NEW IMA COUNCIL

The current Council of IMA. **Left to right, back row**: Anhuai Lu (China), Joel Grice (Canada), Ekkehart Tillmanns (Austria, Chairman of the 2010 General Meeting), Nicolai Yushkin (Russia), Maryse Ohnenstetter (Secretary, France), Herta Effenberger (attending on behalf of EMU). **Front row**: Walter Maresch (Germany), Ian Parsons (Great Britain and Ireland), Takamitsu Yamanaka (President, Japan), Robert Downs (Treasurer, USA), Marcello Mellini (Italy), Kari Kojonen (Finland).

MAC FOUNDATION SCHOLARSHIP TO SASHA WILSON

Every year since 1998, the Mineralogical Association of Canada awards a $10,000 scholarship to a deserving student in one of the fields of mineralogy, crystallography, petrology, or geochemistry. This year's winner is Siobhan A. (Sasha) Wilson, from the University of British Columbia. Born in Oshawa, Ontario, in 1980, Sasha graduated from McMaster University in 2003 with an Honours Bachelor of Science in physics with a minor in Earth sciences. She began her studies at the University of British Columbia as a master's student in the fall of 2003 working under the supervision of Gregory M. Dipple and Mati Raudsepp. She completed her MSc in the fall of 2005 and began work toward her PhD immediately thereafter.

Sasha's MSc and PhD thesis research concern the disposal of atmospheric carbon dioxide in mine tailings. Mineral carbonation is a safe and permanent method of carbon disposal in which silicate minerals react with atmospheric or industrial CO_2 to produce geologically stable, environmentally benign carbonate minerals. Naturally occurring mineral carbonation phenomena have recently been observed at the surface of chrysotile mine tailings at Clinton Creek, Yukon; Cassiar, British Columbia; and Thetford Mines, Québec; as well as at the Mount Keith nickel mine, Western Australia; and the Diavik diamond mine, NWT. The primary focus of her master's research was to characterize and quantify natural mineral carbonation at the abandoned Clinton Creek and Cassiar chrysotile mines. Her PhD research involves documentation and acceleration of mineral carbonation phenomena in the active mine sites at Mouth Keith and Diavik. Sasha describes her research as follows:

The principal techniques employed in my study have been mapping and sampling, X-ray powder diffraction (XRPD), scanning electron microscopy (SEM), Raman spectroscopy, radiogenic carbon dating, stable isotope analysis, and bulk chemical analysis.

As part of my master's research, I presented the first detailed field characterization of natural mineral sequestration in ultramafic mine tailings at Clinton Creek, YT, and Cassiar, BC. I detailed the modes in which the hydrated magnesium carbonate minerals hydromagnesite, dypingite, nesquehonite, and lansfordite occur in tailings environments and defined the mechanisms by which they form.

I have successfully applied the Rietveld method for quantitative phase analysis to X-ray powder diffraction profiles for natural and synthetic serpentinite mine residues. This is the first instance in which the Rietveld method has been used successfully to compensate for structural disorder in the kaolinite–serpentine group minerals. I have confirmed crystallographic binding of carbon and have quantified CO_2 uptake in tailings samples.

I have developed a new procedure allowing unambiguous fingerprinting of the source of carbon tapped in the formation of carbonate minerals. Using radiogenic and stable isotope techniques, it is possible to determine whether the carbon in carbonate efflorescences has been derived from the atmosphere. Using isotope data and Rietveld results, I have quantified the amount of atmospheric CO_2 bound in carbonate minerals.

Studying mineral carbonation in active mines at Mount Keith, Western Australia, and Diavik, NWT will contribute towards the design of new mining processes that will accelerate CO_2 uptake to create the world's first generation of zero-emissions mining operations. I have observed and quantified the precipitation of hydromagnesite in tailings at Mount Keith and have documented the precipitation of nesquehonite in the kimberlite tailings at Diavik. Further field work and bench-top precipitation experiments will determine whether mineral carbonation is a valid means of CO_2-sequestration under the desert conditions at Mount Keith and in the tundra at Diavik.

Global implementation of carbon sequestration in ultramafic mine tailings has the potential to draw CO_2 directly from the atmosphere at a rate of 10^8 tonnes of carbon per year. In situ sequestration in mine tailings bypasses the need to transport large quantities of tailings to industrial point sources and can be accomplished without high-pressure, high-temperature reactors. Mine tailings may, therefore, represent the optimal environment in which to pursue carbon sequestration in minerals.

CSIRO GEOSCIENTIST AWARDED RESEARCH MEDAL

CSIRO scientist Dr Ravi Anand has been awarded the Butt Smith Medal for his outstanding contribution to geoscientific research. The award acknowledges Dr Anand's long-term dedication and excellence in the development of geochemical mineral exploration techniques for Australia's deeply weathered landscapes.

Awarded by the Cooperative Research Centre for Landscape Environments and Mineral Exploration (CRC LEME) and CSIRO's Exploration and Mining Division, the Butt Smith Medal recognises sustained excellence in Australian geoscience research. The award takes its name from two eminent geoscientists, Dr Charles Butt and Dr Ray Smith, who through long association with CRC LEME and CSIRO, have made significant research contributions to the Australian minerals exploration industry.

CRC LEME Chief Executive Officer Dr Steve Rogers said it was fitting that Dr Anand becomes the second recipient of the Butt Smith Medal. "For more than three decades Dr Anand has followed in the footsteps of Dr Butt and Dr Smith to emerge as a leader in regolith research," Dr Rogers said. "His work into understanding how geochemical anomalies form in deeply weathered terrains has contributed to the mineral industry's appreciation that regolith is an essential consideration when designing exploration strategies and interpreting geochemical data."

CSIRO Exploration and Mining Chief Dr Peter Lilly added that recently Dr Anand had discovered an association in plant biogeochemistry and mineralisation. "Some of Dr Anand's newer research has shown that deep-rooted mulga trees in transported regolith over some Australian mineral provinces act as hydraulic pumps for dissolved metals," Dr Lilly said. "His work has raised the awareness of a biological process that can create geochemical anomalies in the plant's biomass near the surface, which could become a valuable indicator for mineral explorers." The Butt Smith Medal complements Dr Anand's other research accolades including the Sir Ian McLennan Achievement for Industry, CSIRO Research and Stillwell Awards.