PhD position in Archaeometry
Department Geosciences – University of Fribourg
Switzerland

Topic: Petrology of archaeological iron smithing slag.
Starting Date: 1st September 2020 – or as quickly as possible
Commitment Rate: 75 %  Duration: 5 years
Supervision: Prof. Vincent Serneels
Location: Department of Geosciences – University of Fribourg

Slag are waste formed during metallurgical processes. The study of the slag pieces recovered from an archaeological site allows to reconstruct qualitatively and quantitatively the past metallurgical activities.

Slag are artificial silicates materials similar to rocks. Their composition reflects the raw materials involved and technical practices (raw iron, fuel, addition). The mineralogy and the texture provide essential information the physical conditions of the process (temperature, oxygen fugacity). A large panel of mineralogical and geochemical methods are used to characterize these materials.

Over the past decades, in Switzerland, more than 25 large assemblages of smithing slag have been studied individually. They were collected from a range of excavated workshops of various periods, from Celtic to Medieval, and various contexts: farms, villages, towns and specialized sites. This very large data set (about 600 samples) is now available for a general comparative approach based on the petrographic and geochemical data. This synthetic approach will be the tool for the identification of long term trends in the iron working technology and major changes. The source and behavior of key chemical elements will be investigated to characterize the variability of raw materials and processes involved.

The PhD student will have to familiarize himself with the smithing slag using the very large collection available in Fribourg. He will have to carry out himself additional analyses on new samples (optical microscopy, SEM, XRF, XRD) and will be involved in collection studies in progress. He will have to produce a comparative study of the variability of smithing slag over two millennia.

Beside his own research topic, the PhD candidate will be a member of the archaeometry research group and will participate in the ongoing projects, specialized meetings and fieldwork. He will also be involved in teaching activities in Earth Sciences at the Bachelor and Master level, including practical exercises (microscopy), excursions and field camps.

Requested background and skills
Master degree in Earth Sciences.
Strong background in Mineralogy-Petrology. Strong interest for archaeology.
Desired skills:
Good knowledge in laboratory techniques (XRF, XRD, SEM, microscopy)
English and French or German

Deadline for application: 20.8.2020

Email address for application: Vincent.serneels@unifr.ch
Requested documents: Curriculum Vitae + Motivation Lettre
PDF of Master work