

## CURRENT PROJECTS

### GeoQuEST contribution to the new laser ablation multi-collector ICPMS lab at UOW

UOW is now equipped with a facility for isotope geochemistry and geochronology amongst the best in the world, thanks to support from GeoQuEST, SMAH and an ARC LIEF grant (*LE140100023 - Innovative isotopic techniques to study the response of soil and water resources to modern and past climate change*).

This facility has been established by Dr Anthony Dosseto and is part of the *Wollongong Isotope Geochronology Laboratory*, founded by Dr Dosseto three years ago. Refurbishment of the new laboratory (building 41, room G56) started in November 2014 and was completed in March 2015. Installation of the equipment started in January 2015, and commissioning was completed in March.

The new laboratory includes a ThermoFisher Neptune Plus multi-collector ICPMS, the top-of-the-range instrument for the determination of isotopic ratios. This offers a wide range of applications: (i) geochronology (U-Th dating), archaeology and Quaternary climate research, (ii) geomorphology (quantifying rates of soil formation and sediment transport), (iii) environmental sciences (using isotopes to determine the origin of minerals, pollutants,...) and (iv) more recently, isotope biochemistry, where we propose that isotopes could be used as a tool to better understand and diagnose a wide range of disease, from cancer to neuro-degenerative diseases.

The laboratory is also equipped with a NWR193 laser ablation system. This will allow the in-situ analysis of geological and biological samples down to the micrometre scale.

Finally, we have also acquired a ThermoFisher iCAP-Q quadrupole ICPMS. Combined to the laser ablation system, this will be used for the (geo)chemical characterisation of a wide range of samples: from zircons (U-Pb dating to understand their origin) to brain tissues (metal concentration mapping to study the role of metals in neuro-degenerative diseases).

In March, the very first analyses were produced on the Neptune by PhD students Ashley Martin and Davide Menozzi. Ashley is using uranium isotopes to study how rivers of northern Australia have responded to past climatic change. Davide is developing ways to use uranium and thorium isotopes to measure how fast rocks are converted into soil, an important geological process because it consumes carbon dioxide and regulates Earth's climate. Ashley and Davide were very pleased to be able to use the new instrument, as they are both in the finishing stage of their PhD. The new facility is already supporting the research of several academics and PhD students in various fields.



The ThermoFisher Neptune Plus multi-collector ICPMS (left) and the NWR193 laser ablation system (right).

*Contributed by Anthony Dosseto  
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