

# Curriculum Vitae of Boda Liu

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**Boda Liu**

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## EMPLOYMENT

Wiess Postdoctoral Research Associate, Rice University, 2019 -

Postdoctoral Research Assistant , Brown University, 2018 - 2019

## EDUCATION

**Ph.D.**, Brown university, 2018, Geology

Advisor: Yan Liang

Thesis: Melt migration dynamics and trace element fractionation beneath mid-ocean ridges

**B.Sc.**, Peking University, 2013, Geology

Advisor: Lifei Zhang

Senior thesis: Geochemistry and metamorphic P-T path of eclogites from Tibetan Sumdo, China

## RESEARCH INTERESTS

- Silicic volcanism
- Melting of heterogeneous mantle
- Trace elements and isotopes fractionation
- Geodynamics of partially molten mantle
- Geochemical inverse problems
- High-order numerical method

## PUBLICATIONS

**Liu B**, Lee C.T. (2020) Large silicic eruptions, episodic recharge, and the transcrustal magmatic system. *Geochemistry, Geophysics, Geosystems*, **21**: e2020GC009220. doi: <http://doi.org/10.1029/2020gc009220>

**Liu B**, Liang Y. (2020) The importance of the size and distribution of chemical heterogeneities in the mantle source on the variations of isotope ratios and trace element abundances in mid-ocean ridge basalts. *Geochimica et Cosmochimica Acta*, **268**: 384-404. doi: <https://doi.org/10.1016/j.gca.2019.10.013>

**Liu B**, Liang Yan. (2019) The importance of permeability and deep channel network on the distribution of melt, fractionation of REE in abyssal peridotites, and U-series disequilibria in basalts beneath mid-ocean ridges: A numerical study using a 2D double-porosity model. *Earth and Planetary Science Letter*, **528**: 115788. doi: <https://doi.org/10.1016/j.epsl.2019.115788>

Liang Y, **Liu B**. (2018) Stretching chemical heterogeneity by melt migration in an upwelling mantle: an analysis based on time-dependent batch and fractional melting models. *Earth and Planetary Science Letter*, **498**: 275-287. doi: <http://doi.org/10.1016/j.epsl.2018.06.042>

**Liu B**, Liang Y. (2017) The prevalence of kilometer-scale heterogeneity in the source region of MORB upper mantle, *Science Advances*, 3(11). doi: <http://dx.doi.org/10.1126/sciadv.1701872>

**Liu B**, Liang Y. (2017) An introduction of Markov chain Monte Carlo method to geochemical inverse problems: Reading melting parameters from REE abundances in abyssal peridotites. *Geochimica et Cosmochimica Acta*, **203**: 216-234. doi: <http://dx.doi.org/10.1016/j.gca.2016.12.040>

Liang Y, **Liu B**. (2016) Simple models for disequilibrium fractional melting and batch melting with application to REE fractionation in abyssal peridotites. *Geochimica et Cosmochimica Acta*, **173**: 181-197. doi: <http://dx.doi.org/10.1016/j.gca.2015.10.020>

## ABSTRACTS

**Liu B**, Lee C-T. (2020) Large Silicic Eruptions, Episodic Recharge, and the Transcrustal Magmatic System. Goldschmidt conference, oral presentation: 05c

**Liu B**, Liang Y. (2019) Changing Shape of Mantle Heterogeneity during Mantle Flow and Melt Migration beneath Mid-ocean Ridges. AGU Fall Meeting, oral presentation: DI12A-02

Ji Z, **Liu B**, Liang Y. (2019) What can We Learn from REE Abundances in Clinopyroxene and Orthopyroxene in Spinel Peridotites? AGU Fall Meeting, poster presentation: DI13B-0003

Liang Y, **Liu B**. (2018) Importance of Permeability and Deep Channel Network on the Distribution of Melt, U-series disequilibria, and Radiogenic Isotope Variations in MORB. AGU Fall Meeting, oral presentation: V14C-03

**Liu B**, Liang Y. (2018) How representative are the isotope ratios of MORB and OIB of their heterogeneous mantle sources? AGU Fall Meeting, oral presentation: V23A-06

**Liu B**, Liang Y. (2018) A double-porosity ridge model constrained by geophysical, geochemical, and field observations. Goldschmidt conference, poster presentation: 106-04i

**Liu B**, Liang Y. (2017) A 2D double-porosity model for melting and melt migration beneath mid-ocean ridges. AGU Fall Meeting, poster presentation: DI51B-0313

Liang Y, **Liu B**. (2017) Size-sensitive mixing of chemical heterogeneities by melting and melt migration beneath mid-ocean ridges. AGU Fall Meeting, poster presentation: V51D-0402

**Liu B**, Liang Y. (2016) Effects of Size and Shape of Mantle Source on the Fractionation of Isotopes during Melting of a Heterogeneous Mantle: A Time-Dependent Study. AGU Fall Meeting, oral presentation: DI14A-06

**Liu B**, Liang Y. (2015) Application of Markov Chain Monte Carlo Method to Mantle Melting: An Example from REE Abundances in Abyssal Peridotites. AGU Fall Meeting, poster presentation: V11B-3065

Liang Y, **Liu B**. (2015) Can LREE Enriched Patterns in Clinopyroxenes in Abyssal Peridotites be Produced by Melting of a Depleted Mantle Source? AGU Fall Meeting, poster presentation: V11B-3059

## **RESEARCH & INSTRUMENTAL EXPERIENCE**

Numerical and Statistical modeling:

- Implementation of the Discontinuous Galerkin method using deal.II library (C++)
- Parallel computation on multi-core CPU using OpenMP and Thread Building Blocks of Intel® (C++)
- alphaMELTS thermodynamic model for mantle melting
- Markov Chain Monte Carlo Method implemented with Metropolis-Hasting algorithm or Gibbs sampling algorithm (C++)
- Geodynamics modeling using ASPECT

Instrumental experience:

- Magnetic mineral separation
- Electron microprobe
- LA-ICP-MS

## **PROFESSIONAL EXPERIENCE**

Postdoctoral Research Assistant, Brown University, June 2018 – present

Research Assistant, Brown University, September 2013 - May 2018

Member of American Geophysical Union, September 2015 – present

## **TEACHING EXPERIENCE**

- Teaching assistant, Brown University, Fall 2016, GEOL0250, Computational Approaches to Modelling and Quantitative Analysis in Natural Sciences: An Introduction
- Teaching assistant, Brown University, Spring 2016, GEOL1620, Continuum Physics of the Solid Earth
- Teaching assistant, Brown University, Fall 2015, GEOL0350, Mathematical Methods of Fluid and Solid Geophysics and Geology

## **HONORS & AWARDS**

- Spring 2018, Brown University Dissertation Fellowship
- 2010-2012 Zengxianzi Fellowship, Peking University
- 2012 “Honorable Mention” in “Interdisciplinary Contest in Modeling”, The Consortium for Mathematics and Its Applications (U.S.)

## **INVITED TALKS**

- 2018/01/09, Peking University
- 2018/01/23, Woods Hole Oceanographic Institution