JULIE OPPENHEIMER

BSc, MRes, PhD

Date of birth: January 1988
Citizenship: France & USA

CONTACT INFORMATION

201F Seismology
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RESEARCH INTERESTS

I am interested in the eruption dynamics of crystal-rich magmas. My current work focuses on mechanical interactions between bubbles and crystals, and specifically on how these interactions affect outgassing and eruption style. I use analogue experiments to track bubble morphology, bubble coalescence and outgassing paths in three-phase suspensions, which I then relate to case studies in volcanology.

EDUCATION

Sep. 2012 – Jan. 2017	**PhD Geology; Marie Curie ITN fellow (NEMOH)**, University of Bristol, UK Thesis: Gas transport and flow regimes in crystal-bearing magmas. Supervisors: Dr. Alison C. Rust, Pr. Katharine V. Cashman
Oct. 2010 - Jan. 2012	**MRes Science of Natural Hazards**, *with distinction*, University of Bristol, UK Thesis: Reactive transport in magmatic hydrothermal systems: a focus on alteration and porosity variations. Supervisors: Dr. Alison C. Rust, Dr. Fiona Whittaker
Sep. 2006 – Aug. 2009	**BSc Geographical Sciences**, *with distinction*, Université Libre de Bruxelles, BE

RESEARCH EXPERIENCE

Mar. 2017 - present	**Postdoctoral Researcher**, Lamont-Doherty Earth Observatory, Columbia University Development of a new 3D imaging technique for volcanic analogues using Swept Confocally-Aligned Planar Excitation (SCAPE) microscopy.
Jan., Feb., & Aug. 2010	**Research assistant**, Royal Observatory of Belgium (ROB) Historical seismology through damage zonation from insurance data; fieldwork + analyses in electrical tomography and H/V ambient noise measurements; picking.
May, Jun 2010	**Field assistant** for Corentin Caudron and Pr. Alain Bernard (joint ROB and ULB). Assisted a first mission to Indonesia. Water sampling, installing seismic stations, temperature/depth probes, and a weather station.

TEACHING & OUTREACH

2012 - 2014	**Demonstrator (or Teaching Assistant)**, University of Bristol, UK Physics of Volcanoes and Hazardous Flows, GIS and Remote Sensing, Geochemistry.
2012 - 2016	**STEM ambassador and other outreach** Volcanology corner at @Bristol science museum; Marie Curie Open Days (with NEMOH); STEM outreach days in primary schools, etc.

EXTRA TRAINING

2013 – present	NEMOH network schools: **Volcanic Hazards: From Observations to Forecasts** (Nov 2015; Linguaglossa, Italy) **Inverse methods in geophysics and volcanology** (Sep 2014, UCD, Dublin, Ireland)**;** **Forward modelling of volcanic processes** (Sep. 2013; UoB, Bristol, UK)**;** **Introduction to Experimental Volcanology** (Feb 2013; LMU, Munich, Germany)
2013 - present	NEMOH field schools: **Volcano deformation and magmatic processes** (Aug 2014, Iceland)**;** **V. monitoring, surveillance and hazard estimation**, (May 2013, Stromboli, Italy).
Apr. 2014	**Visualisation and quantification of tomographic data using Avizo,** Diamond – Manchester collaboration, Harwell, UK
Mar. 2014	**Wave Propagation and Soil Stiffness: Particle-Continuum Duality**, Faculty of Engineering (UoB), Bristol, UK
Jun. 2013	**Melts Glasses Magmas**, Dept. of Earth and Environmental Sc., LMU, Munich, Germany
Sep. 2012	**Advanced Geology Field Course (Santorini, Greece)**, School of Earth Sciences, UoB, Bristol, UK

ADDITIONAL SKILLS

Languages	French (mother tongue), English (expert user), Dutch (basic skills)
Computational	2D image analysis: Image J, Particle Image Velocimetry software, Adobe (Photoshop, Illustrator, After Effects) 3D image analysis: Avizo, Blob3D, Image J MATLAB ArcGIS, MapInfo OpenOffice, Microsoft Office, (LATEX when necessary)
Lab. experience	Pressure and acoustic data acquisition and processing (in MATLAB) Analogue experiments using Hele-Shaw cells and three-phase suspensions Viscosity measurements with concentric cylinder and parallel plate rheometers Sample preparation and analysis for scanning electron microscope (SEM) X-Ray tomography (using Nikon Custom Bay 320kV)
Community services	In charge of the "Hotstuff" weekly seminar series for volcanology and geophysics (2013-2014, University of Bristol); Member of organizing committees for NEMOH events (Marie Curie Open Days, a network school in Bristol, Sept. 2013) and local events in Bristol (oil/volcanoes analogies workshop (April 2013), postgraduate study group using MOOCs)

AWARDS AND FUNDING

Student Travel Grant to attend the American Geophysical Union Fall Meeting (2016).

Marie Curie ITN fellowship under the programme NEMOH (2012 – 2015) Project title: "Gas transport and flow regimes in crystal-bearing magmas"

Partial funding for X-Ray tomography from the Manchester X-Ray Imaging Facility (MXIF). Project title: "Evidence of gas migration regimes in crystal-rich magmas using bubble morphologies in mafic enclaves"

NEMOH/UCD competition for best outreach talk (Sept. 2014): Runner up.

PUBLICATIONS

Oppenheimer J., Rust A. C., Cashman K. V. and Sandnes B. (2015). Gas migration regimes and outgassing in particle-rich suspensions, *Frontiers in Physics* 3:60. DOI: 10.3389/fphy.2015.00060

Lindoo A., Larsen J. F., Cashman K.V., and Oppenheimer J. (accepted). Crystal-controls on permeability development and degassing in basaltic andesite magma, Geology.

SCIENTIFIC REPORTS

Jasim A., Oppenheimer J., Whitaker F., Rust A.C. (2014). Fluid flow, reactions and distribution of mineralization in magmatic hydrothermal systems: a review. VUELCO Public report, Nov. 2014.

FIRST AUTHORED CONFERENCE CONTRIBUTIONS

Oppenheimer J., Cashman K. V., Rust A. C., Dobson K. J., Bacon C. R., Dingwell D. B. (2016), Contortionist bubbles in andesitic enclaves: implications for gas migration and phase segregation in crystal-rich magmas, *AGU 2017 (Poster)*, San Francisco, USA.

Oppenheimer J., Rust A. C., Cashman K. V., Sandnes B. (2015), Gas transport and flow regimes in crystal-bearing magmas, *NEMOH final conference (Oral)*, Catania, Italy.

Oppenheimer J., Cashman K. V, Rust A. C., Capponi A., Lane S. J., James M. R., Dobson K., Bacon C., Sandnes B. (2015), Gas migration regimes in volcanic case studies, *NEMOH final conference (Poster)*, Catania, Italy.

Oppenheimer J., Capponi A., Cashman K. V., James M. R., Lane S. J., Rust A. C. (2015), Slug flow through a particle-rich plug, an analogue for Stromboli Volcano, Italy, *EGU 2015 (poster)*, Vienna, Austria.

Oppenheimer J., Cashman K.V., Rust A.C., Sandnes B. (2014), How do crystal-rich magmas outgas?, *EGU 2014 (oral)*, Vienna, Austria

Oppenheimer J., Cashman K.V., Rust A., Sandnes B. (2013) Flowers, snowflakes and crystalline magmas: insight into gas migration regimes in crystalline viscous melts, *IAVCEI 2013 Scientific Assembly (poster)*, Kagoshima, Japan

Oppenheimer J., Cashman K.V., Rust A., Sandnes B. (2013), Gas migration regimes in crystalline magmas, *Natural Systems and Processes Poster Session (poster)*, Bristol, UK.

SEMINARS

Oppenheimer J., Emma Liu, Ery Hughes, Katharine V. Cashman, Alison Rust. (2016), 3D imaging in volcanology, University of Bristol workshop: Methods for Visualizing Morphology in 3D, Bristol, UK.

Oppenheimer J., Rust A.C., Cashman K.V., Sandnes B., Dobson K., Bacon C. (2015), Bubble migration through the jamming transition: the effect of crystallinity on bubble shape, outgassing and phase segregation in magmas, *LMU Seminar Series*, Munich, Germany.

Oppenheimer J., Cashman K.V, Rust A.C, Sandnes B. (2014). How do crystal-rich magmas outgas? Insights from analogue experiments, *Bristol-Oxford Volcano Meeting 2014*, Oxford, UK.

REFERENCES

Available upon request.