

Sumith Abeykoon (Ph.D.)

RESEARCH INTERESTS

- High-pressure and high-temperature experimental petrology
- Volcanology: differentiation processes of magma
- Properties of fluids and accessory phases in the Earth's crust and mantle
- Behaviour of light elements in the Earth's interior
- Oxidation state of the Earth's mantle
- Earth's core formation

EDUCATION AND PROFESSIONAL EXPERIENCES

- **Postdoctoral researcher at** Centre de Recherches Pétrographiques et Géochimiques (CRPG), CNRS UMR 7358, Université de Lorraine (12.2022 – present)
Project: An experimental investigation on the petrogenesis of carbonatite magmas
- **Ph.D. (05.2018 – 11.2022):** German–Japanese collaborative PhD program, International Research and Training Group – IRTG “Deep Earth Volatile Cycles” Bayerisches Geoinstitut, University of Bayreuth, Germany
Thesis: Experimental constraints on the compositions of sulphides and aqueous fluids in the Earth's interior
Ph.D. advisory committee: Prof. Daniel J. Frost, PD. Dr. Catherine McCammon and Dr. Andreas Audétat
- **Special Research Student at** Tohoku University, Sendai, Japan (11.2019 – 04.2020)
Project: Deuterium content and site occupancy in iron sulphide at high pressure and temperature determined using in situ neutron diffraction measurements.
- **M.Sc. (05.2016 – 04.2018):** Master of Science in Experimental Geosciences Bayerisches Geoinstitut, University of Bayreuth, Germany
Master's thesis: Oxygen content of mantle sulphides
Supervisors: Dr. Vera Laurenz, Prof. Daniel Frost
- **Research assistant at** Department of Geology, University of Peradeniya, Sri Lanka (03.2014 –10.2014)
Project: Quantification of groundwater–seawater interaction in a coastal sandy aquifer system: a study from Panama, Sri Lanka.
- **Visiting researcher at** National Institute of Advanced Industrial Science and Technology (AIST) in Tsukuba, Japan (11. 2013 – 02. 2014)
- **Research assistant at** Ecological Association of Sri Lanka (06.2012 – 10.2013)
- **B.Sc. (07.2008 – 01.2013):** 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

Supervisor: Prof. Rohana Chandrajith

SKILLS

- Experimental techniques
 - Multi-anvil apparatus
 - Piston-cylinder apparatus
 - Gas mixing furnace
- Analytical techniques
 - Electron Probe Micro Analysis (EPMA)
 - Scanning Electron Microscope (SEM)
 - Laser Ablation ICP-MS
 - Raman Spectroscopy
 - High-pressure and high-temperature *in situ* Neutron diffraction
 - Powder X-ray diffraction
 - Mössbauer Spectroscopy

PUBLICATIONS

- **Sumith Abeykoon**, Christopher Howard, Serena Dominijanni, Lisa Eberhard, Alexander Kurnosov, Daniel J. Frost, Tiziana Boffa Ballaran, Hidenori Terasaki, Tatsuya Sakamaki, Akio Suzuki, Eiji Ohtani, Asami Sano-Furukawa, Jun 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, <https://doi.org/10.1029/2023JB026710>
- **Sumith Abeykoon**, Vera Laurenz1, Daniel J. Frost, Nobuyoshi Miyajima, Catherine 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, <https://doi.org/10.1007/s00410-023-01992-3>
- **Sumith Abeykoon**, Andreas 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, <https://doi.org/10.1007/s00410-021-01882-6>
- Ingrid Blanchard, **Sumith Abeykoon**, Daniel J. Frost, Dave C. Rubie, (2021), Sulfur content at sulfide saturation of peridotite melt at upper mantle conditions, *American Mineralogist* (2021) 106 (11): 1835–1843, <https://doi.org/10.2138/am-2021-7649>
- Nobuyoshi Miyajima, Yang Li, **Sumith Abeykoon** and Florian 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,

<https://doi.org/10.1127/ejm/2017/0029-2683>

- Derrick Ian Joshua, **Sumith Abeykoon**, Izumi Watanabe; Lucyna Paszek; Keshava Balakrishna; Masato Akiba; Keerthi Siri Guruge (2018), Seasonal movement of trace-element discharge in a typical south-Indian suburban community, *Water Sci Technol* (2018) 77 (4): 1035–1047, <https://doi.org/10.2166/wst.2017.618>
- 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, <https://doi.org/10.1007/s13762-016-1129-6>
- Saranga Diyabalanage, **Sumith Abekoon**, Izumi Watanabe, Chie Watai, Yuko Ono, Saman Wijesekara, Keerthi S. Guruge & Rohana 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, <https://doi.org/10.1007/s10653-015-9749-1>
- Rohana Chandrajith, Dinusha Chaturangani, **Sumith Abeykoon**, Johannes AC Barth, Robert van Geldern, EANV Edirisinghe, Chandra 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), <https://doi.org/10.1007/s12665-013-3010-y>

CONFERENCES AND WORKSHOPS

- **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
Sumith Abeykoon, Pierre Condamine, Lydéric France, Célia Dalou
- **International School "Understanding Oxygen Fugacity in Geoscience"** in Trieste, Italy (5 - 9 September 2022)
- **Goldschmidt 2021** (Lyon, France), online meeting (04th - 9th 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.
Sumith Abeykoon, Christopher Howard, Serena Dominijanni, Lisa Eberhard, Daniel Frost, Tiziana Boffa Ballaran, Alexander Kurnosov, Hidenori Terasaki, Tatsuya Sakamaki, Akio Suzuki, Eiji Ohtani, Asami Sano-Furukawa, Jun Abe
- **EGU General Assembly 2020** – Zoom meeting (04 - 8 of May 2020)
Oral presentation: The oxygen content of sulphide inclusions in diamond and its use as a mantle geothermometer. **Sumith Abeykoon**, Daniel J. Frost, Vera Laurenz and Nobuyoshi 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. **Sumith Abeykoon**, Anna Rebaza, Daniel J. Frost, Vera Laurenz and Nobuyoshi 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. **Sumith Abeykoon**, Daniel J. Frost, Vera Laurenz and Nobuyoshi Miyajima
- **International Workshop on Deep Volatile Cycling in the Earth** in Tokyo, Japan (31st of May - 1st of June 2019)
Oral presentation: Single-crystal diamond trap (SCDT) method to determine the composition of fluids at high temperature and high pressure. **Sumith Abeykoon** and Andreas 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. **Sumith Abeykoon**, Daniel J. Frost, Vera Laurenz and Nobuyoshi 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, Vera Laurenz, **Sumith Abeykoon**, Antje K. Vogel, David C. Rubie and Daniel 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, Vera Laurenz, **Sumith Abeykoon**, Antje K. Vogel, David C. Rubie and Daniel J. Frost