

**FORM PER PROGETTI BANDO DOTTORATO****1. Project title**

Archean mantle evolution: constraints from peridotite cumulates of SW Greenland

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4. Key words

(Max. 5 – at least 2)

magmatic amphibole, olivine, ultramafic cumulates, melt-peridotite reaction

5. Abstract

<p>Our understanding of Archean geodynamics is limited due to the fragmentary evidence preserved in the geological record, which makes it difficult to constrain the large-scale processes that shaped the early Earth. Additionally, the knowledge on the mantle compositions in Archean times is still fragmentary, thereby arising a series of problems spanning from the effective chondritic composition of the Earth to how fluid mobile elements were added to the mantle. Here we propose a novel approach in deciphering the Archean mantle geochemical signature and its evolution. The approach consists in deriving the geochemical signature of the mantle mostly based on trace element and isotopic (Nd, Sr, Hf, O and B) compositions of minerals from magmatic ultramafic rocks. Specific analytical efforts will be devoted to amphibole, in order to assess whether the selected ultramafic rocks underwent metasomatic modifications by high-temperature fluids and/or crustal melts during their prolonged geological history. In particular, we wish to consider two case studies from SW Greenland. The first is represented by the Eoarchean (3.8-4.0 Ga) Narssaq ultramafic body, and the second is provided by the Mesoarchean (2.9-3.2 Ga) Seqi Ultramafic Complex.</p>
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