Curriculum Vitæ – Richard Foa Katz

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Academic positions

2015– **Professor of Geodynamics**, Department of Earth Sciences, Univ. Oxford, UK.

2011–15 **Associate Professor**, Department of Earth Sciences, University of Oxford, UK.

2012 **Visiting Researcher**, Earthquake Research Institute, Univ. Tokyo, Japan.

2007–12 **Research Councils UK Academic Fellow**, Department of Earth Science, University of Oxford, UK.

2006–08 **Senior Research Fellow**, Institute of Theoretical Geophysics, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, UK.

2006 **Postdoctoral Researcher**, Lamont-Doherty Earth Obs., Columbia Univ., NY.

Education

2006 **PhD with distinction**, Columbia University, NYC, NY, USA. Dissertation: *The Deep Roots of Volcanoes: Models of Magma Dynamics with Applications to Subduction Zones*, supervisor: Marc Spiegelman.

2000 **BA Cum Laude**, Cornell University, Ithaca, NY, USA.

Awards

2015 Editors' Citation for Excellence in Refereeing from *G-Cubed*.

2013 Outstanding Reviewer award from *Geophysical Journal International*.

2012 **The Philip Leverhulme Prize**.

2012 The European Geosciences Union's **Division Outstanding Young Scientist Award for the Division on Geodynamics**.

2008 My paper on wax tectonics is a **10th Anniversary Highlight** of *New J. Phys.*

Grants and fellowships

20/09/23 **Africa–Oxford Catalyst Grant**. [*expired*] £5k over 6 weeks to support an Oxford visit by PI Dr. Ikenna Obasi (Fed. Univ. Lokoja) to develop models of groundwater hydrology for the Abakaliki region of Nigeria.

01/09/22 **Leverhulme Research Grant**. [awarded] £214k over three years to hire one PDRA to study tidally forced porous flow in planets and moons. With Co-Is Ian Hewitt (Oxford) & Bert Vermeersen (Delft). Leverhulme ref. RPG-2021-199.

01/03/19 **European Research Council Consolidator Grant**. [*awarded*] €2M over five years to hire two PDRAs and one student to study magma-assisted tectonics of mid-ocean ridges and continental rifts. RIFT-O-MAT, ERC ref. 772255.

01/04/18 **Deep Carbon Observatory of the Sloan Foundation grant.** [*expired*] $750k over 18 months to continue development of two-phase simulations of carbon transport and a modelling forum for carbon circulation. With PI Prof. L. Kellogg (UC Davis).

01/05/17 **NERC/NSF Collaborative Grant**. [*expired*] £240k over three years to develop two-phase models of temperate ice at ice-stream margins. Co-PIs Hewitt (Oxford), Iverson (Iowa State) and Zoet (Wisconsin). Ref. NE/R000026/1.

01/11/15 **Deep Carbon Observatory of the Sloan Foundation grant.** [*expired*] $700k over 2 years to develop two-phase simulations of carbon transport and a modelling forum for carbon circulation. With PI Prof. L. Kellogg and Co-I Prof. S. Mukhopadhyay (UC Davis).

01/03/15 **Royal Society International Exchanges Grant**. [*expired*] £12k over 2 years to develop 3D simulations of sea-ice formation and brine circulation with adaptive mesh refinement. With Prof. Andrew Wells, AOPP/Oxford.

01/09/14 **NERC Consortium Grant**. [*expired*] £2.25M over five years. ∼20 Co-Is; To investigate terrestrial volatile cycles through the solid Earth. NERC ref. NE/M000427/1.

01/12/10 **NERC Standard Grant**. [*expired*] £338k over three years. Four PIs; collaborative between Cambridge and Oxford. To develop finite element models of magma dynamics. NERC ref. NE/I026995/1.

14/10/10 **European Research Council Starter Grant**. [*expired*] €1.4M over five years to hire two PDRAs and one student to study coupling of climate with magmatism at mid-ocean ridges. ISMAGiC, ERC ref. 279925.

04/09/10 **Royal Society Travel Grant**. [*expired*] £4000 to support a 1-month Oxford visit by Prof. Y. Takei of ERI, Tokyo in 2011.

01/08/09 **Natural Environmental Research Council New Investigator Grant**. [*expired*] "Coupled models of magma/mantle dynamics: melt transport at mid-ocean ridges and subduction zones." £55k over two years for personal salary support, overhead, travel, consumables. NERC ref. NE/H00081X/1.

01/09/06 **US National Science Foundation International Research Fellowship Program**. [*expired*] $163,057 over two years covering salary, travel, research expenses. NSF award #0602101.

Manuscripts in review/revision/press

- Li, Y., T. Davis, A.E. Pusok & **R.F. Katz**. Models of buoyancy-driven dykes using continuum plasticity and fracture mechanics: a comparison. 10.5194/egusphere-2024-3504
- Pusok, A.E., Y. Li, T. Davis, D. May & **R.F. Katz**. Inefficient melt transport across a weakened lithosphere led to reduced magmatism in the Turkana Depression.
- Turner, S.J., I.P. Savov, T.A. Mather, **R.F. Katz**, D.W. Rees Jones, D.M. Pyle, J.C.M. de Hoog, S.F.L. Watt. Volcanic arc structure controlled by liquid focusing from the slab—evidence from boron isotopes and trace elements. 10.31223/X5MM7V
- Zhang, H., **R.F. Katz** and L.A. Stevens. Viscoelastic mechanics of tidally induced lake drainage in the Amery grounding zone. arXiv: 2311.01249

Publications

2024 **Katz, R.F.**, J.F. Rudge and L.N. Hansen. Dilatancy and non-local fluidity of partially molten rock. *J. Fluid Mech.* 10.1017/jfm.2023.1003.

- Hay, H.C.F.C., I. Hewitt and **R.F. Katz**. Tidal forcing in icy-satellite oceans drives mean circulation and ice-shell torques. *J. Geophys. Res. Planets*, 10.1029/2024JE008408.
- Kearney, L.M., **R.F. Katz**, C.W. MacMinn, C. Kirkham and J. Cartwright. Episodic fluid venting from sedimentary basins fuelled by pressurised mudstones. *PNAS*. 10.1073/pnas.2312152121.

2023 Breithaupt, T., **R.F. Katz**, L. Hansen and K. Kumamoto. Dislocation theory of steady and transient creep of crystalline solids: predictions for olivine. *PNAS*. 10.1073/pnas.2203448120.

- Kearney, L.M., C.W. MacMinn, **R.F. Katz**, C. Kirkham and J. Cartwright. Episodic, compression-driven fluid venting in layered sedimentary basins. *Proc. Roy. Soc. A.* 10.1098/rspa.2022.0654.
- Li, Y., A. Pusok, T. Davis, D.A. May, **R.F. Katz**, Continuum approximation of dyking with a theory for poro-viscoelastic–viscoplastic deformation. *Geophys. J. Int.* 10.1093/gji/ggad173.
- Davis, T., E. Rivalta, D. Smittarello and **R.F. Katz**. Ascent rates of 3D fractures driven by a finite batch of buoyant fluid. *J. Fluid Mech.* 10.1017/jfm.2022.986.
- Hooker J.N., **R.F. Katz**, S.E. Laubach, J. Cartwright, P. Eichhubl, E. Ukar, D. Bloomfield, T. Engelder. Fracture-pattern growth in the deep, chemically reactive subsurface. *J. Structural Geol.* 10.1016/j.jsg.2023.104915.

2022 **Katz, R.F.** The Dynamics of Partially Molten Rock, Princeton University Press. Website.

- Huybers, P., P. Liautaud, C. Proistosescu, B. Boulahanis, S. Carbotte, **R.F. Katz** and C. Langmuir. Influence of late Pleistocene sea-level variations on mid-ocean ridge spacing in faulting simulations and a global analysis of bathymetry. *PNAS.* 10.1073/pnas.2204761119.
- **Katz, R.F.**, D.W. Rees Jones, J.F. Rudge and T. Keller. Physics of melt extraction from the mantle: speed and style. *Ann. Rev. Earth Planet. Sci.* 10.1146/annurev-earth-032320-083704.
- Zhang, H., T. Davis, **R.F. Katz**, L.A. Stevens and D.A. May. Basal hydrofractures near sticky patches. *J. Glaciology.* 10.1017/jog.2022.75.
- Pusok, A., **R.F. Katz**, Y. Li and D. May. Chemical heterogeneity, convection and asymmetry beneath mid-ocean ridges. *Geophys. J. Int.* 10.1093/gji/ggac309.
- Rovira-Navarro, M., **R.F. Katz**, Y. Liao, W. van der Wal, F. Nimmo. The tides of Enceladus' porous core. *JGR Planets* 10.1029/2021JE007117.

2021 Rees Jones, D.W., H. Zhang and **R.F. Katz**. Magmatic channelisation by reactive and shear-driven instabilities at mid-ocean ridges: a combined analysis. *Geophys. J. Int.* 10.1093/gji/ggab112.

- Breithaupt, T., L. Hansen, S. Toppaladoddi and **R.F. Katz**. The role of grain-environment heterogeneity in normal grain growth: a stochastic approach. *Acta Materialia.* 10.1016/j.actamat.2021.116699.
- Spencer, D., **R.F. Katz** and I.J. Hewitt. Tidal controls on the lithospheric thickness and topography of Io from magmatic segregation and volcanism modelling. *Icarus.* 10.1016/j.icarus.2021.114352.

2020 Spencer, D., **R.F. Katz** and I.J. Hewitt. Magmatic intrusions control Io's crustal thickness. *JGR Planets.* 10.1029/2020JE006443.

- Spencer, D., **R.F. Katz**, I.J. Hewitt, D.A. May and L. Keszthelyi. Compositional layering in Io driven by magmatic segregation and volcanism. *JGR Planets.* 10.1029/2020JE006604.

2019 Cerpa, N., D.W. Rees Jones and **R.F. Katz**. Consequences of glacial cycles for magmatism and carbon transport at mid-ocean ridges. *EPSL.* 10.1016/j.epsl.2019.115845

- Haseloff, M., I.J. Hewitt and **R.F. Katz**. Englacial pore-water localises shear in temperate ice-stream margins. *JGR Earth Surface.* 10.1029/2019JF005399

- Tian, M., **R.F. Katz**, D.W. Rees Jones. Devolatilization of Subducting Slabs, Part I: Thermodynamic Parameterization and Open System Effects. *G-cubed*. 10.1029/2019GC008488
- Tian, M., **R.F. Katz**, D.W. Rees Jones, D. May. Devolatilization of Subducting Slabs, Part II: Volatile Fluxes and Storage. *G-cubed*. 10.1029/2019GC008489
- Parkinson, J., D. Martin, A. Wells and **R.F. Katz**. Modelling binary alloy solidification with Adaptive Mesh Refinement. *J. Comp. Phys.* 10.1016/j.jcpx.2019.100043
- Lichtenberg T., T. Keller, **R.F. Katz**, G. Golabek and T. Gerya, Magma ascent in planetesimals: control by grain size. *EPSL*. 10.1016/j.epsl.2018.11.034

2018 Rees Jones D.W., **R.F. Katz**, J.F. Rudge and M. Tian, Thermal impact of magmatism in subduction zones. *EPSL*. 10.1016/j.epsl.2017.10.015

- Bo, T., **R.F. Katz**, O. Shorttle and J.F. Rudge. The melting column as a filter of mantle trace-element heterogeneity. *G-cubed*. 10.1029/2018GC007880
- Rees Jones D.W. and **R.F. Katz**. Reaction-infiltration instability in a compacting porous medium. *J. Fluid Mech*. 10.1017/jfm.2018.524

2017 Keller T., **R.F. Katz** and M.M. Hirschmann. Volatiles beneath mid-ocean ridges: Deep melting, channelised transport, focusing, and metasomatism. *EPSL*. 10.1016/j.epsl.2017.02.006.

- Turner A.J., **R.F. Katz**, M.D. Behn and T. Keller, Magmatic focusing to mid-ocean ridges: the role of grain size variability and non-Newtonian viscosity. *G-cubed*. 10.1002/2017GC007048

2016 Keller, T., and **R.F. Katz**; The Role of Volatiles in Reactive Melt Transport in the Asthenosphere. *J. Petrology* 10.1093/petrology/egw030.

- Turner S., C. Langmuir, **R.F. Katz**, M.A. Dungan and S. Escrig; Parental arc magma compositions dominantly controlled by mantle-wedge thermal structure. *Nature Geosci*. 10.1038/ngeo2788.
- Huybers, P., C. Langmuir, **R.F. Katz**, D. Ferguson, C. Proistosescu and S. Carbotte. Comment on "Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply." Technical comment, *Science*. 10.1126/science.aae0451.
- Alisic L., S. Rhebergen, J.F. Rudge, **R.F. Katz**, and G.N. Wells, Torsion of a cylinder of partially molten rock with a spherical inclusion: theory and simulation. *Geochem. Geophys. Geosys.* 10.1002/2015GC006061.
- S. Weatherley and **R.F. Katz**. Melt transport rates in heterogeneous mantle beneath mid-ocean ridges. *Geochim. Cosmochim. Acta*. 10.1016/j.gca.2015.09.029.

2015 Crowley, J., **R.F. Katz**, P. Huybers, C. Langmuir, and S.-H. Park; Glacial cycles drive variations in the production of oceanic crust. *Science*. 10.1126/science.1261508.

- Qi, C., D. Kohlstedt, **R.F. Katz**, and Y. Takei; An experimental test of the viscous anisotropy hypothesis for partially molten rocks. *Proc. Nat. Acad. Sci.* 0.1073/pnas.1513790112.
- Y. Takei and **R.F. Katz**. Consequences of viscous anisotropy in a deforming, two-phase aggregate. Why is porosity-band angle lowered by viscous anisotropy? *J. Fluid Mech.* 10.1017/jfm.2015.592.
- Taylor-West, J. and **R.F. Katz**; Melt-preferred orientation, anisotropic permeability, and melt-band formation in a deforming, partially molten aggregate. *Geophys. J. Int.* 10.1093/gji/ggv372.

- Rhebergen, S., G.N. Wells, A.J. Wathen, and **R.F. Katz**. Optimal three-field block-preconditioners for models of coupled magma/mantle dynamics. *SIAM J. Sci. Comput.* 10.1137/14099718X.
- Kyrke-Smith, T., **R.F. Katz**, and A. Fowler. Subglacial hydrology as a control on emergence, scale, and spacing of ice streams. *J. Geophys. Res. Earth Sfc.* 10.1002/2015JF003505.
- Burley, J. and **R.F. Katz**. Variations in mid-ocean ridge CO_2 emissions driven by glacial cycles. *EPSL*. 10.1016/j.epsl.2015.06.031.
- Turner, A., **R.F. Katz** and M.D. Behn. Grain-size dynamics beneath mid-ocean ridges: Implications for permeability and melt extraction. *Geochem. Geophys. Geosys.* 10.1002/2014GC005692.
- Hooker J.N. and **R.F. Katz**; Vein spacing in extending, layered rock: the effect of synkinematic cementation. *Am. J. Sci.*. 10.2475/06.2015.03.
- Lacey, A.A., M.G. Hennessy, P. Harvey and **R.F. Katz**; Mathematical Modelling of Tyndall Star Initiation. *Eur. J. App. Math.* 10.1017/S095679251500042X.

2014 Rhebergen, S., G. Wells, **R.F. Katz**, and A. Wathen; Analysis of block preconditioners for models of coupled magma/mantle dynamics. *SIAM Journal on Scientific Computing*. 10.1137/130946678.

- Allwright, J. and **R.F. Katz**; Pipe Poiseuille flow of viscously anisotropic, partially molten rock. *GJI*. 10.1093/gji/ggu345.
- Rivalta, E., B. Taisne, A. Bunger, and **R.F. Katz**; A review of mechanical models of dike propagation: schools of thought, results and future directions. *Tectonophysics*. 10.1016/j.tecto.2014.10.003.
- Alisic, L., J.F. Rudge, **R.F. Katz**, G. Wells and S. Rhebergen; Compaction around a rigid, circular inclusion in partially molten rock. *JGR—Solid Earth*. 10.1002/2013JB010906.
- Kyrke-Smith, T., **R.F. Katz** and A. Fowler, Subglacial hydrology and the formation of ice streams. *Proc. Roy. Soc. A*. 10.1098/rspa.2013.0494.

2013 Kyrke-Smith, T., **R.F. Katz** and A. Fowler, Stress balances of ice streams in a vertically integrated, higher-order formulation. *J. Glaciology*, 10.3189/2013JoG12J140.

- Takei, Y. and **R.F. Katz**, Consequences of viscous anisotropy in a deforming, two-phase aggregate: 1. Governing equations and linearised analysis. *J. Fluid Mech.*, 10.1017/jfm.2013.482.
- **Katz, R.F.** and Y. Takei, Consequences of viscous anisotropy in a deforming, two-phase aggregate: 2. Numerical solutions of the full equations. *J. Fluid Mech.*, 10.1017/jfm.2013.483.

2012 Weatherley, S. and **R.F. Katz**, Melting and channelized magmatic flow in chemically heterogeneous, upwelling mantle. *Geochem. Geophys. Geosys.*, 10.1029/2011GC003989.

- **Katz, R.F.** and S. Weatherley, Consequences of mantle heterogeneity for melt extraction at mid-ocean ridges. *EPSL*. 10.1016/j.epsl.2012.04.042.
- Gregg, P.M., L.B. Hebert, L.G.J. Montési, and **Katz, R.F.**, Geodynamic models of melt generation and extraction at mid-ocean ridges. *Oceanography*. 10.5670/oceanog.2012.05.

2011 **Katz, R.F.** and J. Rudge, The energetics of melting fertile heterogeneities within the depleted mantle. *Geochem. Geophys. Geosys.*, 10.1029/2011GC003834.

2010 England, P.C. and **R.F. Katz**, Dry melting and thermal advection in the mantle wedge control the location of volcanic arcs. *Nature*, 10.1038/nature09417.

- England, P.C. and **R.F. Katz**, (Brief Communication Arising) Global systematics of arc volcano position. *Nature*, 10.1038/nature09154.

- **Katz, R.F.** Porosity-driven convection and asymmetry beneath mid-ocean ridges. *Geochem. Geophys. Geosys.*, 10.1029/2010GC003282.

- Weatherley, S. and **R.F. Katz** Plate-driven dynamics and global patterns of mid-ocean ridge bathymetry. *Geochem. Geophys. Geosys.*, 10.1029/2010GC003192.

- **Katz, R.F.** and M.G. Worster. Stability of ice-sheet grounding lines. *Proc. Roy. Soc. A*, 10.1098/rspa.2009.0434.

2008 **Katz, R.F.** Magma dynamics with the Enthalpy Method: benchmark solutions and magmatic focusing at mid-ocean ridges. *J. Petrology*, 10.1093/petrology/egn058.

- **Katz, R.F.** and M.G. Worster. Simulation of directional solidification, thermochemical convection and chimney formation in a Hele-Shaw cell. *J. Comp. Phys.*, 10.1016/j.jcp.2008.06.039.

- van Keken, P., C. Currie, S.D. King, M.D. Behn, A. Cagnioncle, J. He, **R.F. Katz**, S. Lin, E.M. Parmentier, M. Spiegelman, K. Wang, A community benchmark for subduction zone modelling. *Phys. of the Earth and Planetary Interiors*, 10.1016/j.pepi.2008.04.015.

2007 **Katz, R.F.**, M. Knepley, B. Smith, M. Spiegelman, E. Coon. Numerical simulation of geodynamic processes with the Portable Extensible Toolkit for Scientific Computation, *Phys. of the Earth and Planetary Interiors*, 10.1016/j.pepi.2007.04.016.

2006 **Katz, R.F.**, M. Spiegelman, and B. Holtzman, The dynamics of melt and shear localisation in partially molten aggregates. *Nature*, 10.1038/nature05039.

- Knepley, M.G., **R.F. Katz**, and B.F. Smith. Developing a geodynamics simulator with PETSc. In Numerical Solution of Partial Differential Equations on Parallel Computers, Series: Lecture Notes in Computational Science and Engineering, Vol. 51, A.M. Bruaset and A. Tveito, editors. Springer-Verlag.

- Spiegelman, M. and **R.F. Katz**. A semi-Lagrangian Crank-Nicolson algorithm for the numerical solution of advection-diffusion problems, *Geochem. Geophys. Geosys.*, 10.1029/2005GC001073.

2005 **Katz, R.F.**, R. Ragnarsson, and E. Bodenschatz. Tectonic microplates in a wax model of sea-floor spreading, *New J. Phys.*, 10.1088/1367-2630/7/1/037

- **Katz, R.F.** and E. Bodenschatz, Taking wax for a spin: tectonic microplates in an analog model of plate tectonics. *Europhys. News*, Vol. 5. (unrefereed)

2004 **Katz, R.F.**, M. Spiegelman and S. Carbotte. Ridge migration, asthenospheric flow and the origin of magmatic segmentation in the global mid-ocean ridge system. *Geophys. Res. Lttrs.*, 10.1029/2004GL020388

2003 **Katz, R.F.**, M. Spiegelman and C.H. Langmuir. A new parameterisation of hydrous mantle melting. *Geochem. Geophys. Geosys.*, 10.1029/2002GC000433

Citation metrics

- Google Scholar h-index: 32 (accessed 8 December 2024).
- Scopus h-index: 28 (accessed 8 December 2024).

Invited conference lectures

2024 Ada Lovelace workshop, Sète, France; Fall AGU meeting, Washington DC.

2023 European Geoscience Union 2023, Vienna, Austria. Session GMPV7.2.

2021 GEOMOD conference, Utrecht, Netherlands. MEREMA II School, Sestri Levante, Italy.

2019 Fluid Transport Modelling Workshop, Minneapolis, USA.

2015 AGU Fall Meeting, San Francisco, USA. DCO Modeling and Visualization Workshop, Washington DC, USA.

2013 Two invited talks at Fall AGU, SF, USA. Invited talk at SIAM Geosciences conference, Padova, Italy.

2012 Gordon Research Conference on Rock Deformation, Andover, New Hampshire, USA. Award lecture at EGU conference in Vienna.

2011 AGU Fall Meeting, San Francisco, USA. Two invited talks. VMSG Conference, Cambridge, UK. (program substitution).

2010 American Geophysical Union, San Francisco, USA. European Geosciences Union conference in Vienna, Austria. Session GMPV16/GD5.9

2009 11th International Workshop on Modelling of Mantle Convection and Lithospheric Dynamics, Braunwald, CH; Water on Earth and Beyond conference, Durham, UK; In-situ Geophysical Studies of Planetary Surfaces: Past, Present, and Future, Roy. Astro. Soc. meeting, London.

2008 Computational Infrastructure for Geodynamics (CIG) Workshop on Mathematical and Computational Issues in the Solid Earth Geosciences, Santa Fe, USA.

2006 Penrose Conference on Arc Crustal Genesis and Evolution, Valdez, Alaska; Western Pacific Geophysics Conference, Beijing, China.

2005 Fall AGU meeting, San Francisco, USA.

2004 Fall AGU meeting, San Francisco, USA.

PhD student supervision

2023– **Rhiannon Ackland**. Project: Resources for sustainable energy: ore formation by percolative reactive flow.

2020– **Hanwen Zhang**. Project: Flow and fracture of ice sheets and continental rifts (RIFT-O-MAT).

2020– **Luke Kearney**. Project: Fluid-escape pipes in the Levantine Basin.

2017–21 **Tom Breithaupt**. Project: Modelling elements of microstructure in olivine. On to: 1851 Research Fellowship at Univ Cambridge.

2017–21 **Dan Spencer**. Project: Tidal dissipation and volcanism on Io. On to job as applied scientist at Sagentia Innovation.

2013–17 **Jonathan Burley**. Project: Ice ages, sea level, and magmatism: coupled oscillations.

2010–13 **Teresa Kyrke-Smith**. Project: Ice stream emergence in coupled models of ice sheets and subglacial hydrology. On to a postdoc at the British Antarctic Survey.

2009–13 **Samuel Weatherley**. Project: Reactive magmatic flow in a deforming mantle. On to a postdoc at the Danish Geological Survey.

Postdoctoral research supervision

2024– **Calum Braham**. Ongoing.

2022– **Hamish Hay**. Ongoing.

2020– **Yuan Li**. Ongoing.

2021–24 **Tim Davis**. Now postdoctoral researcher at Univ. Bristol.

2019–23 **Adina Pusok**. Now Royal Society University Research Fellow at Univ. Oxford.

2017–19 **Marianne Haseloff**. Now professor at University of Wisconsin.

2016–19 **Meng Tian**. Now staff scientist at LMU Munich.

2016–18 **David Rees Jones**. Now lecturer at University of St. Andrews.

2016–18 **Nestor Cerpa Gilvonio**. Now CNRS research scientist.

2013–16 **Tobias Keller**. Now Reader at Univ. Glasgow.

2013–16 **Andrew Turner**. Now employed in UK government scientific research.

2012–14 **Sander Rhebergen**. Now professor at the University of Waterloo, Canada.

2012–13 **John Crowley**. Now employed at Engineering Seismology Group Canada.

Departmental teaching

2023– **Vector calculus & continuum mechanics** for third-year students.

2015– **Mantle dynamics seminar** for fourth-year students.

2012– **Geodynamics** for third-year students.

2011–16 **Mathematical Problem-Solving in Earth Science** for second-year students.

2010–16 **Introduction to Physical Thermodynamics** for first-year students.

2008–10 **Mathematics for Materials and Earth Sciences**. Tutor conducting weekly problem classes.

2008–14 Demonstrator for the **Oxford volcanology field trip** to Santorini, Greece.

Outreach and external teaching

2023 Lecturer at the Joint ICTP-EAIFR-IUGG Workshop on Computational Geodynamics at the University of Rwanda, Kigali.

2022 Invited seminar, East African Inst. for Fundamental Research, Univ. Rwanda.

2021– Internship supervisor for Mfano Africa programme and its successor MIORPA (1 intern annually).

2017– Lecturer, Introduction to Fluid Dynamics, African Institute for Mathematical Sciences, Cape Town, South Africa.

2016 Invited lecturer at the EMS School in Applied Mathematics Mathematical Modelling, Numerical Analysis and Scientific Computing.

2012–19 Outreach lectures to A-level students taking Further Maths.

2011 Invited lecturer, Abdus Salam Internation Centre for Theoretical Physics Advanced School on Mechanical and Thermal Processes in Geodynamics.

2009 Public lecture at Science Oxford on the L'Aquila earthquake.

Service, training, and qualifications

2021– MPLS Divisional Board, representing Earth Sciences.

2021–23 Chair of Nursery Committee, St. Anne's College.

2020–21 Co-founder and co-lead organiser, earth2earth remote seminar series for the UK geoscience community.

- Committee service in Department: Organiser of Departmental seminars (2010–20), IT committee (2014–22, chair); management committee (2014–23); examiner (2014, 2018), research committee (2013, 2023–).

2019–20 Project Sponsor, Research File Service project board, University of Oxford.

2016–23 Scientific Advisory Committee, Institute for Computing and Data Sciences (ISCD), Sorbonne University, Paris.

2014–20 Divisional representative on Research IT board (University-level committee).

2011–16 Oxford Supercomputing Centre Executive Committee (Chair, 2013–2016).

2014–16	Co-organiser of the Newton Institute for Mathematical Sciences programme Melt in the Mantle.
2015	Co-organiser of the Deep Carbon Observatory meeting Modelling and Vizualization Workshop.
2008–	Session convener at the Goldschmidt Conference (2008, 2012, 2018), the European Geosciences Union conference (2010, 2012, 2013).
2012–	Member of NERC Peer Review College.
-	Reviewer for journals including *Science*, *Nature*, *J. Petrology*, *J. Fluid Mechanics*, *EPSL* and for the European Research Council, UK Natural Environment Research Council, Swiss National Science Foundation and the US National Science Foundation. Guest editor for *PNAS*.
2007	Two-month training in peer-support counselling of graduate students, University of Cambridge.