

Pranabendu Moitra

Curriculum Vitae

Postdoctoral Research Associate
Lunar and Planetary Laboratory, Department of Planetary Sciences
The University of Arizona,
1629 E University Blvd, Tucson, AZ 85721
Email: pmoitra@lpl.arizona.edu
Phone: +1- 520-626-8238
Website: <https://www.lpl.arizona.edu/postdocs/pranabendu-moitra>

Education:

- 2009 – 2015 PhD, Earth Science, Rice University, USA
 Advisor: Prof. Helge M Gonnermann
 Title: *The rheology of particle-liquid suspensions, the shape and interconnectivity of vesicles in pyroclasts and implications for the Plinian eruption of basaltic magma*
- 2006 – 2008 Master of Science, Applied Geology, Jadavpur University, India.
 Advisor: Prof. Nibir Mandal
 Title: *The mode of development of mid-ocean ridges, based on analogue and numerical experiments*
- 2003 – 2006 Bachelor of Science, Geology, Jadavpur University, India

Professional appointments:

- August, 2018 – Postdoctoral Research Associate, Lunar and Planetary Laboratory, The University of Arizona, USA
 Supervisor: Prof. Jeffrey Andrews-Hanna
- June, 2018 – August, 2018 Postdoctoral Scholar (summer appointment), Department of Geology, University at Buffalo, New York, USA
 Supervisor: Prof. Beata Csatho
- Sep, 2017 – August, 2018 Adjunct Instructor, Department of Geology, University at Buffalo, New York, USA (2 courses per semester)
- Sep, 2015 – Aug, 2017 Postdoctoral Research Associate, Center for Geohazards Studies, University at Buffalo, New York, USA
 Supervisor: Prof. Greg A Valentine
- 2009-2015 Graduate research and teaching assistant, Rice University, Houston, Texas, USA
- 2008-2009 Self employed, private tutoring for grades 6-12 and undergraduate majors in geology in Kolkata, India
- 2007-2008 Summer Fellow of Indian Academy of Sciences, National Center for Experimental Mineralogy and Petrology, Allahabad, India

Honors and awards:

- 2014 The Torkild Rieber Award for high academic standing, Earth Science, Rice University, USA

- 2008 Junior Research Fellowship, University Grants Commission, India
- 2007 Rank holder (within top 100) in Graduate Aptitude Test for Engineering (Geology and Geophysics) organized by Ministry of Human Resources and Development, India
- 2006 Summer Research Fellowship, Indian Academy of Sciences

Practical and analytical proficiency:

Computer skills

Programming in MATLAB (fluent)
 Experience in using shared computational cluster facility
 Image analysis using ImageJ, FFmpeg and MATLAB
 Familiarity with other software: ANSYS, COMSOL and Python

Lab skills

Rotational, oscillatory and extensional rheometry
 High-Temperature furnace/experiments
 Gas permeametry
 He-pycnometry
 Tap-density analysis
 Particle size analyser
 Secondary Electron Microscopy (SEM)
 Optical microscopy

Peer-reviewed publications:

Sonder I, Harp A, Graettinger A, **Moitra P**, Valentine G A, Buttner R, Zimanowski B (2018), Meter-Scale Experiments on Magma-Water Interaction, *Journal of Geophysical Research-Solid Earth*, 123, 10597-10615, doi: 10.1029/2018JB015682.

Moitra P, Sonder I, Valentine G A (2018), Effects of size and temperature-dependent thermal conductivity on the cooling of pyroclasts in air, *Geochemistry, Geophysics, Geosystems*, 19, 3623-3636, doi: 10.1029/2018GC007510.

Moitra P, Gonnermann M H, Houghton B F, Tiwary C S (2018), Fragmentation and Plinian eruption of crystallizing basaltic magma, *Earth and Planetary Science Letters*, 500, 97-104, doi:10.1016/j.epsl.2018.08.003.

Moitra P, Gonnermann M H (2015), Effects of crystal shape- and size-modality on magma rheology. *Geochemistry, Geophysics, Geosystems*, 16, 1-26, doi:10.1002/2014GC005554.

Lee C T A, Morton D M, Farner M J and **Moitra P** (2015), Field and model constraints on silicic melt segregation by compaction/hindered settling: The role of water and its effect on latent heat release. *American Mineralogist*, 100, 1762-1777, doi:10.2138/am-2015-5121.

Moitra P, Gonnermann M H, Houghton F B, Giachetti T (2013), Relating vesicle shapes in pyroclasts to eruption styles. *Bulletin of Volcanology*, 75, 1-14, doi:10.1007/s00445-013-0691-8.

In preparation:

Moitra P, Gonnermann M H, Houghton B F, Crozier J, Effect of crystals on the development of permeability during the Plinian eruption of basaltic magma (*to be submitted to Journal of Volcanology and Geothermal Research*).

Moitra P, Sonder I, Valentine G A, The heat flux estimates during magma-water interactions: Implications for thermo-brittle fragmentation of magma (*to be submitted to Earth and Planetary Science Letters*).

Horvath D G, **Moitra P**, Andrews-Hanna J C, A young pyroclastic deposit in Cerberus Palus, Mars (*in preparation*).

Moitra P, Horvath D G, Andrews-Hanna J C, Magma-water interaction and explosive volcanic eruption on Mars (*in preparation*).

Moitra P, Gonnermann M H, Buoyant bubble rise through concentrated particulate suspensions with application to crystallizing magmas (*in preparation*).

Invited talks:

Moitra P, 2019, Department of Earth and Environmental Sciences, Vanderbilt University, Tennessee, USA.

Moitra P, 2018, Planetary Geosciences Group, Brown University, Rhode Island, USA.

Moitra P, 2018, Graduate School of Oceanography, University of Rhode Island, Rhode Island, USA.

Moitra P, 2017, Woods Hole Oceanographic Institute, Massachusetts, USA.

Scientific presentations:

Horvath D G, **Moitra P**, Andrews-Hanna J C, 2019. Explosive magma-water on Mars: Insights from a young pyroclastic deposit in Elysium Planitia, Mars, Lunar and Planetary Science Conference, 2019. [ORAL]

Moitra P, Horvath D G, Andrews-Hanna J C, 2019. A Late Amazonian phreatomagmatic tephra deposit in Elysium Planitia, Lunar and Planetary Science Conference, 2019. [POSTER]

Moitra P, Sonder I, Valentine G A, 2018. Magma-to-water heat transfer rates with implications for quench-induced fragmentation, American Geophysical Union, Fall Meeting. [POSTER]

Sonder I, Harp A, Graettinger A, Valentine G A, **Moitra P**, Buttner R, Zimanowski B, 2018. Meter-Scale Experiments on Magma-Water Interaction, American Geophysical Union, Fall Meeting. [POSTER]

Moitra P, Sonder I, Valentine G A, 2017. Magma-to-water heat flux: Insight from pool-boiling experiments, International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) Scientific Assembly, Portland, Oregon, USA. [POSTER]

Sonder I, Harp A, Graettinger A, Valentine G A, **Moitra P**, Buttner R, Zimanowski B, 2017. Explosive Magma-Water Explosive Experiments: Premix Conditions on Decimeter Scale, International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) Scientific Assembly, Portland, Oregon, USA. [POSTER]

Moitra P, Sonder I, Valentine G A, 2016. Magma-to-water heat flux estimates from laboratory experiments, Postdoctoral symposium, University at Buffalo. [POSTER]

Moitra P, Gonnermann M H, Houghton B F, Crozier J, 2015. Combined effect of permeability and crystallization on the explosive eruption of basaltic magma, American Geophysical Union, Fall Meeting. [ORAL]

Moitra P, Gonnermann M H, Houghton B F, Crozier J, 2014. The effect of microlite and permeability on the Plinian eruption of basaltic magma, American Geophysical Union, Fall Meeting. [POSTER]

Moitra P, Gonnermann M H, 2014. The effect of crystal shape, size and bimodality on the maximum packing and the rheology of crystalline magma, European Geosciences Union, General Assembly. [ORAL]

Moitra P, Gonnermann M H, 2013. Buoyant bubble rise through concentrated particulate suspensions with potential application to crystallizing magmas, International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) Scientific Assembly, Japan. [POSTER]

Moitra P, Gonnermann M H, Houghton F B, Giachetti T, 2013. Relating vesicle shapes in pyroclasts to eruption styles, IAVCEI Scientific Assembly, Kagoshima, Japan. [ORAL]

Moitra P, Gonnermann M H, 2013. Relating vesicle shapes in pyroclasts to eruption styles, ESCI 404, SEM: Department Research. [ORAL]

Moitra P, Gonnermann M H, 2012. Vesicle shapes, bubble overpressure and fragmentation during explosive eruptions. ESCI 404, SEM: Department Research. [ORAL]

Moitra P, Gonnermann M H, Houghton F B, 2011. Characterization of pumice textures to calculate bubble growth rate using Capillary number. American Geophysical Union, Fall Meeting. [POSTER]

Moitra P, Gonnermann M H, 2011. Fragmentation of basaltic magma in Plinian style eruption. ESCI 404, SEM: Department Research. [ORAL]

Moitra P, Gonnermann M H, Houghton F B, 2010. Rheological effect of microlites on the Plinian eruption of basaltic magma. American Geophysical Union, Fall Meeting. [POSTER]

Moitra P, Gonnermann M H, 2010. Fragmentation of basaltic magma in Plinian style eruption. ESCI 404, SEM: Department Research. [ORAL]

Teaching experience:

- **Primary instructor** for 3-credit advanced undergraduate/graduate course on Advance Geofluids and Geomechanics, Spring 2018, Department of Geology, University at Buffalo, USA
- **Primary instructor** for 4-credit undergraduate course on Petrology, Spring 2018, Department of Geology, University at Buffalo, USA
- **Primary instructor** for 4-credit undergraduate course on Sedimentary Geology and Paleontology, Fall 2017, Department of Geology, University at Buffalo, USA
- **Primary instructor** for 4-credit undergraduate course on Mineralogy, Fall 2017, Department of Geology, University at Buffalo, USA
- Organizer of Volcanology Seminar, Spring 2016, University at Buffalo, USA
- Teaching Assistant in grading/organizing ESCI 301 (Introduction to the Earth), Spring 2015, Rice University, USA
- Teaching Assistant in grading/organizing ESCI 101 (The Earth), Spring 2014, Rice University, USA
- Substitute lecturer for ESCI 429 (Volcanic and Magmatic Processes), Fall 2013; Lecture delivered on Magma Rheology, Rice University, USA
- Teaching Assistant in field trip to New Mexico and grading for ESCI 334 (Geological & Geophysical Techniques), Spring 2011, Rice University, USA
- Organizer of department seminar for ESCI 403 (Department Research Seminar), Fall 2010, Rice University, USA

- Private tutor for grades 6-12 and undergraduate geology majors, 2008, Kolkata, India

Experience in research supervision:

- Pauline Devez (summer intern) during Summer-Fall, 2016, University at Buffalo
- Joshua Crozier (undergraduate student) during Summer, 2014, Rice University
- Li Ann Chia (undergraduate student) during Spring 2014, Rice University
- Mira Chen (undergraduate student) during Summer 2010, Rice University

Geology field experience:

- 2017 ***Leading field trips (as the primary instructor)*** to Bennett Beach, Zoar Valley, Lockport and Glen Park, Buffalo, New York, as part of the Sedimentary Geology and Paleontology course, Department of Geology, University at Buffalo, Fall 2017
- 2017 Field study on volcanoclastic rocks and volcanic structures at Zuni Salt Lake, Valles Caldera, Fish Canyon tuff, Summer Coon, New Mexico and Colorado, USA
- 2012 Field study on volcanic eruption deposits in Valles Caldera, New Mexico, USA
- 2012 Structural geology field trip in Albuquerque, New Mexico, USA
- 2011 Field study on mafic-silicic magma interactions in Bernasconi Hills, San Jacinto, California, USA
- 2011 Field study on volcanic eruption deposits in Big Bend, Texas, USA
- 2009 Field study on eruption deposits in the Cascade Range, California, USA
- 2008 Field study on underground and open-cast mining in Jharkhand, India
- 2007 Structural geology field trip in and around Ghatshila, India
- 2006 Field study on modern sedimentary deposits and paleontology in Chandipur, India
- 2005 Field study on metamorphic petrology in and around Jabalpur, India
- 2004 Field study on general geology of Maithon area, India

Organization of International conferences:

- ***Co-chair*** of Session V019 (Developments in Magma-Water Interaction: Field Work, Experiments, and Computation) in American geophysical Union (AGU), 2018, Washington, D.C., USA
- ***Primary convener and co-chair*** of Session V.4 (Just add water: hazards variation in lava flows, steam-driven and hydromagmatic explosive eruptions) in International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), 2017, Portland, Oregon, USA

Professional services:

- Reviewer for *Geochemistry, Geophysics, Geosystems; Geophysical Research Letters; Solid Earth Discussions; Geology; Nature Communications*

Workshops attended:

- Uncertainty in Geo-science: A workshop on hazard analysis, 2016, Center for Geohazards Studies, SUNY, Buffalo, New York, USA
- FEMA Volcano Crisis Awareness training, 2015, Center for Geohazards Studies, SUNY, Buffalo, New York, USA
- Fundamentals of 3D Quantitative Analysis of Geological Materials Using Computed Tomography (CT) facility, 2014, University of Texas at Austin, Texas, USA
- RHEA: A collaborative database for rheological magmatic properties, International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) 2013 Scientific Assembly, Kagoshima, Japan
- Melts, glasses and magmas, 2012, Ludwig Maximilian University, Munich, Germany
- Short Course, Porous Material Inc., 2010, Ithaca, New York, USA

Outreach/Synergistic activities:

- 2014 Maintaining Rice University Earth Science's EQ-1 Seismograph
- 2010 Volunteered as demonstrator in Rice University Earth Science Annual Girl Scout Day outreach program
- 2007 Elected class representative of Science Faculty Students' Union, Jadavpur University, India
- 2006 Geological field trip manager, Jadavpur University, India
- 2005 Co-convenor of the annual festival SANSKRITI 2005 of Science Faculty Students' Union, Jadavpur University, India
- 2004 Performed in intra-university theater, Jadavpur University, India

Membership with professional societies:

American Geophysical Union (AGU)

International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

Rhea (a collaborative database for rheological magmatic properties)
