



International Mineralogical Association

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TOWARDS GEO-GOGGLES: AN IMA COMMISSION ON APPLIED MINERALOGY WORKSHOP ON QUANTITATIVE MINERALOGY, LIÈGE, BELGIUM, 23 MAY 2013

Every one of us would dream of having geo-goggles to painlessly identify rock-forming minerals, and we would be definitely addicted if this technology could offer an estimate of mineral proportions. Although this is still science fiction (sorry), more and more technologies that deliver (semi-)quantitative mineralogical information in both the field and the lab have become available in recent years. This is particularly important in geological exploration and also in mineral processing, where a clear understanding of geometallurgical attributes is a decisive advantage for process optimization.

The Commission on Applied Mineralogy (CAM) of the International Mineralogical Association recently sponsored a one-day event entitled Quantitative Mineralogy at the University of Liège to demonstrate state-of-the-art technologies in this field. Hosted by the GeMME (Génie Minéral, Matériaux & Environnement) Department, this event attracted more than sixty participants from all corners of Europe and beyond (Nancy, Liège, Aachen, Luxembourg, Amsterdam).

After a general introduction by CAM's president, Prof. Eric Pirard, under the title "Reinventing Docimasy," Dr Erick Ramanaidou (CSIRO, Perth) spoke about recent advances in a very exciting lecture titled "Using VNIR-SWIR-Raman spectroscopy in exploration." In a talk entitled "X-ray diffraction spectra," Qmineral's director, Dr Gilles Mertens (KU Leuven), presented a comprehensive review of the possibilities and limits of the method. The second part of the workshop was dedicated to microscope imaging techniques. A lecture by Dr Alan Butcher, FEI's principal petrologist, was on the subject "Quantitative mineralogy and petrography using automated SEM-EDS technology." This lecture highlighted recent case studies using automated mineralogy to support operations in oil and gas as well as in mining. The last lecture of the day was given by Ing. Laura Perez-Barnuevo (UP Madrid), during which she demonstrated the benefits of multispectral microscopy and presented a series of new textural indices aimed at supporting a geometallurgical description of individual particles.

A general conclusion from the workshop is that sampling and sample preparation are still very critical steps. Innovation in sample preparation is needed to shorten the response time of microscopy-based techniques while at the same time allowing an increase in the representativeness of the measured surface. On the other hand, there is little doubt that other breakthroughs will occur in the near future in terms of fast and accurate mineral-mapping techniques, whether using Raman spectroscopy, hyperspectral imaging, or LIBS (laser-induced breakdown



Invited lecturers at the IMA-CAM Quantitative Mineralogy workshop held in Liège. From left to right: Alan Butcher (FEI), Laura Perez-Barnuevo (UPM Madrid), Eric Pirard (Université de Liège), Erick Ramanaidou (CSIRO, Perth) and Gilles Mertens (KU, Leuven)



spectroscopy)-based instruments. CAM's president reiterated his intention to set up a round-robin test in quantitative mineralogy and invited interested labs to send suggestions, or simply statements of intention to participate, to CAM's secretary, Dr Megan Becker. The final event of the workshop was also the most rewarding: the traditional Belgian beer tasting. It certainly smoothed the networking among participants and facilitated the elaboration of future cooperative projects.

As a follow-up, CAM will hold a series of sessions on archaeometallurgy, X-ray CT and remote mineral mapping at IMA's upcoming 21st general meeting. We look forward to meeting more passionate mineralogists in Johannesburg in 2014.



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