B. Beaudoin, J. Hole, **M. Fouch**, J. Fowler, D. James, and the PASSCAL Staff and Standing Committee, IRIS PASSCAL program marks 20 years of scientific discovery, *Eos Trans. AGU*, 86, 171-172, 2005.
21. Anglin*, D.K., and **M.J. Fouch**, Seismic anisotropy in the Izu-Bonin subduction system, *Geophys. Res. Lett.*, 32, doi:10.1029/2005GL022714, 2005.
20. Maupin, V., E.J. Garnero, T. Lay, and **M.J. Fouch**, Azimuthal anisotropy in the D'' layer beneath the Caribbean, *J. Geophys. Res.*, 110, B08301, doi:10.1029/2004JB003506, 2005.
19. Anderson^, M.E., G. Zandt, E. Triep, **M. Fouch**, and S. Beck, Anisotropy and mantle flow in the Chile-Argentina subduction zone from shear-wave splitting analysis, *Geophys. Res. Lett.*, 31, doi:10.1029/2004GL020906, 2004.
18. Garnero, E.J., V. Maupin, T. Lay, and **M.J. Fouch**, Variable azimuthal anisotropy in Earth's lowermost mantle, *Science*, 306, 259-261, 2004b.
17. Garnero, E.J., M. Moore*, T. Lay, and **M.J. Fouch**, Isotropy or weak vertical transverse isotropy in D'' beneath the Atlantic Ocean, *J. Geophys. Res.*, 109, doi:10.1029/2004JB003004, 2004a.
16. **Fouch, M.J.**, P.G. Silver, D.R. Bell, and J.N. Lee^, Small-scale variations in seismic anisotropy near Kimberley, South Africa, *Geophys. J. Int.*, 157, 764-774, doi: 10.1111/j.1365-246X.2004.02234.x, 2004.
15. **Fouch, M.J.**, D.E. James, J.C. VanDecar, S. van der Lee, and the Kaapvaal Seismic Group, Mantle seismic structure beneath the Kaapvaal and Zimbabwe cratons, *S. African J. Geol.*, 107, 35-46, 2004.
14. Silver, P.G., **M.J. Fouch**, S.S. Gao, M. Schmitz, and the Kaapvaal Seismic Group, Seismic anisotropy, mantle fabric, and the magmatic evolution of Precambrian southern Africa, *S. African J. Geol.*, 107, 47-60, 2004.

13. Shirey, S.B., J.W. Harris, D.E. James, **M.J. Fouch**, P. Deines, S.H. Richardson, P. Cartigny, F. Viljoen, Regional patterns in the paragenesis and age of inclusions in diamond, diamond composition and the lithospheric seismic structure of southern Africa, *Lithos*, 71, 243-258, 2003.
12. Stern, R.J., **M.J. Fouch**, and S.L. Klemperer, An overview of the Izu-Bonin-Mariana subduction factory, in *Inside the Subduction Factory*, edited by J.M. Eiler, pp. 175-222, American Geophysical Union, Washington, DC, 2003.
11. James, D.E., and **M.J. Fouch**, Formation and evolution of Archaean cratons: insights from southern Africa, in *The Early Earth: Physical, Chemical and Biological Development, Spec. Pub. 199*, edited by C.M.R. Fowler, C.J. Ebinger, and C.J. Hawkesworth, pp. 1-26, Geological Society, London, 2002.
10. Shirey, S.B., J.W. Harris, S.H. Richardson, **M.J. Fouch**, D.E. James, P. Cartigny, P. Deines, F. Viljoen, Diamond genesis, seismic structure, and evolution of the Kaapvaal-Zimbabwe craton, *Science*, 297, 1683-1686, 2002.
- 9a. **Fouch, M.J.**, K.M. Fischer, and M.E. Wysession, Erratum to “Lowermost mantle anisotropy beneath the Pacific: Imaging the source of the Hawaiian plume”, *Earth Planet. Sci. Lett.*, 195, 299-300, 2002.
9. **Fouch, M.J.**, K.M. Fischer, and M.E. Wysession, Lowermost mantle anisotropy beneath the Pacific: Imaging the source of the Hawaiian plume, *Earth Planet. Sci. Lett.*, 190, 167-180, 2001.
8. James, D.E., **M.J. Fouch**, J.C. VanDecar, S. van der Lee, and the Kaapvaal Seismic Group, Tectospheric structure beneath southern Africa, *Geophys. Res. Lett.*, 28, 2485-2488, 2001.
7. **Fouch, M.J.**, K.M. Fischer, E.M. Parmentier, M.E. Wysession, and T.J. Clarke, Shear wave splitting, continental keels, and patterns of mantle flow, *J. Geophys. Res.*, 105, 6255-6276, 2000.
6. Wysession, M.E., A. Langenhorst, **M.J. Fouch**, K.M. Fischer, G.I. Al-Eqabi, P.J. Shore, T.J. Clarke, Lateral variations in compressional/shear velocities at the base of the mantle, *Science*, 284, 120-125, 1999.
5. Fischer, K.M., **M.J. Fouch**, D.A. Wiens, and M.S. Boettcher, Anisotropy and flow in Pacific subduction zone back-arcs, *Pure Appl. Geophys.*, 151, 463-475, 1998.
4. **Fouch, M.J.**, and K.M. Fischer, Shear wave anisotropy in the Mariana subduction zone, *Geophys. Res. Lett.*, 25, 1221-1224, 1998.
3. Fischer, K.M., M.E. Wysession, T.J. Clarke, **M.J. Fouch**, G.I. Al-eqabi, P.J. Shore, R.W. Valenzuela, A. Li, and J.M. Zaslow, The 1995-1996 Missouri to Massachusetts broadband seismometer deployment, *IRIS Newsletter*, 6-9, Summer 1996.
2. **Fouch, M.J.**, and K.M. Fischer, Mantle anisotropy beneath northwest Pacific subduction zones, *J. Geophys. Res.*, 101, 15,987-16,002, 1996.
1. Wysession, M.E., K.M. Fischer, T.J. Clarke, G.I. Al-Eqabi, **M.J. Fouch**, P.J. Shore, R.W. Valenzuela, A. Li, and J.M. Zaslow, Slicing into the earth, *Eos Trans. AGU*, 77, 477-482, 1996.

PRESENT SERVICE DETAILS

Professional

- Chair, EarthScope USArray Advisory Committee (2009-present)
- Member, NASA Lunar Surface Scenarios for Human Exploration Specific Action Team, (2009-present)
- Associate Editor, *Journal of Geophysical Research-Solid Earth* (2009-present)
- Chair, EarthScope/USArray Transportable Array Working Group (2008-present)
- Member, IRIS PASSCAL Standing Committee (2003-present)
- Co-organizer, 2010 Ground-based geophysics on the Moon workshop (Tempe, AZ)
- Co-organizer, SSA 2010 annual meeting special session on High Lava Plains

School, College, University

- Associate Director for Graduate Education, SESE (2009-present)

GRANTS FUNDED

| # | Title | Agency | ASU funds | Duration | Fouch % | Role/Collaborators |
|-----|---|---------------------------|-----------|--------------------------------------|---------|--|
| 13. | Seismic Hazard Update for the State of Arizona (<i>current</i>) | Arizona Geological Survey | \$45,614 | 3 years 06/27/2008-06/26/2011 | 50% | Co-PI: R. Arrowsmith, ASU (50%) |
| 12. | Acquisition of a Linux PC Cluster for Joint Geodynamical and Seismological Research at Arizona State University (<i>current</i>) | NSF-IF | \$75,000 | 2 years 01/01/2008-12/31/2009 | 33% | Co-PIs: A. McNamara, ASU (33%) E. Garnero, ASU (33%) |
| 11. | CAREER: Integrating Multidisciplinary Geophysical Studies Through the EarthScope Initiative (<i>current</i>) | NSF-EarthScope | \$499,852 | 5 years 06/01/2006-05/31/2011 | 100% | <i>Sole PI</i> |
| 10. | Collaborative Research: Understanding the Causes of Continental Intraplate Tectonomagmatism: A Case Study in the Pacific Northwest (<i>current</i>) | NSF-Continental Dynamics | \$751,578 | 5 years 08/01/2005 – 08/31/2010 | 100% | <i>Sole ASU PI</i> Co-PIs: Collaborators from 6 institutions |
| 9. | USArray Transportable Array Siting Reconnaissance | EarthScope/USArray | \$105,552 | 1.2 years 04/01/2005-05/31/2006 | 50% | <i>Lead PI</i> Co-PI: S. Semken, ASU (50%) |
| 8. | USArray Transportable Array Siting Outreach Reconnaissance | IRIS E&O | \$30,179 | 1.5 years 01/01/2005-06/30/2006 | 50% | Co-PI: S. Semken, ASU (50%) |
| 7. | Native American Perspectives and Preferences Bearing on EarthScope Deployments in the Southwest | NSF-EarthScope | \$29,998 | 1 year 03/01/2005-02/28/2006 | 25% | Co-PIs: S. Semken, ASU (25%) E. Garnero, ASU (25%) P. Zah, ASU (25%) |
| 6. | Mantle Dynamics of the Izu-Bonin Subduction System | NSF-MARGINS | \$135,052 | 2.5 years 07/01/2003 – 12/31/2005 | 100% | <i>Sole PI</i> |
| 5. | Preliminary Seismic Investigation of the Structure and Evolution of the Southern Basin and Range to Colorado Plateau Transition in Central Arizona | ASU CLAS | \$19,747 | 1 year 01/01/2003 – 12/31/2003 | 50% | <i>Lead PI</i> Co-PI: Ed Garnero, ASU (50%) |
| 4. | Project SLAM: A Flexible Field Seismology and Earthquake Studies Teaching Module | IRIS E&O | \$19,000 | 1 year 07/01/2002 – 06/30/2003 | 100% | <i>Sole PI</i> |
| 3. | Collaborative Research: Multidisciplinary Investigations of Structure and Deformation Beneath Southern Africa | NSF-Geophysics | \$52,429 | 2 years 01/01/2002 – 12/31/2003 | 100% | <i>Sole ASU PI</i> Co-PI: Aibing Li, U. Houston |
| 2. | Collaborative Research: Creation of a Geospatial Data System for the Transition Between the Colorado Plateau and Basin and Range Provinces (Geoinformatics in Action) | NSF-ITR | \$199,913 | 3 years 09/01/2001 – 08/31/2004 | 25% | Co-PIs: R. Arrowsmith, ASU (25%) S. Reynolds, ASU (25%) W. Stefanov, ASU (25%) Several UTEP colleagues |
| 1. | Technician Support: Geosciences Computing at Arizona State University (Phase I) | NSF-IF | \$210,000 | 3 years 03/01/2001 – 02/28/2004 | 40% | Co-PIs: E. Garnero, ASU (40%) S. Peacock, ASU (20%) |