

CURRICULUM VITAE

MAXIM DIONYS BALLMER

ORCID: [0000-0001-8886-5030](https://orcid.org/0000-0001-8886-5030)

E-mail: m.ballmer@ucl.ac.uk

homepage: <http://jupiter.ethz.ch/~ballmer/>

BACKGROUND

March 2019-today: *Lecturer (Asst. Professor), Dept. Earth Sciences, Univ. College London*
Apr 2019-Apr 2020: Visiting Scientist, Dept. Earth Sciences, ETH Zürich
January 1-31, 2018: Part-time Lecturer, Graduate School of Science, University of Tokyo
Aug 2015-Feb 2019: Oberassistent (senior scientist) at Dept. Earth Sciences, ETH Zürich
August 2015-today: *Research Affiliate, Earth-Life Science Institute, Tokyo Inst. Technology*
Apr 2015-Jul 2015: Project Assistant Professor, Earth-Life Science Institute, Tokyo Tech
Sep 2014-Mar 2015: Research Scientist, Earth-Life Science Institute, Tokyo Tech
Jan 2010-July 2014: PostDoc, Dept. Geology & Geophysics, SOEST, University of Hawaii
Sep 2009-Nov 2009: PostDoc, Dept. Earth Sciences, ETH Zürich
Jul 2005-Jun 2009: Ph.D. candidate, Inst. Geophysics, Dept. Earth Sciences, ETH Zürich
(*advisors: Prof. Jeroen van Hunen and Prof. Paul Tackley*)
Okt 1999-Jun 2005: Diplom (analogous to BSc+MSc) in Geology at Ruhr-University Bochum
(*advisors: Prof. Bernhard Stöckhert and Prof. Taras Gerya*)

AWARDS

- Swiss National Science Foundation Fellowship for Prospective Researchers (2009) awarded for one year of geodynamical and geochemical modeling at Univ. of Hawaii
- Editor's Citation for Excellence in Refereeing (2018), *Geochem., Geophys., Geosys.*

SERVICE TO THE COMMUNITY AND PUBLIC

Associate Editor: *AGU Monograph: "Mantle Convection and Surface Expressions"; American Mineralogist*

Conference Organization: *chair of Gordon Research Seminar "Interior of the Earth" (2013); organizing committee member "Mini-Workshop on Feedbacks Between Mantle Composition, Structure, and Evolution" (2020) & "Origin and Evolution of Plate Tectonics" workshop (2016); co-organizer "Mantle and Core" theme, Goldschmidt (2021)*

Panel member: *BGR (magmatism), DFG (review panel TRR)*

Outstanding Student Poster Contest Coordinator: *EGU Geodynamics section (2013-2016); "Origin and Evolution of Plate Tectonics" workshop (2016); DEEP General Assembly (2018)*

Session Convenor/Chair: *AGU (2011-2014, 2016, 2020); EGU (2012, 2016, 2018-2019, 2021); AOGS (2018); EPSC (2019); SEDI (2020); Goldschmidt (2020)*

Student-Poster Judge: *AGU (2010-2018, 2020), EGU (2012-2013, 2015-2016, 2018-2019), DEEP General Assembly (2018)*

Seminar organization: *Univ. Hawaii Geophys. Interest Group (2010-2011, 2014), Tokyo Tech ELSI Lunch Talk (2014-2015), ETH GFD seminar (2015-2018).*

PhD Committee Member: *Juliane Dannberg (Univ. Potsdam, 2016), Antonio Manjón-Cabeza Córdoba (ETH Zurich, 2020)*

Reviewer for Journals: *Nature, Science, Nature Geosci., Science Advances, Nature Comms., G-cubed, Scientific Reports, GRL, JGR Solid Earth, JGR Planets, Tectonophysics, EPSL, GJI, PNAS, PEPS, Geology, ...*

CURRICULUM VITAE

Reviewer for Funding Agencies: *National Science Foundation, NERC, DFG, Marsden Fund, Netherlands Organisation for Scientific Research, ANR, ERC*

Outreach activity: SOEST Open House (2011, 2013); public full-dome presentation (Planetarium Bochum; April 2015, May 2018), virtual public presentation (*Astronomical Society Urania Zurich*, NOV 2020)

PROPOSAL RECORD

<i>Proposal title</i>	PIs and co-PIs	<i>program</i>	<i>status</i>
Interplay of small-scale sublithospheric convection and the Hawaii plume: implications for melt volume flux, plume-lithosphere interaction, and secondary volcanism	Maxim Ballmer	SNF fellowship for prospective res.	awarded (1/2010-12/2010)
Coll. Research: Hawaii PLUME II: A Joint Seismic and Geodynamic Modeling study to Redefine the “Archetypal” Mantle Plume	Cecily J. Wolfe Gabriele Laske Garrett Ito	NSF Marine Geophysics (6/2010)	rejected
Beyond the 'Classical' Mantle Plume: Dynamics, Melting, and Seismic Structure of thermochemical Plumes in the upper mantle	Garrett Ito Cecily J. Wolfe	NSF C-SEDI (9/2010)	rejected
Beyond the 'Classical' Mantle Plume Concept: Upwelling Dynamics, Seismic Structure, and Partial Melting of Thermochemical Plumes	Garrett Ito Cecily J. Wolfe	NSF Geophysics (1/2011)	awarded (8/2012 - 7/2014)
Coll. Research: Observations and Modeling of Shear-Driven Upwelling and Volcanism West of the Colorado Plateau	Eugene I. Smith Clinton Conrad	NSF Geophysics/Geochem. (2013/2014)	rejected
Testing Shear-Driven Upwelling as an explanation for spatio-temporal patterns of Colorado Plateau Uplift and Volcanism	Clinton Conrad Eugene I. Smith		rejected
Dynamical behavior and seismic signature of compositionally layered thermochemical structures in the deep Earth's mantle	Maxim Ballmer	Kakenhi Wakate-B (9/2014)	rejected
Near-Continent intraplate volcanism in the Atlantic: Implications for mantle dynamics, composition and melting	Maxim Ballmer	Swiss NSF (2015-2020)	awarded (full PhD)
The persistence of primordial domains in the mantle of Earth and Mars	Maxim Ballmer Paul J. Tackley	ETH grants (3/2016)	awarded (full PhD) ongoing
Interaction of thermo-chemical upwellings with the Mantle Transition Zone: Looking through the lens of plume dynamics	Maxim Ballmer	ETH grants (9/2017)	rejected
The effects of bulk composition on the dynamics and evolution of the coupled interior-atmosphere evolution of exoplanets	Paul J. Tackley Maxim Ballmer	ETH grants (9/2018)	awarded (full PhD) ongoing
Magma Ocean freezing chemical-dynamics sets Earth's initial condition	Maxim Ballmer Oliver Shorttle	NERC (1/2020)	rejected

MENTORING OF STUDENTS

- main supervisor of MSc student *Matthew Jones* (UCL, JAN 2021-...)
- main supervisor of PhD student *Mohamed Abdel-Maboud Khalil* (UCL, JAN 2021-...)
- main supervisor of PhD student *Matteo Desiderio* (UCL, OCT 2020-...)
- co-advisor of PhD student *Rob Spaargaren* (ETH Zurich, FEB 2019-...)
- main advisor of PhD student *Anna Gülcher* (ETH Zurich, NOV 2018-...)
- co-advisor of PhD student *Kar Wai Cheng* (ETH, OCT 2018-...)
- main advisor of PhD student *David Gebhardt* (ETH Zurich, 2017-2018)
- main advisor of MSc student *Rob Spaargaren* (ETH Zurich, JAN-SEP 2018)
- co-advisor of PhD student *Daniela Bolrão* (ETH, 2016-...)

CURRICULUM VITAE

- main advisor of PhD student *Jun Yan* (ETH, 2016-...)
- main advisor of PhD student *Antonio Manjón-Cabeza Córdoba* (ETH Zurich, 2016-2020)
- main on-site advisor of PhD student *Xiaogang Long* (Tongji Univ., visiting ETH: 2016-2018)
- main on-site advisor of MSc student *Thomas Duvernay* (IPG Paris, internship at ETH 2017)
- co-advisor of PhD students *Diogo Lourenço* and *Ilya Fomin* (ETH: both defended in 2017)
- co-advisor of MSc student *Yang Li* (BGI Bayreuth, 2015-2016)
- main advisor of undergraduate *Andrei Dmitrovskii* (ETH, 2019)
- main advisor of undergraduate *Matthew Motoki* (Univ. Hawaii, 2013-2014)

TEACHING EXPERIENCE

Full modules/responsibility:

- “Geodynamics and Global tectonics”, Dept. Earth Sciences, UCL (2021)
- BSc-level course “Gravimetry” (spring 2016, 2017), Dept. Earth Sciences, ETH Zurich
- BSc-level course “Geophysics II” (spring 2018), Dept. Earth Sciences, ETH Zurich
- block course (8x2 hrs): “Introduction to Solid-Earth Fluid Dynamics”, Univ Tokyo (JAN 2018)
- Geophysics Field Course, *Gravimetry experiment*, Dept. Earth Sci., ETH (spring 2016-2018)
- “Science Communication at Intl. Conferences” (Geology 610) at Univ. Hawaii (spring 2014)

Contribution:

- Geophysics Field Course, Dept. Earth Sciences, UCL (2019, 2020)
- “Geodynamics and Global tectonics”, Dept. Earth Sciences, UCL (2020)
- BSc “MATLAB” course (1 hour), Dept. Earth Sciences, UCL (2019)
- MSc-level course “Topics in Planetary Sciences” (2 hrs each), ETH Zurich (spring 2017, 2018)
- various Guest Lectures (2-3 hrs each) at Geography (2010), Geology&Geophysics (2012), and Mathematics (2013) Depts. of Univ. Hawaii; Dept. Earth Sciences, ETH Zurich (2015, 2017); Kapiolani Comm. College (APR 2011, OCT 2011); School of Pacific and Asian Studies (FEB 2014); Dept. Sciences de la Terre, ENS Lyon (OCT 2017)

PEER-REVIEWED PUBLICATIONS

- Samuel, H., M. D. Ballmer, S. Padovan, N. Tosi, A. Rivoldini, A.-C. Plesa. The thermo-chemical evolution of Mars with a strongly stratified mantle, *J Geophys. Res.—Planets*, in press
- Bolrão, D. P., M. D. Ballmer, A. Morison, A. B. Rozel, P. Sanan, S. Labrosse, P. J. Tackley. Timescales of chemical equilibrium between the convecting solid mantle and over-/underlying magma oceans, *Solid Earth*, in press
- Manjón-Cabeza Córdoba, A., and M. D. Ballmer. The role of Edge-Driven Convection in the generation of intraplate volcanism: a 2D systematic study, *Solid Earth*, in press
- Vilella, K., T. Bodin, C.-E. Boukaré, F. Deschamps, J. Badro, M. D. Ballmer, Y. Li (2021): Constraints on the composition and temperature of LLSVPs from seismic properties of lower mantle minerals, *Earth and Planetary Science Letters*, 554, 116685
- Spaargaren, R., M. D. Ballmer, D. J. Bower, C. Dorn, P. J. Tackley (2020): The influence of bulk composition on long-term interior-atmosphere evolution of terrestrial exoplanets, *Astronomy & Astrophysics*, 643, A44, doi:10.1051/0004-6361/202037632
- Lourenço, D., A. Rozel, M. D. Ballmer, and P. J. Tackley (2020): Plutonic-squishy lid: a new global tectonic regime generated by intrusive magmatism on Earth-like planets, *Geochemistry Geophysics Geosystems*, 21, doi:10.1029/2019GC008756

CURRICULUM VITAE

- Yan, J., M. D. Ballmer, P. J. Tackley (2020): The evolution and distribution of recycled oceanic crust in the Earth's mantle: Insight from geodynamic models, *Earth Planet. Sci. Lett.*, 537, 116171, doi:10.1016/j.epsl.2020.116171
- Gülcher, A. J. P., D. J. Gebhardt, M. D. Ballmer, P. J. Tackley (2020): Variable dynamic styles of primordial heterogeneity preservation in the Earth's lower mantle, *Earth Planet. Sci. Lett.*, 536, 116160, doi.org/10.1016/j.epsl.2020.116160
- Deng, H., M. D. Ballmer, C. Reinhardt, M. M. M. Meier, L. Mayer, J. Stadel, F. Benitez (2019): Primordial Earth mantle heterogeneity caused by the Moon-forming Giant Impact, *The Astrophysical Journal*, 887 (2), 211, doi: 10.3847/1538-4357/ab50b9
- Long, X., M. D. Ballmer, A. Manjon Cabeza-Cordoba and C.-F. Li (2019): Mantle melting and intraplate volcanism due to self-buoyant hydrous upwellings from the stagnant slab that are conveyed by small-scale convection, *Geochemistry Geophysics Geosystems*, 20, doi:10.1029/2019GC008591
- Caracas, R., K. Hirose, R. Nomura, and M. D. Ballmer (2019): Melt-crystals density crossover in a deep magma ocean, *Earth and Planetary Science Letters*, 516, 202–211, doi:10.1016/j.epsl.2019.03.031
- Waszek, L., N. C. Schmerr, and M. D. Ballmer (2018): Global Observations of Reflectors in the Mid-Mantle and Implications for Mantle Structure and Dynamics, *Nature Communications*, 9, 385, doi:10.1038/s41467-017-02709-4
- Helfrich, G., M. D. Ballmer, and K. Hirose (2018): Core-exsolved SiO₂ dispersal in the Earth's mantle, *J. Geophys. Research – Solid Earth*, 123, doi:10.1002/2017JB014865
- Ballmer, M. D. (2017): Small-scale convection in the Earth's mantle. *Reference Module in Earth and Environmental Sciences*, doi:10.1016/B978-0-12-409548-9.09494-X
- Liao, J., Q. Wang, T. V. Gerya, and M. D. Ballmer (2017): Modeling craton destruction by hydration-induced weakening of the upper mantle, *Journal of Geophysical Research Solid Earth*, 122, 9, 7449–7466, doi:10.1002/2017JB014157
- Conrad, C. P., K. Selway, M. M. Hirschmann, M. D. Ballmer, and P. Wessel (2017): Constraints on Volumes and Patterns of Asthenospheric Melt from the Space-Time Distribution of Seamounts. *Geophys. Res. Lett.*, 44, 14, 7203–7210, doi:10.1002/2017GL074098
- Ballmer, M. D., D. Lourenço, K. Hirose, R. Caracas, and R. Nomura (2017): Reconciling Magma-Ocean Crystallization Models with the present-day Structure of the Earth's mantle, *Geochemistry Geophysics Geosystems*, 18, doi:10.1002/2017GC006917
- Ballmer, M. D., C. Houser, J. W. Hernlund, R. Wentzcovitch, K. Hirose (2017): Persistence of Strong Silica-Enriched Domains in the Earth's Lower Mantle. *Nature Geoscience*, 10, 236-240, doi:10.1038/ngeo2898
- Ballmer, M. D., L. Schumacher, V. Lekic, C. Thomas, and G. Ito (2016): Compositional layering within the Large Low Shear-wave Velocity Provinces in the lower mantle, *Geochem. Geophys. Geosys.*, 17, 5056-5077, doi:10.1002/2016GC006005
- Kato, C., K. Hirose, R. Nomura, M. D. Ballmer, A. Miyake, and Y. Ohishi (2016): Melting in the FeO–SiO₂ system to deep lower-mantle pressures: Implications for subducted Banded Iron Formations. *Earth and Planetary Science Letters*, 440, 56-61, doi:10.1016/j.epsl.2016.02.011
- Ballmer, M. D., N. C. Schmerr, T. Nakagawa, and J. Ritsema (2015): Compositional mantle layering revealed by slab stagnation at ~1,000 km depth, *Science Advances*, doi:10.1126/sciadv.1500815

CURRICULUM VITAE

- Ballmer, M. D., C. P. Conrad, E. I. Smith, R. Johnsen (2015): Intraplate volcanism at the edges of the Colorado Plateau sustained by a combination of edge-driven and shear-driven upwelling, *Geochemistry Geophysics Geosystems*, 16, doi:10.1002/2014GC005641.
- Motoki, M. H. and M. D. Ballmer (2015): Convective instability of Stagnant Slabs in the Mantle Transition Zone, *Geochem. Geophys. Geosys.*, 16, doi:10.1002/2014GC005608.
- Ballmer, M. D., G. Ito, and P. van Keken (2015): Hotspots, Large Igneous Provinces and Melting Anomalies. in: *Mantle Dynamics*, edited by G. Schubert and D. Bercovici, Elsevier, *Treatise of Geophysics 7.10*, 2nd edition, pp. 393-459
- Ballmer, M. D., G. Ito, and C. Cheng: Asymmetric Dynamical Behavior of Thermochemical Plumes and Implications for Hawaiian Lava Composition (2015). in: *Hawaiian Volcanism, From Source to Surface*, edited by R. Carey, M. Poland, V. Cayol and D. Weis; *AGU Monograph 208*, 36-57p., doi:10.1002/9781118872079.ch3
- Cheng, C., R. M. Allen, R. W. Porritt, and M. D. Ballmer (2015): Seismic constraints on a double-layered asymmetric whole-mantle plume beneath Hawaii, in: *Hawaiian Volcanism, From Source to Surface*, edited by R. Carey, M. Poland, V. Cayol and D. Weis; *AGU Monograph 208*, 19-34p., doi:10.1002/9781118872079.ch2
- Sakamaki, T., Suzuki, A., Ohtani, E., Terasaki, H., Urakawa, S., Katayama, Y., Funakoshi, K.-I., Wang, Y., Hernlund, J. W., Ballmer, M. D. (2013): Poned melt at the boundary between the lithosphere and asthenosphere, *Nature Geosci.*, doi:10.1038/ngeo1982
- Ballmer, M. D., G. Ito, Wolfe, C. J., and Solomon, S. C. (2013): Double layering of a thermochemical plume in the upper mantle beneath Hawaii, *Earth and Planetary Science Letters*, 376, 155-164, doi:10.1016/j.epsl.2013.06.022
- Bianco, T. A., G. Ito, J. van Hunen, J. J. Mahoney, and M. D. Ballmer (2013): Geochemical variations at ridge-centered hotspots caused by variable melting of a veined mantle plume, *Earth Planet. Sci. Lett.*, 371, pp: 191-202, doi: 10.1016/j.epsl.2013.03.050
- Ballmer, M. D., C. P. Conrad, E. I. Smith, and N. Harmon (2013): Non-hotspot volcano chains produced by migration of shear-driven upwelling toward the East Pacific Rise, *Geology*, 41, 479-482, doi:10.1130/G33804.1
- Cadio, C., M. D. Ballmer, I. Panet, M. Diament, and N. Ribe (2012): New constraints on the origin of the Hawaiian swell from wavelet analysis of the geoid to topography ratio, *Earth and Planetary Science Letters*, 359, 40-54, doi:10.1016/j.epsl.2012.10.006
- Ballmer, M. D., G. Ito, J. van Hunen, and P. J. Tackley (2011): Spatial and temporal variability in Hawaiian hotspot volcanism induced by small-scale convection, *Nature Geoscience*, 4, 7, 457-460, doi:10.1038/ngeo1187
- Bianco, T. A., G. Ito, J. van Hunen, M. D. Ballmer, and J. J. Mahoney (2011): Geochemical variations at intraplate hot spots caused by variable melting of a veined mantle plume, *Geochemistry Geophysics Geosystems*, 12, Q0AC13, doi:10.1029/2011GC003658.
- Ballmer, M. D., G. Ito, J. van Hunen, and P. J. Tackley (2010): Small-scale sublithospheric convection reconciles geochemistry and geochronology of ‘Superplume’ volcanism in the western and south Pacific, *Earth and Planetary Science Letters*, 290, 224-232, 10.1016/j.epsl.2009.12.025
- Ballmer, M. D., J. van Hunen, G. Ito, T. A. Bianco, and P. J. Tackley (2009): Intraplate volcanism with complex age-distance patterns – a case for small-scale sublithospheric convection, *Geochemistry Geophysics Geosystems*, 10, doi:10.1029/2009GC002386
- Bianco, T. A., G. Ito, J. van Hunen, M. D. Ballmer, and J. J. Mahoney (2008): Geochemical variation at the Hawaiian hot spot caused by upper mantle dynamics and melting of a heterogeneous plume, *Geochem. Geophys. Geosys.*, 9, doi: 10.1029/2008gc002111

CURRICULUM VITAE

Ballmer, M. D., J. van Hunen, G. Ito, P. J. Tackley, and T. A. Bianco (2007): Non-hotspot volcano chains originating from small-scale sublithospheric convection, *Geophysical Research Letters*, 34, doi:10.1029/2007GL031636

PhD THESIS

Ballmer, M. D. (2009). Small scale convection - an alternative mechanism for oceanic intraplate volcanism, *Diss. ETH No. 18425*

MANUSCRIPTS IN REVIEW

Ballmer, M. D., and L. Noack. The diversity of exoplanet interior dynamics and their surface expressions, *Elements*

Duvernay, T., J. O'Connor, M. D. Ballmer, M. D., N. Ribe, W. Jokat. Plume pulsations linked to synchronous changes along the Hawaiian hotspot track, *Earth Planet. Science Lett.*

Finlayson, V., M. D. Ballmer, J. G. Konter, M. G. Jackson, A. A. P. Koppers, K. Konrad. Long-lived (>100 Myr) stable lower mantle geochemical structure sampled by the forked Rurutu-Arago mantle plume, *Nature Comms.*

Gülcher, A. J. P., M. D. Ballmer, P. J. Tackley. Coupled dynamics and evolution of primordial and recycled heterogeneity in Earth's lower mantle, *Solid Earth*

Hier-Majumder, S., M. D. Ballmer, M. Agius, C. Rychert, N. Harmon. Melt Leakage from the Hawaiian Plume above the Mantle Transition Zone, *Phys. Earth Planet. Interiors*

Moore, L., E. Gazel, M. D. Ballmer, R. J. Bodnar. The volatile budget of Hawaiian magmatism: constraints from melt inclusions from Haleakala Volcano, East Maui, Hawaii, *Journal of Volcanology and Geothermal Research*

Waszek, L., B. Tauzin, N. C. Schmerr, M. D. Ballmer, J.-C. Afonso. A poorly mixed mantle and its thermal state inferred from seismic waves, *Nature Geoscience*

INVITED PRESENTATIONS AT CONFERENCES AND WORKSHOPS

Ballmer, M. D. (2021): The distribution of primordial and recycled mantle heterogeneity through time: insight from geodynamic modeling, *Collège de France workshop "Global Scale Seismic Imaging and Dynamics of the Earth's Mantle"*, Paris

Ballmer, M. D., J. Yan, A. J. P. Gülcher, D. J. Gebhardt (2019): Mantle heterogeneity in terrestrial planets: Formation, mixing, and segregation through time, *AGU fall meeting*, San Francisco

Ballmer, M. D., T. Duvernay, J. M. O'Connor, N. M. Ribe (2018): Volcanic flux variations along the Hawaiian hotspot track: plume pulsations vs. plume-lithosphere interaction, *AGU fall meeting*, Washington DC

Ballmer, M. D. (2018) [*keynote*]: Geodynamic mechanisms for the preservation of large-scale compositional heterogeneity in the Earth's mantle, *CGU-CIG Joint Assembly*, Niagara Falls, Canada

Ballmer, M. D. (2018): Geodynamic mechanisms for the preservation of large-scale compositional heterogeneity in the Earth's mantle, *DEEP General Assembly*, Hurtigruten, Norway

Ballmer, M. D. (2017): Large-scale compositional heterogeneity in the Earth's mantle, *AGU fall meeting*, New Orleans

Ballmer, M. D. (2017): The preservation of large-scale heterogeneity in the Earth's Mantle, workshop on *Mantle Dynamics and Deep Earth Material Cycles*, München, Germany

CURRICULUM VITAE

- Ballmer, M. D. (2017): Persistence of large-scale heterogeneity in the Earth's Mantle, *Goldschmidt*, Paris
- Ballmer, M. D., T. Duvernay, and J. O'Connor (2017): Evolution of whole-mantle plumes: Consequences for hotspot volcanism, *Goldschmidt*, Paris, France
- Ballmer, M. D. (2017): Large-scale compositional heterogeneity in the Earth's mantle, *IAG-IASPEI joint assembly*, Kobe, Japan
- Ballmer, M. D. (2017): Magma-ocean crystallization and the preservation of ancient crust in the lowermost mantle, *From Crust to Core Summer Workshop*, Omishima, Japan
- Ballmer, M. D., D. Lourenço, K. Hirose, R. Caracas, and R. Nomura (2017): Reconciling Magma-Ocean Crystallization Models with the present-day Structure of the Earth's mantle (2017): *JpGU-AGU joint assembly*, Makuhari, Japan
- Ballmer, M. D., C. Houser, J. W. Hernlund, R. Wentzcovitch, K. Hirose: Persistence of Strong Silica-Enriched Domains in the Earth's Lower Mantle (2017): *JpGU-AGU joint assembly*, Makuhari, Japan
- Ballmer, M. D. (2017): Large-scale compositional heterogeneity in the Earth's mantle, *Big Transition Zone and beyond*, London
- Ballmer, M. D., V. Lekic, C. Thomas, L. Schumacher, and G. Ito (2016): Compositional layering within the large low shear-wave velocity provinces (LLSVPs) in the lower mantle, *EGU General Assembly*, Wien
- Ballmer, M. D., N. C. Schmerr, T. Nakagawa, J. Ritsema and M. Motoki (2015): Compositional mantle layering revealed by slab stagnation at ~1,000 km depth, *AGU fall meeting*
- Ballmer, M. D., V. Lekic, C. Thomas, L. Schumacher, and G. Ito (2015): Compositional layering within the large low shear-wave velocity provinces (LLSVPs) in the lower mantle, *AGU fall meeting*, San Francisco
- Ballmer, M. D., S. French, V. Lekic, and G. Ito (2014): Simultaneous generation of Superdomes and Superplumes in the deep Earth's mantle, *14th Symp. of SEDI*, Kanagawa, Japan
- Ballmer, M. D., C. P. Conrad, E. I. Smith, and N. Harmon (2013): Non-hotspot volcano chains produced by migration of shear-driven upwelling toward the East Pacific Rise, *AGU fall meeting*, San Francisco
- Ballmer, M. D., C. P. Conrad, N. Harmon, E. I. Smith, R. Johnsen (2013): Intraplate volcanism at the edges of the Colorado Plateau sustained by shear-driven upwelling, *EGU General Assembly*, Wien
- Ballmer, M. D., G. Ito, Wolfe, C. J., Solomon, S. C. (2012): Double layering of a thermochemical plume in the upper mantle beneath Hawaii, *EGU General Assembly*, Wien
- Ballmer, M. D., C. P. Conrad, N. Harmon, T. A. Bianco, E. I. Smith (2011): 3-D patterns and volumes of decompression melting fueled by asthenospheric flow: comparison and interaction of shear-driven upwelling with small-scale convection, *AGU fall meeting*
- Ballmer, M. D., G. Ito, Wolfe, C. J., Solomon, S. C., Laske, G. (2011): Double layering of thermochemical-plume material can reconcile upper-mantle seismic velocity structure beneath Hawaii, *AGU fall meeting*, San Francisco
- Ballmer, M. D., G. Ito, J. van Hunen, P. J. Tackley, T. A. Bianco (2011): The role of small-scale sublithospheric convection in generating and modulating oceanic intraplate volcanism, *EarthScope Inst. on the Lithosphere-Asthenosphere Boundary*, Portland
- Ballmer, M. D., G. Ito, J. van Hunen, P. J. Tackley, T. A. Bianco (2011): The role of small-scale sublithospheric convection in generating and modulating oceanic intraplate volcanism, *GORDON Research Seminar*, Mount Holyoke, USA

CURRICULUM VITAE

Ballmer, M. D., G. Ito, J. van Hunen, P. J. Tackley (2010): Small-scale convection induces temporal and spatial variability in Hawaiian plume volcanism, *AGU fall meeting*

Ballmer, M. D., G. Ito, J. van Hunen, P. J. Tackley (2009): Small-scale sublithospheric convection reconciles geochemistry and geochronology of 'Superplume' volcanism in the western and south Pacific, *AGU fall meeting*, San Francisco

INVITED LECTURES AND SEMINARS

Astronomical Society Urania Zurich (AGUZ), Zurich, Switzerland (NOV 2020)

Dept. Earth Sciences, *Univ. Oxford*, Oxford, UK (MAR 2019)

Kavli Inst. Theoretical Physics, *Univ. California Santa Barbara*, Goleta, USA (JUL 2018)

Planetarium Bochum, Bochum, Germany (MAY 2018)

Geodynamic Research Center, *Ehime University*, Matsuyama, Japan (JAN 2018)

Japan Agency for Marine and Earth Sci. and Tech. (*JAMSTEC*), Yokosuka, Japan (JAN 2018)

Dept. Earth and Planetary Sciences, *Univ. Tokyo*, Tokyo, Japan (JAN 2018)

Dept. Sciences de la Terre, *ENS Lyon*, Lyon, France (OCT 2017)

Dept. Geology & Geophysics, Yale, New Haven, USA (SEP 2017)

Dept. Earth Sciences, *Univ. Cambridge*, Cambridge, UK (MAY 2017)

Institut du Physique du Globe (IPG Paris), *Univ. Paris 7*, Paris, France (NOV 2016)

Dept. Earth Sciences, *University College London*, London, UK (NOV 2016)

Dept. Earth and Planetary Sciences, *Univ. Tokyo*, Tokyo, Japan (JUL 2016)

Centre of Earth Evolution and Dynamics, Oslo, Norway (NOV 2015)

Institut für Geophysik, *Univ. Frankfurt*, Frankfurt, Germany (NOV 2015)

Bayerisches Geoinstitut, *Univ. Bayreuth*, Bayreuth, Germany (OCT 2015)

Inst. Geophysics, *ETH Zurich*, Zurich, Switzerland (SEP 2015)

Institut für Geophysik, *Westfälische Wilhelms Univ. Münster*, Münster, Germany (APR 2015)

Planetarium Bochum, Bochum, Germany (APR 2015)

Berkeley Seismological Laboratory, *Univ. California Berkeley*, Berkeley, USA (MAR 2014)

SOEST, *Univ. of Hawaii*, Honolulu HI, USA (JAN 2014)

Earth Life Science Institute, *Tokyo Inst. Technology*, Meguro, Tokyo, Japan (JAN 2014)

FAST, *Univ. Paris-Sud*, Orsay, France (APR 2013)

Dept. Sciences de la Terre, *Univ. Lyon 1*, Lyon, France (APR 2013)

Kavli Inst. Theoretical Physics, *Univ. California Santa Barbara*, Goleta, USA (AUG 2012)

Inst. Geophysics, *ETH Zurich*, Zurich, Switzerland (MAY 2012)

Helmholtz Centre, *Geoforschungszentrum (GFZ) Potsdam*, Potsdam, Germany (APR 2012)

Hawaiian Volcano Observatory, *US Geological Survey*, Volcano NP, USA (JUL 2011)

Dept. Terrestrial Magnetism, *Carnegie Inst. Washington*, Washington DC, USA (JUN 2011)

SOEST, *Univ. of Hawaii*, Honolulu HI, USA (FEB 2009)

Department of Earth Sciences, *Durham Univ.*, Durham, UK (SEP 2007)

SOEST, *Univ. of Hawaii*, Honolulu HI, USA (JAN 2007)

Inst. Geophysics, *ETH Zurich*, Zurich, Switzerland (DEC 2006)

RESEARCH VISITS

Inst. Geophysics, *ETH Zurich* (APR 2019-APR 2020; OCT 2020-JUL 2021)

Dept. Earth and Planetary Science, *Univ. Tokyo* (5 weeks in JAN/FEB 2018)

Dept. Geology & Geophysics, SOEST, *Univ. Hawaii at Manoa* (6 weeks in FEB/March 2009)

CURRICULUM VITAE

SEA AND FIELD EXPERIENCE

geologic mapping in Ahlsburg mountains, Dörringsen, Germany (1 week in 2000)
geologic mapping in Ardennes mountains, Comblain-Fairon, Belgium (2 weeks in 2003)
geologic mapping in the Alps (Asten/Laste, Penserjoch, Tatschspitze), Italy (4 weeks in 2004)
R/V Kilo Moana cruise to Hawaiian N-arch (Mohole Project), central Pacific (1 week in 2010)

MEDIA APPEARANCE

Deschamps, F. (2017), Surviving Mantle Convection, *Nature Geoscience* (Focus), 10, 161
Wright, M. (2015), Twin studies provide first explanations for boundary within Earth's mantle
Witze, A. (2013), Under The Volcano, *Nature* (News), 504, 206-207
Morton, M. C. (2013), East Pacific Rise volcanoes finally line up, *Earth Magazine*, June, 17-18
Koppers, A. A. P. (2011), Mantle Plume Persevere, *Nature Geoscience* (Focus), 4, 12, 816-817

h-INDEX

Scopus: **16**; Google Scholar: **19** (measured on 05/02/2020)

i10-INDEX

Scopus: **22**; Google Scholar: **23** (measured on 05/02/2020)