Laura Calabrò

Curriculum Vitae

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RESEARCH EXPERIENCES

02/09/2024- Prensent	**Post-doc** in Earth Sciences, Consiglio Nazionale delle Ricerche (CNR) - Istituto di Scienza, Tecnologia e Sostenibilità per lo Sviluppo dei Materiali Ceramici (ISSMC) Research Topic: "Nanoscale dynamics of volcanic processes: Experimental insights and numerical simulations of explosive eruptions". Main activities: Understanding the physicochemical dynamics of magma during its ascent in volcanic conduits through petrological tools and numerical modelling.
16/12/2022- 31/08/2021	**Post-doc** in Earth Sciences, Istituto Nazionale di Geofisica e Vulcanologia (INGV) – Sezione di Pisa. Research Topic: "EPOS/KMT project - Numerical simulations of magmatic dynamics of Krafla volcano". Main activities: Evaluate the feasibility of drilling in a magma chamber and fully understand the interaction between water and magma through numerical modelling.
01/10/2021- 31/10/2022	**Tutoring,** Roma Tre University. Grant for tutoring, didactive-integrative activities, preparatory and recovery related to the petrography, paleontology and geology 1 for the academic year 2021/2022.
01/11/2018- 25/03/2022	**Ph.D. Research,** Roma Tre University. Research Topic: **"**Numerical model of pyroclastic density current and probabilistic hazard map**."**
10/01/2018- 10/07/2018	**ANR RiskAdapt Project,** LMV: Laboratoire Magmas et Volcans (France). Research Topic: "Risk-perception on the Aeolian Islands". Main activities: Study of exposure to natural hazards, including the analysis of risk perception through surveys conducted among the population of the Aeolian Islands. Data analysis related to hazards.
25/9/2017- 23/12/2017	**ANR Lava research**, LMV: Laboratoire Magmas et Volcans (France). Research Topic: "Lava-tree interactions for channel-fed 'a'a: Etna's 2002-03 Linguaglossa flow". Main activities: Studying the mechanical, thermal and environmental interactions between lava and forest and laboratory research activities (Scanning Electron Microscopy-SEM; electron microprobe analyse-EMPA; Pycnometer and Permeameter).

23/01/2017-
10/07/2017

ANR Lava research, LMV. Laboratoire Magmas et Volcans (France).

Research Topic: "Lava-tree interactions for channel-fed 'a'a: the case of Kīlauea, Hawaii"

Main activities: Sample preparation for microanalysis with Scanning Electron microscope (SEM) and electron microprobe analyse (EMPA) on experimental and natural products; Texture analysis with CSD-Correction and FOAMS.

EDUCATION AND TRAINING

Ph.D. in Earth Sciences, Roma Tre University

Ph.D. Research Topic: "Fluid dynamics and hazard of pyroclastic currents: from field data to numerical modeling". Tutor: Guido Giordano e Tomaso Esposti Ongaro.

25/03/2022
(Ph.D. Defense)

Main activities: Application of numerical models for the study of fluid dynamics and of the hazard associated with pyroclastic currents. Using Python as a programming language to enhance the numerical models adopted by modifying the code base. Creation of several scripts (both in Python and as Excel macros) to improve data management and analysis.

05/09/2016-
05/12/2016

Erasmus plus at Universitè Blaise Pascal Aubiere, France.

Main activities: Microanalytical study of experimental and natural products (SEM and EMPA); Texture analysis with CSD-Correction (with excel script) and FOAMS program (Matlab-based).

Master degree in "Geological Sciences and Technologies", Pisa University, Italy.

MSc Research Topic:" Codola eruption: preliminary geochemical data". Tutor Giovanni Zanchetta and Roberto Santacroce.
Mark 109/110

10/06/2016

Main activities: Collection and reprocessing of available geochemical and isotopic data. Preparation and analysis of samples from explosive eruptions using: i) X-ray powder diffraction (XRPD), ii) Fourier-transform infrared spectroscopy (FT-IR), iii) mass spectrometry (TIMS); iv) electron microprobe (SEM). Mineralogical and petrological characterization of the various samples collected along the studied stratigraphic sequence.

Bachelor's degree in Analysis and management of natural and anthropic risks – "AGRINA", Messina University, Italy.

BSc. Research Topic: "Volcanological evolution and volcanic risk of the Tenerife Island (Canary Islands)" Tutor: Alessandro Tripodo
Mark 108/110

28/03/2013

Main activities: Collection and processing of geochemical and volcanological data for the creation of risk maps for the Tenerife island.

2010-2011	**Course:** Quality Management. Held by the Faculty of Mathematical, Physical, and Natural Sciences (MM.FF.NN.) at the University of Messina (UNIME) as part of the Excellence in Sciences Program (PES).
2009-2010	**Course:** Risk and Safety in Scientific Laboratories according to current regulations (Legislative Decree 81/08). Held by the Faculty of Mathematical, Physical, and Natural Sciences (MM.FF.NN.) - UNIME within the Excellence in Sciences Program (PES).
2007/2008	Scientific High School Diploma - Experimental Track "National Computer Plan" (PNI); G. Seguenza Scientific High School, Messina (ME).

WORKSHOP AND SEMINARS

03/06/2024 – 06/06/2024	**International school on hot rock avalanches:** Experimental, analytical and numerical approach to volcanic rock failure and deposit-derived PDCs formation
23/07/2023 - 29/07/2023	**International Summer school:** Improve Network School on Mount Etna – Multiparametric volcano monitoring: Data processing, analysis and modelling.
08/06/2022 – 11/06/2022	**Workshop AIV**: Paleomagnetic applications to volcanology: the case study of Lipari and Vulcano (Aeolian Islands – Italy). Held by: Profs. Gianfilippo De Astis, Federico Lucchi, Sara Mana, Fabio Speranza, Claudio Tranne and Elena Zanella.
05/09/2021- 10/09/2021	**Geological FieldTrips –AIV**: Recent eruptive history of Lipari and Vulcano (Lithofacies analysis. Held by: Profs. Federico Lucchi, Gianfilippo De Astis, Eugenio Nicotra and Claudio Tranne.
18/02/2020 - 27/02/2020	**Course:** Introduction to Computational Fluid Dynamics for Earth Sciences. Held by researchers Mattia de' Michieli Vitturi and Tomaso Esposti Ongaro.
19/11/2019 – 12/12/2019	**Course:** Python Basic. Held by prof. Paola Celio and researchers Pietro Corsi and Sergio Lins.
17/10/2019 – 18/10/2019	**Seminar**: Fluid Geochemistry and Environmental Isotopes to investigate geological processes in Latium Region (central Italy). Held by profs. Paola Tuccimei, Luca Pizzino, Carlo Lucchetti.
15/06/2019 - 22/06/2019	**International Summer school:** Working on an active volcano (Stromboli): learning the tools of modern volcanology (Field measurements, instruments, data acquisition and processing).
16/04/2019 – 19/04/2019	**Short Course:** Topics in Magma Rheology, Transport and Volcanic Eruption. Held by prof. J. Kelly Russell

25/03/2019 – 29/03/2019 **Short Course:** MATLAB. Held by researcher Silvia Brizzi.

23/02/2018 - 24/02/2018 **Workshop in Forensic Geology** for the master of "Consulente tecnico in ambito giudiziario"; Held by Dr. Rosa Maria di Maggio.

PERSONAL SKILLS AND COMPETENCES

Languages:

- Mother tongue: Italian

- Other languages:

	Understanding		Speaking		Writing
	Listening	Reading	Spoken interaction	Spoken production	
ENGLISH	B1	B1	B1	B1	B1
FRENCH	B1	A2	B1	A2	A1

Levels:A1/A2 Basic User – B1/B2 Intermediate User – C1/C2: Advanced User
Common European Framework of Reference for Languages

Computer system:

- Windows (Advanced)
- Linux (Advanced)

Coding language:

- Python (Advanced)
- Bash (Intermediate)
- Matlab (Intermediate)
- C++ (Intermediate)
- Actionscript (Basic)
- JAVA Script (Basic)

Software:

- Microsoft office package (Advanced)
- LibreOffice package (Advanced)
- Adobe package (Advanced)
- QGIS (Intermediate)
- Docker (Basic)

Analytical tools and techniques:

- Fieldwork/Sampling experience;
- Physical volcanology: Grain-size analysis; Componentry; Density/vesicularity (construction and operation of Archimedes-based setup);
- He-pycnometer and permeameter (porosity-connectivity of vesicles);
- Thermal Ionization Mass Spectrometry (TIMS) Sr and Nd;
- Fourier Transform Infrared Spectroscopy (FT-IR);
- X-Ray Diffraction (XRD);
- Electron micro probe analyzer (EPMA);
- Scanning electron microscopy (SEM);
- Raman spectroscopy;
- Infrared spectroscopy;
- Remote sensing;
- Monitoring;
- Data acquisition and processing;

PUBLICATION

1. F. Di Fiore, A. Vona, D. Di Genova, A. Pontesilli, **L. Calabrò**, S. Mollo, J. Taddeucci, C. Romano, P. Scarlato. (2024) Magma Titanium and Iron contents dictate crystallization timescales and rheological behaviour in basaltic volcanic system. Communications Earth & Environment. Doi:10.1038/s43247-024-01452-1.

2. A.J.L. Harris, S. Mannini, **L. Calabrò**, S. Calvari, L. Gurioli, M.O. Chevrel, M. Favalli, N. Villeneuve. (2022). Forest destruction by 'a'a lava flow during Etna's 2002-03 eruption: Mechanical, thermal and environmental interactions. Journal of Volcanology and Geothermal Research. DOI: 10.1016/j.jvolgeores.2022.107621.

3. **L. Calabrò**, T. Esposti Ongaro, G. Giordano, and M, de' Michieli Vitturi (2022). Reconstructing pyroclastic currents' source and flow parameters from deposit characteristics and numerical modeling: The Pozzolane Rosse ignimbrite case study (Colli Albani, Italy). Journal of Geophysical Research: Solid). https://doi.org/10.1029/2021JB023637.

4. **L. Calabrò**, A.J.L Harris and J-C Thouret (2020) The newspaper view of the Stromboli 2002-2003 eruption and evacuation: a content analysis to understand framing of risk communication, IJDRR, Journal of Applied Volcanology, 2020, 9(1), 5. https://appliedvolc.biomedcentral.com/articles/10.1186/s13617-020-00094-0.

5. J. Biren, A.J.L. Harris, H. Tuffen, M. O. Chevrel, L. Gurioli, I. Vlastélic, F. Schiavi, M. Benbakkar, C. Fonquernie and **L. Calabrò** (2020) Chemical, textural and thermal approaches on the local interactions between a lava flow and a tree –case study from Pahoa, Hawaii, Frontiers.Front. Earth Sci., 30 June 2020. https://doi.org/10.3389/feart.2020.00233.

6. M.O. Chevrel, A.J. Harris A.Ajas, J. Biren and **L. Calabrò** (2019) Investigating physical and thermal interactions between lava and trees: the case of Kīlauea's July 1974 flow. Bulletin of Volcanology. https://hal.archives-ouvertes.fr/hal-01980212/document.

7. M.O. Chevrel, A.J.L Harris, M.R. James, **L. Calabrò**, L. Gurioli, H. Pinkerton. The viscosity of pahoehoe lava: In situ syneruptive measurements from Kilauea, Hawaii Earth and Planetary Science Letters 493(2018)161–171. https://doi.org/10.1016/j.epsl.2018.04.028.

8. L. Gurioli et al., Les apports d'une vision intégrée des données volcanologiques (DynVolc) Des volcans aux nuages, L'observatoire de physique du globe de Clermont –Ferrand, Volume (Revue D'Auvergne)

CONFERENCE and WORKSHOP

1. Krafla Magma Testbed Symposium Museum Mineralogia, 10-12 April Münich, Germany: 2D Numerical simulations of thermo-fluid dynamics in a magma-borehole system. Poster Presentation: **L. Calabrò,** Deepak Garg and Paolo Papale.

2. BeGeo 2023 - 2nd Conference of Young Geoscientists. Convener at the session BG1: From magma chamber to Earth's surface: eruptive dynamics, emplacement mechanisms, and volcanic hazard.

3. Congresso congiunto SIMP, SGI, SOGEI, AIV: Geoscience paradigm: Resources, Risks and future perspectives. Convener at the session S42: Magma storage, transport, fragmentation, and dynamics of deposition: advances in understanding magmatic processes and eruptive behaviors.

4. AIV-INGV - 5° Conferenza "Rittmann: Reconstructing pyroclastic currents' source and flow parameters from deposit characteristics and numerical modeling: The Pozzolane Rosse ignimbrite case study (Colli Albani, Italy). Oral Presentation. **L. Calabrò,** T. Esposti Ongaro, G. Giordano and M, de' Michieli Vitturi.

5. AIV-INGV - 5° Conferenza "Rittmann: Pyroclastic current probabilistic invasion maps at the Campi Flegrei (Italy): from field data, numerical modeling and statistics of the input parameters. Poster Presentation. **L. Calabrò,** T. Esposti Ongaro and G. Giordano.

6. EGU General Assembly 2022, 23–27 May 2022 Vienna, Austria: Reconstructing pyroclastic currents' source and flow parameters from deposit characteristics and numerical modeling: The Pozzolane Rosse ignimbrite case study (Colli Albani, Italy). Oral Presentation: **L. Calabrò,** T. Esposti Ongaro, G. Giordano and de' Michieli Vitturi, M.

7. COV10, Napoli, Italy: The newspaper view of the Stromboli 2002-2003 eruption and evacuation: a content analysis to understand framing of risk communication. Poster Presentation **L. Calabrò,** A.J.L Harris and J-C Thouret.
8. AIV-INGV - 4° Conferenza "Rittmann: Sedimentation processes in pyroclastic density current through Numerical modelling approach. Poster Presentation. **L. Calabrò,** T. Esposti Ongaro and G Giordano, G.

9. Workshop: Lava, trees, models and newspapers – LMV Clermont-Ferrand, November 15 – 17, 2017. **L. Calabrò**, S. Mannini, A.J.L. Harris et al (2017) *Chemical, texture and thermal approaches on the interactions between a lava flow and a tree – case study from Etna – Preliminary Results*, ANR-LAVA : year .

10. 88° Congress SGI, Naples 2016 M. Piochi, R. Isaia, B. Giaccio, A. Mormone, **L. Calabrò**, C. Moizio, R. Zanchetta and R. Santacroce. The Codola euption in the potassic-rich belt of the Southern Italy: new constraints on the eruptive dynamics and magma evolution.