

## OCGC Seminar

# Enigmatic archives of magmatic processes: Decoding mineral zoning and melt inclusions with Fe-Mg isotopes

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Carleton University  
Herzberg Laboratories  
Room 3120

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Herzberg Laboratories  
Chambre 3120 HP

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<https://carleton-ca.zoom.us/j/99572079915?pwd=SmxpL1UvQRWSy9KOGdyOW1tVWlydz09>

**Abstract:** Mineral zoning and melt inclusions reveal the inner workings of volcanoes. For example, mineral zoning may be used to infer the timescales of magmatic processes. Melt inclusions, on the other hand, may record primary melt compositions and depths of entrapment. Though potentially valuable, interpreting these magmatic archives is far from straightforward. Similar patterns of mineral zoning can result from crystal growth or chemical diffusion. Melt inclusions may incorporate disequilibrium compositions arising from boundary layer formation. I will demonstrate how stable isotopes can reveal the nature of these magmatic archives, allowing appropriate crystals and melt inclusions to be identified for diffusion chronometry and geobarometry studies. Stable isotopes are powerful discriminators of equilibrium versus kinetic processes, adding a dimension to petrologic studies that yields conclusive interpretations.

**Speaker Bio:** Dr. Corliss Kin I Sio is a geochemist working at the intersection of isotope geochemistry and experimental petrology with interests in the formation and evolution of magmatic systems on Earth and other planetary bodies. Dr. Sio completed a PhD in 2014 at the University of Chicago, and then held positions at the Carnegie Geophysical Lab and Lawrence Livermore National Laboratory, USA. Dr. Sio is now an Assistant Professor at the University of Toronto, building a mass spectrometry facility to continue research in non-traditional stable isotopes.

For further information, and to arrange to meet the speaker, please contact Lyle Nelson (Lyle.Nelson@carleton.ca)

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