

## COST Action G8: Non-destructive analysis and testing of museum objects

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### Summary

*COST Action G8 (2000-2004) aims at creating a Europe-wide network that would enable co-operation and interaction between two groups of professionals: people directly concerned with the maintenance of our cultural heritage – conservators, curators, art historians, archaeologists – and analytical scientists, including chemists, physicists, geologists, metallurgists, mineralogists and microbiologists. The main objective of the action is to improve preservation and conservation of our cultural heritage by increasing knowledge of museum objects through non-destructive analysis and testing. The scientific activities of COST G8 include organising short-term scientific missions to train scientists of both groups in the other's field as well as to transfer practical experience among the European countries. Regular meetings in the form of workshops are organised in order to exchange the obtained knowledge in a broader group, and six working groups are active, which allows close collaboration in a specific field.*

### Introduction

The conservation and preservation of our cultural heritage has become one of the main concerns within Europe today. In particular, the increasing need for non-destructive investigations is a major issue, as sampling is in most cases restricted in view of the value or the uniqueness of the object. Even in cases that allow sampling, non-destructive testing offers the possibility of obtaining more information about one specific sample as complementary techniques may be applied.

In the analytical sciences many non-destructive techniques are available, such as ion beam analysis, autoradiography and optical spectroscopy, all of which can, in principle, be used in this field. Museums, however, do not always have access to these techniques, while many of the necessary research instruments and analytical facilities are located in specialised research institutes, as they require very specific expertise. Some techniques may still need to be introduced and established in the field of cultural heritage.

It is for these reasons that COST Action G8 has been established, which aims at creating an environment that enables co-operation and interaction between museums and natural scientists. COST is an intergovernmental framework for European co-operation in the field of scientific and technical research, allowing the co-ordination on a European level of nationally funded research projects (<http://cost.cordis.lu/src/home.cfm>).

### Objective and benefits

The main objective of COST Action G8 is to improve the preservation and conservation of our cultural heritage by increasing knowledge of museum objects through non-destructive analysis and testing. This is accomplished by creating a Europe-wide environment, in which people directly concerned with the maintenance of our cultural heritage (i.e. art historians, archaeologists, conservators and curators) and analytical scientists (i.e. physicists, chemists, material scientists, geologists, etc.) can exchange knowledge. A 50/50% balance is aimed at between the activities of both groups, which should result in greater interest. The expected benefits are twofold. First, the capability of answering questions related to museum objects, which cannot be readily solved now, will be enhanced. This includes the exchange of knowledge of available non-destructive techniques and the requirements for performing investigations on valuable or unique objects. In addition, museums and similar institutes will have easy access to universities and research facilities that provide such techniques.

The first successful step in this direction has been provided by COST Action G1 (1995-2000). The focus of this action was confined to the use of ion beam analysis (IBA) for art and archaeological objects. Applications were done for various archaeological objects, such as paint layers, pottery, glass, enamels, obsidian, stone, tools, bronzes, coins and gold jewellery (RESPALDIZA, 1997; DEMORTIER, 2000). The expansion to a multidisciplinary community and the use of additional non-destructive techniques allows to obtain further complementary information.

### The scientific programme

COST Action G8 has three main scientific activities. The first one includes organising short-term scientific missions (STSM) between participating institutions. The goal of these STSMs (3 days – 1 month) involves the training of scientists of both professional groups in the other's field as well as the transfer of practical experience among European countries. Priority here is especially given to young researchers.

Secondly, regular meetings in the form of workshops are organised to exchange obtained knowledge in a broader group, to discuss new themes, and to build interest and create possibilities for new collaborations.

**Table 1. Scientific goals of short-term scientific missions and workshops**

Short term scientific missions	Workshops
Train scientists of both professional groups in the other's field as well as transfer practical experience between the European countries.	Exchange (obtained) knowledge in a broader group.
Address specific problems concerning museum objects as well as collect and compare data.	Prove the non-destructive properties of the techniques.
Compare the use of standing facilities and portable equipment.	Build interest and give the possibility of new collaborations.
Exploit the advantages and limitations of the different techniques also in comparison to techniques commonly used today in the field of cultural heritage.	Assist in choosing the method(s) best suited for a specific problem.
Art historians, archaeologists and conservators obtain easier access to analytical research instruments.	

**Table 2. Participating countries (June 2002)**

Austria	France	Italy	Slovenia
Belgium	Germany	Malta	Spain
Czech Republic	Greece	Poland	Switzerland
Denmark	Hungary	Romania	United Kingdom
Finland	Israel	Slovakia	

The goals of both activities are listed in detail in Table 1.

Apart from to the yearly workshops and STSMs between participating groups, separate working group meetings have been created. The working groups allow close collaboration and an extended and efficient exchange of knowledge within a specific topic, and therefore a more efficient way of publishing the obtained results. The following themes are addressed:

- Technology and techniques of manufacture
- Origin and provenance (including trade routes and supply zones)
- Degradation processes, corrosion, weathering
- Preservation and conservation
- Authenticity and authentication
- Development of analysis procedures

COST Action G8 started on December 21, 2000 and will run for four years. At the time of writing, nineteen European countries have joined. They are listed in Table 2.

### Further information

For further details and information about the possibility of joining the Action, please contact the author or visit our web site at <http://srs.dl.ac.uk/arch/cost-g8>.

### References

DEMORTIER G. and ADRIAENS A., *Ion Beam Study of Art and Archaeological Objects*, EUR 19218, Office for Official Publications of the European Commission, Luxembourg, 2000.

RESPALIZA M.A. and GOMEZ-CAMACHO J., *Applications of Ion Beam Analysis Techniques to Arts and Archaeometry*, Secretariado de Publicaciones de la Universidad de Sevilla, Sevilla, 1997.

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