



Funded PhD in igneous petrology and geochemistry

A fully funded 3.5-year PhD project in igneous petrology and geochemistry has opened at the Earth Dynamics Research Group (<https://geodynamics.curtin.edu.au>) as part of an Australian Research Council Discovery Future Fellowship project "*Linking the deep carbon cycles with critical mineral deposits*".

Project background

The current consensus is that carbonatites are produced by low-degree partial melting of the Earth's mantle, but not the usual mantle. Experimental, geochemical, and isotopic studies suggest that the lithospheric mantle is the source of carbonatite, but it must be fertilised in a particular way by CO₂-rich fluids or magmas, the so-called *carbonate metasomatism*. Carbonate metasomatism has been reported in many mantle rocks of various tectonic environments, making it a ubiquitous process that plays a critical role in modifying the mineralogy and geochemistry (enrichment in CO₂ and REE) of the lithospheric mantle, but carbonatites remain paradoxically rare. In other words, we have a conundrum: carbonatites are all sourced from the carbon-rich mantle, but not all carbon-rich mantle can produce carbonatites.

Your work will involve applying state-of-the-art geochemistry and isotopic analyses techniques (whole-rock and in-situ radiogenic and non-traditional stable isotopes) on carbonatite and mantle xenoliths to decipher the link between the deep carbon cycle, carbonate metasomatism and mantle enrichments in the concentrations necessary to produce the critical ore carrier.

Fieldwork is planned for East Africa, France, and other places deemed necessary for the project.

This project will contribute to a federally funded research project that aims to decipher the first order mechanisms that control REE enrichment in the lithosphere and CO₂-rich magmas. You will be given the opportunity to contribute and learn from other projects led by team member of the Earth Dynamics Research Group.

Scholarship details

This project provides a living stipend of AU\$35,000 p.a. pro rata indexed, based on full-time studies, for up to a maximum of 3.5 years. International students will receive a 100% fee offset for up to 4 years. Support for fieldwork, analytical time, travel, conference attendances and publications will be fully covered by the scholarship.

Applicant requirements

- Must have a BSc Hons (first class) or Masters (by research) in geoscience (ideally related to geochemistry / isotope geology, igneous petrology or geochronology) by the time of appointment.
- We expect a solid background in geological processes and igneous petrology and/or geochemistry and isotope geochemistry (in-situ analyses expertise is especially valuable).

- The candidate requires the ability to work both independently and with a broad range of people from diverse backgrounds, as well as evidence of strong oral and written scientific English language competencies.
- The candidate requires a demonstrated commitment to publish results in scientific journals. Evidence of research experience, academic awards/publications/presentations at conferences is desirable.

Application details

Further information about the project and the specific application requirements may be found through the Curtin Scholarships website – <https://scholarships.curtin.edu.au/Scholarship/?id=7205>

The deadline for complete applications (note specific requirements of endorsements on the scholarships webpage) is **31 August 2024 (Western Australia time, UTC+8)**. The PhD may be started as soon as practicable, but we recognise arranging visas and travel may impact this (where relevant).

Email applications with the email titled “**FT23_PhD**” to luc-serge.doucet@curtin.edu.au.

Applications should contain a 2- to 3-page CV and a 1-page motivation statement, together in a single pdf, labelled “**Lastname_FirstName_FT23PhD.pdf**”.

Applications failing to use the correct email title, or provide incomplete documents may not be considered.

Shortlisted applicants will have an online interview invitation by 15 September 2023. If you have not heard from us by then, your application was unsuccessful.

Recommended applicants will be provided with further information on the PhD enrolment process at Curtin University (including upload of certified transcripts and demonstration of English language requirements).

About Curtin University and the School of Earth and Planetary Sciences

Curtin is a dynamic, research-intensive University consistently ranked in the top 1% of universities worldwide. Curtin was recently ranked 39th in the world for Geology in the QS World University Rankings by Subject 2024. The disciplines of Geology and Geochemistry have both been awarded the maximum ranking of 5 in the recent federal government's "Excellence in Research for Australia" assessments.

These factors, coupled with excellent analytical facilities (SeIFrag, SEM, (LA-)MC-ICPMS Neptune 2 and Neoma, TIMS, CAMECA 1300 IMS, etc.) ensures that candidates will be hosted within a vibrant and dynamic research environment and will receive exceptional research training.