PhD Opportunity in Laser Ablation applied to mineral characterisation

A PhD scholarship is available within the ARC Transforming the Mining Value Chain (TMVC) Industrial Transformation Research Hub, which is hosted at CODES, University of Tasmania. This PhD project will focus on the application of Laser Ablation (LA) to characterising trace element abundances in minerals within ores and alteration haloes around ore deposits. The techniques involve LA-ICPMS and LIBS (Laser-Induced Breakdown Spectroscopy). The main aim will be the development of analytical methods and data reduction protocols for generating large-scale images of element distribution within drill core samples. An emphasis will be placed on integration of the data with other imaging techniques such as optical mineralogy, electron microscopy and vibrational microscopy.

The Project Scope:

The potential scope of this research project includes:

- Developing algorithms for LA-ICPMS and/or LIBS mineral identification by validation against more established techniques (MLA, QRD, laser Raman, SWIR);
- Using LA-ICPMS and/or LIBS mineral identification to improve quantification for mineral trace element analysis;
- Developing approaches for combining LIBS and LA-ICPMS data; and
- Comparing and optimising LA-ICPMS/LIBS trace element deportment data for different deposit types and for different applications.

This project will integrate a range of laboratory and data processing skills and is therefore suited to a candidate with geochemical laboratory skills and a strong background in physics, maths and chemistry. The candidate should have a broad interest in exploration and geometallurgy. The candidate is likely to be working with analytical equipment manufacturers and mining companies.

Duration: 3 years, with the possibility of a six month extension.

Value: AUD 31,561 per annum.

Sponsor: Funded by the ARC TMVC Industrial Transformation Research Hub.

The Applicant

Applicants should have a strong background in mineralogy, maths, physics and chemistry. Practical experience working with Laser Ablation is an advantage. Applicants from outside Australia and New Zealand will be required to either obtain a tuition fee-waiver scholarship from the University of Tasmania or pay tuition fees.

Working Environment

The PhD candidate will join the ARC TMVC Industrial Transformation Research Hub team which currently consists of 15 senior academics and industry professionals, five postdoctoral research fellows, four technical & administrative staff, and seven PhD students. The candidate will have access to a range of analytical facilities at CODES and the Central Science Laboratory at the University of Tasmania, including laser-ablation ICP-MS, a range of SEM instruments, an electron microprobe, Raman and FTIR microanalysis, XRF, XRD and advanced optical microscopy.

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