

## Research interests

**Experimental Petrology and Volcanology:** Focus on high-pressure and high-temperature experiments, magma processes, melt viscosity, and fluid–phase interactions in Earth's crust and mantle.

**Deep Earth Geochemistry:** Study of light elements, redox conditions, and core formation processes in Earth's interior.

## Education and professional experiences

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|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>06.2024 – present</b> | <b>Postdoctoral researcher at</b> University of Camerino, School of Science and Technology, Geology Division.<br><b>Project:</b> Quantifying micro- and nano-crystallization kinetics of magmas: from laboratory and real-time in situ observations to implications on magma fragmentation                                                                                                                                                                                                                                                          |
| <b>12.2022 – 06.2024</b> | <b>Postdoctoral researcher at</b> Centre de Recherches Pétrographiques et Géochimiques (CRPG), CNRS UMR 7358, Université de Lorraine<br><b>Project:</b> An experimental investigation on the petrogenesis of carbonatite magmas                                                                                                                                                                                                                                                                                                                     |
| <b>05.2018 – 11.2022</b> | <b>Ph.D. in Experimental Geoscience:</b> German Japanese collaborative PhD program, International Research and Training Group – IRTG “Deep Earth Volatile Cycles” at the Bayerisches Geoinstitut, University of Bayreuth, Germany<br><b>Thesis:</b> Experimental constraints on the compositions of sulphides and aqueous fluids in the Earth's interior <br>Ph.D. advisory committee: Prof. Daniel J. Frost, PD. Dr. Catherine McCammon and Dr. Andreas Audétat |
| <b>11.2019 – 04.2020</b> | <b>Special Research Student at</b> Tohoku University, Sendai, Japan<br><b>Project:</b> Deuterium content and site occupancy in iron sulphide at high pressure and temperature determined using in situ neutron diffraction measurements.                                                                                                                                                                                                                                                                                                            |
| <b>05.2016 – 04.2018</b> | <b>M.Sc. in Experimental Geosciences</b> at Bayerisches Geoinstitut, University of Bayreuth, Germany<br><b>Thesis:</b> Oxygen content of mantle sulphides<br>Supervisors: Dr. Vera Laurenz, Prof. Daniel Frost                                                                                                                                                                                                                                                                                                                                      |
| <b>03.2014 – 10.2014</b> | <b>Research assistant at</b> Department of Geology, University of Peradeniya, Sri Lanka<br><b>Project:</b> Quantification of groundwater–seawater interaction in a coastal sandy aquifer system: a study from Panama, Sri Lanka.                                                                                                                                                                                                                                                                                                                    |
| <b>11.2013 – 02.2014</b> | <b>Visiting research student at</b> National Institute of Advanced Industrial Science and Technology (AIST) in Tsukuba, Japan                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>06.2012 – 10.2013</b> | <b>Research assistant at</b> Ecological Association of Sri Lanka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

**07.2008 – 01.2013**      **B.Sc.** Bachelor of Science in Geology, University of Peradeniya, Sri Lanka  
**Thesis:** Effect of forest management on soil carbon sequestration – a study from the Maragamuwa biodiversity conservation site at Naula, Sri Lanka

## Skills

### Experimental techniques

Multi-anvil apparatus, Piston-cylinder apparatus, Cold seal pressure vessel (CSPV) Titanium Zirconium Molybdenum (TZM) pressure vessel, Gas mixing furnace, Paris-Edinburgh cell: *in situ* synchrotron experiments

### Analytical techniques

Electron Probe Micro Analysis (EPMA), Scanning Electron Microscope (SEM), Laser Ablation ICP-MS, Raman Spectroscopy, Thermal Analysis: Conventional and Flash Differential scanning calorimetry (DSC, F-DSC), Thermogravimetry (TGA), Thermomechanical (TMA) analysis, High-pressure and high-temperature *in situ* Neutron diffraction, Powder X-ray diffraction, Mössbauer Spectroscopy, Tomography techniques (Synchrotron and laboratory CT)

### Synchrotron sessions participated

|                             |               |                        |
|-----------------------------|---------------|------------------------|
| ESRF-ID18 (ES-884)          | 07-11/12/2018 | PI: Luca Ziberna       |
| Spring8-BL35XU (2019B1323)  | 20-25/01/2020 | PI: Eiji Ohtani        |
| Spring8- BL10XU (2019B1323) | 03-05/01/2020 | PI: Eiji Ohtani        |
| J-PARC (PLANET)             | 09-15/03/2020 | PI: Dan Frost          |
| SOLEIL (PSICHE)             | 23-28/10/2024 | PI: Serena Dominijanni |
| ESRF-ID27 (ES-1631)         | 24-28/04/2025 | PI: Serena Dominijanni |
| ESRF-BM18 (ES-1647)         | 10-14/07/2025 | PI: Fabio Arzilli      |

## Prizes

### PhD Thesis Prize – “Miglior Tesi di Dottorato 2024”

Awarded on September 4, 2024, at the General Assembly of the SIMP (Italian Society of Mineralogy and Petrology) Congress, Bari, Italy [🔗](#)

## Publications

D. Di Genova, G. Giuliani, **S. Abeykoon**, K. Dadwal, S. Sharma, A. Khanna, A. Zandoná, D. Bondar, S. Meyer, J. Deubener (2025). Intralaboratory calibration of the DSC shift-factor approach for melt viscosity determination: A case study on lead metasilicate glass. *Accepted - Journal of Non-Crystalline Solids* [🔗](#)

E. Fanesi, D. Di Genova, P. Valdivia, D. Bondar, S. Dominijanni, **S. Abeykoon**, G. Giuliani, A. Kurnosov, G. Giordano, M. Cassetta, A. Vona, C. Romano, F. Arzilli (2025). A review of the differential scanning calorimetry shift-factor approach: Application to Colli Albani melt viscosity and implications for mafic Plinian eruptions. *Journal of Volcanology and Geothermal Research*, 108276 [🔗](#)

- S. Abeykoon**, C. Howard, S. Dominijanni, L. Eberhard, A. Kurnosov, D. J. Frost, T. Boffa Ballaran, H. Terasaki, T. Sakamaki, A. Suzuki, E. Ohtani, A. Sano-Furukawa, J. Abe (2023). Deuterium content and site occupancy in iron sulphide at high pressure and temperature determined using in situ neutron diffraction measurements. *Journal of Geophysical Research: Solid Earth*, 128, e2023JB026710 [🔗](#)
- S. Abeykoon**, V. Laurenzi, D. J. Frost, N. Miyajima, C. McCammon, (2023) An experimental investigation of factors controlling the oxygen content of sulphide melts in the Earth's upper mantle. *Contrib Mineral Petrol* 178, 13 [🔗](#)
- S. Abeykoon**, A. Audétat, (2022), The single-crystal diamond trap (SCDT): a new method to determine the composition of high-P–T fluids. *Contrib Mineral Petrol* 177, 24 [🔗](#)
- I. Blanchard, **S. Abeykoon**, D. J. Frost, D. C. Rubie, (2021), Sulfur content at sulfide saturation of peridotite melt at upper mantle conditions, *American Mineralogist* (2021) 106 (11) [🔗](#)
- N. Miyajima, Y. Li, **S. Abeykoon** and F. Heidelbach (2018), Electron channelling contrast imaging of individual dislocations in geological materials using a field emission scanning electron microscope equipped with an EBSD system, *European Journal of Mineralogy* (2018) 30 (1): 5–15 [🔗](#)
- D. I. Joshua, **S. Abeykoon**, I. Watanabe; L. Paszek; K. Balakrishna; M. Akiba; K. S. Guruge (2018), Seasonal movement of trace-element discharge in a typical south-Indian suburban community, *Water Sci Technol* (2018) 77 (4): 1035–1047 [🔗](#)
- K. S. Guruge, P. Goswami, I. Watanabe, **S. Abeykoon**, V. P. Prabhasankar, K. R. Binu, D. I. Joshua, K. Balakrishna, M. Akiba & N. Munuswamy (2017), Trace element distribution and risk assessment in South Indian surface waterways. *Int. J. Environ. Sci. Technol.* 14, 1–18 [🔗](#)
- S. Diyabalanage, **S. Abeykoon**, I. Watanabe, C. Watai, Y. Ono, S. Wijesekara, K. S. Guruge & R. Chandrajith (2016), Has irrigated water from Mahaweli River contributed to the kidney disease of uncertain etiology in the dry zone of Sri Lanka? *Environ Geochem Health* 38, 679–690 [🔗](#)
- R. Chandrajith, D. Chaturangani, **S. Abeykoon**, J. A. C. Barth, R. van Geldern, E. Edirisinghe, C. B. Dissanayake (2014), Quantification of groundwater–seawater interaction in a coastal sandy aquifer system: a study from Panama, Sri Lanka. *Environ Earth Sci* 72, 867–877 (2014) [🔗](#)

## **Publications: submitted and in preparation**

- G. Giuliani, L. Calabró, V. Stopponi, D. Bondar, **S. Abeykoon**, D. B. Dingwell, C. Romano, D. Di Genova (2025). Aluminium control on viscosity and structure of haplogranitic melts: Implications for rhyolitic melt viscosity and its determination. *Submitted to Chemical Geology*
- V. Stopponi, G. Giuliani, L. Calabró, D. Bondar, **S. Abeykoon**, D. B. Dingwell, C. Romano, D. Di Genova (2025). Na<sub>2</sub>O-induced structural evolution in haplogranitic melts: Insights from Raman spectroscopy, differential scanning calorimetry and viscosity measurements. *Submitted to Chemical Geology*
- S. Abeykoon**, L. France, P. Condamine, C. Dalou and M. C. Caumon. Direct experimental evidence for the onset of Ca-carbonatite immiscibility by protracted differentiation of primitive silicate magma, *in preparation*

**S. Abeykoon**, D. Di Genova, E. Bamber, L. Calabro, D. Bondar, P. Valdivia-Munoz, M. Carroll, and F. Arzilli. Melt structure and viscosity of hydrous Trachyte: Insights from Agnano–Monte Spina, Campi Flegrei, *in preparation*

B. Bonechi<sup>1</sup>, F. Arzilli, M. Polacci, A. Fabbrizio, G. La Spina, E. Michailidou, E. Biagioli, R. A. Brooker, J. L. Hazemann, R. C. Atwood, D. di Genova, **S. Abeykoon**, D. A. Neave<sup>1</sup>, R. R. Almeev, M. Burton. The role of superheating on clinopyroxene nucleation delays in mafic magmas: implications for pre-eruptive crystal content and magma ascent dynamics, *in preparation*

E. Califano, S. Mollo, M. Brenna, A. Pontesilli, J. Wu, P. Marks, D. Eul, M. Nowak, S. Cronin, F. Di Fiore, A. Vona, **S. Abeykoon**, D. Di Genova, C. Romano, P. Scarlato. Experimental and thermodynamic constraints on the magmatic variables governing pre-eruptive conditions at Hunga volcano, *in preparation*

L. Calabrò, S. Dominijanni<sup>1</sup>, E. C. Bamber, V. Stopponi, G. Giuliani, A. Scarani, **S. Abeykoon**, A. Zandonà, F. Arzilli, P. Valdivia, D. Bondar, A. Longo, D. Di Genova. Nanocrystallization dynamics in depolymerized alkaline melts using Small-Angle X-ray Scattering (SAXS) and Wide-Angle X-ray Scattering (WAXS) measurements, *in preparation*

## Conferences and workshops

**XIX International Symposium on Experimental Mineralogy, Petrology and Geochemistry** in Orléans, France (16-19 June 2025)

Poster presentation: Investigating the melt structure and viscosity of the Agnano–Monte Spina trachyte, Campi Flegrei caldera, Italy.

**S. Abeykoon**, D. Di Genova, E. Bamber, L. Calabro, D. Bondar, P. Valdivia-Munoz, M. Carroll, and F. Arzilli

Poster presentation: Trace element partitioning along the liquid lines of descent of Mg-nephelinite and melilitite.

S. Lambart, L. France, **S. Abeykoon**, C. Dalou

**6a Conferenza Alfred Rittmann** in Catania, Italy (18-20 September 2024)

**EGU24 General Assembly** in Vienna, Austria (14 - 19 April 2024)

Poster presentation: Fractional crystallization of melilitite and Mg-nephelinite at 1 GPa: An experimental study on the petrogenesis of phonolite and related immiscible carbonatite magmas.

**S. Abeykoon**, L. France, P. Condamine, and C. Dalou

**XVIII International Symposium on Experimental Mineralogy, Petrology and Geochemistry** in Milan, (12-15 June 2023)

Poster presentation: Fractional crystallization of melilitite and Mg-nephelinite at 1 GPa: An experimental study on the petrogenesis of carbonatite magmas.

**S. Abeykoon**, P. Condamine, L. France, C. Dalou

**International School "Understanding Oxygen Fugacity in Geoscience"** in Trieste, Italy (5 - 9 September 2022)

**Goldschmidt 2021** in Lyon, France, online meeting (04<sup>th</sup> - 9<sup>th</sup> of July 2021)

Oral presentation: Deuterium content and site occupancy in iron sulphide at high pressure and high temperature; Implications for the oxidation of early Earth's mantle.

**S. Abeykoon**, C. Howard, S. Dominijanni, L. Eberhard, D. J. Frost, T. Boffa Ballaran, A. Kurnosov, H. Terasaki, T. Sakamaki, A. Suzuki, E. Ohtani, A. Sano-Furukawa, J. Ab

**EGU General Assembly 2020** – online meeting (04 - 08 of May 2020)

Oral presentation: The oxygen content of sulphide inclusions in diamond and its use as a mantle geothermometer.

**S. Abeykoon**, D. J. Frost, V. Laurenz and N. Miyajima

**GeoMünster 2019** in Münster University, Germany (22 - 25 of September 2019)

Oral presentation: A new geothermometer based on the oxygen content of sulphide inclusions in diamond.

**S. Abeykoon**, A. Rebaza, D. J. Frost, V. Laurenz and N. Miyajima

**Goldschmidt 2019** in Barcelona, Spain (18 - 23 of August 2019)

Oral presentation: A new geothermometer based on the oxygen content of sulphide inclusions in diamond.

**S. Abeykoon**, D. J. Frost, V. Laurenz and N. Miyajima

**International Workshop on Deep Volatile Cycling in the Earth** in Tokyo, Japan (31<sup>st</sup> of May-1<sup>st</sup> of June 2019)

Oral presentation: Single-crystal diamond trap (SCDT) method to determine the composition of fluids at high temperature and high pressure.

**S. Abeykoon** and A. Audétat

**Japan Geoscience Union Meeting (JpGU) 2019** in Chiba, Japan (24 - 28 of May 2019)

Poster presentation: Oxygen content of mantle sulphides as a new geothermometer.

**S. Abeykoon**, D. J. Frost, V. Laurenz and N. Miyajima

**Goldschmidt 2017** in Paris, France (13 -18 of August 2017)

Poster presentation: Sulfide–silicate partitioning of moderately siderophile elements at high *P-T*.

**S. Abeykoon**, V. Laurenz, D. J. Frost, D. C. Rubie and A. K. Vogel

**International interdisciplinary workshop** on: "Accretion, differentiation and early evolution of the terrestrial planets" in Nice, France (29 May – 3 June of 2017)

Abstract title: The effect of sulfur on the behaviour of moderately siderophile elements during core formation.

V. Laurenz, **S. Abeykoon**, A. K. Vogel, D. C. Rubie and D. J. Frost

**GeoBremen 2017** – Joint Meeting of DGGV and DMG on “The System Earth and its Materials from Seafloor to Summit” in Bremen, Germany (24 – 29 of September 2017)

Abstract title: The effect of sulfur on the partitioning behaviour of moderately siderophile elements.

V. Laurenz, **S. Abeykoon**, A. K. Vogel, D. C. Rubie and D. J. Frost