

**Curriculum Vitae
Peter E. van Keken**

Peter E. van Keken
Staff Scientist
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A list of acronyms used is on the last page.

Education

1993	PhD cum laude	University of Utrecht, The Netherlands
1989	MSc	University of Utrecht, The Netherlands

Professional Positions

2020–	Staff Scientist	Earth and Planets Laboratory, Carnegie Institution for Science
2016–2020	Staff Scientist	Department of Terrestrial Magnetism, Carnegie Institution for Science
2016–2020	Adjunct Research Scientist	University of Michigan
2011–2015	Associate Chair for Curriculum	Earth and Environmental Sciences, University of Michigan
2010–2015	Professor	Earth and Environmental Sciences, University of Michigan
2008–2010	Professor	Geological Sciences, University of Michigan
2002–2008	Associate Professor	Geological Sciences, University of Michigan
1996–2002	Assistant Professor	Geological Sciences, University of Michigan
1994–1996	Visiting Assistant Professor	Geological Sciences, University of Michigan
1993–1994	Visiting Fellow	Army High Performance Computing Research Center, University of Minnesota
1993	Postdoctoral Assistant	Earth Sciences, University of Utrecht
1989–1993	Research Assistant	Earth Sciences, University of Utrecht

Professional affiliations

American Association for the Advancement of Science (Fellow)
Geological Society of America (Fellow)
American Geophysical Union
Geochemical Society

Honors and Awards

2010–2012	GeoPRISMS Distinguished Lecturer
2009	Faculty Recognition Award, University of Michigan
2009	Fellow, American Association for the Advancement of Science
2005	Fellow, Geological Society of America

2002 Computer World Honors
 2001 LSA Excellence in Education Award, University of Michigan
 1998 LSA Excellence in Education Award, University of Michigan
 1993 PhD cum laude, University of Utrecht
 1993 Royal Dutch Shell Travel Prize for the most outstanding thesis in the natural sciences at Utrecht University

Invited Lectures

2019 American Geophysical Union (Union session), San Francisco, CA.
 2019 Keynote, “The Evolving Earth”, Institute de Physique du Globe, Paris, France.
 2019 Department of Geosciences, Virginia Tech, Blacksburg, VA.
 2019 European Geosciences Union, Vienna, Austria.
 2018 School of Earth Sciences, University of Bristol, UK.
 2018 Earth, Atmosphere, and Planetary Sciences, MIT, Cambridge, MA.
 2017 JpGU/AGU meeting, Chiba, Japan.
 2017 Lunch-time plenary at JpGU/AGU meeting, Chiba, Japan.
 2017 Keynote, “Plate Tectonics at 50”, William Smith meeting, Geological Society of London, Burlington House, London, UK.
 2016 American Geophysical Union, San Francisco, CA.
 2016 Department of Geology, University of Maryland, College Park, MD.
 2016 CIG national meeting, UC Davis, CA.
 2016 Goldschmidt Conference, Yokohama, Japan.
 2016 European Geosciences Union, Vienna, Austria.
 2015 Goldschmidt Conference, Prague, Czech Republic.
 2015 CSEDI workshop, Scripps Institution of Oceanography, La Jolla, CA.
 2015 NERC Volatiles Consortium meeting, University of Oxford, United Kingdom.
 2015 Centre for Earth Evolution and Dynamics, University of Oslo, Norway.
 2014 Department of Terrestrial Magnetism, Carnegie Institution for Science, Washington DC.
 2014 Field symposium ZIP training network, Sampeyre, Italy.
 2014 Keynote, SEDI symposium, Kanagawa, Japan.
 2014 “Deep Earth Processes” symposium, Geological Society of London, Burlington House, London, UK.
 2013 NSF Earthcube Modeling meeting, Boulder, CO.
 2013 Ocean and Earth Science, National Oceanography Centre Southampton, UK.
 2013 Keynote, 10th International Eclogite Conference, Courmayeur, Italy.
 2012 UK Research Council planning workshop, Oxford, UK.
 2012 School of Earth and Atmospheric Sciences, University of Manchester, UK.
 2012 Department of Earth Sciences, University of Bristol, UK.
 2012 Earth & Environmental Sciences, Rensselaer Polytechnic Institution, Troy, NY.
 2012 Department of Geology, Stanford University, Stanford, CA.
 2012 Department of Geophysics, Stanford University, Stanford, CA.
 2012 Department of Earth and Planetary Sciences, University of California at Davis, CA.
 2012 Graduate School of Science, Tohoku University, Sendai, Japan.
 2012 Department of Geology, Grand Valley State University, Allendale, MI.
 2012 American Geophysical Union, San Francisco, CA (Deep Interior session).
 2012 American Geophysical Union, San Francisco, CA (Tectonophysics session).
 2011 Keynote, COMPRES annual meeting, Williamsburg, VA.
 2011 Goldschmidt Conference, Prague, Czech Republic.
 2011 Department of Geosciences, University of Texas at Dallas, TX.
 2011 Department of Geology, University of South Florida, Tampa, FL.
 2011 Department of Marine Science/Oceanography, Texas A&M University at Galveston, TX.

2011 Department of Earth Science, Rice University, Houston, TX.
 2011 Water on Earth and in Space symposium, University of Michigan, Ann Arbor, MI.
 2011 GeoPRISMS planning meeting, Portland, OR.
 2011 Institut des Sciences de la Terre de Paris, Université Pierre et Marie Curie, Paris, France.
 2011 American Geophysical Union (Union session), San Francisco, CA.
 2011 American Geophysical Union (Deep Interior session), San Francisco, CA.
 2010 Department of Geosciences, Virginia Tech, Blacksburg VA.
 2010 Keynote, Goldschmidt conference, Knoxville, TN.
 2010 Keynote, Subduction Zone Symposium, Tohoku University, Sendai, Japan.
 2010 COMPRES computational workshop, Minneapolis, MN.
 2010 Keynote, State of the Arc, Santorini, Greece.
 2010 Department of Geology, University of Toronto, Ontario, Canada.
 2010 American Geophysical Union Fall Meeting, San Francisco, CA.
 2009 Keynote, Stagnant Slab Symposium, Kyoto, Japan.
 2009 Keynote, Gordon Research Conference “Interior of the Earth” Mount Holyoke College,
 South Hadley, MA.
 2009 Keynote, Goldschmidt Conference, Davos, Switzerland.
 2009 Keynote, “Water on Earth and Beyond”, Durham Institute of Advanced Study, UK.
 2009 Pacific Geoscience Centre, Sydney, BC, Canada.
 2009 Department of Terrestrial Magnetism, Carnegie Institution of Washington, DC.
 2009 Department of Fluid Dynamics (FAST), Université Paris Sud, Orsay, France.
 2009 American Geophysical Union Fall Meeting, San Francisco, CA.
 2008 Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY.
 2008 Geology and Geophysics, Woods Hole Oceanographic Institution, Falmouth, MA.
 2007 Geological Sciences, University of California at Davis, CA.
 2007 Geological Sciences, Brown University, Providence, RI.
 2007 Earth and Planetary Sciences, Washington University, St. Louis, MO.
 2007 Keynote, Gordon Research Conference “Interior of the Earth” at Mount Holyoke College,
 South Hadley, MA.
 2007 MARGINS workshop on Izu-Bonin-Marianas subduction, Honolulu, HI.
 2007 American Geophysical Union, Fall Meeting, San Francisco, CA.
 2006 Keynote, MARGINS meeting on subduction zones, Woods Hole Oceanographic
 Institution, Falmouth, MA.
 2006 Seismolab, California Institute of Technology, Pasadena, CA.
 2006 American Geophysical Union, Fall Meeting, San Francisco, CA.
 2005 Geology and Environmental Geosciences, Northern Illinois University, De Kalb, IL.
 2005 Geology and Environmental Sciences, Western Michigan University, Kalamazoo, MI.
 2005 Keynote, Mantle Convection Workshop, Boulder, CO.
 2005 Workshop on Earth’s composition and structure, Saint-Malo, France.
 2005 School of the Earth, Atmosphere and Environment, University of Manchester, UK.
 2005 Geological Sciences, Arizona State University, Tempe, AZ.
 2005 American Geophysical Union, Fall Meeting, San Francisco, CA.
 2004 Geophysics, ETH, Zürich, Switzerland.
 2004 Keynote, CSEDI meeting, Scripps, La Jolla, CA.
 2004 American Geophysical Union Spring Meeting, Montreal, Canada.
 2004 Department of Geology and Geophysics, Yale University, New Haven, CT.
 2002 Department of Terrestrial Magnetism, Carnegie Institution of Washington, DC.
 2001 Keynote, Gordon Research Conference “Interior of the Earth” at Mount Holyoke College,
 South Hadley, MA.
 2000 Earth Sciences, University of Wisconsin, Madison, WI.
 2000 Keynote, Plume-3 meeting, Kailua-Kona, Hawaii.

- 2000 Keynote, 12th annual IRIS workshop, Rockport, ME.
- 2000 Earth and Atmospheric Sciences, Purdue, West Lafayette, IN.
- 2000 Geology and Geophysics, Rice, Houston, TX.
- 1999 Isotope Geology, ETH, Zürich, Switzerland.
- 1999 Institute of Geophysics and Planetary Physics, Los Alamos National Laboratory, Los Alamos, NM.
- 1997 Atmospheric, Oceanographic, and Space Sciences, University of Michigan, Ann Arbor, MI.
- 1997 Earth Sciences, Bowling Green, OH.
- 1996 Geological Sciences, University of Michigan, Ann Arbor, MI.
- 1995 Keynote, workshop on Krylov methods, Mathematics, North Carolina State, Raleigh, NC.
- 1995 Geology and Geophysics, University of Bologna, Italy.
- 1995 Geological Sciences, Princeton, NJ.
- 1994 Geological Sciences, University of Michigan, Ann Arbor, MI.

Research Grants

- Accumulated funding: \$3.86M (to van Keken and co-PIs at his institution), \$6.59M (total)
- 2020–2022 \$298,067 NSF-EAR “Thermal constraints on the role of hydrated oceanic mantle lithosphere in the genesis of intermediate-depth seismicity”, with Lara Wagner
 - 2019–2022 \$36,637 NSF-EAR/OCE (GeoPRISMS), “Collaborative Research: Constraining the thermal conditions of the subduction interface by integrating petrology and geodynamics”, with three co-PIs (Sarah Penniston-Dorland at Maryland; Ikuko Wada at Minnesota; and Besim Dragovic at South Carolina) (total award: \$396,291).
 - 2017–2021 \$293,800 NSF-EAR (CSEDI): “Geochemical evolution of the Earth’s mantle constrained by observations and dynamical modeling”, with Erik Hauri.
 - 2017–2019 \$100,000 Carnegie Venture grant: “Thermal evolution of Mars constrained by thermal conductivity measurements”, with Alexander Goncharov.
 - 2014–2017 \$39,312, NSF-OCE (MGG): “Collaborative Research: Advanced modeling for understanding fluid and magma migration in subduction zones”, with three co-PIs (Cian Wilson, Marc Spiegelman, and Peter Kelemen at Columbia University) (total award: \$267,392).
 - 2013–2017 \$1,219,960, NSF-EAR/OCE (GeoPRISMS), “GeoPRISMS Office support”.
 - 2013–2017 \$249,923 NSF-EAR, “Consequences of plate tectonics in a compressible mantle”.
 - 2013–2016 \$176,865, NSF-EAR/OCE (GeoPRISMS), “Collaborative Research: The role of fluids in intermediate-depth seismicity and wedge anisotropy: Case studies for Cascadia and Alaska, with comparison to Japan”, with two co-PIs (Geoff Abers at Columbia University and Brad Hacker at UC Santa Barbara) and two international collaborators (Jun Nakajima at Tohoku University and Saeko Kita at the University of Tsukuba) (total award: \$374,988).
 - 2009–2013 \$294,914, NSF-EAR (CSEDI), “Collaborative Research: Joint seismic, geodynamic, and mineral physics investigation of mantle plumes”, with Jeroen Ritsema, one co-PI (Derek Schutt at Colorado State University) and one international collaborator (Saskia Goes at Imperial College) (total award: \$345,671).
 - 2009–2012 \$68,829, NSF-EAR/OCE (MARGINS): “Collaborative Research: Synthesis and integration of magmagenetic controls for subduction factory focus sites”, with three co-PIs (Jim Gill at UC Santa Cruz; Bob Stern at UT Dallas; and Mark Feigensen at Rutgers) (total award: \$400,730).
 - 2009–2011 \$56,164, NSF-EAR/OCE (MARGINS), “Collaborative Research: Advanced models of magma migration at convergent MARGINS”, one co-PI (Marc Spiegelman at Columbia University) (total award: \$332,229).

2007–2009 \$75,000, NSF-EAR (IF), “Acquisition of a linux cluster for geodynamical and seismological modeling”, with Jeroen Ritsema.

2007–2010 \$97,052, NSF-EAR/OCE (MARGINS), “Collaborative Research: 3D modeling of subduction in the Pacific”, two co-PIs (Geoff Abers at Columbia University and Karen Fischer at Brown University) (total award: \$245,060).

2006–2008 \$84,073, NSF-EAR (CSEDI), “CSEDI Collaborative Research: Geochemical structure and dynamics of the mantle below the East African Rift System”, three co-PIs (Tanya Furman at Penn State; David Graham at Oregon State University; and Julia Bryce at the University of New Hampshire) (total award: \$295,745).

2003–2007 \$144,959, NSF-EAR, “Collaborative Research: Geochemistry and whole mantle convection”, one co-PI (Erik Hauri at Carnegie Institution) and one international collaborator (Chris Ballentine at the University of Manchester) (total award: \$214,959).

2002–2006 \$141,714, NSF-EAR, “Collaborative research: H₂O in the mantle wedge”, three co-PIs (Simon Peacock at Arizona State University and Shun Karato & Jeffrey Park at Yale University) (total award: \$255,225).

2002–2006 \$193,280, NSF-ITR, “ITR: Collaborative Research: The Geowall – visualization for the Earth Sciences”, one co-PI (Andrew Johnson at the University of Illinois at Chicago) (total award: \$475,821).

2002–2006 \$26,455, NSF-EAR (CSEDI), “Collaborative research: the thermal, petrological, and seismological structure of subduction zones”, with three co-PIs (Simon Peacock at Arizona State University; Geoff Abers at Boston University; and Brad Hacker at UC Santa Barbara) (total award: \$379,688).

2001–2002 \$20,735, NSF-EAR, “MARGINS: Workshop on modeling of subduction zone dynamics and thermal structure”.

2001–2004 \$79,900, NSF-EAR (IF), OVPR&LSA, “Upgrading of a linux PC cluster for geodynamical modeling”.

2001 \$15,000, LSA, “Geowall: utilizing affordable stereo projection technology in geology undergraduate education”.

1999–2002 \$70,638, NSF-EAR, “Collaborative Research: Mineral physics based geodynamical modeling of anisotropic structure in the lower mantle”, with one co-PI (Shun Karato at Yale University) (total award: \$172,922).

1999 \$10,000, OVPR&LSA, “Building the core of a PC cluster in Geological Sciences”.

1997–1998 \$28,100, LSA, “Computer-aided learning in the Earth Sciences”, with Ben van der Pluijm.

1996–1999 \$90,025, NSF-EAR (CSEDI), “Dynamical models of lower mantle volatile evolution”, with Chris Ballentine.

1996–1999 \$37,935, NSF-EAR, “Dynamical consequences of a high viscosity lower mantle”.

Graduate student mentoring

PhD	2014–2015	Sam Haugland (PhD 2019 with Jeroen Ritsema)
PhD	2012–2015	Ross Maguire (PhD 2018 with Jeroen Ritsema)
MSc	2012–2015	Kate Volk
MSc	2010–2013	Zhangyi Hu
MSc	2010–2012	Andrea Bossmann (with Jeroen Ritsema)
MSc	2008–2010	Hannah Smith (with Jeroen Ritsema)
MSc/PhD	2002–2008	JP Brandenburg
MSc/PhD	2002–2007	Erik Kneller
PhD	1998–2002	Allen McNamara
MSc	1995–1997	Debra Tjoa

Postdoc mentoring

2021–2023	Ningli Zhao (Postdoctoral Fellow)
2020–2022	Nate Sime (NSF supported Fellow, with Cian Wilson and Lara Wagner)
2018–2020	Nate Sime (Postdoctoral Fellow, with Cian Wilson)
2018–2020	Tim Jones (Postdoctoral Fellow)
2018–2020	Jonathan Tucker (NSF supported Fellow, with Erik Hauri)
2018–2019	Zack Geballe (Carnegie Venture postdoc, with Alexander Goncharov)
2012–2013	Manabu Morishige (visiting from JAMSTEC, Japan)
2008–2010	Amy Bengston (Turner postdoc, with Udo Becker and Rod Ewing)
2003–2005	Shu-Chuan Lin

Journal Publications (student names are in italics)

Submitted manuscripts or manuscripts in revision

- S1. Arzilli, F., M. Burton, G. La Spina, C. Macpherson, P. E. van Keken, and J. McCann, Lithology-dependent dissolution of subducting carbonate-bearing sediments: insights into recycling of CO₂ through volcanic arcs. *Earth and Planetary Science Letters*, under review.
- S2. Tucker, J. M., P. E. van Keken, and C. J. Ballentine, Earth's missing Ar resides in recycled oceanic crust. *Nature Geoscience*, under review.
- S3. Sime, N., Wilson, C. R., and van Keken, P. E., A pointwise conservative method for thermochemical convection under the compressible anelastic liquid approximation. Submitted to *Geochemistry, Geophysics, Geosystems*.

Published or accepted articles and book chapters

1. Shirey, S. B., L. S. Wagner, M. J. Walter, D. G. Pearson, and P. E. van Keken (2021). Slab transport of fluids to deep focus earthquake depths – Thermal modeling constraints and evidence from diamonds. *AGU Advances*, 2, article number e2020AV000304. <https://doi.org/10.1029/2020AV000304>
2. Sime, N., J. M. Maljaars, C. R. Wilson, and P. E., van Keken (2021). An exactly mass conserving and pointwise divergence free velocity method: Application to compositional buoyancy driven flow problems in geodynamics. *Geochemistry, Geophysics, Geosystems*, 22, article number e2020GC009349. <https://doi.org/10.1029/2020GC009349>.
3. Jones, T. D., N. Sime, and P. E. van Keken (2021). Burying Earth's primitive mantle in the slab graveyard. *Geochemistry, Geophysics, Geosystems*, 22, article number e2020GC009396. <https://doi.org/10.1029/2020GC009396>.
4. Abers, G. A., P. E. van Keken, and C. R. Wilson (2020). Deep decoupling in subduction zones: Observations and temperature limits. *Geosphere*, 16, 1408–1424. <https://doi.org/10.1130/GES02278.1>.
5. Tucker, J. M., P. E. van Keken, R. E. Jones, and C. J. Ballentine (2020), A role for subducted oceanic crust in generating the depleted mid-ocean ridge basalt mantle. *Geochemistry, Geophysics, Geosystems*, 21, article number e2020GC009148. <https://doi.org/10.1029/2020GC009148>.
6. Jones, T. D., R. R. Maguire, P. E. van Keken, J. Ritsema, and P. Koelemeijer (2020), Subducted oceanic crust as the origin of seismically slow lower-mantle structures. *Progress in the Earth and Planetary Sciences*, 7, article number 17. <https://doi.org/10.1186/s40645-020-00327-1>
7. Geballe, Z. M., N. Sime, J. Badro, P. E. van Keken, and A. F. Goncharov (2020). Thermal conductivity near the bottom of the Earth's lower mantle: Measurements of pyrolite up to 120 GPa and 2500 K. *Earth and Planetary Science Letters*, 536, article number 116161. <https://doi.org/10.1016/j.epsl.2020.116161>
8. *Ruscic, M., G. M. Bocchini, D. Becker, T. Meier, and P. E. van Keken (2019). Variable spatio-temporal clustering of microseismicity in the Hellenic Subduction Zone as possible indicator for*

- fluid migration. *Lithos*, 346–347, article number 105154. <https://doi.org/10.1016/j.lithos.2019.10154>
9. Fisher, D. M., A. J. Smye, C. Marone, P. E. van Keken, and A. Yamaguchi (2019). Kinetic models for healing of the subduction interface based on observations of ancient accretionary complexes. *Geochemistry, Geophysics, Geosystems*, 20, 3431–3449. <https://doi.org/10.1029/2019GC008256>
 10. van Keken, P. E., I. Wada, N. Sime, and G. A. Abers (2019). Thermal structure of the forearc in subduction zones: A comparison of methodologies. *Geochemistry, Geophysics, Geosystems*, 20, 3268–3288. <https://doi.org/10.1029/2019GC008334>
 11. Jones, R. E., P. E. van Keken, E. H. Hauri, J. M. Tucker, J. Vervoort, and C. J. Ballentine (2019). Origins of the terrestrial Hf-Nd mantle array: Evidence from a combined geodynamical-geochemical approach. *Earth and Planetary Science Letters*, 518, 26–39. <https://doi.org/10.1016/j.epsl.2019.04.015>
 12. van Keken, P. E., I. Wada, G. A. Abers, B. R. Hacker, and K. Wang (2018). Mafic high-pressure rocks are preferentially exhumed from warm subduction settings. *Geochemistry, Geophysics, Geosystems*, 19, 2934–2961. <https://doi.org/10.1029/2018GC007624>
 13. Bocchini, G. M., A. Brüstle, D. Becker, T. Meier, P. E. van Keken, M. Ruscic, G. A. Papadopoulos, M. Rische, and W. Friederich (2018). Tearing, segmentation, and backstepping of subduction in the Aegean: New insights from seismicity. *Tectonophysics*, 734–735, 96–118. <https://doi.org/10.1016/j.tecto.2018.04.002>
 14. Morishige, M., and P. E. van Keken (2018). Fluid migration in a subducting viscoelastic slab. *Geochemistry, Geophysics, Geosystems*, 19, 337–355. <https://doi.org/10.1002/2017GC007236>
 15. Maguire, R., J. Ritsema, M. Bonnin, P. E. van Keken, and S. Goes (2018). Evaluating the resolution of deep mantle plumes in teleseismic traveltome tomography. *Journal of Geophysical Research*, 123, 384–400. <https://doi.org/10.1002/2017JB014730>
 16. Haugland, S. M., J. Ritsema, P. E. van Keken, and T. Nissen-Meyer (2018). Analysis of PKP scattering using mantle mixing simulations and axisymmetric 3D waveforms. *Physics of the Earth and Planetary Interiors*, 276, 226–233. <https://doi.org/10.1016/j.pepi.2017.04.001>
 17. Abers, G. A., P. E. van Keken, and B. R. Hacker (2017). The cold and relatively dry nature of mantle forearcs in subduction zones. *Nature Geoscience*, 10, 333–337. <https://doi.org/10.1038/NGEO2922>
 18. Wilson, C., M. Spiegelman, and P. E. van Keken (2017). TerraFERMA: The Transparent Finite Element Rapid Model Assembler for multi-physics problems in Earth Sciences. *Geochemistry, Geophysics, Geosystems*, 18, 769–810. <https://doi.org/10.1002/2016GC006702>
 19. Kimura, J.-I., J. B. Gill, P. E. van Keken, H. Kawabata, and S. Skora (2017). Origin of geochemical mantle components: Role of spreading ridges and thermal evolution of mantle. *Geochemistry, Geophysics, Geosystems*, 18, 697–734. <https://doi.org/10.1002/2016GC006696>
 20. Morishige, M., and P. E. van Keken (2017). Along-arc variation in short-term slow slip events caused by 3-D fluid migration in subduction zones. *Journal of Geophysical Research*, 122, 1434–1448. <https://doi.org/10.1002/2016JB013091>
 21. Wei, S. S., D. A. Wiens, P. E. van Keken, and C. Cai (2017). Slab temperature controls on the Tonga double seismic zone and slab mantle dehydration. *Science Advances*, 3, article number e1601755. <https://doi.org/10.1126/sciadv.1601755>
 22. Horning, G., J. P. Canales, S. M. Carbotte, S. Han, H. Carton, M. R. Nedimović, and P. E. van Keken (2016). A 2-D tomographic model of the Juan de Fuca plate from accretion at Axial seamount to subduction at the Cascadia margin from an active source ocean bottom seismometer survey. *Journal of Geophysical Research*, 121, 5859–5879. <https://doi.org/10.1002/2016JB013228>
 23. Kimura, J.-I., J. B. Gill, S. Skora, P. E. van Keken, and H. Kawabata (2016). Origin of geochemical mantle components: Role of subduction filter. *Geochemistry, Geophysics, Geosystems*, 17, 3289–3325. <https://doi.org/10.1002/2016GC006343>

24. Maguire, R., J. Ritsema, P. E. van Keken, A. Fichtner, and S. Goes (2016). P- and S-wave delays caused by thermal plumes. *Geophysical Journal International*, 206, 1169–1178. <https://doi.org/10.1093/gji/ggw187>
25. Ballmer, M. D., P. E. van Keken, and G. Ito (2015). Hotspots, large igneous provinces, and melting anomalies. In: Volume 7, Mantle Dynamics (D. Bercovici, editor), pp. 393–459, Treatise on Geophysics (2nd edition; G. Schubert, editor), Elsevier, Amsterdam. <https://doi.org/10.1016/B978-0-444-53802-4.00133-0>
26. Morishige, M., and P. E. van Keken (2014). Along-arc variation in the 3-D thermal structure around the junction between the Japan and Kurile arcs. *Geochemistry, Geophysics, Geosystems*, 15, 2225–2240. <https://doi.org/10.1002/2014GC005394>
27. Kimura, J.-I., J. B. Gill, T. Kunikiyo, I. Osaka, Y. Shimoshioiri, M. Katakuse, S. Kakubuchi, T. Nagao, K. Furuyama, A. Kamei, H. Kawabata, J. Nakajima, P. E. van Keken, and R. J. Stern (2014). Diverse magmatic effects of subducting a hot slab in SW Japan: Results from forward modeling. *Geochemistry, Geophysics, Geosystems*, 15, 691–739. <https://doi.org/10.1002/2013GC005132>
28. Wilson, C. R., M. Spiegelman, P. E. van Keken, and B. R. Hacker (2014). Fluid flow in subduction zones: The role of solid rheology and compaction pressure. *Earth and Planetary Science Letters*, 401, 261–274. <https://doi.org/10.1016/j.epsl.2014.05.052>
29. Bossmann, A. B., and P. E. van Keken (2013). Dynamics of plumes in a compressible mantle: Implications for phase boundary topography. *Physics of the Earth and Planetary Interiors*, 224, 21–31. <https://doi.org/10.1016/j.pepi.2013.09.002>
30. Abers, G. A., J. Nakajima, P. E. van Keken, S. Kita, and B. R. Hacker (2013). Thermal-petrological controls on the location of earthquakes within subducting plates. *Earth and Planetary Science Letters*, 369–370, 178–187. <https://doi.org/10.1016/j.epsl.2013.03.022>
31. van Keken, P. E., A. Davaille and J. Vatteville (2013). Dynamics of a laminar plume in a cavity: The influence of boundaries on the steady state stem structure. *Geochemistry, Geophysics, Geosystems*, 14, 158–178. <https://doi.org/10.1029/2012GC004383>
32. van Keken, P. E., C. J. Ballentine, and E. H. Hauri (2013). Convective mixing in the Earth's mantle. In: Volume 3, Geochemistry of the Mantle and Core (R. W. Carlson, editor), pp. 509–525, Treatise on Geochemistry (K. K. Turekian and H. D. Holland, editors), 2nd edition, Elsevier, Amsterdam. <https://doi.org/10.1016/B978-0-08-095975-7.00212-6>
33. van Keken, P. E. (2013). Mantle mixing: processes and modeling. In: Physics and Chemistry of the Deep Earth (S.-I. Karato, editor), pp. 351–371, John Wiley & Sons, New Jersey. <https://doi.org/10.1002/9781118529492>
34. van Keken, P. E., S. Kita, and J. Nakajima (2012). Thermal structure and intermediate-depth seismicity in the Tohoku-Hokkaido subduction zones. *Solid Earth*, 3, 355–364. <https://doi.org/10.5194/se-3-355-2012>
35. Bengtson, A. K., and P. E. van Keken (2012). Three-dimensional thermal structure of subduction zones: effects of obliquity and curvature. *Solid Earth*, 3, 365–373. <https://doi.org/10.5194/se-3-365-2012>
36. Barcheck, C. G., D. A. Wiens, P. E. van Keken, and B. R. Hacker (2012). The relationship of intermediate- and deep-focus seismicity to the hydration and dehydration of subducting slabs. *Earth and Planetary Science Letters*, 349–350, 153–160. <https://doi.org/10.1016/j.epsl.2012.06.055>
37. Nelson, W. R., T. Furman, P. E. van Keken, S. B. Shirey, and B. B. Hanan (2012). Os–Hf isotopic insight into mantle plume dynamics beneath the East African Rift System. *Chemical Geology*, 320–321, 66–79. <https://doi.org/10.1016/j.chemgeo.2012.05.020>
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- Kimura, J.-I., J. B. Gill, P. E. van Keken, S. Skora, and H. Kawabata (2018). Origin of geochemical mantle components: role of spreading ridge, subduction zone, and thermal evolution of the mantle, Goldschmidt Conference, Boston, MA.
- Morishige, M., and P. E. van Keken, (2017). A wide range of behavior of slab-derived fluid, Seismological Society of Japan, Kagoshima, Japan.
- Jones, R., P. E. van Keken, E. Hauri, J. Vervoort, and C. J. Ballentine (2017). A combined geodynamical-geochemical approach to investigating the Lu-Hf isotopic evolution of the terrestrial mantle and crust, AGU, New Orleans, LA.
- Morishige, M., and P. E. van Keken (2017). Temporal and spatial variation in porosity and compaction pressure for the viscoelastic slab, AGU, New Orleans, LA.
- Abers, G. A., P.E. van Keken, B. R. Hacker, A. Mann, and B. Crosbie (2017). Imaging hydration and dehydration across the Cascadia subduction zone, AGU, New Orleans, LA.

- Fisher, D. M., A. J. Smye, C. Marone, P. E. van Keken, A. Yamaguchi, D. Oakley, and G. Ramirez (2017). Spectrum of megathrust slip behavior recorded within ancient accretionary complexes: the role of silica redistribution, GSA, Seattle, WA.
- Morishige, M., and P. E. van Keken, (2017). Fluid migration in poro-viscoelastic slab, JpGU/AGU, Chiba, Japan.
- Morishige, M., and P. E. van Keken (2017). 3D fluid migration due to complex slab geometries and its implication for short-term slow slip events, JpGU/AGU, Chiba, Japan.
- van Keken, P. E. (2017). Impact of H₂O on intermediate-depth seismicity, slow slip, and mantle wedge hydrology, JpGU/AGU, Chiba, Japan.
- van Keken, P. E., G. A. Abers, B. R. Hacker, J. Nakajima, S. Kita, M. Spiegelman, and C. Wilson (2016). Water recycling in subduction zones and the role of rehydration in the generation of intermediate-depth seismicity and the nature of the cold fore-arc mantle, AGU, San Francisco, CA.
- Haugland, S. M., J. Ritsema, P. E. van Keken, and T. Nissen-Meyer (2016). Geodynamic modeling of PKP precursors, AGU, San Francisco, CA.
- Maguire, R. R., J. Ritsema, P. E. van Keken, M. Bonnin, S. D. B. Goes, and A. Fichtner (2016). Resolving plume tails in the lower mantle with finite frequency tomography: insight from synthetic experiments.
- Morishige, M., and P. E. van Keken, Spatial variation in slow slip events caused by 3D fluid migration in subduction zones, Seismological Society of Japan, Nagoya, Japan.
- van Keken, P. E., J. Ritsema, S. Haugland, S. Goes, and S. Kaneshima (2016). Ocean crust recycling and the formation of lower mantle heterogeneity, EGU, Vienna, Austria.
- van Keken, P. E., G. A. Abers, B. R. Hacker, J. Nakajima, S. Kita, M. Spiegelman, and C. Wilson (2016). Water recycling in subduction zones and the role of rehydration in the generation of intermediate-depth seismicity and the nature of the cold fore-arc mantle, Goldschmidt Conference, Yokohama, Japan.
- Jones, R., P. E. van Keken, E. Hauri, J. Vervoort, and C. J. Ballentine (2016). Geodynamic investigation of the processes that control Lu-Hf isotopic differences between different mantle domains and the crust, EGU, Vienna, Austria.

Courses taught at the University of Michigan

Year	Term	Course	Type	Name	Cr.h.	Enr	Q1/Q2*	Div mean**
2014	F	255	Lect.	Earth&Space	1	28	3.9/3.8	3.6/4.3
	F	500	Lect/lab	Linux computing	2	13	4.5/4.8	4.5/4.7
	W	119	Lect.	Physical Geology	4	100	4.3/4.8	3.9/4.1
		118	Lab.	Geology Lab	1	71	(GSI evals only)	
2013	F	255	Lect.	Earth&Space	1	27	3.1/4.5	3.8/4.2
	Su	113	Lect.	Planets and Moons	1	114	3.9/4.1	4.0/4.3(UM)
	W	500	Lect/lab	Linux computing	2	13	4.4/4.7	4.5/4.6
		119	Lect.	Physical Geology	4	102	4.4/4.7	3.9/4.2
		118	Lab.	Geology Lab	1	90	(GSI evals only)	
2012	F	113	Lect.	Planets and Moons	1	151	4.5/4.9	3.8/4.2
		525	Lect.	Tectonophysics	1	9	4.6/4.9	4.5/4.7
	Sp	113	Lect.	Planets and Moons	1	47	4.2/4.7	3.8/4.3
	W	500	Lect/lab	Computational Methods	2	13	4.5/4.2	4.3/4.6
		113	Lect.	Planets and Moons	1	146	4.3/4.7	3.8/4.1
		130	Lect.	Physical World	4	33	4.2/4.6	3.9/4.3
2011	F	113	Lect.	Planets and Moons	1	142	4.2/4.6	3.9/4.1
	Sp	113	Lect.	Planets and Moons	1	42	4.0/4.7	4.3/4.7
	W	500	Lect/lab	Computational methods	2	11	4.1/4.4	4.3/4.5
		119	Lect.	Physical Geology	2	148	4.0/4.1	3.9/4.2
		130	Lect.	Physical World	4	30	4.1/4.8	3.8/4.3
2010	Sp	113	Lect.	Planets and Moons	1	42	4.4/4.4	3.8/4.6
	W	500	Lect/lab	Computational methods	2	11	4.4/4.6	4.3/4.6
		420	Lect.	Geophysics	3	16	4.8/4.9	4.1/4.3
2009	Su	440	Field	Field Methods	1	21	4.8/4.0	
	W	130	Lect.	Physical World	4	36	4.5/4.5	3.8/4.3
		113	Lect.	Planets and Moons	1	319	4.0/4.3	3.8/4.1

2008	W	500	Lect/lab	Computational methods	2	14	4.5/4.8	4.3/4.5
		130	Lect.	Physical World	4	36	4.2/4.4	3.9/4.2
		113	Lect.	Planets and Moons	1	421	4.0/4.2	4.0/4.3
		Su	500	Lect/lab	Computational methods	2	7	4.6/4.8
	F	440	Field	Field Methods	1	11	4.9/4.9	3.9/4.1
	F	525	Lect	Tectonophysics	1	5	4.3/4.9	4.3/4.6
2007	Su	440	Field	Field Methods	1	17	4.3/4.1	
2006	W	130	Lect.	Physical World	4	55	3.7/4.2	
	Su	440	Field	Field methods	1	13	/4.1	
	F	500/503	Lect/lab	Computational methods	4	10	4.3/4.3	
		420	Lect	Geophysics	3	13	4.5/4.5	
		525	Lect	Tectonophysics	1	5	4.7/4.7	
2005	W	130	Lect.	Physical World	4	30	3.9/4.3	
	F	113	Lect.	Planets and Moons	1	150	3.9/4.1	
		420	Lect.	Geophysics	3	8	3.9/4.3	
2004	W	130	Lect.	Physical World	4	35	4.3/4.5	
	Su	440	Field	Field Geology	1	8	/4.5	
	F	525	Lect.	Tectonophysics	1	12	4.3/4.5	
		420	Lect.	Geophysics	3	15	4.8/4.9	
2003	F	420	Lect.	Geophysics	3	19	4.7/4.8	
		113	Lect.	Planets and Moons	1	140	4.0/4.2	
2002	F	525	Lect.	Tectonophysics	1	9	4.5/4.6	
		420	Lect.	Geophysics	3	14	4.3/4.8	
	Su	440	Field	Field Geology	1	10	/3.9	
	W	113	Lect.	Planets and Moons	1	250	4.0/4.3	
		153	Sem.	Earthlike Planets	3	18	3.6/3.6	
2001	F	420	Lect.	Geophysics	3	13	4.8/4.9	
	Su	440	Field	Field Geology	1	10	4.9/4.9	
		441	Field	Environmental Geology	1	20		
2000	W	H252	Sem.	Earthlike Planets	3	6	3.8/4.5	
		113	Lect.	Planets and Moons	1	300	4.1/4.3	
	Sp	113	Lect.	Planets and Moons	1	54	3.9/4.2	
	F	130	Lect.	Physical World	4	26	4.1/4.4	
		525	Lect.	Tectonophysics	1	10	4.5/4.5	
1999	Sp	113	Lect.	Planets and Moons	1	46	4.0/4.2	
	Su	440	Field	Field Geology	1	15	4.7/4.7	
	F	130	Lect.	Physical World	4	23	4.0/4.3	
1998	W	278	Sem.	Earthlike Planets	3	25	3.9/4.4	
		486	Lect.	Geodynamics	3	1	5.0/5.0	
	Sp	113	Lect.	Planets and Moons	1	66	4.1/4.3	
	Su	440	Field	Field Geology	1	12	4.4/4.3	
	F	130	Lect.	Physical World	4	17	4.1/4.3	
		204	Lect.	Planetary Geology	1.5	40	4.1/4.2	
		525	Lect.	Tectonophysics	1	9	4.2/4.6	
1997	W	113	Lect.	Planets and Moons	1	184	4.1/4.1	
		278	Sem.	Earthlike Planets	3	25	4.1/4.6	
	Sp	113	Lect.	Planets and Moons	1	59	4.1/4.3	
	Su	440	Field	Field Geology	1	14	4.4/3.9	
	F	130	Lect.	Physical World	4	12	4.0/4.3	
1996	W	486	Lect.	Geodynamics	3	1	4.0/5.0	
	Sp	113	Lect.	Planets and Moons	1	57	4.0/4.0	
	F	113	Lect.	Planets and Moons	1	248	4.1/4.5	
		278	Sem.	Earthlike Planets	3	25	3.9/4.1	
1995	W	278	Sem.	Earthlike Planets	3	16	4.0/3.9	
	F	278	Sem.	Earthlike Planets	3	24	3.9/4.1	
		113	Lect.	Planets and Moons	1	210	3.9/4.2	
1994	F	486	Lect.	Geodynamics	3	3	5.0/4.0	

*Q1/Q2: median scores on two questions answered by students on a scale of 1 ('strongly disagree') through 5 ('strongly agree') on the end-of-term evaluation form. Q1 is "Overall, this was an excellent course". Q2 is "Overall, this was an excellent instructor".

** Div. Mean: the divisional mean score on all courses similar to the one reported on (determined by course level and enrollment).

The division in most cases is the College of Literature, Sciences, and the Arts. In some cases only University-wide mean scores were available.

Additional teaching information:

I held several seminars on scientific and parallel computing (2003, 2004, 2005), co-taught a seminar on the geology of Scotland (2005), and co-organized a departmental fieldtrip to Scotland (May 2005).

Professional Society Service

2013–2020 Editorial board, Japan Geoscience Union journal Progress in Earth and Planetary Science
2016–2017 Co-organizer of 2017 CIDER at Berkeley, CA
2013–2017 Advisory committee of the “Zooming In between Plates” Marie Curie training network
2013–2016 Chair, GeoPRISMS steering and oversight committee
2013–2016 Director, GeoPRISMS office
2012–2016 Member, GeoPRISMS steering and oversight committee
2013–2016 Advisory committee of the Institute of Earth Sciences, Academia Sinica, Taiwan
1999–2016 Convener for special sessions at EUG/EGU (Nice & Vienna), Fall AGU (San Francisco), Goldschmidt conferences (Davos, Prague, and Prague again), Spring AGU (Baltimore)
2012–2014 Editorial board, Japan Geosciences Union journal Geosphere and Space
2014 Subduction theme co-organizer for Goldschmidt conference, Sacramento, CA
2011–2013 CIDER-II advisory committee
2010–2013 CIG science steering committee
2012 Co-convener CIG lithosphere and mantle dynamics meeting at UC Davis, CA
2010–2012 COMPRES advisory council
2010–2012 AGU book board
2011 Ad-hoc WHOI promotion panel
2010 CIDER summer school, Santa Barbara, CA
2009 Selection panel for Marine Geoscience Leadership Symposium
2009 Co-convener MARGINS Theoretical and Experimental Institute on Volatiles, Timberline Lodge, Mount Hood, OR
2009 Proposal writing committee, CIG
1999–2009 Judge for AGU student presentations
2005–2009 Editor, Geochemistry, Geophysics, Geosystems
2008 CIDER summer school, Santa Barbara, CA
2004–2008 Member, MARGINS steering committee
2006 CIDER summer school, Santa Barbara, CA
2002–2004 Guest editor for two special volumes of Physics of the Earth and Planetary Interiors
2004 Editor (acting for Karen Fischer) Geochemistry, Geophysics, and Geosystems
2003–2005 Associate editor for Geochemistry, Geophysics, and Geosystems
2005 Medal nomination committee of the European Geophysical Union
2000–2002 Associate editor for Geochemistry, Geophysics, and Geosystems for special volume
2002 Lead organizer of MARGINS subduction meeting, University of Michigan

Community Outreach

2018 DTM Carnegie neighborhood lecture “When Earth Attacks”, Washington, DC
2012 Public lecture on natural hazards, Grand Valley State University, Grand Rapids, MI
2001 Press contact (UPN 50, Channel 7, Ann Arbor News) after Seattle EQ
2001–2009 Co-organizer of alumni getaways at Camp Davis, WY (2001, 2002, 2004, 2006, 2009)
1999 “Teachers as Scholars” program (4 days, with Kacey Lohmann)

Proposal Review Panels

Member of nine NSF EAR panels (2001-present)

Service at Carnegie Institution

2015–2018 Member scientific computing committee
2016–2018 Chair scientific computing committee
2016 Member search committee for DTM staff scientist
2016–2017 Member search committee for GL Director
2016 Chair search committee for HPC linux administrator
2016–2017 DTM colloquium organizer

Service at the University of Michigan (at College and University level)

2014 Member ad-hoc promotion committee for AOSS
2012 UM visualization planning committee
2011–2012 Office of research cyberinfrastructure programs advisory group
2011–2012 Ad-hoc third-year renewal committee for AOSS
2008–2009 Search committee for director of 3D Lab (Duderstadt Center)
2007–2008 LSA advanced computational infrastructure committee
2001 LSA ad-hoc committee on large scale computing
2000–2002 LSA information technology committee

Departmental Service at the University Michigan

2011–2015 Associate chair for curriculum
2011–2015 Undergraduate advisor
2011–2015 Chair curriculum committee
2014 Member ad-hoc promotion committee
2012–2015 Member computer committee
1996–2015 PhD committees. Chair: Allen McNamara, Erik Kneller, JP Brandenburg; Member: Yoshioka Tanioka, Boris Kiefer, Yong Keun Hwang, Yang Zhang, Sarah Rilling, Zeyu Li, Trevor Hines, Ross Maguire, Sam Haugland; Cognate Member: Mike Wong (AOSS), Erik Wilson (AOSS), Kate Copic (Physics), Kentaro Hanaki (Physics); External Member: Ikuko Wada (PGC, Vancouver), Judith Vatteville (IPG Paris), Changyeol Lee (Virginia Tech), Samuel Angiboust (UPMC Paris)
2011–2013 Member executive committee
2013 Member ad-hoc promotion committee
2012 Chair ad-hoc promotion committee
2012 Member ad-hoc promotion committee
2010–2011 Co-chair long term planning committee
2003–2011 Chair computer committee; member computer committee
2010 Member ad-hoc promotion committee
2007–2009 Member executive committee
2007–2008 Member geophysics search committee
2008 Member ad-hoc tenure committee
2007 Member curriculum revision committee
2006–2007 Member Turner postdoc committee
2004–2005 Member curriculum committee
2002–2003 Faculty computer staff liaison (in lieu of committee)
2000–2002 Chair computer committee
1996–1997 Organizer of Turner speaker series
1997–1999 Member executive committee
1996–2005 Unix system administration & supervision

Acronyms used

AGU	American Geophysical Union (agu.org)
GSA	Geological Society of America (www.geosociety.org)
EGU	European Geosciences Union (www.egu.eu)
JpGU	Japan Geoscience Union (jpgu.org)
LSA	College of Literature, Science, and the Arts, University of Michigan (lsa.umich.edu)
AOSS	Department of Atmospheric, Oceanic, and Space Sciences, University of Michigan (now Climate and Space Sciences and Engineering, clasp.engin.umich.edu)
OVPR	Office of the Vice-President for Research, University of Michigan (research.umich.edu)
UM	University of Michigan (umich.edu)
NSF	National Science Foundation (nsf.gov)
EAR	Earth Sciences (NSF division)
OCE	Ocean Sciences (NSF division)
IF	Instrumentation and Facilities (NSF program)
CSEDI	Collaborative Studies of the Earth's Dynamic Interior (NSF program)
CIDER	Collaborative Institute for Dynamic Earth Research (www.deep-earth.org)
CIG	Computational Infrastructure for Geodynamics (www.geodynamics.org)
COMPRES	Consortium for Materials Properties Research in Earth Sciences (compres.unm.edu)
MARGINS	Decadal NSF program to study plate margins 2000-2010 (nsf-margins.org)
GeoPRISMS	Decadal NSF program to study plate margins 2010-2020 (geoprisms.org)