

GAETANO FERRANTE

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SUMMARY AND PERSPECTIVE

Graduated in Physics at the University of Bologna, I have there also obtained a Master of Science in Physics of the Earth System with a thesis about the spatio-temporal evolution of volcanism in rifted areas. Now I am a Ph.D. candidate at Rice University, where I research about magmatic processes. My research interests include physics-based numerical modeling of magma transport at Kīlauea Volcano, on the Island of Hawai'i, and the experimental investigation of the rheology of magmas.

EDUCATION

Ph.D. in Earth Science

January 2022 - Present

Rice University, Houston (TX), USA.

Description: Physics-based numerical modeling of magma transport at Kīlauea Volcano, Hawai'i. Reservoir modeling of the 2018 eruption and modeling of magma transport from mantle to the shallow subsurface during the 2003-2007 surge in magma supply.

Master of Science in Physics of the Earth System

September 2019 - October 2021

Alma Mater University of Bologna, Bologna (BO), Italy.

Thesis: "Numerical simulation of magma pathways and vent distribution in rifts from the early stages to maturity"
Description: Analyzing the spatio-temporal evolution of rift-related volcanism as controlled by the stress redistribution in the crust due to the progressive deepening of the rift basin through a boundary element dike propagation code. Investigating the effect of dike-dike interaction in rifted areas by accounting for the stresses generated by intruded dikes and the loading caused by erupted dikes.

Bachelor of Science in Physics

September 2016 - September 2019

Alma Mater University of Bologna, Bologna (BO), Italy.

Thesis: "Fracturing conditions induced by temperature and pore pressure variations in thermo-poro-elastic media"
Description: Obtaining the pressure and temperature field in a thermo-poro-elastic medium due to a degassing spherical magma chamber. Investigating the fracturing conditions of the medium through the calculation of the Coulomb Failure Function.

PUBLICATIONS

Ferrante, G., Rivalta, E. and Maccaferri, F., 2024. Spatio-temporal evolution of rift volcanism controlled top-down by a deepening graben. *Earth and Planetary Science Letters*, 629, p.118593.
<https://doi.org/10.1016/j.epsl.2024.118593>

CONFERENCE PRESENTATIONS

Ferrante, G. and Gonnerman, H., Magma transport to the shallow subsurface during the 2003-2007 "surge" in magma supply at Kīlauea Volcano, Hawai'i. AGU23.

Gonnermann, H.M., **Ferrante, G.**, Anderson, K.R., Foster, J. and Johanson, I.A., 2023. The Magma Plumbing System of Kīlauea Volcano, Hawaii, During its 2018 Eruption. AGU23.

Ferrante, G. and Gonnermann, Helge M.: Magma transport processes leading to "surges" in magma supply at Kīlauea Volcano, Hawai'i, IAVCEI Scientific Assembly 2023, Rotorua, New Zealand, 30 January-3 February.

Ferrante, G., Rivalta, E., and Maccaferri, F.: Spatio-temporal evolution of rift volcanism driven by progressive crustal unloading, EGU General Assembly 2022, Vienna, Austria, 23-27 May 2022, EGU22-8663.

AWARDS

Alison Henning Teaching Award

April 2023

Awarded by the Earth, Environmental and Planetary Sciences Department of Rice University to the Teaching Assistant with the most outstanding initiative and valuable contributions to undergraduate instruction in the department.

Best Thesis Award (*1st place ex aequo*)

December 2021

Awarded by Alma Mater University of Bologna to particularly deserving students graduated in the academic years 2019/2020 or 2020/2021 in the following degrees: Physics, Astrophysics and Cosmology and Physics of the Earth System who have produced the best thesis.

WORKSHOPS/SUMMER SCHOOLS

IMPROVE Network School on Mount Etna

July 24 - July 28 2023

Nicolosi (Mount Etna), Italy

Short Course in Melts, Glasses and Magmas

July 5 - July 9 2021

Ludwig Maximilian University, Munich, Germany

Summer School in Planetary Sciences

July 18 - August 1 2021

Chinese Academy of Sciences, Beijing, China.

University of Science and Technology, Hefei, China

PROGRAMMING SKILLS

Languages C, C++, MATLAB, Python, FORTRAN90.

Editors Word, LaTeX.

Illustrators Inkscape, GMT.

Platforms Windows, Linux, MacOS.