

SEMINAR

DEPARTMENT OF EARTH SCIENCES

DALHOUSIE UNIVERSITY

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Natural Resources Canada**

**“A Petrochronological Approach for the Detrital Record:
Tracking mm-sized Eclogite Clasts in the Northern Canadian Cordillera”**

Thursday, February 1, 2018

11:30 a.m.

**Milligan Room, 8th Floor Biology-Earth Sciences Wing,
Life Sciences Centre, Dalhousie University**

**COFFEE AND DOUGHNUTS WILL BE AVAILABLE IN THE
MILLIGAN ROOM BEFORE THE SEMINAR**

A Petrochronological Approach for the Detrital Record: Tracking mm-sized Eclogite Clasts in the Northern Canadian Cordillera

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Rocks exposed near suture zones can record the timing and style of orogenic accretionary events, but subsequent plate motions can obscure original terrane relationships or eliminate suture rocks through erosion. A detrital record of the suture may be preserved in adjacent sedimentary basins, and the tectonic history of large lithic clasts of suture-zone rocks can be approached in much the same way if they were hard rock samples. However, the detrital record may involve very small clasts that historically have posed an analytical challenge. Microanalysis has been a major goal driving recent advances in analytical geochemistry. I will demonstrate in this case study how microanalysis now allows us to apply modern techniques commonly used in hard rock petrochronology studies to investigate the tectonic history of even mm-sized lithic clasts preserved in the detrital record.

Sutures recording the accretion history of the northern Canadian Cordillera terranes to North America are poorly preserved. The Whitehorse trough syn-orogenic basin formed during early Mesozoic terrane accretion and contains a ~300 m thick horizon that includes mm-sized high pressure eclogite clasts possibly sourced from a suture zone. A range of microanalytical techniques applied to the clasts provide a pressure-temperature-time history for the clasts that requires minimum mean cooling and exhumation rates on the order of ~38 °C/myr and ~4 km/myr, respectively, consistent with rates reported for subduction-related eclogite worldwide, and suggests both a source terrane and tectonic setting for the eclogite. This case study demonstrates the value of microanalysis to studying the detrital record of orogenesis.