

# PhD student in the framework of the metallogenesis of rare-metal pegmatites

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The Ore Geology and Geofluids (OGG) research unit of the division of Geology (KU Leuven) is seeking a PhD student in the framework of the metallogenesis of rare metals in pegmatites. Studies on ore geology in the OGG research unit currently concentrate on the formation mechanisms of magmatic and magmatic-hydrothermal rare-metal deposits, especially pegmatite-type Nb-Ta-Sn-Rb-Li-Cs-Be and vein-type Sn-W-Au deposits, which are dominantly studied in the Great Lakes Region of Central Africa. Fieldwork, petrography, geochemical analyses (ICP-OES, [LA-] ICP-MS, FEG-EPMA, Raman spectroscopy etc.) and fluid-melt inclusion research are the main research methodologies applied by the unit.

The division of Geology at the department of Earth and Environmental Sciences at the KU Leuven consists of 8 full-time professors, 7 part-time (guest) professors and some 30 academic staff members (PhD students and postdocs).

## Project

- This PhD will specifically aim to define the physicochemical drivers for differentiation and fractionation of phosphorus- and boron-rich lithium-caesium-tantalum (LCT) pegmatites and their role in Ta, Sn and Nb mineralisation. Recent findings indicate that the accumulation of phosphorus and boron in this type of evolved felsic melts can play an important role on the solubility of rare metals and lowering of the crystallization temperature. However, the natural constraints of these fluxing compounds on the petro- and metallogenic processes is currently lacking.
- The PhD will focus on the novel application of geochemical analyses of the bulk rock, mineral and inclusions record of the Buranga pegmatite dyke system (Gatumba District, Western Province, Rwanda). The Buranga system is well-known for its Ta-Sn-Nb mineralisation and its rich variety of associated primary and secondary phosphate minerals, which record the magmatic, magmatic-hydrothermal to weathering-leaching stages in the evolution of phosphorus-rich pegmatites. The main sample collection of the Buranga system is stored at the Royal Museum for Central Africa in Tervuren (Belgium).
- The successful candidate will contribute to the development of differentiation models for these water- and flux-rich pegmatitic melts in collaborations with other scientists working on the topic. The PhD candidate will develop and apply Raman microscopic mapping techniques to quantify the paragenetic sequence of mineralisation, especially for phosphate formation. The composition and evolution of the mineral, fluid inclusion and melt inclusion record of the different internal zones of the pegmatite system will be studied by micro-analytical techniques such as Raman spectroscopy, FEG-EPMA and LA-ICP-MS. Strong focus of this PhD project will lie on the application of Raman microscopy (i) for 2D and 3D confocal imaging and mapping; and (ii) to quantify the content of fluxing components in fluid and melt inclusions. Ultimately, the main goal of this PhD will be the establishment of a generic petro- and metallogenic model for the evolution of phosphorus- and boron-rich, lithium-caesium-tantalum pegmatites.

## Profile

- Successful candidates must have a Master's degree in Geology or related field (e.g. geochemistry).
- Being familiar with rare metal deposit research or Raman spectroscopy can be an advantage.
- Candidates must be proficient in oral and written English, must have excellent communication skills, and be proactive and results driven.
- It is also anticipated that the candidate will actively participate as an assistant in bachelor and/or master courses of the division of Geology.

## Offer

- We offer a PhD position of 2 x 24 months in a stimulating environment at a top European university.
- The expected starting date is 1 October 2018.
- The work location will be the Department Earth and Environmental Sciences, KU Leuven, Leuven, Belgium.
- The KU Leuven Arenberg Doctoral School (<https://set.kuleuven.be/phd>) supports training of the PhD students.
- KU Leuven seeks to foster an environment where all talents can flourish, regardless of gender, age, cultural background, nationality or impairments. If you have any questions relating to accessibility or support, please contact us at: [diversiteit.HR@kuleuven.be](mailto:diversiteit.HR@kuleuven.be).

## Interested?

For more information please contact dr. Niels Hulsbosch, tel.: +32 16 37 22 90, mail: [niels.hulsbosch@kuleuven.be](mailto:niels.hulsbosch@kuleuven.be) or Prof. dr. Philippe Muchez, tel.: +32 16 32 75 84, mail: [philippe.muhez@kuleuven.be](mailto:philippe.muhez@kuleuven.be).

Applicants should send (i) a personal statement expressing their experience, qualification and interest, (ii) a complete CV, (iii) academic transcripts and (iv) the names and e-mail of two references to the online application system of KU Leuven. Review of the applications will start 15 June 2018 and the call is open until the position is filled.

You can apply for this job no later than June 15, 2018 via the online application tool :<http://www.kuleuven.be/eapplyingforjobs/light/54609387>

KU Leuven seeks to foster an environment where all talents can flourish, regardless of gender, age, cultural background, nationality or impairments. If you have any questions relating to accessibility or support, please contact us at [diversiteit.HR@kuleuven.be](mailto:diversiteit.HR@kuleuven.be).