

Swetha Venugopal

PhD / Doctorante

Centre for Natural Hazards Research, Simon Fraser University, Canada

Laboratoire Magmas et Volcans, Université Clermont-Auvergne, France

Email: swethav@sfu.ca Phone: 778-347-9143

Citizenship: Canadian

Languages spoken: English. Working knowledge of French & Tamil.

Personal webpage: vforvolcano.com

Education

2019 Ph.D. in Volcanology & Geochemistry.

Joint degree between Simon Fraser University (SFU) and the Laboratoire Magma et Volcans (LMV), Université Clermont Auvergne.

Thesis title Magmatic sources to volcanic gas emissions: insight from the Garibaldi Volcanic Belt, western Canada.

Supervisors: Dr. Séverine Moune (OVSG-LMV), Dr. Tim Druitt (LMV) & Dr. Glyn Williams-Jones (SFU)

Successfully defended October 18, 2019.

2015 M.Sc. in Volcanology (M2 Recherche)

Laboratoire Magma et Volcans, Université Blaise Pascal.

Ranked 2nd out of 15.

Thesis title Magma mixing and subsurface connections evidenced by olivine- and pyroxene-hosted melt inclusions from Cerro Negro volcano and the Las Pilas – El Hoyo Complex (Nicaragua).

Supervisors: Dr. Séverine Moune & Dr. Glyn Williams-Jones

2014 B.Sc. Hons in Geology (Specialised in Geoscience & Mineral Exploration), Simon Fraser University (SFU)

Areas of specialization

Volcanology, geochemistry, gas geochemistry, petrology, mineral exploration

Work & Research experience

Present Sessional Lecturer. Introduction to Geochemistry (EASC 208). Simon Fraser University.

Present Mineral Processing Research Scientist and Project Manager. EcoMine Technologies, Vancouver.

Present Community Outreach Scientist and Natural Hazards Leader. Telus World of Science, Vancouver.

- 2015 Geophysical Field Assistant: Microgravity and Bouger surveys. Laguna del Maule, Chile.
- 2015 Graduate Research Assistant. Melt inclusion sample preparation. LMV.
- 2013 Undergraduate Research Assistant. Melt inclusion sample preparation. SFU
- 2013 NSERC Research Associate. 3D oil and gas reservoir modeling of Vancouver, BC. SFU
- 2012 Field and Research Assistant. Groundwater and biomass sampling. Department of Agriculture, Government of Canada, Manitoba.

Awards and Grants

- 2019 Conference Travel Grant. Awarded by the International Union of Geodesy and Geophysics.
- 2017 Mobility Grant. Awarded by Université Clermont-Auvergne. (\$1000 CDN)
- 2016 Graduate Student Travel Grant. Etna International Training School of Geochemistry. Awarded by INGV Catania. (\$1000 CDN)
- 2015 Student Travel Grant Recipient. Awarded by American Geophysical Union. (\$1000 CDN)
- 2013 Excellence in studies. Awarded by the Canadian Institute of Mining, Vancouver. (\$1000 CDN)
- 2013 Excellence in studies. Awarded by the Greater Vancouver Mining Women's Association. (\$500 CDN)

Fellowships

- 2015 Research Partnership Fellowship. Awarded by SFU. (\$103,000 CDN)

Student Supervision

Present Co-supervisor for an Honors student (Jugraj Aulakh Singh) at Simon Fraser University.

Honors project title: Magmatic conditions of the 2360 B.P. Mount Meager eruption revealed by quartz- and pyroxene-hosted melt inclusions.

Publication & talks

Published

Venugopal, S., Moune, S., Williams-Jones, G., Druitt, T., Vigouroux, N., Wilson, A., Russell, J. K. 2019. Two distinct mantle sources beneath the Garibaldi Volcanic Belt: insight from olivine-hosted melt inclusions. *Chem. Geol.* doi: 10.1016/j.chemgeo.2019.119346

Tamburello, G., Moune, S., Allard, P., **Venugopal, S.**, et al. 2019. Spatio-temporal relationships between fumarolic activity, hydrothermal fluid circulation and

geophysical signals at an arc volcano in degassing unrest: La Soufrière of Guadeloupe (French West Indies). *Geosciences*. doi: 10.3390/geosciences9110480

Venugopal, S., Moune, S., Williams-Jones, G. 2016. Investigating the subsurface connection between Cerro Negro volcano and the El Hoyo Complex, Nicaragua. *J. Volcanol. Geotherm. Res.* 325, 211-224. doi: 10.1016/j.jvolgeores.2016.06.001.

Accepted or Submitted

Venugopal, S., Schiavi, F., Bolfan-Casanova, N., Moune, S. 2019. Melt inclusion vapor bubbles: the hidden reservoir for major, trace and volatile elements. Submitted.

Gaborieau, M., Laubier, M., Bolfan-Casanova, N., McCammon, C., Vantelon, D., Chumakov, A., Schiavi, F., Neuville, D., and **Venugopal, S.** 2019. Fe³⁺/ΣFe of olivine-hosted melt inclusions inferred from Mössbauer and XANES spectroscopy. *Chem. Geol.* Submitted.

In prep

Venugopal, S., Williams-Jones, G., Moune, S., Druitt, T., Vigouroux, N. Gas emissions and magma source of the Mount Meager Volcanic Complex, western Canada. *J. Volcanol. Geotherm. Res.*, In prep.

Conferences & Meetings

- 1) **Venugopal, S.**, Venugopal, S., Schiavi, F., Bolfan-Casanova, N., Moune, S., Williams-Jones, G., and Druitt, T. 2019. The behaviour of C- and S- bearing species in shrinkage bubbles before and after melt inclusion homogenisation: insight from Raman spectroscopy. IUGG, Montreal, Canada, [Talk](#).
- 2) **Venugopal, S.**, Moune, S., Williams-Jones, G., Wilson, A., Druitt, T. & Russell, J.K. 2018. Along arc variations in magma source beneath the Garibaldi Volcanic Belt. EGU General Assembly, Vienna, Austria, [Talk](#).
- 3) Roberti, G., van Wyk de Vries, B., Ward, B., Le Corvec, N., Williams-Jones, G., Clague, J.J., Falorni, G., Menounos, B., Friele, P., Perotti, G., Giardino, M., Baldeon, G. & **Venugopal, S.** 2018. Hazards posed by large mass movements at Mount Meager volcano, Canada. EGU General Assembly, Vienna, Austria, [Talk](#).
- 4) Roberti, G., Le Corvec, N., van Wyk de Vries, B., Ward, B.C., **Venugopal, S.**, Williams-Jones, G., Clague, J.J., Friele, P., Falorni, G., Baldeon, G., Perotti, G., Giardino, M., & Menounos, B. 2018. Can large landslides trigger volcanic eruptions? Insights from Mount Meager, British Columbia. EGU General Assembly, Vienna, Austria, [Poster](#).
- 5) **Venugopal, S.**, Schiavi, F., Bolfan-Casanova, N., Moune, S. 2018. The behaviour of C- and S- bearing species in shrinkage bubbles before and after melt inclusion homogenisation: insight from Raman spectroscopy. International Symposium on

Experimental Mineralogy, Petrology and Geochemistry (EMPG). Clermont-Ferrand, France. Poster.

- 6) **Venugopal, S.**, Moune, S., Williams-Jones, G., Wilson, A. & Russell, J.K. 2017. Gas emissions and magma source of the Mount Meager Volcanic Complex, Garibaldi Volcanic Belt, BC. IAVCEI, Portland, USA, Talk.
- 7) **Venugopal, S.**, Moune, S. & Williams-Jones, G. 2015. Subsurface Connections and Magma Mixing as revealed by Olivine- and Pyroxene-Hosted Melt Inclusions from Cerro Negro Volcano and the Las Pilas-El Hoyo Complex, Nicaragua. EOS. Trans. AGU, Fall Meet. Suppl., Poster.

Professional Development

2018 European Geophysical Union (EGU). Vienna, Austria. April 8 – 13 2018. **Co-convenor** of PICO session entitled “Arctic, Antarctic and other glaciated terranes volcanism - magmatic, tectonic, geomorphic and climatic implications.”

Workshops

- 2016** Etna International Training School of Geochemistry, Catania, Italy. August 2016.
- Courses and field training concerning various gas sampling techniques, both direct and indirect.
- 2015** MeMoVolc Summer School: “Magma from crustal storage to eruption triggering” Santorini, Greece. October 2015.
- Courses concerning insight into magma storage conditions, crystal mush and conduit dynamics.

Outreach

- Present** Community Outreach Scientist at Telus World of Science. As a volunteer scientist, I create and deliver programs, exhibits and activities for children and students of all ages. I specifically design programs concerning natural hazards, with an emphasis on the hazards we face in the Pacific Northwest, such as earthquakes, tsunamis and landslides. My role is to engage students in the natural sciences using interactive activities and visual media.
- 2017 – 2018** EnviroPot: An environmental seminar series. Along with a fellow PhD student, I began a seminar series at Laboratoire Magmas et Volcans to spread awareness about environmental issues. We have presented various seminars, including one entitled Plastic Earth, where we focused on reducing our dependency on plastic. We also requested and gained screening rights to play a documentary entitled “Plastic Oceans”. This seminar series continues today, with each session focused on the actions researchers can take to reduce waste and plastic use in science.

Technical skills

Proficient in the following analytical instruments and software:

- MultiGAS and Giggenbach bottle sampling
- Electron Microprobe
- Neptune LA-ICPMS
- Secondary Ion Mass Spectrometer
- Raman Spectrometer
- Re-heating and homogenization experiments
- R geochemical modelling
- SolEx
- MagmaSat
- alphaMELTS and Petrolog
- Adobe Illustrator
- Microsoft Office

Fieldwork

- 2018** **Soufriere Springs, Saint Lucia.**
Measured the volcanic gases of the fumarole fields using: filter packs, active alkaline traps, MultiGAS and Giggenbach bottles. Rock sampling.
- 2017** **Garibaldi Volcanic Belt, British Columbia, Canada.**
Rock sampling within the volcanic complexes of Mount Meager, Mount Cayley and Mount Garibaldi.
- 2016** **Mount Etna, Italy.**
Learned and tested new gas sampling techniques on the summit of Mount Etna. Techniques included: SO₂ camera, MultiGAS, filter packs and Giggenbach bottles.
- 2016** **La Soufriere, Guadeloupe.**
Valley of Desolation and Boiling Lake, Dominica.
Measured the volcanic gases atop the summit of La Soufriere using MultiGAS.
Conducted one of the first MultiGAS traverses of the Valley of Desolation.
Measured the SO₂ flux of the Boiling Lake.
Rock sampling across both islands.
- 2016** **Laguna del Maule, Chile.**
Assisted with Microgravity, Bouger anomaly and magnetic surveys across the volcanic field and caldera.
- 2014** **Cerro Negro and the El Hoyo Complex, Nicaragua.**
Rock sampling across the lava fields of Cerro Negro and Las Pilas.

References

Timothy Druitt
Professor
Laboratoire Magmas et Volcans (LMV)
PhD Supervisor
tim.druitt@uca.fr

Severine Moune
Physicien-Adjoint
Institute de Physique du Globe de Paris (IPGP) and Observatoire volcanologique et
sismologique de la Guadeloupe (OVSG)
PhD Supervisor
moune@ipgp.fr

Glyn Williams-Jones
Professor
Simon Fraser University (SFU)
PhD Supervisor
glynwj@sfu.ca