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Mineralogical Association of Canada

MAC FOUNDATION SCHOLARSHIP TO JASON MACKENZIE

The Mineralogical Association of Canada awarded its 2005–2006 Foundation Scholarship to Jason Mackenzie from the University of Victoria. This scholarship is awarded annually to a student in the second year of an MSc program or the second or third year of a PhD program.



Jason Mackenzie

Jason Mackenzie comes from southwestern Nova Scotia, and his interest in geology began when he became the inaugural president of the James Hutton Geology Club at age 14. Jason completed his BSc (geology) at Acadia University in 1996. Later that year, he started working on his MSc thesis with Dr. Dante Canil at the University of Victoria, where he studied kimberlite-hosted mantle xenoliths from the Slave Province. Jason worked in diamond

exploration in the Canadian Arctic and Finland from 1997 to 2001. Seeking a new challenge, he has since been working on developing a crystal growth process with Redlen Technologies in Victoria, BC. Experimenting with semiconductor crystal growth prompted him to pursue a PhD in experimental petrology under Dante Canil.

Jason's research seeks to answer questions regarding how, and at what rate, volatile elements (especially rhenium) are released from magma during ascent and emplacement. This work will help constrain the contribution of Re volatility to estimates of Re flux from the mantle to the crust.

Jason conducts experiments to quantify Re volatility and mobility in silicate liquids and establish the roles of melt composition, temperature, fO_2 , and speciation on degassing behavior.

Jason's research also aims to establish a robust experimental and analytical procedure that captures the behavior of Re and several important heavy metals (Hg, Pb, As, Se). Volcanic emission of Re and other heavy metals may contribute a significant load to the hydrosphere and atmosphere. For example, it has been suggested that volcanic emissions of the volatile element Hg may represent as much as 40% of natural emissions of Hg to the atmosphere. A quantitative understanding of rates and processes related to volatile release of heavy metals will provide important constraints on the geochemical behavior of these elements and their flux across geochemical reservoirs.

MAC-SPONSORED SESSIONS AT MONTREAL 2006 AND OTHER MEETINGS

MAC is sponsoring three special sessions and one symposium at its upcoming annual meeting Montreal 2006.

Alkaline Igneous Systems: Dissecting Magmatic to Hydrothermal Mineralizing Processes

This symposium will explore the entire range of processes involved in the generation, evolution, association, and mineralization of alkaline rocks of both plutonic and volcanic association. The convenors, David Lentz (University of New Brunswick), André Lalonde (University of Ottawa), Stefano Salvi (LMTG, Toulouse), and Jeanne Paquette (McGill University), have invited several keynote speakers, including Nelson Eby (University of Massachusetts), Anthony Mariano (consultant), Dima Kamenetsky (University of Tasmania), Ilya V. Veksler (GeoForschungsZentrum Potsdam, Germany), Alexander M. Dorfman and Donald B. Dingwell (Ludwig-Maximilian University, Munich, Germany).

Advances in Micro- and Nanoscale Characterization and Analysis of Earth Materials

This session will highlight recent advances in micro- and nanoscale techniques and their application to the study of selected regions in amorphous and crystalline materials. Presentations will focus on the analysis and imaging of (1) inclusions (glass, devitrified glass, and fluid) in minerals, (2) experimental run products, and (3) zones and intergrowths in accessory minerals. Convenors Alan Anderson (St. Francis Xavier University) and Penny King (University of Western Ontario) have invited two plenary lecturers: Richard Wirth (GFZ Potsdam, Germany) will talk on his recent work on nanoscale characterization of inclusions in diamonds using the focused ion beam and TEM, and Robert Mayanovic (Missouri State University) will present on XAFS analysis of high-field-strength elements in hydrous silicate melts and aqueous fluids.

The Earth's Mantle: New Insights from Diamonds and Mantle Xenoliths

Convened by Maya Kopylova (University of British Columbia) and Don Francis (McGill University), this special session will feature Dr. Larry Barron (Geological Survey of New South Wales, Australia) as plenary speaker. His talk will bear on identifying the parentage of alluvial diamonds using new techniques that are able to discriminate between ultrahigh pressure, mobile zone, cratonic, and transition zone diamonds.

Metamorphism, Crustal Fluids, and Experimental Petrology: A Tribute to George Skippen

This special session, convened by Dan Marshall (Simon Fraser University), Fred Ford (Inco), and Jo-Anne Goodwin Bell (Carleton University), will honor George Skippen, one of Canada's foremost metamorphic petrologists. Guest speaker Greg Dipple from the University of British Columbia will talk about carbonate phase diagrams and their application to CO_2 (greenhouse gas) remediation. As Skippen published early on about carbonates, especially thermometry and the application of phase diagrams in the metamorphism of calc-silicate rocks, it will be a nice transition from the early experimental work of Skippen to the modern-day applications of petrology.

MAC will also sponsor two special sessions on weathering in the solar system at the 2006 Goldschmidt Conference: "Aqueous and Space Weathering of Asteroids, the Moon and Mars" and "Spectroscopic Analyses of Aqueous Weathering Products in the Solar System." Both sessions are convened by Penny King, University of Western Ontario, and Tom Sharp, Arizona State University.

MAC will also be a sponsor of the Geofluids V Conference (www.geofluids5.org), to be held in Windsor next May, immediately after the GAC-MAC conference.

www.gacmac2006.ca

2005 TRAVEL AND RESEARCH GRANT WINNERS

MAC awarded 17 travel and research grants to students in 2005. Amounts awarded ranged from \$400 to the maximum \$1200. We would like to recognize these deserving students.



Anetta Banas (University of Calgary) presented the results of her MSc thesis on trace element analyses of garnet inclusions in

diamonds from the DeBeers Pool, South Africa, at the symposium "From Cratons to Carats: a Symposium to Honour the Career of Herwart Helmstaedt" at Halifax 2005. The two-day symposium featured presentations on the structure and tectonics of Archean cratons and the geotectonic controls on diamond exploration. It provided Anetta with an opportunity to interact with some of the most renowned researchers in this field.



Elsbeth Barnes (University of British Columbia) is doing a PhD project on the Little Nahanni Pegmatite

Group, Yukon. She received some funding to carry out a halogen study of fluid inclusions from these LCT-type highly evolved pegmatites. She hopes that this will shed light on the evolution of the pegmatite-forming silicate fluid during the development of the dike system. Glacial erosion of the ridge has produced a series of immense cirque walls that expose vertical cross sections of numerous pegmatites.



Tashia Dzikowski (University of British Columbia) received funding to assist with field work in Florida,

where she collected natural carbonate mud samples. This gave her the opportunity to see

carbonate mud environments first hand and is now proving very beneficial to her MSc project, which is aimed at understanding how whittings form under controlled laboratory conditions and how they originate in nature. Whittings are produced in lakes or seas when fine-grained calcium carbonate precipitates in the open water column, giving the water a milky or white appearance. The origin of whittings is controversial, but recent work has shown that they are coincident with blooms of cyanobacteria in parts of the ocean, such as the Great Bahama Bank, and in some freshwater lakes.



Diana Loomer (University of New Brunswick) presented a paper on the characterization of Mn-oxide

minerals and microbially mediated reductive dissolution of oxide at the Goldschmidt Conference and participated in a field trip to Yellowstone National Park with the aid of a MAC travel grant. She reports the following: "What a spectacular, living, breathing laboratory! Along with the hot springs, geysers, and fumaroles, what Yellowstone shows you is the dramatic impact that microscopic creatures have."



John Moreau (University of California-Berkeley) is studying microbial sulfur cycling and the fate of metals in mining-

impacted sediments, under Dr. Jill Banfield. Hoping to pursue the topic of biogeochemical mercury transformations in his postdoctoral research, he applied for a travel grant to attend the mercury short course in Halifax. Of his experience, he concludes: "All in all, the course served well to introduce and update newcomers and experts alike to the state of the science in mercury biogeochemistry."



Ian Power (University of Western Ontario) presented a talk at the Goldschmidt Conference on the results of his

undergraduate honours thesis. The topic: carbon dioxide sequestration through enhanced weathering of chrysotile mine tailings and subsequent microbial precipitation of magnesium carbonates.



Gregory Shellnut (University of Hong Kong) presented the initial results of his PhD research project on the petrological

association of peralkaline quartz syenites and layered Fe-Ti-V oxide-bearing gabbroic intrusions in southwest China in a special session on rift-related magmatism and associated mineralization at Halifax 2005. The feedback he received from his presentation was positive and insightful, and helped him develop and test new ideas.



Kim Tait is now working on her PhD at the University of Arizona (advisor Robert Downs). However,

she spends most of her time at the Los Alamos National Laboratory, as a graduate research assistant, where she is studying gas hydrates with neutron diffraction. Thanks to a MAC travel grant, she was able to present some of her ongoing work on the alluaudite-group minerals (with co-author Frank Hawthorne) and also attend the MAC 50th anniversary special session.



Coby Wong is a PhD candidate at the University of Hong Kong. She is currently studying environmental

mercury contamination in a village in Guangdong Province, China, where primitive processing of electronic waste has been conducted for nearly a decade. Her research project focuses on mercury contamination in the village and its potential environmental and health consequences. In order to build a solid foundation of understanding of the subject, she applied to the Mineralogical Association of Canada for a travel grant to attend the two-day short course "Mercury: Sources, Measurements, Cycles, and Effects" held just prior to Halifax 2005. She gave a presentation entitled "Environmental Mercury Contamination Arising from Mercury-containing Electronic Components in Southeast Asia" at the special session "Mercury in the Environment." She says, "I presented my study with the hope to raise public awareness of the ever-growing volume of e-waste and its potential environmental effects. I think I achieved that!"

The following students also received travel grants:

Allison Brand (University of British Columbia), Fernando Colombo (University of Cordoba, Argentina), Heather Kaminsky (University of Alberta), Paul Kenward (University of Windsor), Guangrong Ning (University of Western Ontario), Dustin K. Rainey (University of Alberta), Michael Schultz (University of Alberta), and Jingshi Wu (University of Western Ontario). Congratulations to them all.

Please check our website www.mineralogicalassociation.ca for more detailed reports.