Fully-funded 4-year Ph.D position in Critical Metals

Project: Controls on high-grade stratiform Co mineralisation in the Central African Copperbelt (CRITICAL)

Supervision team

Dr. Lingli Zhou (lead supervisor)
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Prof. Murray Hitzman (co-supervisor)
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About the project

A sustainable supply of energy critical battery metals (e.g., cobalt, nickel and lithium) is required if society is to succeed in the decarbonisation of the global economy. Understanding the genesis of such resources is needed for the discovery of new metal deposits. Most existing genetic models of ore deposit formation deal with major industrial metals (e.g., lead, zinc and copper). Genetic models do not yet exist for many critical metals such as cobalt, which are produced largely as by-products of major metals.

This fully-funded four-year PhD project will utilise an integrative approach through trace element, isotope and mineralogical geochemistry, seeking to determine the reasons for the precipitation of high grades of cobalt at the Tenke-Fungurume Mining (TFM) copper-cobalt (Cu-Co) mining district located in the northeast corner of the Central African Copperbelt. The TFM district contains one of world's largest known resources of mineable cobalt (resources of 857.7 Mt at 2.9% Cu and 0.29% Co). The main objective of the Ph.D project is to develop i) a genetic model for high-grade cobalt mineralisation that is broadly applicable and ii) a geochemical vectoring toolkit for use by minerals industry.

This research project will be carried out in conjunction with the team of researchers at the SFI iCRAG Research Centre who focused on the geology of the Central African Copperbelt, the largest such research team worldwide. The Ph.D candidate will receive training in economic geology, geochemistry, and mineralogy. The candidate will also have access to the world-class geochemical analytical facilities at University College Dublin (e.g. LA-MC-ICP-MS and TIMS), Trinity College Dublin (e.g., SEM-EDS and LA-ICP-MS) and NUI Galway (e.g. fluid inclusion analysis), and will receive specific training in the use of laboratories and analytical methods. Access to key software such as Iolite, ioGAS and Leapfrog will also be provided.

Principal duties and responsibilities

- Work independently and manage the project efficiently, commit adequate time and effort to the project

- Sampling, detailed microscopy characterisation, and acquisition of geochemical data
- Presentation and publication of research output in peer-reviewed scientific journals, conferences and workshops
- Contribution to discussions and activities of a wider research group to integrate the research output and increase its impact

Selection criteria

Mandatory

- An excellent, relevant geoscience honours degree or a geoscience MSc degree
- A solid background in Economic Geology, Geochemistry and/or Sedimentology
- Passion for laboratory work, core sampling and fieldwork
- Skills in data processing and interpretation, and documentation and dissemination of project results

Desirable

- Enthusiastic about international collaboration and overseas travel
- Keen interest and self-motivation for solving problems
- Great communication skills working with both academia and industry partners

Funding notes

This fully-funded 4-year Ph.D scholarship is funded by the Science Foundation Ireland-Irish Research Council (SFI-IRC) Pathway programme. The scholarship covers all university tuition fees, an annual tax-free stipend of €18,500, and a project-specific research grant covering research expenses and conferences.

The project has an envisioned start date of **1st September 2022**.

Application

Please e-mail a CV (max. 2 pages) and a cover letter (max. 1 page) outlining your experience and motivation to Dr. Lingli Zhou (lingli.zhou@ucd.ie) by the **31st May 2022**.

The application may be followed up by an online interview in the second half of June. Applicants will be notified of the outcome of their application in early July.

Equality, diversity, and inclusion

University College Dublin and iCRAG is committed to creating an inclusive environment where diversity is celebrated, and everyone is afforded equality of opportunity. To that end the university adheres to a range of equality, diversity and inclusion policies. We encourage applicants to consult those policies here https://www.ucd.ie/equality/. We welcome applications from everyone, including those who identify with any of the protected characteristics that are set out in our Equality, Diversity and Inclusion policy.

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