

PEDRO ANTONIO VALDIVIA MUÑOZ

DOB: 7th of April 1989 (Santiago, Chile)

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Bayerisches Geoinstitut, University of
Bayreuth, 95440 Bayreuth, Germany



EDUCATION

PhD Bayerisches Geoinstitut, University of Bayreuth 2024 (*current*)

Thesis: “The effect of nanolite heterogeneities in the viscosity of silicate melts”
Advisor: Danilo Di Genova,
Co-advisors: Hans Keppler, Tony Withers

MS Boise State University, Geoscience September 2021

Thesis: “Mafic Plinian Volcanism at Llaima volcano (Chile):
3D reconstruction of pyroclasts to constrain shallow conduit processes”
Advisor: Brittany Brand
Co-advisors: Michael Manga, Dorsey Wanless
GPA: 3.888

BS Universidad de Chile, Geology June 2016

Thesis: “Petrological and geochemical study of Hualilco volcano
IX Region, Chile”
Advisor: Lucy McGee
Distinction grade

BS Universidad de Chile, Physical and Mathematical Science May 2011

Minor in Geoscience
Distinction grade

RESEARCH EXPERIENCE

Ph.D Research at Bayerisches Geoinstitut, University of Bayreuth 2021 – present

Raman Spectroscopy - Mössbauer spectroscopy - FTIR - Transmission Electron Microscopy (TEM) - Brillouin spectroscopy - Differential Scanning Calorimetry (DSC) - Scanning Electron Microscopy (SEM) - Karl Fischer Titration (KFT) – Viscometry – Diffraction.

MS Thesis, Boise State University, Idaho 2019 - 2021

Advisor: Brittany Brand

- Analyzed pyroclast vesicle network using X-ray microtomography.
- Proposed permeability/tortuosity model and implications for explosive eruptions.
- Worked in a multidisciplinary study of Mafic volcanism at Llaima Volcano.

BS Thesis, Universidad de Chile, Santiago 2015 - 2016

Advisor: Lucy McGee

- Identified and characterized mineral phases using scanning electron microscope (SEM).
- Analyzed whole rock geochemical data (major, minor and trace elements).
- Analyzed geochemistry of mineral phases (EMPA at LAMARX-National University of Cordoba, Argentina).

TEACHING EXPERIENCE

Bayerisches Geoinstitut (Bayreuth, Germany) November 2023 to *present*

MS co-supervisor

- Supervised master student Emanuel Fanesi (Camerino University, Italy) during his one semester exchange program at BGI.

Boise State University, ID (USA) August 2019 to 2021

Teaching Assistant, Department of Geoscience

- Led weekly laboratories and practical classes. On-line format implemented due to COVID-19
- General Geology and Natural Hazards.

Centro Politecnico Particular de Conchalí March 2015 to Dec 2016

(Polytechnic School), Santiago (Chile)

Department Coordinator and Teacher, Assistance in Geology

- Planned and implemented Assistance in Geology program
- Coordinated courses, schedules, syllabus, and lab materials.
- Developed a Health and Safety guidance for field trips
- Managed annual budget
- Organized field trips and extracurricular activities
- Taught 4 courses as a main teacher: Sampling techniques, Geological data resources, Recognition of rocks and minerals, and Introduction to Earth Sciences.
- Developed quizzes, exams, labs and homework

Universidad Andres Bello, Santiago (Chile) March 2013 to Dec 2014

Teaching Assistant, Department of Geoscience

- Led 4 undergraduate lab modules (between 24 to 120 students per class): General Geology, Ore Mineralogy, Engineer Geology, Igneous and Metamorphic Petrology
- Prepared course material including laboratory experiments, lectures, exams, homework, and practice problems
- Led weekly laboratories, practical classes and field trips

LANGUAGES

English: Fluent (B2/C1)

German: Beginner (A1/A2)

Spanish: Native Language

SOFTWARE PROFICIENCY

MATLAB (Intermediate/Advance), DragonFly (Advanced), ArcGIS (Intermediate), MS Office (Advanced), Google Earth PRO (Advanced), Photoshop/Illustrator/GIMP (Intermediate). Igor Pro (Intermediate), LabSpec (Intermediate)

PUBLICATIONS

Valdivia, P *et al.* (under review). Nanoscale chemical heterogeneities control magma viscosity. PREPRINT [<https://doi.org/10.21203/rs.3.rs-3891365/v1>]

Valdivia, P. *et al.* Are volcanic melts less viscous than we thought? The case of Stromboli basalt. *Contrib. to Mineral. Petrol.* **178**, 45 (2023).

Di Genova, D. *et al.* Viscosity of anhydrous and hydrous peridotite melts. *Chem. Geol.* **625**, (2023).

Scarani, A. *et al.* A chemical threshold controls nanocrystallization and degassing behaviour in basalt magmas. *Commun. Earth Environ.* **3**, 284 (2022).

Marshall, A. A. *et al.* The mafic Curacautín ignimbrite of Llaima volcano, Chile. *J. Volcanol. Geotherm. Res.* **421**, 107418 (2021).

Valdivia, P., Marshall, A. A., Brand, B. D., Manga, M. & Huber, C. Mafic explosive volcanism at Llaima Volcano: 3D x-ray microtomography reconstruction of pyroclasts to constrain shallow conduit processes. *Bull. Volcanol.* **84**, 2 (2022).

McGee, L. E. *et al.* A geochemical approach to distinguishing competing tectono-magmatic processes preserved in small eruptive centres. *Contrib. to Mineral. Petrol.* **172**, 1–26 (2017).

CONFERENCES

Rittman Conference 2022. “Viscosity of Stromboli magmas: are melts less viscous than we thought?” poster on site.

EGU 2023. “Are volcanic melts less viscous than we thought? The case of Stromboli basalt” poster on site.

EMPG 2023. “The viscosity of volcanic melts: current knowledge and challenges”. Presentation on site.

EGU 2024. “In situ nanoscale insights on magma viscosity and explosive eruptions”. Poster on site

Rittman Conference 2024. “A new viscosity model for hydrous andesitic magmas: insights from Sakurajima volcano” poster on site.

REFERENCES

Dr. Brittany Brand, Associate Professor
Department of Geoscience
Boise State University, Idaho (USA)
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Dr. Danilo Di Genova
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National Research Council (CNR), Rome, Italy
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