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Mineralogical Association of Canada

2007 STUDENT TRAVEL AND RESEARCH GRANTS

MAC awarded ten travel and research grants to students in 2007. We would like to recognize these deserving students by presenting highlights of their reports.



Kristy-Lee Beal (University of New Brunswick) attended the "Granitic Pegmatites: State of the Art" conference in Porto, Portugal, May 6–12, 2007. The conference included a field trip in the NW Iberian Peninsula and many cultural activities. Participants heard exciting, new theories from many of the leading scientists in granitic pegmatite research. Kristy-Lee presented a poster on her undergraduate honors thesis project, "Zealand Station Beryl (Aquamarine) Deposit, West-Central NB: Mineralogic, Geochronologic, and Petrogenetic Constraints," and received positive and insightful feedback from many geoscientists. By getting to know people who were once only authors of papers and seeing their excitement for geology, she is encouraged to continue her academic career into granite pegmatite research.



Aaron Bell (University of Nevada, Las Vegas) traveled to Ludwig Maximilian Universität in Munich, Germany, in July 2007, to fabricate synthetic PGE-doped and PGE-free anorthite–diopside eutectic glasses in collaboration with Dr. Don Dingwell. The fabricated synthetic glasses will be utilized in diffusion couple experiments constructed to quantify the diffusive behavior of Pt, Pd, and potentially Rh in simple silicate melt systems. The first experiments were scheduled for late January 2008, utilizing gas mixing furnaces at the California Institute of Technology in collaboration with Dr. Ed Stolper. The experimental diffusion couples will then be analyzed by LA-ICP-MS in collaboration with Dr. Thomas Pettke and Dr. Carl Spandler at the University of Bern, Switzerland. If successful, this work will provide the first experimentally quantified diffusion coefficients for any PGEs in any silicate melt system.



Nathan Bridge undertook detailed field mapping at the Hurd Property in the Ontario portion of the Abitibi Greenstone Belt in order to characterize ancient Archean ichnofossils preserved in volcanic glass. Because the mineralogy of these microfossils, which have been found in several Archean rocks around the world, is important in understanding early life and early processes, he carried out micro X-ray diffraction work on the minerals associated with the Archean microfossils. His research grant allowed him to develop his undergraduate thesis at the University of Western Ontario to a level that would not have been attainable without this funding.



Brent Hyde presented a poster at the Lunar and Planetary Science Conference in March 2007. The poster included the results of his MSc thesis at the University of Western Ontario on the infrared (IR) detection of halophilic organisms in a Mg-sulfate matrix. The results of this study provide constraints on the minimum wt% of organisms required to produce an IR signature for organic material on Mars. The halophiles used in this study showed distinct IR features, which were used to monitor the organics in the mixtures. The features weaken as the halophiles are diluted with increasing Mg-sulfate until they appear only as small distortions in the spectrum at 10 wt% halophiles. This placed the lower limit of conclusive detection at approximately 10 wt%. These results will help the interpretation of alpha particle X-ray spectrometer (APXS) data that will be collected by the Mars Science Laboratory set to land on Mars in 2010.



Dawn Kellett is a PhD candidate at Dalhousie University, Halifax, Canada. With financial assistance from the MAC Student Grant, she is analyzing a suite of Chekha Group samples from Bhutan for their bulk rock Nd isotopic signature. The resulting geochemical signature will be compared and contrasted with the existing geochemical database on the metamorphic core and Tethyan sedimentary rocks to establish the affinity of the Chekha Group. This independent research project complements her main PhD research on the evolution of the South Tibetan detachment system, eastern Himalaya, in which she will use geochemical data, in conjunction with geochronologic, thermometric, and structural data, to test predictions about the South Tibetan detachment system proposed in recent models of orogenesis.



Marc-Antoine Laporte travelled to Japan in May 2007 in order to sample Quaternary volcanic flows around the Izu peninsula and ceramics from the middle Jomon Period in the collection of the International University of Mitaka. The field work was concentrated around two major volcanoes, Mount Fuji and Hakone. He brought back samples to analyze major, minor and trace elements in clinopyroxene, olivine, and amphibole from known outcrops, and compare these compositions with those of rock fragments in ceramics. This will help to link rock fragments in ceramics with specific outcrops. This research will complement his master's thesis at Laval University, Québec, Canada.



Matthew R.M. Izawa (University of Western Ontario) employed SEM-EDX to produce high-resolution chemical element maps for major and minor elements (Si, Al, O, Fe, Mg, Ni, Cr, Ca, K, Na, S, and P) in the Tagish Lake carbonaceous chondrite. Tagish Lake is perhaps the most primitive meteorite ever recovered. Its orbit, composition, and spectral properties link it with supercarbonaceous D-type outer belt asteroids. The thin sections mapped have previously been investigated using micro X-ray diffraction, which creates a point-correlated structural and chemical data set. The two in situ survey techniques are highly complementary: SEM-EDX provides chemistry and μ XRD the crystal structure, thus enabling more confident mineral identification. These coordinated surveys also provide an opportunity to identify areas of interest for further, more detailed study.



Ian Power, a PhD student at the University of Western Ontario, received funding to assist him with fieldwork to investigate the hydromagnesite playas near Atlin, BC and an abandoned mine near Clinton Creek, YT. The hydromagnesite deposit is a natural model for CO₂ sequestration and has been particularly useful in the study of biological processes involved in mineral carbonation. At the Clinton Creek mine site, numerous carbonate crusts were sampled and bulk sampling was performed to aid in quantifying the level of carbonation in these tailings. If an efficient process can be developed, global implementation of carbon capture in mine tailings could contribute significantly toward the stabilization of atmospheric carbon dioxide levels.



Deanne van Rooyen is a PhD student at Carleton University, Ottawa, under the supervision of Sharon Carr. Her thesis topic bears on timing constraints on deformation and exhumation of the core zone of the Cordilleran mountain belt. She will be using U–Pb geochronology and ⁴⁰Ar/³⁹Ar thermochronology and characterizing isotope systematics in migmatitic rocks in the Thor-Odin dome, southeastern British Columbia. Funding from MAC made it possible to add a second helicopter-supported camp to the existing field budget, thus making it possible to have a complete sample transect. The complete data set will be of greater value for characterizing the differences between the basement gneiss complex and overlying rocks. It will also make it possible to apply the combination of ⁴⁰Ar/³⁹Ar and U–Pb dating to a wider variety of rock types, giving a more complete picture of the different systematics involved.

SHORT COURSE – LASER-ABLATION-ICPMS IN THE EARTH SCIENCES: CURRENT PRACTICES AND OUTSTANDING ISSUES

Goldschmidt 2008, Vancouver, BC, Canada
July 19–20, 2008

Laser-ablation–inductively coupled plasma mass spectrometry is a powerful technique that is capable of providing micron-scale analyses of trace element concentrations and isotopic ratios in a variety of minerals and other objects of geologic interest. Seven years ago, the Mineralogical Association of Canada sponsored a landmark short course that helped bring the potential of laser-ablation ICPMS to the attention of Earth scientists around the world. Since then the technique has become arguably the fastest-growing analytical method in the Earth sciences, with tremendous advances in the understanding of basic laser–sample interactions and the practices used to obtain the most precise and accurate data possible.

The purpose of the new course, sponsored by the Mineralogical Association of Canada and convened by Paul Sylvester of Memorial University, is to update Earth scientists on this remarkable period of research and to provide a practical guide

to the procedures used by today's leading analysts. Topics to be covered are: ICPMS fundamentals (H. Longrich); laser-produced aerosols (D. Günther); modeling of ablation and transport (D. Bleiner); femtosecond lasers (I. Horn); matrix effects (P. Sylvester); spot versus rastering laser sampling (J. Košler); neodymium and strontium isotope analyses of accessory mineral phases (C. MacFarlane); mass bias corrections for stable and radiogenic isotope analysis (N. Pearson); isotope and element imaging and depth profiling (J. Woodhead); reference glasses for element and isotope analyses (K.P. Jochum); calibration strategies (S. Jackson); fluid inclusion analyses (T. Pettke); melt inclusion analyses (P. Mason); U-series dating of biominerals (S. Eggins); use of ion counters for uranium–lead geochronology (T. Simonetti); use of ion counters for common lead isotope analyses (K. Souders); data reduction strategies and error analysis (M. Horstwood).

For more information, contact Paul Sylvester (pauls@esd.mun.ca) or check the MAC website at www.mineralogicalassociation.ca or www.goldschmidt2008.org/shortCourses

\$10 000

Scholarship




Mineralogical Association of Canada
Association minéralogique du Canada

The Mineralogical Association of Canada Foundation annual scholarship for graduate students involved in an M.Sc. or Ph.D. thesis program in the fields of:

- Mineralogy
- Crystallography
- Geochemistry
- Mineral Deposits
- Petrology

Deadline to apply: May 1st, 2008

Eligibility

- 1 Students entering the second year of an M.Sc. program or the second or third year of a Ph.D. program at a Canadian university in September 2008.
- 2 Canadian citizens enrolled in the above or equivalent programs at any university.

For more information, contact:

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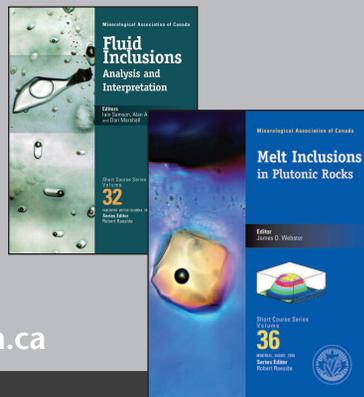
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