PhD Research Studentship
University of Dublin, Trinity College

Developing a multi-radioisotope approach to dating sedimentation

Supervisors: Dr David Chew (Trinity College Dublin)
Dr David Selby (University of Durham)
Dr J. Stephen Daly (University College Dublin)

Research Area Sedimentary rocks are critical for reconstructing past climatic conditions, the evolution of life and other aspects of Earth history. Accurate and precise depositional ages are critical in these reconstructions. This project will evaluate three new isotopic dating methods: U-Pb dating of diagenetic xenotime, Lu-Hf dating of apatite and Re-Os dating of shales. Initially, the techniques will be tested in a biostratigraphically well-constrained basin. The ultimate goal is to assess their suitability for dating Neoproterozoic glacial deposits, the majority of which are poorly dated. Worldwide correlation of Neoproterozoic glacial events is a key element in assessing the Snowball Earth hypothesis.

Project Scope The project will involve a comparative study of the three chronometers in the Carboniferous Clare Basin in southwest Ireland. This basin offers a well-constrained biostratigraphy, a high degree of thermal maturation and numerous dating targets. In particular, it is proposed to test whether there is a resolvable time gap between methods that date deposition (Re-Os shale, Lu-Hf dating of phosphatic fossils) and methods that date diagenesis (Lu-Hf dating of apatite cements, U-Pb xenotime). The work will include a detailed study of the diagenetic (e.g. phosphate cements, xenotime overgrowths) and thermal histories (based on low temperature thermochronology), which are critical to the interpretation of isotopic ages.

Requirements and Training The ideal candidate is a geologist or geochemist with laboratory experience, preferably with a Masters degree. He/she will be based in Dublin, but will undertake laboratory work at several leading European isotope laboratories including the University of Durham and the University of Geneva. The project is fully funded and includes EU fees and a tax-free stipend of €15,500 per annum. Candidates from outside the EU will require top-up fees.

Contact: Send an academic C.V. and the names and contact details of three academic referees to `chewd@tcd.ie` by May 31st, 2006.