

# Matthew G. Jackson

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## Education

Ph.D., Massachusetts Institute of Technology – Woods Hole Oceanographic Institution ‘Joint Program’.  
Advisor: Dr. Stan Hart. Thesis committee: Stan Hart, Fred Frey, Erik Hauri, Peter Keleman, Mark Kurz, Nobu Shimizu, Ken Simms. **Degree awarded February 2008**

B.S., Geology, 2001, Yale University. Graduated *cum laude*  
Advisor: Dr. Philip D. Ihinger

## Current Position

Professor, Department of Earth Science, UC Santa Barbara. July 2017 – Present  
Dept. of Terrestrial Magnetism (Carnegie Institution of Washington) Visiting Investigator Appointment  
2014 – Present

## Previous Positions

Associate Professor, Department of Earth Science, UC Santa Barbara. July 2013 – June 2017.  
Assistant Professor, Department of Earth Sciences, Boston University. January 2010 - June 2013.  
Post-doctoral Fellow, Department of Terrestrial Magnetism, Carnegie Institution of Washington.  
Post-doctoral mentors: Dr. Richard Carlson, Dr. Steven Shirey, Dr. Erik Hauri. 2008 - 2009  
Post-doctoral Investigator, Woods Hole Oceanographic Institution. Post-doctoral supervisors: Dr. John Collins and Dr. Stanley R. Hart. Spring 2008

## Leadership, Awards, Honors

- Secretary, Volcanology Geology & Geochemistry Section of American Geophysical Union (2018 - )
- Awarded “Most Inspirational Teacher” by Graduate Students of Dept. Of Earth Sci. (2016 and 2017)
- Editors’ Citation for Excellence in Refereeing for Geochemistry, Geophysics, Geosystems (2016)
- Macelwane Medal–American Geophysical Union, 2015
- Fellow, American Geophysical Union, 2015
- Kuno Award–American Geophysical Union (Volcanology, Geochemistry, Petrology), 2014
- Clarke Medal–Geochemical Society, 2014
- WHOI Ruth and Paul Fye award: Graduate Student Best Paper, June 2010
- Carnegie Postdoctoral Fellowship, Carnegie Institution of Washington, 2008-2009
- Caltech O.K. Earl Postdoctoral Fellowship (declined)
- AGU Outstanding Student Paper Award, December 2005
- NSF Graduate Research Fellowship, September 2002-August 2005
- Fulbright Grant for geological study in Iceland, 2001-2002
- WHOI Deep Ocean Exploration Institute award, Samoan seismic deployment, April 2005
- WHOI Ocean Ventures Fund award, deployment of seismic stations in Samoa, March 2005
- WHOI Coastal Ocean Institute award for geologic fieldwork in Samoa, June 2006
- Yale Geology & Geophysics Dept. Belknap Prize for achievement in the geology major, May 2000
- Yale Geology & Geophysics Dept. Hammer Prize for Senior Thesis Presentation, May 2000

### Manuscripts in Review (\*Jackson grad student, \*\*Jackson u-grad, \*\*\*Jackson post-doc)

75. Mundl-Petermeier, A., R.J. Walker, **M.G. Jackson**, J. Blichert-Toft, M.D. Kurz, S.A. Halldórsson. Temporal evolution of primordial tungsten-182 and  $^3\text{He}/^4\text{He}$  signatures in the Greenland-Iceland mantle plume system. *EPSL*, in review.

### Manuscripts Published, In Press, or Accepted

74. Inglis, E., F. Moynier, J. Creech, Z. Deng, J. Day, F.-Z. Teng, M. Bizzarro, **M.G. Jackson**, P. Savage. Isotopic fractionation of zirconium during magmatic differentiation and the stable isotope composition of the silicate Earth. *GCA*, accepted.
73. Reinhard, A.A.\* , **M.G. Jackson**, J. Blusztajn, A.A.P. Koppers, A.R. Simms, J.G. Konter. ‘Petit Spot’ rejuvenated volcanism superimposed on plume-derived Samoan shield volcanoes: Evidence from a 645 meter drill core from Tutuila Island, American Samoa. Accepted, *G-cubed*.
72. Edwards, M.A.\* , **M.G. Jackson**, A.R.C. Kylander-Clark, J. Harvey, G.A. Hagen-Peter, G.G.E. Seward, C.B. Till, J.V. Adams, J.M. Cottle, B.R. Hacker, F.J. Spera. Beyond EM2: extreme enriched and heterogeneous  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios recorded in magmatic plagioclase from the Samoan hotspot. Accepted, *EPSL*.
71. Konter, J.G., V.A. Finlayson, J. Engel, **M.G. Jackson**, A.A.P. Koppers, S. Sharma. Shipboard characterization of Tuvalu, Samoa, and Lau dredge samples by Laser-Induced Breakdown Spectroscopy (LIBS). Accepted, *Applied Spectrometry*.
70. Horton, F., K. Farley, **M.G. Jackson** (2018). Helium distributions in ocean island basalt olivine phenocrysts revealed by X-ray computed tomography and single-grain crushing experiments. *Geochim. Cosmochim. Acta*. 224, 467-477.
69. **Jackson, M.G.**, T.W. Becker, J.G. Konter (2018). Geochemistry and distribution of recycled domains in the mantle inferred from Nd and Pb isotopes in oceanic hotspots: implications for storage in the large low shear wave velocity provinces (LLSVPs). *Geochem. Geophys. Geosyst.* doi:10.1029/2018GC007552
68. Reinhard, A.A.\* , **M.G. Jackson**, J.M. Koornneef, E.F. Rose-Koga, J. Blusztajn, J.G. Konter, K.T. Koga, P.J. Wallace, J. Harvey (2018). Analyses of Sr and Nd isotopes in individual olivine-hosted melt inclusions from Hawaii and Samoa: implications for the origin of isotopic heterogeneity in melt inclusions from OIB lavas. *Chem. Geol.* **495**, 36-49.
67. Finlayson, V., J.G. Konter, K. Konrad, A.A.P. Koppers, **M.G. Jackson**, T.O. Rooney (2018). Sr–Pb–Nd–Hf isotopes and  $^{40}\text{Ar}/^{39}\text{Ar}$  ages reveal a Hawaii–Emperor-style bend in the Rurutu hotspot. *Earth Planet. Sci. Lett.* **500**, 168–179.
66. Putirka, K., Y. Tao, K.R. Hari, M. Perfit, **M.G. Jackson**, R. Arevalo Jr (2018). The mantle source of thermal plumes: trace and minor elements in olivine and major oxides of primitive liquids (and why the olivine compositions don't matter). *American Mineralogist* 103, 1253-1270.
65. Zhang, G.-L., Q. Luo, J. Zhao, **M.G. Jackson**, L.-S. G., L.-F. Zhong (2018). Geochemical nature of sub-ridge mantle and opening dynamics of the South China Sea. *Earth Planet. Sci. Lett.* 489, 145-155.
64. Konrad, K., A.A.P. Koppers, B. Steinberger, V. Finlayson, J. Konter, **M.G. Jackson** (2018). On the relative motions of long-lived Pacific mantle plumes. *Nature Communications* 9. DOI: 10.1038/s41467-018-03277-x
63. Sigwart, J.D., M.K. Wicksten, **M.G. Jackson**, S. Herrera (2018). Deep-sea video technology tracks a monoplacophoran to the end of its trail (Mollusca, Tryblidia). *Marine Biodiversity*. <https://doi.org/10.1007/s12526-018-0860-2>
62. **Jackson, M.G.**, T. Becker, J.G. Konter (2018). Evidence for a deep mantle source for EM and HIMU domains from integrated geochemical and geophysical constraints. *Earth Planet. Sci. Lett.* **484**, 1-14.

61. Horan, M.F., R.W. Carlson, R.J. Walker, **M.G. Jackson**, M. Garçon, M. Norman (2018). Tracking Hadean processes in modern basalts. *Earth Planet. Sci. Lett.* **484**, 184-191.
60. Rose-Koga, E., K.T. Koga, M. Moreira, I. Vlastélic, **M.G. Jackson**, M.J. Whitehouse, N. Shimizu, N. Habib (2017). Geochemical systematics of Pb isotopes, fluorine, and sulfur in melt inclusions from São Miguel, Azores. *Chem. Geol.* **458**, 22-37.
59. Mundl, A., M. Touboul, **M.G. Jackson**, J.M.D. Day, M.D. Kurz, V. Lekic, R.T. Helz, R.J. Walker (2017). Tungsten-182 heterogeneity in modern ocean island basalts. *Science*. **356**, 66-69.
58. **Jackson, M.G.**, A.A. Price\*, J. Blichert-Toft, M.D. Kurz, A. Reinhard\* (2017). Geochemistry of lavas from the Caroline hotspot, Micronesia: Evidence for primitive and recycled components in the mantle sources of lavas with moderately elevated  $^3\text{He}/^4\text{He}$ . *Chem. Geol.* **455**, 385-400.
57. Price, A.A.\* , **M.G. Jackson**, J. Blichert-Toft, M.D. Kurz, J. Gill, J. Blusztajn, F. Jenner, R. Brens, R. Arculus (2017). Geodynamic implications for zonal and meridional isotopic patterns across the northern Lau and North Fiji Basins. *Geochem. Geophys. Geosyst.* **18**. doi: 10.1002/2016GC006651
56. Kendrick, M.A., C. Hemond, V. S. Kamenetsky, L. Danyushevsky, C. Devey, T. Rodemann, **M.G. Jackson**, M.R. Perfit (2017). Seawater cycled throughout Earth's mantle in partially serpentinized lithosphere. *Nature Geoscience* **10**, 222–228. doi:10.1038/ngeo2902
55. Zhang, G., L.-H. Chen, **M.G. Jackson**, A.W. Hofmann (2017). Evolution of carbonated melt to alkali basalt in the South China Sea. *Nature Geoscience* **10**, 229–235. doi:10.1038/ngeo2877
54. **Jackson, M.G.**, J.G. Konter, T.W. Becker (2017). Primordial helium entrained by the hottest mantle plumes. *Nature* **542**, 340–343. doi:10.1038/nature21023
53. **Jackson, M.G.** (2016). Ocean island basalts. In Encyclopedia of Geochemistry, Ed. W. White. Springer International Publishing, Switzerland. pp 1-5. doi: 10.1007/978-3-319-39193-9\_248-1
52. Konter, J.G., A.J. Pietruszka, B.B. Hanan, V. Finlayson, P.R. Craddock, **M.G. Jackson**, N. Dauphas (2016). Unusual  $\delta^{56}\text{Fe}$  values in Samoan rejuvenated lavas generated in the mantle. *Earth Planet. Sci. Lett.* **450**, 221-232.
51. Pringle, E.A., F. Moynier, P.S. Savage, **M.G. Jackson**, M. Moreira, and J.M.D. Day (2016). Silicon isotopes reveal recycled altered oceanic crust in the mantle sources of ocean island basalts. *Geochim. Cosmochim. Acta.* **189**, 282–295.
50. Reinhard\*, A., **M.G. Jackson**, J. Harvey, C. Brown\*\*, J.M. Koornneef (2016). Extreme differences in  $^{87}\text{Sr}/^{86}\text{Sr}$  between magmatic olivines and Samoan host lavas: Evidence for highly heterogeneous  $^{87}\text{Sr}/^{86}\text{Sr}$  in the magmatic plumbing system sourcing a single lava. *Chem. Geol.* **439**, 120-131.
49. Rizo, H., R.J. Walker, R.W. Carlson, M. Horan, S. Mukhopadhyay, V. Manthos, D. Francis, **M.G. Jackson** (2016). Memories of Earth formation in the modern mantle: W isotopic compositions of flood basalt lavas. *Science* **352**, 809-812.
48. **Jackson, M.G.**, S. Shirey, E. Hauri, M. Kurz, H. Rizo (2016). Peridotite xenoliths from the Polynesian Austral and Samoa hotspots: Implications for the destruction of ancient  $^{187}\text{Os}$  and  $^{142}\text{Nd}$  isotopic domains and the preservation of Hadean  $^{129}\text{Xe}$  in the modern mantle. *Geochim. Cosmochim. Acta* **185**, 21-43 doi:10.1016/j.gca.2016.02.011
47. Price, A.A.\* , **M.G. Jackson**, J. Blichert-Toft, J. Blusztajn, C.S. Conatser, J.G. Konter, A.A.P. Koppers, M.D. Kurz (2016). Geochemical evidence in the Northeast Lau Basin for subduction of the Cook-Austral volcanic chain in the Tonga Trench. *Geochem. Geophys. Geosyst.* **17**. doi:10.1002/2015GC006237.
46. Starkey, N., C. Jackson, R.C. Greenwood, S. Parman, I.A. Franchi, **M.G. Jackson**, J.G. Fitton, F.M. Stuart, M. Kurz, L.M. Larsen (2016). Triple oxygen isotopic composition of the high- $^3\text{He}/^4\text{He}$  mantle. *Geochim. Cosmochim. Acta* **176**, 227–238.
45. Miao, M.-S., X. Wang, J. Brgoch, F. Spera, **M.G. Jackson**, G. Kresse, H. Lin (2015). Anionic chemistry of noble gases: formation of Mg-NG (NG = Xe, Kr, Ar) compounds under pressure. *J. Am. Chem. Soc.* **137**, 14122–14128.

44. Garapic, G.\*\*\*, A. Mallik, R. Dasgupta, **M.G. Jackson** (2015). Oceanic lavas sampling the high  $^3\text{He}/^4\text{He}$  mantle reservoir: Primitive, depleted, or re-enriched? *American Mineralogist* **100**, 2066–2081.
43. **Jackson, M.G.**, K.T. Koga, A. Price\*, J.G. Konter, A.A.P. Koppers, V.A. Finlayson, K. Konrad, E.H. Hauri, A. Kylander-Clark, K.A. Kelley, M.A. Kendrick (2015). Deeply-dredged submarine HIMU glasses from the Tuvalu Islands, Polynesia: Implications for volatile budgets of recycled oceanic crust. *Geochem. Geophys. Geosyst.* **16**. DOI: 10.1002/2015GC005966
42. **Jackson, M.G.**, R.A. Cabral\*, E.F. Rose-Koga, K.T. Koga, A. Price\*, E.H. Hauri, P. Michael (2015). Ultra-depleted melts in olivine-hosted melt inclusions from the Ontong Java Plateau. *Chem. Geol.* **414**, 124-137.
41. Jellinek, A.M., **M.G. Jackson** (2015). Connections between the bulk composition, geodynamics and habitability of the Earth. *Nature Geoscience* **8**, 587–593 [INVITED PERSPECTIVE ARTICLE]
40. Garapic, G.\*\*\*, **M.G. Jackson**, E.H. Hauri, S.R. Hart, K.A. Farley, J.S. Blusztajn, J.D. Woodhead (2015). A radiogenic isotopic (He-Sr-Nd-Pb-Os) study of lavas from the Pitcairn hotspot: Implications for the origin of EM-1 (enriched mantle 1). *Lithos* **228–229**, 1–11.
39. Labidi, J., P. Cartigny, **M.G. Jackson** (2015). Multiple sulfur isotope composition of oxidized Samoan melts and the implications of a sulfur isotope 'mantle array' in chemical geodynamics. *Earth Planet. Sci. Lett.* **417**, 28-39.
38. Kendrick, M.A., **M.G. Jackson**, E.H. Hauri, D. Phillips (2015). The halogen (F, Cl, Br, I) and H<sub>2</sub>O systematics of Samoan lavas: assimilated-seawater, EM2 and high- $^3\text{He}/^4\text{He}$  components. *Earth Planet. Sci. Lett.* **410**, 197-209.
37. Cabral, R.A.\* , **M.G. Jackson**, K.T. Koga, E.F. Rose-Koga, E.H. Hauri, M.J. Whitehouse, A.A. Price\*, J.M.D. Day, N. Shimizu, K.A. Kelley (2014). Volatile cycling of H<sub>2</sub>O, CO<sub>2</sub>, F, and Cl in the HIMU mantle: A new window provided by melt inclusions from oceanic hotspot lavas at Mangaia, Cook Islands. *Geochemistry, Geophysics, Geosystems* **15**. DOI: 10.1002/2014GC005473
36. **Jackson, M.G.**, S.R. Hart, J.G. Konter, M.D. Kurz, J. Blusztajn, K. Farley (2014). Helium and lead isotopes reveal the geochemical geometry of the Samoan plume. *Nature* **514**, 355-358.
35. Harpp, K.S., P.S. Hall, **M.G. Jackson** (2014). The Galápagos and Easter: A Tale of Two Hotspots, in *The Galápagos: A Natural Laboratory for the Earth Sciences*. Editors: K. Harpp, E. Mittelstaedt, D. Graham, N. d'Ozouville, Geophysical Monograph Series 204, p 27-40, American Geophysical Union, Washington, DC. doi: 10.1002/9781118852538.ch3
34. Hart, S.R., **M.G. Jackson** (2014). Evolution of Ta'u and Ofu/Olosega Volcanoes – The “Twin Sisters” of Samoa, *Geochem. Geophys. Geosyst.* **15**. doi: 10.1002/2013GC00522
33. Herzberg, C., R.A. Cabral\*, **M.G. Jackson**, C. Vidito, J.M.D. Day, E.H. Hauri (2014). Phantom Archean crust in Mangaia hotspot lavas and the meaning of heterogeneous mantle. *Earth Planet. Sci. Lett.* **396**, 97-106.
32. Jackson, C., L. Zeigler, H. Zhang, **M.G. Jackson**, D.R. Stegman (2014). A geochemical evaluation of potential magma ocean dynamics using a parameterized model for perovskite crystallization. *Earth Planet. Sci. Lett* **392**, 154-165.
31. Pringle, E.A., P.S. Savage, **M.G. Jackson**, J.A. Barrat, F. Moynier (2014). Si isotope homogeneity of the solar nebula. *Astrophys. J.* **779**. doi:10.1088/0004-637X/779/2/123.
30. Kendrick, M.A., **M.G. Jackson**, A. Kent, E. Hauri, P. Wallace, J. Woodhead (2014). Contrasting behaviours of CO<sub>2</sub>, S, H<sub>2</sub>O and halogens (F, Cl, Br and I) in the enriched-mantle melts from the Pitcairn and Society seamounts. *Chem. Geol.* **370**, 69-81.
29. Price, A.A.\* , **M.G. Jackson**, J. Blichert-Toft, P.S. Hall, J.M. Sinton, M.D. Kurz, J. Blusztajn (2014). Evidence for a broadly distributed Samoan-plume signature in the northern Lau and North Fiji Basins. *Geochem. Geophys. Geosyst.* **15**. doi: 10.1002/2013GC005061

28. **Jackson, M.G.**, A.M. Jellinek (2013). Major and trace element composition of the high  $^3\text{He}/^4\text{He}$  mantle: Implications for the composition of the bulk silicate Earth. *Geochem. Geophys. Geosyst.* **14**. doi: 10.1002/ggge.20188
27. Cabral, R.A.\* , **M.G. Jackson**, E.F. Rose-Koga, K.T. Koga, M.J. Whitehouse, M.A. Antonelli, J. Farquhar, J.M.D. Day, E.H. Hauri (2013). Anomalous sulphur isotopes in plume lavas reveal deep mantle storage of Archaean crust. *Nature* **496**, 490-493.
26. Herzberg, C., P. Asimow, D. Ionov, C. Vidito, **M.G. Jackson**, D. Geist (2013). Nickel and helium evidence for melt above the core–mantle boundary. *Nature*, **493**, 393-397.
25. Payne\*\*, J.A., **M.G. Jackson**, P.S. Hall (2013). Parallel volcano trends and geochemical asymmetry of the Society Islands hotspot track. *Geology* **41**, 19-22.
24. **Jackson, M.G.**, D. Weis, S. Huang (2012). Major element variations in Hawaiian shield lavas: Source features and perspectives from global ocean island basalt (OIB) systematics. *Geochem. Geophys. Geosyst.* (G-cubed) **13**, doi:10.1029/2012GC004268.
23. **Jackson, M.G.**, R.W. Carlson (2012). Homogeneous superchondritic  $^{142}\text{Nd}/^{144}\text{Nd}$  in the mid-ocean ridge basalt and ocean island basalt mantle. *Geochem. Geophys. Geosyst.* (G-cubed) **13**, doi:10.1029/2012GC004114.
22. Konter, J.G., **M.G. Jackson** (2012). Large volumes of rejuvenated volcanism in Samoa: Evidence supporting a tectonic influence on late-stage volcanism. *Geochem., Geophys., Geosyst.* (G-cubed) **13**, doi:10.1029/2011GC003974.
21. **Jackson, M.G.**, S. Shirey (2011). Re-Os systematics in Samoan shield lavas and the use of Os-isotopes in olivine phenocrysts to determine primary magmatic compositions. *Earth Planet. Sci. Lett.* **312**, 91-101.
20. Huang, S., P.S. Hall, **M.G. Jackson** (2011). Geochemical zoning of volcanic chains associated with Pacific hotspots. *Nature Geoscience* **4**, 874-878.
19. **Jackson, M.G.**, R. Carlson (2011). An ancient recipe for flood basalt genesis. *Nature* **476**, 316–319.
18. Koppers, A.A.P., J.A. Russell, J. Roberts, **M.G. Jackson**, J. Konter, D. J. Wright, H. Staudigel, S.R. Hart (2011). Age systematics of two young en echelon Samoan volcanic trails. *Geochem. Geophys. Geosys.* (G-cubed) **12**, doi:10.1029/2010GC003438.
17. **Jackson, M.G.**, S.R. Hart, J.G. Konter, A.A.P. Koppers, H. Staudigel, M.D. Kurz, J. Blusztajn, J.M. Sinton (2010). The Samoan hotspot track on a “hotspot highway”: Implications for mantle plumes and a deep Samoan mantle source. *Geochem. Geophys. Geosyst.* (G-cubed) **11**, doi:10.1029/2010GC003232.
16. **Jackson, M.G.**, R. Carlson, M.D. Kurz, P.D. Kempton, D. Francis, J. Blusztajn (2010). Evidence for the survival of the oldest terrestrial mantle reservoir. *Nature* **466**, 853-856.
15. Dasgupta, R., **M.G. Jackson**, C.-T.A. Lee (2010). Major element chemistry of ocean island basalts - conditions of mantle melting and heterogeneity of mantle source. *Earth Planet. Sci. Lett.* **289**, 377-392.
14. **Jackson, M.G.**, M.D. Kurz, S.R. Hart (2009). Helium and neon isotopes in phenocrysts from Samoan lavas: Evidence for heterogeneity in the terrestrial high  $^3\text{He}/^4\text{He}$  mantle. *Earth Planet. Sci. Lett.* **287**, 519-528.
13. **Jackson, M.G.**, S.R. Hart, N. Shimizu, J. Blusztajn (2009). The  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $^{143}\text{Nd}/^{144}\text{Nd}$  disequilibrium between Polynesian hot spot lavas and the clinopyroxenes they host: Evidence complementing isotopic disequilibrium in melt inclusions. *Geochem. Geophys. Geosys.* (G-cubed) **10**, Q03006, doi:10.1029/2008GC002324
12. **Jackson, M.G.**, R. Dasgupta (2008). Compositions of HIMU, EM1, and EM2 from global trends between radiogenic isotopes and major elements in ocean island basalts. *Earth Planet. Sci. Lett.* **276**, 175-186.
11. Workman, R.K., S.R. Hart, J.M. Eiler, **M.G. Jackson** (2008), Oxygen isotopes in Samoan lavas: confirmation of continent recycling. *Geology* **36**, 551-554.

10. Koppers, A.A.P., J.A. Russell, **M.G. Jackson**, J. Konter, H. Staudigel and S.R. Hart (2008). Samoa reinstated as a primary hotspot trail. *Geology* **36**, 435-438.
9. **Jackson, M.G.**, S.R. Hart, A.E. Saal, N. Shimizu, M.D. Kurz, J. Blusztajn, A. Skovgaard (2008). Globally elevated titanium, tantalum, and niobium (TITAN) in ocean island basalts with high  $^3\text{He}/^4\text{He}$ . *Geochem. Geophys. Geosyst.* (G-cubed) **9**, doi:10.1029/2007GC001876.
8. **Jackson, M.G.**, S.R. Hart, A.A.P. Koppers, H. Staudigel, J. Konter, J. Blusztajn, M.D. Kurz, J.A. Russell (2007). The return of subducted continental crust in Samoan lavas. *Nature* **448**, 684-687.
7. **Jackson, M.G.**, M.D. Kurz, S.R. Hart, R.K. Workman (2007). New Samoan lavas from Ofu Island reveal a hemispherically heterogeneous high  $^3\text{He}/^4\text{He}$  mantle. *Earth Planet. Sci. Lett.* **264**, 360–374.
6. Courtier, A.M., **M.G. Jackson**, J.F. Lawrence, Z. Wang, C.-T.A. Lee, R. Halama, J.M. Warren, R. Workman, W. Xu, M.M. Hirschmann, A.M. Larson, S.R. Hart, C. Lithgow-Bertelloni, L. Stixrude, W.-P. Chen (2007). Correlation of seismic and petrologic thermometers suggests deep thermal anomalies beneath hotspots. *Earth. Planet. Sci. Lett.* **264**, 308–316.
5. Putirka, K.D., M. Perfit., F.J. Ryerson, **M.G. Jackson** (2007). Ambient and excess mantle temperatures, olivine thermometry, and active vs. passive upwelling. *Chem. Geol.* **241**, 177-206.
4. **Jackson, M.G.**, S.R. Hart (2006). Strontium isotopes in melt inclusions from Samoan basalts: Implications for heterogeneity in the Samoan plume. *Earth Planet. Sci. Lett.* **245**, 260-277.
3. **Jackson, M.G.**, N. Oskarsson, R.G. Trønnes, J.F. McManus, D.W. Oppo, K. Grönvold, S.R. Hart, J.P. Sachs (2005). Holocene loess deposition in Iceland: Evidence for millennial-scale atmosphere-ocean coupling in the North Atlantic. *Geology* **33**, 509-512.
2. Workman, R.K., S.R. Hart, **M.G. Jackson**, M. Regelous, K.A. Farley, J. Blusztajn, M. Kurz (2004). Recycled metasomatised lithosphere as the origin of the Enriched Mantle II (EM2) end-member: Evidence from the Samoan Volcanic Chain. *Geochem. Geophys. Geosys.* (G-cubed), **5**, doi:10.1029/2003GC000623.
1. Hart, S.R., H. Staudigel, A.A.P. Koppers, J. Blusztajn, E.T. Baker, R. Workman, **M.G. Jackson**, E. Hauri, M. Kurz, K. Sims, D. Fornari, A. Saal, S. Lyons (2001). Vailulu'u undersea volcano: The new Samoa. *Geochem. Geophys. Geosys.* (G-cubed), **1**, doi:10.1029/2000GC000108.

### Other articles

2. Farquhar, J., **M.G. Jackson** (2016). Missing Archean sulfur returned to the mantle. *Proc. Nat. Acad. Sci.* doi: 10.1073/pnas.1616346113
1. Herrera, S., **M.G. Jackson**, J. Konter, M. Lobecker, K. Elliott (2018). 2017 American Samoa Expedition: Suesuega o le Moana Amerika Samoa. *Oceanography*.

### Funding

9. Amount: \$299,756 (UCSB) (Jackson lab award at UCSB)  
Title: "Origin of highly heterogeneous strontium isotopic ratios in melt inclusions from oceanic hotspot lavas."  
OCE-1736984  
Agency: NSF-OCE (Marine Geology & Geophysics); Period: 08/15/17 to 07/31/20.  
Lead-PI: M. Jackson
8. Amount: \$299,928 (UCSB) (Jackson lab award at UCSB)  
Title: "Preservation of Hadean geochemical signatures in the Icelandic high  $^3\text{He}/^4\text{He}$  mantle domain."  
EAR-1624840  
Agency: NSF-EAR (Petrology and Geochemistry); Period: 07/01/16 to 06/31/19  
Lead-PI: M. Jackson
7. Amount: \$524,244 (UCSB) (Jackson lab award at UCSB)

Title: "MRI: Acquisition of a Thermal Ionization Mass Spectrometer (TIMS) for high-precision isotopic research of the Earth's mantle, crust and oceans." EAR-1429648

Agency: NSF-EAR (MRI); Period: 08/01/14 to 07/31/18

Lead-PI: M. Jackson, Co-PI's: J. Cottle, B. Hacker, M. Rioux, S. Weldeab

6. Amount: \$111,566 (Jackson lab award at UCSB); \$206,590 (total grant award)

Title: "Collaborative Research: Using sulfur isotopes to identify subducted Archean crust in modern oceanic hotspot lavas." EAR-1348082.

Agency: NSF-EAR (Petrology and Geochemistry); Period: 06/01/14 to 12/31/15

Lead-PI: M. Jackson, Co-PI: J. Farquhar (U. Maryland College Park)

5. Amount: \$37,702 (Jackson lab award at UCSB); \$395,753 (total grant award)

Title: "Collaborative Research: The role of oxygen fugacity in calc-alkaline differentiation and the creation of continental crust at the Aleutian arc." EAR-1347377.

Agency: NSF-EAR (GeoPRISMS); Period: 08/01/14-07/31/17

Lead-PI: K. Kelley (URI), Co-PI's: L. Cottrell (Smithsonian), M. Jackson

4. Amount: \$200,815 (Jackson lab award at Boston U.); \$698,809 (total grant award)

\$184,294 (Amount of award transferred to UCSB)

Title: "Collaborative Research: Using the Rurutu hotspot to evaluate mantle motion and absolute plate motion models." OCE-1153894.

Agency: NSF-OCE (Marine Geology and Geophysics); Period: 07/01/12 – 09/30/15

Lead-PI: J. Konter (U. Hawaii, Manoa), Co-PI's: M. Jackson, A.A.P. Koppers (Oregon State University)

3. Amount: \$199,703 (Jackson lab award at Boston U.)

\$99,395 (Amount of award transferred to UCSB)

Title: "Isotopic diversity in Mangaia melt inclusions: Mantle source or crustal assimilation?" EAR-1145202.

Agency: NSF-EAR (Petrology and Geochemistry); Period: 02/01/12-01/31/15

Lead-PI: M. Jackson

2. Amount: \$220,000 (Jackson lab award at Boston U.)

\$392 (Amount of award transferred to UCSB)

Title: "Constraining mantle flow between Samoa and the northern Lau and N. Fiji Basins with geochemistry and geodynamics." OCE-1061134

Agency: NSF-OCE (Marine Geology and Geophysics); Period: 01/01/11 - 3/31/14

Lead-PI: M. Jackson, Co-PI: P. Hall

1. Amount: \$140,000 (award at Boston U.)

Title: "Facility Support: Phase Two of a NSF/Boston University partnership ensuring long-term technician support for the BU TIMS Facility (technician support)." EAR-0949390

Agency: NSF (Instrumentation and Facilities); Period: 06/01/10 - 05/31/12

Lead-PI: E. Baxter, Co-PI's: M. Jackson, A. Kurtz, R. Murray

### **Keynote and Plenary Contributions at International Conferences**

9. "Consequences for an Alternative Earth Composition: A Decade of Insight." AGU, 2015. ***New Generation of Scientists' Union session at AGU for Macelwane Medal.***

8. "Inferring the 'geochemical geometry; of mantle plumes". *Goldschmidt* 2015, Session 20f. Mantle-derived intraplate magmas, their xenolith and diamond cargo: process, timescales and geodynamic implications. Prague, August 2015. **Keynote.**

7. "The geochemical geometry of mantle plumes". European Geophysical Union, 2014. Session GMPV3.1, Magmas from the mantle. Vienna, April 2015. **Kuno Lecture.**

6. "The origin of the mantle "species": Five decades of debate." *Goldschmidt* 2014, Session 5e. Intra-Plate Magmatism from Recycled Crust and Mantle. Sacramento, June 2014. **Clarke Medal talk.**
5. "Formation of mantle domains in the Hadean and Archaean: Evidence for deep mantle preservation in oceanic lavas." *Deep Earth Structure and Dynamics*, multidisciplinary workshop, Collège de France. Paris, November 2012. **Plenary talk.**
4. "The deep mantle feeding Hawaiian volcanism: New perspectives on old models." *AGU Chapman conference: Hawaiian volcanoes, from source to surface.* Hawaii, August 2012. **Plenary talk.**
3. "A new composition for the Earth: Implications for mantle dynamics." *International Geological Congress*, Deep Earth Circulation session. Brisbane, August 2012. **Keynote.**
2. "New constraints on the composition of the Earth's primitive mantle." *Goldschmidt* 2011, Session 4e. Mantle Compositional Variability: From Ocean Basins to Melt Inclusions. Prague, August 2011. **Keynote.**
1. "Ocean Islands and mantle plumes: Outstanding geochemical and petrological questions." *AGU Chapman Conference: The Galápagos as a Laboratory for the Earth Sciences.* Galápagos, July 2011. **Plenary Talk.**

### **Other Invited Contributions at Conferences and Workshops**

20. "Hidden Hotspot Volcanoes and Disappearing Seamounts: The Joint Program in the Age of Ocean Discovery." WHOI-MIT Joint Program 50-year anniversary, September 2018.
19. "Mantle isotopes." Lecture at CIDER Berkeley, July 2017.
18. "Sampling primordial reservoirs with hot plumes." UK-SEDI meeting, Burlington House, May 2017.
17. "Overview of questions and challenges." CIDER, UC Santa Barbara, June 2016.
16. "Chemical Geodynamics of Helium." CIDER Community Workshop, Point Reyes, May 2016.
15. "Sediment subduction and the generation of extreme geochemical enrichment in lavas erupted at oceanic hotspots." Fall AGU, 2015, Session V44A-05. Geochemistry of Sediments and Sediment Recycling and Implications for Crust and Mantle Evolution over Earth History I.
14. "Os-isotopic compositions of peridotite xenoliths from the oceanic mantle: Implications for the age of isotopic domains in the oceanic mantle." Fall AGU, 2015, Session D153A-07. Constraints on Heterogeneities in Earth's Mantle II.
13. "Sediment Subduction and the Generation of Extreme Geochemical Enrichment in Lavas Erupted at Oceanic Hotspots." Fall AGU, 2015, Session V44A-05. Geochemistry of sediments and sediment recycling and implications for crust and mantle evolution over Earth history I.
12. "Relating the chemistry and structure of the deepest mantle to the geochemistry of mantle melts erupted at the surface." Deep-Earth Processes meeting, Geological Society of London, Burlington House, September, 2014.
11. "Radiogenic heating and geo-neutrinos from mantle." Geo-neutrino Working Group Meeting at KITP, Santa Barbara, 2014.
10. "A genetic approach to mantle taxonomy reveals the geochemical geometry of a plume." Fall AGU 2013, Session DI008. Multidisciplinary constraints on the nature and scale of mantle Heterogeneities.
9. "Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas." Fall AGU 2013, Session DI006. Linking the Earth's surface with the deep interior: Comparing predictions and observations of mantle plumes.
8. "Major and trace element composition of the high  $^3\text{He}/^4\text{He}$  (FOZO) mantle: Implications for the composition of the bulk silicate Earth". Interior of the Earth Gordon Research Conference, Mt. Holyoke, 2013.
7. "Mass independently fractionated sulfur isotopes reveal recycling of Archean lithosphere in modern oceanic hotspot lavas." Interior of the Earth Gordon Research Seminar, Mt. Holyoke, 2013.



6. "Mass independently fractionated sulfur isotopes reveal recycling of Archean lithosphere in modern oceanic hotspot lavas." EGU 2013. Vienna, Austria. April 2013.
5. "Radioactivity in primitive mantle." Neutrino Geoscience Conference, March 2013, Takayama, Japan.
4. "Trace element composition of a non-chondritic Earth: Potential solutions and geodynamic implications." Goldschmidt 2012, Session 5c, From chondrite to a differentiated Earth: The formation of primitive silicate reservoirs, their fate and evolution through Earth's early times. June 2012.
3. "The unusual Samoan hotspot: A 'hotspot highway' juxtaposed with a trench." AGU 2011, Session V15. The Subduction Filter: Effects on the Mantle, Arcs and Continents.
2. "Rehydration of the Deep Earth Indicated by Sediment Recycling." Fall AGU 2010, Session V15. The Subduction Filter: Effects on the Mantle, Arcs and Continents.
1. "The enigmatic high  $^3\text{He}/^4\text{He}$  mantle: Characteristics and Origins." Fall AGU 2009, Session V31F. Mantle Heterogeneity: Origin, Scales, and Caveats.

### Invited Seminars

49. "Hidden Hotspot Volcanoes and Disappearing Seamounts: The Age of Ocean Discovery." Cosmopolitan Club, Santa Barbara, October 2018.
48. Lost continents and preserved primordial reservoirs: Clues from the Earth's deep interior. Cornell, September 2018
47. Lost continents and preserved primordial reservoirs: Clues from the Earth's deep interior. Lehigh U., September 2018.
46. Lost continents and preserved primordial reservoirs: Clues from the Earth's deep interior. U. Washington, May 2018
45. Lost continents and preserved primordial reservoirs: Clues from the Earth's deep interior. Yale University, February 2018.
44. The fate of subducted tectonic plates and the survival of primordial reservoirs in the Earth's deep interior. Coastal Geological Society, September 2017.
43. Hot plumes entrain higher  $^3\text{He}/^4\text{He}$ . California State University Fresno, April 2015.
42. Plumes and Helium. U. Nebraska, March 2015.
41. The geochemical geometry of mantle plumes. U. South Carolina, November 2015.
40. Geochemical and geodynamic consequences for a non-chondritic Earth. Lamont Doherty Earth Observatory, September 2015.
39. The geochemical geometry of mantle plumes. UT Austin, September 2015.
38. The geochemical geometry of mantle plumes. UC Davis, May 2015.
37. Relating the chemistry and structure of the deepest mantle to the geochemistry of mantle melts erupted at the surface. U. Oslo, September 2014.
36. Relating the chemistry and structure of the deepest mantle to the geochemistry of mantle melts erupted at the surface. U. Iowa. September 2014.
35. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, Caltech Geological and Planetary Sciences Division seminar. October 2013.
34. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, MIT Chemical Oceanography and Geobiology seminar. September 2013.
33. The lost continents and oceanic plates: Resurrection in mantle plumes, Dept. Seminar, U. Wyoming. April 2013.
32. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, UC Santa Cruz, Earth and Planetary Sciences Department, Dept. Colloquium. March 2013.
31. Opening Pandora's box: What is the Earth's composition? U. of British Columbia, Department of Earth, Ocean and Atmospheric Sciences, Dept. Colloquium. February 2013.

30. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, Georgia Tech, School of Earth and Atmospheric Sciences, February 2013.
29. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, UC Santa Barbara, Department of Earth Science, February 2013.
28. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, Arizona State Univ., School of Earth and Space Exploration, February 2013.
27. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, Washington University St. Louis, Dept. of Earth and Planetary Sciences, January 2013.
26. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, Scripps Institute of Oceanography. Departmental Seminar. January 2013.
25. The lost continents and oceanic plates: Resurrection in mantle plumes, Dept. Seminar, Rice. January 2013.
24. Returning from the deep: Archean atmospheric fingerprints in modern hotspot lavas, Oxford U., January 2013.
23. The lost continents and oceanic plates: Resurrection in mantle plumes, Dept. Seminar, Brown U. 2013.
22. The lost continents and oceanic plates: Resurrection in mantle plumes, Gechemistry Seminar, IPGP, Paris, France, Nov. 2012.
21. The lost continents and oceanic plates: Resurrection in mantle plumes, Dept. Seminar, U. Oregon, Oct. 2012.
20. The lost continents and oceanic plates: Resurrection in mantle plumes, Dept. Seminar, UNC, Oct. 2012.
19. The lost continents and oceanic plates: Resurrection in mantle plumes, Dept. Seminar, SOEST, U. Hawaii. Sept, 2012.
18. "The deep mantle feeding hotspot volcanoes: New perspectives and future ways forward." U. of Idaho, Sept. 2012.
17. "What is the Composition of the Bulk Silicate Earth?" CIDER workshop, Santa Barbara. July 2012.
16. "What is the composition of the Earth." Harvard, Dept. Colloquium. April 2012.
15. "Redefining the composition of the Earth: Implications for global geodynamics." CIDER post-AGU workshop. December 2011.
14. "Redefining the composition of the Earth." Boston College, Dept. Colloquium. November 2011.
13. "Redefining the composition of the Earth." U. of Rochester, Dept. Colloquium. November 2011.
12. "Redefining the composition of the Earth." U. of British Columbia, Dept. Colloquium. October 2011.
11. "A surviving piece of the earliest Earth?" University of Rhode Island, GSO, Dept. Colloquium. May 2011.
10. "A surviving portion of the earliest Earth?" Laboratoire Magmas et Volcans, Université Blaise Pascal, Clermont-Ferrand, France. March 2011.
9. "A surviving portion of the Earliest Earth?" UC Berkeley. March 2011.
8. "A Surviving Piece of the Earliest Earth?" Geochem. Seminar, U. of Hawaii, Manoa. January 2011.
7. "A Surviving Piece of the Earliest Earth?" Princeton, Dept. Colloquium. September 2010.
6. "The fate of subducted continental crust in the Earth's mantle: Evidence from the Samoan hotspot." Smithsonian Museum of Natural History, September 23, 2009.
5. "The fate of subducted continental crust in the Earth's mantle: Evidence from the Samoan hotspot." James Madison University, Dept. Colloquium. October 1, 2009.
4. "The fate of subducted continental crust in the Earth's mantle: Evidence from the Samoan hotspot." Geological Society of Washington, September 2008.
3. "Pervasive isotopic disequilibrium in ocean island lavas: Clinopyroxene phenocrysts and melt inclusions." University of Maryland, September 2008.

2. "The return of subducted crust in Samoan lavas: Implications for mantle dynamics." Boston University, February 2008.
1. "Sr isotopes in melt inclusions from Samoan basalts: Clues about the nature of FOZO." Brown University, February 2006.

### **Leadership and Service to Field**

- Secretary, Volcanology Geology & Geochemistry Section of American Geophysical Union (2018 - )
- Scientific Committee for Neutrino Geoscience 2019 meeting in Prague.
- NSF panelist, Ocean Sciences, 2015, 2018.
- Committee member, Nature "Awards for Mentoring in Science", September 20, 2016
- SZO workshop, Boise Idaho. Breakout group discussion leader for "Enabling Interdisciplinary Collaboration," Sept 2016.
- Discussion leader (Session 1: "From accretion to today: the evolution of Earth's deep interior"), Gordon Research conference, Mt. Holyoke, 2017.
- AGU-VGP Liaison, Program Committee, Geochemical Society, 2013-2016.
- Mentor for Fall Meeting 2017 Union Session for Student Engagement to Enhance Development (SEED).
- Judge for student presentations at EGU Spring meeting (2015) and AGU Fall meetings, 2010, 2011, 2012, 2013, 2016, 2017.
- Kuno Award committee, AGU, 2015, 2016, 2017.
- Chair, Program Committee, Geochemical Society 2014-2015.
- Organizing committee, CIDER (Cooperative Institute for Dynamic Earth Research) 2016.
- Proposal writing committee, CIDER (Cooperative Institute for Dynamic Earth Research); co-wrote "scientific motivation" portion of NSF CIDER-renewal grant with Ved Lekic, 2016.
- Advisory committee member, CIDER (Cooperative Inst. for Dynamic Earth Research) 2012-2015.
- Lecturer/tutorial leader, CIDER, 2014 (UCSB)
- MIT-WHOI Joint Program alumni committee. 2013-Present.
- Invited Participant, EarthCube Earth Career Strategic Visioning Workshop, Oct. 2012.
- Invited participant and scribe at the IODP "Building U.S. Strategies Workshop". May 2012.
- Invited participant at Eastern Pacific Workshop, to determine targets of the R/V Nautilus in the Eastern Pacific for the next 2 years.
- Invited participant at NSF-sponsored CSEDI 10-year planning committee. San Diego, 2015.
- Invited participant at IODP "Building U.S. Strategies Workshop". May 2012.
- Refereed articles (N > 100 reviews) for *Nature*, *Science*, *Geology*, *Earth and Planetary Science Letters*, *Geochimica et Cosmochimica Acta*, *Chemical Geology*, *Journal of Geophysical Research Letters*, *Solid Earth Discussions*, *Reviews of Geophysics*, *Journal of Petrology*, and *Contribution to Mineralogy and Petrology*.
- Refereed proposals (N=50) for NSF-EAR, NSF-OCE, NSF-IODP, NSERC (Canada) and NERC (UK).

### **Service at International Meetings/Conferences**

- Theme co-chair (with Vincent Salters and Gretchen Frueh-Green) for theme 5, ("Mantle to Crust") of the International Program Committee for Goldschmidt 2014.
- Theme co-organizer for 2011 Prague Goldschmidt
- International conference sessions chaired/co-chaired:
- 15. Co-convener (with Janne Koornneef) of 2019 Barcelona Goldschmidt session titled, "Melt and fluid inclusions hosted in lavas and their xenolith cargo: tools for understanding magma and mantle evolution."

14. Co-convener (with Andrea Giuliani and Ashlea Wainwright) of 2018 Boston Goldschmidt session titled, “Magmas and their cargoes as tracers of mantle evolution: Implications for Chemical Geodynamics.”
13. Co-convener and co-chair (with Andrea Giuliani and Ashlea Wainwright) of 2017 Paris Goldschmidt session titled, “The geochemistry of intraplate magmas: Mantle sources, metasomatism, magmatic processes and xenolith cargoes.”
12. Co-convener and co-chair (with Pilar Madrigal, Curtis Williams, Jessica C. Irving, Elizabeth Cottrell) of 2016 AGU SEDI session titled “Heterogeneity in Earth’s Deep Interior – from natural and laboratory observations to theoretical models”.
11. Co-chair (with Rita Parai, Shichun Haung and Sujoy Mukhopadhyay) of 2015 AGU session titled, “Chemistry of the Earth’s mantle: Implications for the structure and evolution of the Earth.”
10. Co-convener and co-chair (with Peter van Keken) of 2015 Goldschmidt session entitled “Chemical geodynamics through time.”
9. Co-convener and co-chair (with James Day and Jasper Konter) of 2014 AGU session titled, “The geochemical diversity of the mantle inferred from hotspots: Five decades of debate.”
8. Co-convener and co-chair (with Hanika Rizo and Vicky Bennett) of 2014 Goldschmidt session titled, “Chemical heterogeneities in the Early Earth: their formation, preservation and destruction.”
7. Co-convener and co-chair (with James Day and Jasper Konter) American Geophysical Union session titled, “Ocean islands and large igneous provinces.” Fall AGU, 2013.
6. Co-convener and co-chair (with Esteban Gazel, Paul Hall, Shichun Huang, Dominic Weis, Ed Garnero, Cinzia Farnetani) American Geophysical Union session titled, “Mantle Plumes: What Do We Really Know?” Fall AGU, 2012.
5. Co-convener and co-chair (with Paul Hall and Nick Schmerr) American Geophysical Union session, “Mantle plumes: combining perspectives from geophysics, geochemistry and geodynamics”. Fall AGU, 2011.
4. Co-convener and co-chair (with Al Hofmann, Francis Albarede and Thorsten Becker) of 2011 Goldschmidt session, “Chemical Geodynamics: 25 Years of Mantle Components.”
3. Co-convener and co-chair (with James Day and Raj Dasgupta) of 2010 Goldschmidt session, “Mantle Reservoirs and their Creation.”
2. Co-convener and co-chair (with Jessica Warren, Estelle Rose-Koga, Ken Koga and Stan Hart) of AGU session, “Using Small-Scale Observations to Answer Big Questions in Earth Sciences: Advances From 30 Years of Ion Microprobe Analysis”. Fall AGU, 2009.
1. Co-convener and co-chair (with Glenn Gaetani) American Geophysical Union session, “From Subduction Zones to Mantle Plumes: High Field Strength Elements as Geochemical Tracers of Crustal Recycling”. Fall AGU, 2008.

### **University and Departmental Service, UCSB**

- Graduate Council member – Academic Senate UCSB (Sept 1, 2018 until Aug 31, 2019).
- Recruitment Fellowship Committee - Recruitment (Feb 2019).
- Environmental Health and Safety peer review of laboratory safety program; Representative for Earth Sci. Dept. (Nov, 2018).
- Assembled appointment case for senior hire (with Andy Wyss, Susannah Porter, and Stan Awramik). Spring 2018.
- Grad committee (Oct 2017 - )
- Ad hoc committee (Sept 2016). UCSB.
- Organized Speaker’s Club (department seminar series). 2015-2016; 2017-2018 UCSB.
- Geophysics search committee member, 2015-2016. UCSB.
- Faculty Senate representative (Sept 2014 – Spring 2015). UCSB.

- Search committee for Dept. Earth Science Electronics Engineer. Summer 2015-Spring2016. UCSB.
- Chair for ERI Ad hoc review committee (Feb 2016). UCSB
- Ad hoc committee (Sept 2014). UCSB.
- Comprehensive exam grader. 2015-2016. UCSB.
- Co-leader of field trip for visiting prospective graduate students, March 2015 (with Alex Sims). UCSB
- “Earth evolution” meeting participant for ERI external review (Oct 2014). UCSB.
- IGPMS meet-and-greet with students (Oct. 24, 2014). UCSB.
- Served on ERI promotion committee for Dylan Rood (Jan. 2014). UCSB
- Space committee (Oct. 2014, substituting for Toshiro Tanimoto). UCSB.
- Faculty Senate, Fall 2013 (in lieu of John Cottle; October 18, 2013 meeting) and Spring 2014 (in lieu of Stan Awramik; May 8, 2014 meeting). UCSB
- Served as written exam co-ordinator for Luyuan Ding (Mar. 2014). UCSB

### **University and Departmental Service, Boston University**

- Organized Department Seminar series. Fall 2011-Spring 2012. Boston University
- Graduate student admission committee. Spring 2010, 2011. Boston University
- Represented Earth Sciences department at the “Department Expo” during the Freshman Friday activities events. Spring 2010, Spring 2011, Spring 2012. Boston University
- Represented Earth Sciences department at Major Expo Fair, Fall 2011. Boston University
- Geophysics search committee, Spring 2013. Boston University

### **Served on thesis committees for the following graduate students:**

- Lori Willhite (comprehensive committee, November 2018). UCSB.
- James Dottin (Ph.D. committee, external member, 2018). U. Maryland.
- Mark Edwards (comprehensive committee, May 2018). UCSB.
- Al Greaney (qualifying exam, April 2017; Ph.D. defense committee, November 2018). UCSB.
- Andrew Reinhard (comprehensive committee, chair, November 2016). UCSB
- Jenna Adams (comprehensive committee, November 2016; qualifying exam, June 2018). UCSB
- Madeline Shaffer (comprehensive committee, October 2016). UCSB
- Nicoletta Browne (comprehensive committee, Oct 2016; M.A. Thesis Committee Jan 2018). UCSB
- Jared Wilson (comprehensive committee, November 2016; M.A. Thesis Committee Jan 2018). UCSB
- Will Junkin (comprehensive committee, December 2015). UCSB
- Melissa Scruggs (comprehensive committee, November 2015; qualifying exam October 2017). UCSB
- Menso de Jong (comprehensive committee, November 2015; qualifying exam Feb 2017). UCSB
- Nina Bingham (Geography, MS thesis committee, Fall 2015). UCSB
- Ryan Neilson (qualifying exam, July 2015; PhD examination committee, June 2017). UCSB
- Graham Hagen-Peter (PhD examination committee, July 2015). UCSB
- Mary Kate Fiddler (qualifying exam committee, July 2015; PhD examination committee, December 2017). UCSB
- Forrest Horton (PhD examination committee, June 2015). UCSB
- Alison Price (comprehensive committee, Spring 2013; qualifying exam committee, March 2015; PhD examination committee, August 2016). Boston University and UCSB.
- Herrmann Drescher (Master’s defense committee, external member, Sept. 2014). U. Oslo
- Demian Nelson (comprehensive committee, 2014; qualifying exam committee, April 2015). UCSB
- Jason Schmidt (comprehensive committee, 2014; Master’s defense committee, 2015). UCSB
- Josh Garber (qualifying exam committee, Nov 2013; PhD examination committee, Oct 2017). UCSB
- Emily Wilson (Master’s defense committee external member, May 2013). U. Idaho
- Katherine Eccles (comprehensive committee, chair; Spring 2013). Boston University.

- Ann Dunlea (comprehensive committee, Spring 2012). Boston University.
- Mu Shangshang (comprehensive committee, Spring 2012). Boston University.
- Rohan Kundargi (Master's defense committee, Spring 2012). Boston University.
- Rita Cabra (comprehensive committee, Spring 2012; (PhD examination committee, April 2014)). Boston University.
- Ken Takagi (comprehensive committee, Spring 2011). Boston University.
- Ethan Fahey (Master's defense committee, Spring 2011). Boston University.
- Jen Lamp (comprehensive committee, Fall 2011). Boston University.
- Nora Sullivan (comprehensive committee, Spring 2010). Boston University.
- Rachel Scudder (comprehensive committee, Summer 2010). Boston University.

## **Teaching**

- Nominated for Distinguished Teaching Award (did not pursue nomination), Fall 2014.
- UCSB, Earth 215: Isotope Geochemistry. Spring 2015, Winter 2016, Fall 2017.
- UCSB, Earth 201A: Graduate Research Seminar. 2013, 2014, 2015, 2016, 2017, 2018.
- UCSB, Earth 124IG and 224IG: Intro. Geochemistry. Winter 2014, 2015, Spring 2016, Spring 2017.
- UCSB, Earth 20: Geological Catastrophes. Fall 2014, 2015, 2016, 2017, 2018, 2019.
- UCSB, Earth 270: Trace Element Geochemistry. Spring 2014. Fall 2018.
- Boston University, ES772: Trace Element Geochemistry. Spring 2013.
- Boston University, ES424: Igneous and Metamorphic Petrology. Spring 2010, 2012.
- Boston University, ES371&671: Intro. Geochemistry. Fall 2010, 2011, 2012.
- Boston University, ES302: History of the Earth. Spring 2011.
- Boston College, Guest Lecturer, co-taught GE530: Marine Geology. Spring 2007.

## **Graduate Student, Undergraduate Student, and Post-Doctoral Mentoring**

### -Postocs:

3. Ben Byerly at UCSB (2018-2019).
2. Xiao Li Wang at UCSB (2014-2015; with Maosheng Miao and Frank Spera)
1. Gordana Garapic at UCSB (2013-2014).

### -Graduate students:

6. Lori Willhite (UCSB, M.S., 2nd year)
5. Olivia Anderson (UCSB, Ph.D., 2nd year)
4. Mark Edwards (UCSB, M.S. September 2018)
3. Andrew Reinhard (UCSB, Ph.D. September 2018)
2. Alison Price (UCSB, Ph.D. 2016).
1. Rita Cabral (Boston University, Ph.D. May 2014)

### -Undergraduate students:

15. Scott Peimann (2018-2019). Senior thesis examining carbonatites from Cape Verde and Canary Is.
14. Cassidy Meehan (2017). Co-advised with graduate student, Mark Edwards. Independent study (enrolled in Earth 199A) to evaluate anthropogenic CO<sub>2</sub> production resulting from wetlands restoration project.
13. Alexandra Nicklin (2017, 2018). Independent study (enrolled in Earth 199) to identify the mineral hauyne in oceanic lavas and determine variability in its composition.
12. Jonathan Pinko (2016). Senior Thesis (enrolled in Earth 196HA, 196HB, and 196HC). Recipient of competitive Undergraduate Research & Creative Activities (URCA) funding (\$750) for research in the senior thesis.

11. Lori Willhite (2016). Independent study (enrolled in Earth 199). Recipient of competitive Undergraduate Research & Creative Activities (URCA) funding (\$750) for undergraduate research.
10. Floyd Jaggy (2014-2015); Summer 2014 (enrolled in 199RA), Fall 2014 (199RA), Winter 2015 (199RA). Recipient of 2015 Coastal Geological Society Award. UCSB
9. Addison Sani (2014-2015; 2015 Winter enrolled in Earth 199; 2015 Spring enrolled in 199Ra). UCSB
8. David Huckle (Boston U.). Served as UROP (Undergraduate Research Opportunity) sponsor and (Summer 2010) Directed Study advisor (Fall 2010). Mr. Huckle presented his research as a poster at the Fall 2010 AGU meeting. Boston University
7. Jarod Payne (Boston U.). Senior thesis advisor for Jarod Payne (Fall 2011 – Spring 2012). Mr. Payne presented his research as a poster during the Fall 2011 meeting and his work was published (with Mr. Payne as lead author) in the journal *Geology*. Boston University
6. Stephanie Kukolich (Boston U.). Served as UROP sponsor (Summer 2012, Fall 2012). Ms. Kukolich presented the results of her research at the Fall 2012 AGU meeting. Boston University
5. Moira Poje (Boston U.). Supervised independent research project. (Spring 2012 – Spring 2013). Ms. Poje joined us on a 5-week NSF-funded oceanographic cruise to the Tuvalu atolls (summer 2013). Boston University
4. Caitlin Brown (Boston U.). Supervised independent research project. (Summer 2010-Summer 2011). Boston University
3. Zuo Jin (“Georgie”) Ang (Boston U.). Supervised independent research project. (Spring 2011). Boston University
2. Austin Su (Boston U.). Supervised independent research project. (Summer 2011). Boston University
1. Jessica Stelman (Boston U.). Supervised independent research project. (Fall 2011). Boston University

## Outreach

- During the 2017 seagoing expedition to American Samoa and Independent Samoa aboard the NOAA Okeanos Explorer, we conducted ship tours for local students, teachers, VIPs and media in both Pago Pago and Apia. 118 participants visited the ship in Pago Pago, American Samoa and ~115 participants and 15 media representatives visited the ship in Apia, Samoa. The expedition received news and media coverage by more than 45 outlets (including CNN, CBS, Huffington Post, Scientific American, Gizmodo, and local media in American Samoa and Samoa). Live video feeds of the expedition were streamed to the public worldwide via the Internet, with the live video received more than 6.2 million views via YouTube and Facebook. We conducted two live interactions with the Tauese P.F. Sunia Ocean Center in American Samoa to engage and share the expedition with ~170 local students, the Office of Samoan affairs, and other agency representatives and officials. At least 48 scientists and students from 12 U.S. states and 5 countries (Japan, Russia, Chile, and Trinidad and Tobago) participated in the expedition as members of the science team.
- Co-leader (with Jasper Konter) of a tour of the research vessel R/V Roger Revelle. Gave a presentation of ship-board operations to a group of Fijian students while at port in Fiji. August 2013
- Gave a presentation to the Mangaia (Cook Islands) high school about the geological history of the island, August 2010.
- Taught elementary classes about tsunami hazards, Ta’u high school, American Samoa, two weeks after local tsunami, October 2009.
- Co-taught two day-long classes about local geology at Ta’u and Savai’i high schools in American and Independent Samoa, 2005 and 2006.
- Interviewed with *Nature* Podcast, Preceding *Nature* (2007) publication, August, 2007.

- Interviewed with BBC News, Physics Today, National Geographic, Scientific American, Discovery, Our Amazing Planet, Chemical and Engineering News, New Scientist, Deutschlandfunk (German radio station), etc. Preceding *Nature* (2010) paper publication, August 2010.
- Interviewed with Earth Magazine, DiscoveryNews, Science Daily, etc. Preceding *Nature* (2011) paper publication, August 2011.
- Served as Samoan expert on television interview during the aftermath of the Samoan tsunami/earthquake (Oct 1, 2009). Harrisonburg, VA.

### Synergistic Activities

- CIDER workshop participant (Cooperative Institute for Dynamic Earth Research). Participated in discussions exploring interdisciplinary approaches to deep earth problems. Summer 2006, 2012, 2013, 2014, 2016, 2017.
- Attended DINGUE 2 (Developments in Noble Gas Understanding and Expertise) workshop to give invited talk, Paris, France. August 12-13, 2011.

### Field Work and Shipboard experience

- Geology Lead Scientist, EX1702 expedition aboard the NOAA *Okeanos Explorer*. ROV dives were conducted on island and seamount targets throughout the American Samoa Exclusive Economic Zone.
- Co-PI aboard the R/V Roger Revelle, Rurutu hotspot expedition: Dredged the Tuvalu islands and seamounts to constrain their age and origin. July-August, 2013
- Sampling expedition to Cook Islands (with Dr. James Day and graduate student Rita Cabral) to investigate the origins of the HIMU mantle.
- Samoan Lithosphere Integrated Seismic Expedition (SLISE). Installed seismic stations along the Samoan Island chain with graduate student funding. Project goal is to relate lithospheric thickness (using receiver functions) to geochemistry of the islands. Fall 2005 to Fall 2009.
- Shipboard Scientific Party aboard the R/V Kilo Moana, ALIA expedition in Samoa: Dredged Samoan seamounts to constrain hotspot age-progression. May 2005.
- Shipboard Scientific Party aboard R/V Atlantis: Deep-sea coral collection from New England Seamounts with DSV Alvin. May-June 2003.

### Abstracts (\*Jackson grad student, \*\*Jackson undergrad student, \*\*\*Jackson post-doc)

129. Ashley, A.W., J. Edelson, A.H. Peslier, L. Bruce, M.G. Jackson, J. Konter, R. Dasgupta, M. Bizimis, M. (2019). Evidence for dry carbonatite metasomatism in the oceanic lithosphere from peridotite xenoliths of Samoa and Lanzarote. European Geophysical Union. Session GMPV2.1/GD3.8.
128. Botana, J., Z. Liu, M.-S. Miao, F. Spera, M.G. Jackson (2019). How are light elements present in Earth's core? An ab initio exploration. American Physical Society.
127. Anderson, O.E.\*, **M.G. Jackson**, E.F. (2018). Rose-Koga, Geochemistry of Mauna Loa olivine-hosted melt inclusions with unusual trace element fingerprints, AGU.
126. Byerly, B.L\*\*\*, **M.G. Jackson** (2018). Examining grain-scale Sr and Nd isotopic heterogeneities in metasomatized harzburgite xenoliths from Savai'i, Western Samoa, AGU.
125. Dottin III, J.W., J. Labidi, J. Farquhar, **M.G. Jackson** (2018). Characterizing primordial S-isotope compositions in Ocean Island Basalts using  $\mu^{182}\text{W}$  and  $^3\text{He}/^4\text{He}$  relationships, AGU.
124. **Jackson, M.G.**, T.W. Becker, J.G. Konter (2018). Geochemistry of Large, Low Shear-Wave Velocity Provinces in the Lower Mantle Inferred from Nd and Pb Isotopes in Oceanic Hotspots, AGU.



123. Konrad, K., A.A.P. Koppers, B. Steinberger, V. Finlayson, J. Konter, M.G. Jackson (2018). Determining Relative Mantle Plume Motion using Hotspot Track Geometry, Geochronology and Geochemistry, AGU.
122. Willhite, L.N.\*, **M.G. Jackson**, J. Blichert-Toft, I. Bindeman, M.D. Kurz (2018). The Icelandic Mantle Plume: A 62 Million Year Record of the Deep Mantle, AGU.
121. Mundl, A., R.J. Walker, **M.G. Jackson**, M.D. Kurz, S.A. Halldórrson (2018). A global picture on correlating primordial mantle signatures in Ocean Island basalts, AGU.
120. Ashley, A.W., M. Bizimis, A. Peslier, **M.G. Jackson**, J. Konter (2018). Samoa: A case study for “dry” metasomatism? *Goldschmidt Conf. Program and Abstracts*.
119. Marschall, H.R., **M.G. Jackson** (2018). Isotopically heavy boron in the source of ocean island basalts. *Goldschmidt Conf. Program and Abstracts*.
118. Dottin, J.W., J. Farquhar, J. Labidi, **M.G. Jackson** (2018). A relationship between sulfur isotopes,  $\mu^{182}\text{W}$ , and  $^3\text{He}/^4\text{He}$ : Evaluating the possibility of S-isotope heterogeneity in a primitive mantle reservoir. *Goldschmidt Conf. Program and Abstracts*.
117. Ashlea, A., M. Bizimis, A. Peslier, **M.G. Jackson** (2018). Water systematics of peridotites from the Samoa hotspot. 2018 Southeast GSA.
116. Mundl, A., R.J. Walker, **M.G. Jackson**, J. Blichert-Toft, M.D. Kurz, S.A. Halldórrson (2018). Two distinct primordial mantle sources beneath Iceland. EGU 2018.
115. Wang, X.\*\*\*, J. Li, F. Spera, **M.G. Jackson**, M. Miao (2017). The stability and the structures of Fe-I and Fe-Br compounds under Earth core condition. American Physical Society.
114. Botana, J., Z. Liu, M.-S. Miao, F. Spera, **M.G. Jackson** (2017). What is the form of H in the Earth’s inner core? American Physical Society.
113. Adams, J., F. Spera, **M.G. Jackson**, J. Schmidt (2017). Petrogenetic Evaluation of Clinopyroxene-hosted Melt Inclusions from an Enriched Submarine Lava of the Samoan Hotspot Track: A Phase Equilibria and Diffusion Modeling Study. AGU 2017. EOS (Transactions of AGU), 98, V33G-0593.
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111. Herrera, S., **M.G. Jackson**, K. Elliot (2018). Biodiversity of the deep-sea benthic fauna in the American Samoa region. *Ocean Sciences Meeting*. Portland, OR.
110. Peterson, M.E., M. Brounce, E. Stolper, J. Eiler, T. Hanyu, A. Nichols, **M.G. Jackson** (2017). The oxidation state of Fe in glasses from the Austral Islands: limits on effects of the HIMU mantle end-member on oxygen fugacity. *Goldschmidt Conf. Program and Abstracts*.
109. Mundl, A., R.J. Walker, M. Touboul, **M.G. Jackson**, J.M. Day, M.D. Kurz, V. Lekic, R.T. Herz (2017). Ancient  $^{182}\text{W}$  Signatures in Modern Ocean Island Basalts. *Goldschmidt Conf. Program and Abstracts*.
108. **Jackson, M.G.**, J.G. Konter, T. Becker (2017). Hot plumes entrain higher  $^3\text{He}/^4\text{He}$ . *Goldschmidt Conf. Program and Abstracts*.
107. Horan, M.F., R.W. Carlson, R.J. Walker, **M.G. Jackson**. Hadean processes in modern basalts. *Goldschmidt Conf. Program and Abstracts*.
106. Kendrick, M.A., C. Hémond, V.S. Kamenetsky, L. Danyushevsky, C.W. Devey, T. Rodemann, **M.G. Jackson** (2017). Perfit M.R. Halogens and water in MORB and OIB and the origin of HIMU. *Goldschmidt Conf. Program and Abstracts*.
105. Kendrick, M., C. Hémond, V.S. Kamenetsky, L. Danyushevsky, C.W. Devey, T. Rodeman, **M.G. Jackson**, M.R. Perfit (2017). Seawater cycled throughout Earth’s mantle in partially serpentinised lithosphere. Session S-GC52 “Volatile Cycles in the Earth - from Surface to Deep Interior.” JpGU-AGU Joint Meeting 2017.

104. Konter, J.G., A.A.P. Koppers, **M.G. Jackson**, V. Finlayson, K. Konrad (2017). The two longest-lived Pacific hotspots, diverging since 80 Ma. Session Number 22 “T6. Magmatic Processes and Sources for Hotspot Volcanoes.” 2017 GSA Cordillera Section Meeting, Honolulu.
103. Finlayson, V.A., J.G. Konter, K. Konrad, A. Price, A.A.P. Koppers, **M.G. Jackson** (2016). Identification of a Hawaiian-Emperor Style Bend in the Tuvalu segment of the Rurutu hotspot track. AGU 2016. EOS (Transactions of AGU), 97, DI52A-05.
102. **Jackson, M.G.**, A. Reinhard, J. Blichert-Toft, A. Price, M.D. Kurz, S.A. Halldórsson (2016). Primitive helium isotopic compositions associated with Miocene lavas from Northwest Iceland. AGU 2016. EOS (Transactions of AGU), 97, DI11A-2342.
101. Lupton, J., A. Price, **M.G. Jackson**, R. Arculus, O. Nebel (2016). Elevated helium isotope ratios in the northern Lau and north Fiji basins: Intrusion of the Samoan hotspot or another OIB component? AGU 2016. EOS (Transactions of AGU), 97, V11B-2783.
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95. Rose-Koga, E., K.T. Koga, M. Moreira, I. Vlastelic, **M.G. Jackson**, M.J. Whitehouse, N. Shimizu (2016). F, Cl, S concentrations and Pb isotopes in melt inclusions from Sao Miguel, Azores. *Goldschmidt Conf. Program and Abstracts*.
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93. Day, J.M.D., R.J. Walker, **M.G. Jackson**, **M.G.** (2016).  $^{186}\text{Os}$ - $^{187}\text{Os}$  systematics of ocean island basalts. 4th International Workshop on Highly Siderophile Element Geochemistry, Durham, UK.
92. Pringle, E.A., F. Moynier, P.S. Savage, **M.G. Jackson**, **M.A.** Moreira, J.M. Day (2015). Silicon Isotope geochemistry of ocean island basalts: Mantle heterogeneities and contribution of recycled oceanic crust and lithosphere. AGU 2015. EOS (Transactions of AGU), 96, DI31A-2571.
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89. Rizo, H., R.J. Walker, R.W. Carlson, S. Mukhopadhyay, D. Francis, **M.G. Jackson** (2015). Memories of Earth formation in the modern mantle: W isotopic composition of flood basalt lavas. EOS (Transactions of AGU), 96, DI43B-05.
88. Reinhard, A.A.\*, **M.G. Jackson**, J. Harvey (2015). Implications of heterogeneous Sr-Isotopes in olivines from Samoan lavas. EOS (Transactions of AGU), 96, DI31A-2557.

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74. Cartigny, P., J. Labidi, C. Devey, **M.G. Jackson**, E. Thomassot, E. Deloule, E. (2015). On the Archean vs. Proterozoic age of the HIMU mantle component : New  $^{33}\text{S}/^{32}\text{S}$ ,  $^{34}\text{S}/^{32}\text{S}$ ,  $^{36}\text{S}/^{32}\text{S}$ -data from Saint-Helena glasses. AGU Joint Assembly: Montreal, Canada. VGP33A-03.
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72. Garapic, G.\*\*\*, A. Mallik, R. Dasgupta, **M.G. Jackson** (2014). Oceanic lavas sampling the high  $^3\text{He}/^4\text{He}$  mantle reservoir: Primitive, depleted, or re-enriched? *EOS (Transactions of AGU)*, 95.
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