

## OCGC Seminar

# Geochemistry of Large Igneous Provinces

**Dr. Julian Pearce**

Cardiff University, UK

**Thursday, March 14<sup>th</sup>, 2019 11:30 AM**

**Carleton University**

**Department of Earth Sciences**

**3120 Herzberg Laboratories**

**Jeudi le 14 mars 2019, 11h30**

**Carleton University**

**Département des sciences de la terre**

**3120 Herzberg Laboratories**

Julian is visiting Carleton University to complete a publication on LIP-printing in collaboration with Richard Ernst and Chris Rogers. In this talk he will summarize the principles of LIP-printing (the geochemical fingerprinting of LIPs) and demonstrate some of its applications.

The concept of LIP printing emerged from the development of his published methods of geochemical fingerprinting of volcanic rocks. The principal LIP-printing diagram uses two magma genesis proxies: Th/Nb (a proxy for crustal input) and Ti/Yb a proxy for residual garnet). Usefully for LIP printing, a plot of Th/Nb v Ti/Yb separates the two principal potential magma sources: sub-continental lithospheric mantle (SCLM) and the plume, or mantle asthenosphere, while also providing information on melt-crust interaction and degree of plume melting. As with forensic (crime-scene) lip-printing, it turns out that no two LIP-prints are alike and that LIP-prints therefore have potential applications that include the cross-correlation of dyke swarms, the tracing of plume evolution and the interpretation of ore-productive magmatic units. To illustrate this talk, Julian has chosen examples of LIPs related to Proterozoic dyke swarms from the Superior craton, the Bushveld plume and terranes related to Atlantic opening (NAIP, CAMP and Parana-Etendeka), and he will also use the Turkey-Iran post-orogenic-terrane to demonstrate how LIP-printing methodologies can help track the evolution of orogenic belts from the final stages of subduction through post-collision delamination to orogenic collapse.

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