

## General Information

### Luca Caricchi

Associate Professor, Petrology and Volcanology

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Group Page: <https://www.unige.ch/sciences/terre/en/research/petrology-and-volcanology/>

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Born 23<sup>rd</sup> February 1979 Married to Jessica Kandlbauer, father of Nicolò (05.03.2019) and Gemma (18.02.2021).

## Research interest

I am petrologist and volcanologist interested in the processes controlling the transport, accumulation, and eruption of magma on Earth. I use a combination of classic petrology, modelling, machine learning and statistics to quantify magma flux through the lithosphere and chemical evolution of and unveil its control on the frequency and magnitude of volcanic eruptions and the formation of ore deposits.

## Education and Employment history

Currently	Associate Professor (University of Geneva, Switzerland)
2012-2017	Assistant Professor (University of Geneva, Switzerland)
2009-2012	NERC Postdoctoral fellow (University of Bristol, UK)
2008-2009	Postdoctoral Researcher (CNRS, Orleans, France)
2008	Doctor in Sciences (ETH-Zurich, Switzerland)

## Institutional responsibilities

Since 2015	Member of the Conseil Participatif Faculté des Sciences (UNIGE)
Since 2017	Member of the commission enseignement at the Department of Earth Sciences (UNIGE)
Since 2019	Member of the direction committee of the Joint Geneva and Lausanne School of Earth Sciences (ELSTE -UNIGE/UNIL)
2020	Member of the committee charged to reform the master program ELSTE
2018-2020	Member of the Conseil de Section of Earth and Environmental Sciences (UNIGE)
2013-2018	Member of the Commission Sécurité Faculté des Sciences (UNIGE)

### OTHER SERVICES

- Associate editor for Journal of Geophysical Research
- Associate editor for Artificial Intelligence in Geosciences
- Member of the IAVCEI commission on Volcanic Igneous Plumbing Systems
- IAVCEI national representative for Switzerland
- Member of the Kuno award committee (AGU) 2017-2018
- Reviewer for international journals: Bulletin of Volcanology, Contribution to Mineralogy and Petrology, Earth and Planetary Science Letters, Geochimica and Cosmochimica Acta, Geology, Geosphere, Geophysical Research Letters, Journal of Geophysical Research, Journal of Petrology, Journal of Volcanology and Geothermal Research, Nature, Nature Communications, Nature Geoscience, Science advances.
- Reviewer of proposals for the European Research Council (ERC), the National French Agency (ANR), the German Research Foundation (DFG), the American National Science Foundation (NSF), and the Icelandic National Science foundation.

## Professional memberships

- International Association of Volcanology and Chemistry of the Earth Interior (IAVCEI)
- European Geoscience Union (EGU)
- American Geophysical Union (AGU)
- Swiss Geological Society

## ORGANISATION OF MEETING AND CONFERENCES

- Member of the local organising committee -Swiss Geoscience meeting 2021

- Examining the validity of geochemical signatures as proxies for the state of Earth systems. University of Geneva (November 2019).
- Physics of magmatic and volcanic processes: From reservoir to stratosphere at University of Geneva and University of Lausanne, Switzerland (November 2016).
- Probing magma reservoirs in time and space at ETH Zurich, Switzerland (April 2016).
- Rheology and physical properties of magmas at ETH Zurich, Switzerland (February 2010).

## DIVULGATIVE TALKS AND OUTREACH

- Quale ruolo gioca e giocherà la geologia sul cambiamento climatico e la transizione energetica? Città della Pieve, Italy. February 2020
- Le Volcanisme du Massif Central et Borée: Borée, France. Divulgate event on the volcanism of the massif central (6th May, 2015).
- Vivere con I vulcani: Città della Pieve, Italy. Divulgate event on effect of volcanic activity on our society (January 10th, 2015).
- Exposition for the 250th anniversary of the Royal Society, London, UK (July 2010).
- Discover, University of Bristol, The Mall Bristol, Broadmead and Cabot Circus, Bristol, UK (11-13 March 2010).

## NEWS AND MEDIA

- Interviews for a variety of outlets: Deutschlandfunk German radio. 10th January 2014. Nature news and views, Nature news, Nature world news, AAA Science, Scientific American, New Scientist, Los Angeles Times, Japan times, Le Figaro, BBC-news, Die Welt, Guardian, Telegraph, Spiegel, Wired, Discovery news, Daily Mail, Livescience
- Multiple live radio and TV interviews for the Radio Television Suisse (RTS): <https://avisdexperts.ch/Videos/search?recherche=Caricchi>

## KEY PUBLICATIONS

- Giordano, G., Caricchi, L. (2022). Determining the State of Activity of Transcrustal Magmatic Systems and Their Volcanoes. *Annu. Rev. Earth Planet. Sci.* 50. <https://doi.org/10.1146/annurev-earth-032320-084733>
- Chiaradia, M., Caricchi, L. (2022). Supergiant porphyry copper deposits are failed large eruptions. *Commun. Earth Environ.* 3, 107. <https://doi.org/10.1038/s43247-022-00440-7>
- Jorgenson C., Higgins O., Petrelli M., Bégué F., Caricchi L. (2021). A machine learning based approach to clinopyroxene thermobarometry: model optimization and distribution for use in the Earth Sciences. *Journal of Geophysical Research*, 124, 1-21, doi: 10.1029/2021JB022904.
- Caricchi L., Townsend M., Rivalta E., Namiki A. (2021). The build-up and triggers of volcanic eruptions. *Nature Reviews Earth and Environment*. Doi: 10.1038/s43017-021-00174-8
- Liu P.P., Caricchi L., Chung S-L, Li X-H, Li Q-L, Zhou M-F, Lai Y-M, Ghani A.A., Sihotang T., Sheldrake T.E., Simpson G. (2021). Growth and thermal maturation of the Toba magma reservoir. *Proceedings of the National Academy of Sciences*, 10.1073/pnas.2101695118.
- Weber G., Caricchi L., Arce J.L., Schmitt A.K. (2020) Determining the size and state of subvolcanic magma reservoirs. *Nature Communications*, 11, 5477.
- Caricchi, L., Sheldrake, T. E., & Blundy, J. (2018). Modulation of magmatic processes by CO<sub>2</sub> flushing. *Earth and Planetary Science Letters*, 491, 160–171.
- Caricchi L., Biggs, J., Annen, C., Ebmeir, S. (2014), The influence of cooling, crystallisation and re-melting on the interpretation of geodetic signals in volcanic systems. *Earth and Planetary Science Letters*, 388, 166-17
- Caricchi L., Simpson G., Schaltegger G. (2014), Zircons reveal magma fluxes in the Earth's crust: *Nature* 511, 457-461.
- Caricchi L., Burlini L., Ulmer P., Gerya T., Vassalli M., Papale P. (2007), Non-Newtonian rheology of crystal-bearing magmas and implication for magma ascent dynamics. *Earth and Planetary Science Letters*, 264, 402-419.