



## Authentication methodologies for metal artefacts based on material composition and manufacturing techniques

The forgery of original works of art and fraudulent dealing of counterfeits has been a problem ever since ancient times, a global challenge at level with trafficking of weapons, drugs and human beings.

AUTHENTICICO project CT n. 044480 proposes a multidisciplinary research to face this problem and provide a cost-effective science, technology and culture based strategy for the authentication of movable cultural patrimony, in particular precious and non-precious metal artefacts.

Ten partners take part in the project, representing 8 countries: Belgium, Czech Republic, Egypt, France, Italy, Poland, Tajikistan and United Kingdom, involving research centers, academia, museums, conservation services, superintendencies and SMEs, significantly contributing to building strong ties beyond Europe, spreading a European ethical approach for cultural heritage through third countries participation.

AUTHENTICICO is coordinated by EJTN GEIE, European Jewellery Technology Network, active in research since 1998.

Direct support and interaction from Law Enforcement Agency – the Italian Comando Carabinieri Tutela Patrimonio Culturale – and from Civil Protection representatives will expand and increase the validity, applicability and usefulness of the project.

### OBJECTIVES

- Assessing an innovative, shared and international protocol, for a set of non-invasive authentication techniques and procedures on movable metal artefacts, integrating different approaches: experienced evaluation of the artefacts on the historical and morphological sides, description of manufacturing techniques and analysis of material composition with state-of-the-art diagnostic technologies, commonly used for the study of modern technological materials and unexplored in the study of ancient materials;

- Developing portable instruments, integrating micro-topography performed with portable optical instruments, elemental analysis based on Laser Induced Breakdown Spectroscopy and electronic-nose technology for the detection of selective molecular markers, for a simplified and non-invasive set of analyses and diagnostics to be carried out in situ, changing the perspective of authentication procedures for valuable objects, masterpieces, and large museum collections.



### IMPACTS

- Environmental impact, preventing the deliberate damage, destruction or defacement of priceless works of art.
- Ethical impact, with respect to intangible values, such as ethical and moral values, fostering respect and appreciation of humankind tradition, culture and heritage.
- Social impact, fostering involvement and appreciation of individuals, countries and local populations towards their own cultural heritage.
- Political impact, supporting countries and governments favouring respect and protection of CH.
- Economic impact, positive on legal and correct trade exchanges of CH, whether private or public (e.g. Museums, Auction houses, private collectors) and negative on illicit CH trace.
- Impact on taxation, supporting governments to recover unpaid revenue, preventing laundering from illegal sales of artefacts
- Impact on local and international Law Enforcement activities meant to curb black marketing of works of art.

### IAMs

The proposed Integrated Authentication Methodology (IAM) constitutes a scientific support for the authentication of artefacts to be applied to the following areas of interest:

- Attribution of historical period of production.
- Authentication with respect to copies of the later periods.
- Anti-fraud measures (this is generalized for all methodologies related to metal artefacts).
- Artefact's fingerprints for traceability and identification.

The IAM will be experimented in pilot studies carried out on real authentication problems by the research organizations involved, in national level research laboratories in cooperation with national museums and superintendencies.

### Partners

**Belgium**  
 EJTN GEIE European Jewellery Technology Network.  
[www.ejtn.org](http://www.ejtn.org)

**Czech Republic**  
 EDU-ART Conservation & Restoration of Prague Castle Royal Jewellery.

**Egypt**  
 CULTNAT Center for Documentation of National and Cultural Heritage. [www.culnat.org](http://www.culnat.org)

**Italy**  
 CNR IFAC Institute of applied Physics – Italian National Council of Research. [www.ifac.cnr.it](http://www.ifac.cnr.it)

CSP Project Development Centre.  
[www.centrosviluppoprogetti.it](http://www.centrosviluppoprogetti.it)

CR. SBAT-MIBAC Restauration Center Tuscany  
 Archaeological Heritage Superintendency.

**France**  
 C2RMF Centre of Research and Restoration of the French Museums. [www.c2rmf.fr](http://www.c2rmf.fr)

**Poland**  
 UMK Nicholas Copernicus University.  
[www.umk.pl](http://www.umk.pl)

**Tajikistan**  
 SoDeSCo Society for Development of Scientific Cooperation. [www.tajiknlp.org](http://www.tajiknlp.org)

**United Kingdom**  
 UCL-IA University College London  
 Institute of Archaeology. [www.ucl.ac.uk](http://www.ucl.ac.uk)

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