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## EXALUHR

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### Examination of re-employed historical aluminium

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#### OBJECTIVES

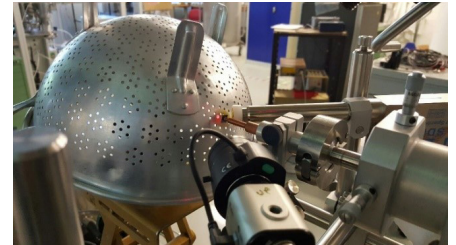
With this project, we aim to use a PIXE for elementary analysis of some aluminium based materials of historical objects from Swiss public collections and see whether the results can be used to deduce their manufacturing techniques (and date them).

#### PROGRAM

The history of aluminium is recent. If originally it was considered as an expensive metal due to its difficult chemical manufacturing process, its cost decreased after 1886 when it was produced electrolytically. The composition of aluminium alloys of the end of the « chemical » period (1880 to 1886) and of the beginning of the « electrolytic » period (1886 to 1900) are not well controlled. Many materials were recycled or disappeared. Those that survived are witnesses of the technological development of the time.

This recycling phenomenon comes back at several times during the aluminium history. As a result, it is difficult today to tell whether the alloys of the end of the 19th century or the beginning of the 20th century have a chemical or electrolytic origin. Similarly, it is delicate to trace back the history of certain alloys produced after the 2nd world war. Were they new or recycled ?

Some recent researches show that the analysis of trace metal elements (Pb, Mn) with a particles accelerator (PIXE method) allows to precise the production mode of aluminium alloys<sup>1</sup>. HE-Arc has such an equipment (IONLab – Institut des Microtechnologies Appliquées) and will be used with a portable XRF to investigate a few artefacts from the Swiss National Museum (SNM) and the Historical Museum of Lausanne (MHL) collections.



#### FUNDING

Haute Ecole Arc

#### PROJECT LEADER

Christian Degrigny  
christian.degrigny@he-arc.ch

#### PARTNERS

The Collection Centre of the Swiss National Museum, Zurich; Historical Museum, Lausanne; Institut des Microtechnologies Avancées, La Chaux-de-Fonds

#### DURATION

12 months  
1.1.2016 – 31.12.2016

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<sup>1</sup>Bourgarit, D., Plateau, J. Quand l'aluminium valait de l'or : peut-on reconnaître un aluminium «chimique» d'un aluminium «électrolytique» ? ArchéoSciences, 29, 2005, p. 95-105.