Funded PhD project at SUERC, University of Glasgow:

**A multi-chronometer approach to understanding emplacement and cooling history of nested plutons.**

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The emplacement and construction of large plutons is a widely debated topic and controversies centre on (1) the origin of voluminous granites, and (2) how they are emplaced. Zircon U-Pb geochronology suggests plutons are accreted by addition of small magma batches to the middle-upper crust over 10,000 to 100,000 year timescales. During these periods pulses of high magma flux can be followed by periods of relative quiescence with magmatic flare-up periods proposed to explain the non-linear growth of large batholiths. An integrated approach of coupling geochemical approaches to high precision chemical abrasion ID-TIMS U-Pb dating and Ar/Ar geochronology provides a novel approach to reconstructing the emplacement and cooling history plutons.

The student will work with the Caledonian Geochronology & Geochemistry Research Group (CG2RG) at SUERC utilising both the U-Pb and Ar/Ar geochronology suites. The student will become an expert in high-precision geochronology and conduct fieldwork on the Cornubian Batholith (Cornwall) and/or the Skye Central Complex.

The Cornubian Batholith is the large mass of granite that forms much of the peninsula of SW England. It is exposed in a series of six major plutons (large igneous bodies exposed as irregular outcrops) and several minor stocks, intruded into Devonian and Carboniferous aged metasedimentary and igenous rocks. The batholith owes its origin to the Variscan Orogeny, a mountain building event that occurred in the late Palaeozoic. The Paleogene Igneous Complex, Isle of Skye has fascinated geologists for over 200 years, encouraging multiple field expeditions. The Skye Central Complex was emplaced more than 61 million years ago during the initial opening stages of the North Atlantic Ocean. As North America and Europe ripped apart, large volumes of basalt lava were erupted from long narrow fissures on what is now the West coast of Scotland. The remnants of these volcanoes can be observed today as either thick lava flows or large intrusive complexes and nested plutons (e.g., Cullins).

This PhD project aims: (1) use zircon U-Pb geochronology and isotopic variability (Hf and O isotopes) to precisely determine the timescales for emplacement of the Paleogene Igneous Complex, Isle of Skye. (2) Document the development of a crustal thermal anomaly leading to increased crustal assimilation in the magmas and use Ar/Ar geochronology to detail the eventual cessation of activity and cooling of the intrusive bodies. (3) Use modelling to quantify emplacement rates.

We are seeking a dynamic candidate with strong background in Physics, Engineering or Earth Science. The student must be mathematically competent with experience of working with, or desire to work with programming languages such as Python or Matlab. The 42-month studentship will be based at the Scottish Universities Environmental Research Centre (SUERC) in East Kilbride, Scotland (<http://www.gla.ac.uk/research/az/suerc/>). The student will be a member of the College Science & Engineering, University of Glasgow Graduate School (<https://www.gla.ac.uk/colleges/scienceengineering/graduateschool/>) and will work directly with our industry partners Thermo Fisher Scientific.

To discuss the project please contact Professor Darren Mark (Darren.mark@glasgow.ac.uk).

To apply for the projects follow the instructions found at the link: <https://www.gla.ac.uk/colleges/scienceengineering/graduateschool/postgraduateresearchstudy/howtoapply/>

**Closing date 15th November 2021. The project will start early in 2022.**