JAMIE I. FARQUHARSON

jifarquharson.github.io jfarquharson@gs.niigata-u.ac.jp /in/jamie-farquharson /jifarquharson

I'm an experimental and computational geoscientist with a passion for volcanology. I use multimethod approaches to investigate volcanic processes across scales to shed light on complex natural phenomena. I have a background in experimental rock deformation and numerical modelling, coupled with hands-on machine engineering and programming experience. Past and current research topics include (1) Micro- to meso-scale rock deformation and fluid flow; (2) Reactive fluid flow in geologic systems; (3) Eruption triggers and dynamics; and (4) The response of volcanic systems to past and future climate change. I'm a firm believer in open scholarship, cross-disciplinary science, and international collaboration.

PROFESSIONAL EXPERIENCE

Niigata University — **Sep 2023 – present**
Specially appointed Professor — *Japan*

Université de Strasbourg — **Jul 2022 – Jun 2023**
Journal manager — *France*

Lancaster University — **Jun 2021 – Sep 2021**
Honorary Researcher — *UK*

Stallard Scientific Editing — **Apr 2021 – Jul 2022**
Freelance Scientific Editor — *NZ*

University of Miami — **Apr 2018 – Apr 2021**
Post-doctoral Research Associate — *USA*

Université de Strasbourg — **Nov 2017 – Apr 2018**
Course Lecturer — *France*

Université de Strasbourg — **Nov 2016 – Apr 2018**
Post-doctoral Research Associate — *France*

Universidad de Colima — **Nov 2011 – Mar 2012**
Research Assistant — *Mexico*

EDUCATION

Université de Strasbourg — **2013 – 2016**
PhD., Geophysics (Experimental Volcanology); *Exceptional* — *France*

Lancaster University — **2012 – 2013**
M.Sc., Volcanology and Geological Hazards; *Distinction* — *UK*

University of Stirling — **2007 – 2011**
B.Sc.(Hon.), Environmental Geography; *First class* — *UK*

AWARDS AND HONOURS

Award for Outstanding Editorial or Publishing Contribution — **2023**
Association of Earth Science Editors — *USA*

Zeiss Post-doctoral Keynote Award — **2021**
Volcanic and Magmatic Studies Group — *UK*

Prix de thèse [*Thesis prize*] — **2017**
Societé des Amis des Universités de l'Académie de Strasbourg — *France*

"Best Dissertation" prize — **2013**
Lancaster Environment Center — *UK*

University Medal — **2011**
Royal Scottish Geographical Society — *UK*

Recent Funded Proposals

"The role of phase changes in volcanic plume dynamics" **2025**
¥2M; JSPS–Royal Society Bilateral Research Grant (~14,000 US$ equivalent) *Japan/UK*

"Understanding reactive fluid transport mechanisms for predicting explosive eruptions" **2024**
¥14.2M; JSPS Fundamental research (B) (~94,000 US$ equivalent) *Japan*

"Investigating reactive fluid transport in volcanic systems" **2023**
£720k; UKRI NERC Independent Research Fellowship [*declined by applicant*] (~909,000 US$ equivalent) *UK*

"Growing an innovative community open access testbed in the Earth Sciences" **2021**
€45k; Fonds National pour la Science Ouverte [*National Funds for Open Science*] (~49,000 US$ equivalent) *France*

Recent Keynotes and Invited Talks

"***Climate change, extreme weather events, and volcanic hazards***" **June 2023**
University of Edinburgh EPS Geoscience seminar *UK*

"***An open science testbed for volcanology***" **Dec 2021**
American Geophysical Union Fall meeting *USA*

"***Fluid transport in volcanoes: from micro- to macro-scale***" **Oct 2021**
Paris École normale supérieure, Geosciences invited seminar *France*

"***Rainfall-induced volcanic hazard in a changing climate***" **May 2021**
University of East Anglia Atmospheres, Oceans and Climate seminar series *UK*

"***Pore fluid pressure evolution in volcanic environments: the role of rainfall***" **Apr 2021**
European Geosciences Union meeting *Austria*

"***Assessing rainfall-induced volcanic hazard***" **Jan 2021**
Volcanic and Magmatic Studies Group Zeiss Keynote *UK*

Service to the Community

- Founder and Editor-in-Chief of Volcanica
- Secretary of the Free Journal Network
- Co-organiser & panellist of the International Union of Geodesy and Geophysics Early Career Scientists forum
- Co-organiser & moderator of the European Geoscience Union Great Debate on Open Science
- Senior Advisory Council member for EarthArXiv
- Elective member of the IAVCEI ECR-Net working group
- Reviewer for 20+ scholarly journals
- Outreach initiatives, such as the Scientist in Every Florida School program.

Select Publications

Farquharson, J. I., H. Tuffen, F. B. Wadsworth, J. M. Castro, H. Unwin, and C. I. Schipper, 2022. In-conduit capture of sub-micron volcanic ash particles via turbophoresis and sintering. *Nature Communications.* DOI: 10.1038/s41467-022-32522-7.

Farquharson, J. I. and F. Amelung, 2022. Volcanic hazard exacerbated by future global warming–driven increase in heavy rainfall. *Royal Society Open Science.* DOI: 10.1098/rsos.220275.

Aubry, T., **J. I. Farquharson**, et al., 2022. Impact of climate change on volcanic processes: current understanding and future challenges. *Bulletin of Volcanology.* DOI: 10.1007/s00445-022-01562-8.

Farquharson, J. I., & F. Amelung, 2020. Extreme rainfall triggered the 2018 rift eruption at Kīlauea Volcano. *Nature*. DOI: 10.1038/s41586-020-2172-5. [Cover feature]

Farquharson, J. I., B. Wild, A. R. L. Kushnir, M. J. Heap, P. Baud, & B. Kennedy, 2019. Acid-induced dissolution of andesite: evolution of permeability and strength. *JGR: Solid Earth*. DOI: 10.1029/2018JB016130.

Farquharson, J. I., M. J. Heap, N. Varley, P. Baud, & T. Reuschlé, 2015. Permeability and porosity relationships of edifice-forming andesites: A combined field and laboratory study. *J. Volcanol. Geoth. Res.* DOI: 10.1016/j.jvolgeores.2015.03.016.

All (37) publications can be accessed via my website: https://jifarquharson.github.io #publications, either as a downloadable PDF (green open-access) or a link to an open-access version via the publisher (gold or diamond open-access). Code associated with various publications are openly available via Zenodo, GitHub, or Figshare.

Professional Memberships

- American Geophysical Union (AGU)
- European Geosciences Union (EGU)
- The American Ceramic Society (ACerS)
- Association of Earth Science Editors (AESE)
- Asia Ocean Geosciences Society (AOGS)
- International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).
- Volcanological Society of Japan (日本火山学会)

Teaching Experience

M.Sc. level
- Petrophysics
- Brittle microstructure
- Applied rock physics
- Geophysical laboratory measurements.

Ph.D. level
- Geological Hazards
- Physical Volcanology.

Research Techniques and Expertise

Laboratory techniques
- Experience conducting mechanical deformation experiments.
- Experience measuring rock physical properties (e.g. permeability, porosity).
- Experience with analytical imaging techniques such as scanning electron microscopy.
- Experienced at design, construction, and operation of fluid flow apparatus, including apparatus using gases, aggressive acids, elevated temperatures, and high pressures.
- Experience designing and building data acquisition systems, to allow sensors to communicate with computers.

Fieldwork
- Experience installing monitoring apparatus, including infrasound and seismometer stations, in rugged and remote volcanic environments.
- Experience field-testing gas monitoring systems (including radon, CO_2, and multi-gas apparatus).
- Experience conducting suites of permeability and sample density measurements using field-appropriate methods.

Computer skills
- Numerical modelling in `Python` and `MATLAB`.
- Statistics and data analytics.
- Analysis of satellite-based remote sensing datasets.
- Analysis of large ensemble climate model datasets.
- Open-source plugin development.
- Data visualisation.
- LaTeX and typesetting.

Metrics and Impact

- h-index: 24
- i10-index: 29
- citations: 1905

- My research featured in 90+ news articles in 2020, including *NPR*, *New York Times*, *New Scientist*, and *VICE*. See more via Impactstory: 0000-0003-4933-2607.
- My work on permeability of volcanic material has seen uptake in official policy documentation; for example, multiple of my research articles are cited in Rural Water Supply Network Forum policy documents.
- My research and development of a diamond open access publishing model has provided a blueprint for new open access initiatives across the Earth sciences, including seismology, tectonics, and sedimentology. My publications and outreach efforts have been cited in each case, highlighting the wider community and societal benefit of my open access advocacy and praxis.