DIPARTIMENTO
DI SCIENZE DELLA TERRA

SAPIENZA
UNIVERSITÀ DI ROMA

DOTTORATO DI RICERCA
IN SCIENZE DELLA TERRA

## 1. Research activity (max 1.000 words)

The objective of the research is the characterization of roman orichalcum coins and the definition of their making technique. Furthermore, the aim of this study is to increase the knowledge about the cementation process (the technique used to produce orichalcum) and to understand the corrosion processes of this ancient alloy.

The samples analysed are representative of different roman denominations (As, Sestertius, Dupondius, Semis, Quadrans) considered by the researchers as orichalcum coins. Using non-destructive techniques, as XRD and XRF, it was possible to confirm that only a few number of sample were made in orichalcum, a Cu-Zn based alloy, while the rest of the samples were made in copper-based alloy.

Some samples of the collections were analysed with destructive techniques.
SEM-EDS analysis were realized on cross-section, in order to value the dezincification process from the external layers to the core, for each sample. X-ray maps were useful to study the distributions of the alloy elements through the whole thickness of the coins. Furthermore, EMPA allowed to know the real Cu/Zn ratio (quantitative method) in the uncorroded core and to value the amount of Zn loss in the degraded layers of each sample.
This information would have been impossible to obtain without cross-section or analysing the only external surfaces of the samples, due to the presence of the *patinas* and corrosion product.

Results collected during the first year will provide a strong

**Research products**

d) Abstracts:
- **Workshop:** Scientia Ad Artem 3. "*Archaeometric characterization of XIII century "Provisini" coin: a multi-analytical approach*" (University of Firenze, 08/06/2017). **Poster contribution.**
- **AIV-SGI-SIMP-SOGEI Congress**: Geoscience: a tool in a changing world. "*A Multi-analytical approach for the characterization of ancient Roman coins in orichalcum*" (University of Pisa 03-04/09/2017). **Oral contribution.**

**N.B. I dottorandi del primo anno al punto 1 possono inserire il riassunto del progetto di ricerca (max 1.000 parole)**