

Project no. SPI-CT-2008-219301-NET-HERITAGE

# **NET-HERITAGE**

# EUROPEAN NETWORK ON RESEARCH PROGRAMME APPLIED TO THE PROTECTION OF TANGIBLE CULTURAL HERITAGE

Instrument: Coordination and support actions (Coordinating type)

Deliverable 5.3

Report on short conferences, disseminating the approach proposed, as well as pilot courses, following this approach.

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Start date of project: 1 October 2008 Duration: 3 Years Project coordinator: Ministry of Cultural Heritage and Activities (Italy) Antonia Pasqua Recchia

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# INTRODUCTION

Workpackage 5 'Implementation of joint activities through the coordination of advanced training in the field of tangible cultural heritage' is implemented within the Net-Heritage project with the aim to:

- improve possibilities for the advanced training of professionals working both in the public sector and in the companies active in the heritage market,
- develop a coherent and high-profile Advanced Training Programme in sciencebased conservation in Europe,
- promote and encourage the dissemination of research results from the research community as widely as possible among professional practitioners, especially SMEs,
- promote partnerships and mutual learning between EU member states,
- build an effective critical mass in research and training across member states, achieving a multiplier effect as compared to the relatively small-scale efforts of individual institutions and single-state initiatives,
- improve the competitiveness and promote EU leadership in the global heritage sector, enhancing job creation.

Within the implementation of Task 5.1 'Analysis of existing training possibilities' a 'Report on the opportunities in advanced education in conservation-restoration and science for conservation in Europe' was prepared. The report was based on information provided by all partner countries of the Net-Heritage project in the 'Questionnaire on the opportunities in advanced training in conservation-restoration and science for conservation in Europe'. The WP5 team was supported by the Panel of Experts of WP5 who were selected from national experts on education in conservation and conservation science nominated by the project's partners – Dr. Martina Caruana, Malta, Professor May Cassar, United Kingdom, Professor Annamaria Giovagnoli, Italy, Professor Roman Kozłowski, Poland, Professor Rocco Mazzeo, Italy. Additionally, one external expert – Professor René Larsen, Denmark - was asked to join the Panel. The six experts represented different backgrounds and professional areas and provide insight into various training schemes in different parts of Europe.

Based on the survey, the Panel of Experts made a number of recommendations forming the Model Framework for Advanced Education (see below) which, it is believed, are essential to encourage opportunities to carry out advanced study and research in the broadest possible range of disciplines of the heritage field and thereby better meet the many challenges to the long-term preservation of European cultural heritage. The Framework will improve opportunities of advanced study and research, enable the development of a more effective cadre and ensure sustainable public access and protection of cultural heritage. It is also essential for the competitiveness of the European heritage sector, knowledge export and the leadership of Europe in this area.

#### Model Framework for Advanced Education

The opportunities for advanced education, study and research in conservation-restoration and science for conservation in Europe, a specific area where science and the humanities overlap, range from studies for formal gualifications like doctoral degrees, through long courses, down to workshops and short courses aimed at the exploration of a specific topic or the transfer of results of innovative research. The educational activities, providing an optimum environment for professionals interested in a specific subject in the field of science-led conservation, share a common framework which is characterised by the elements set out below:



The process of dissemination of the approach proposed by the Net-Heritage project started already within task 5.2 'Definition of the model for Advanced Training Programme' and was continued within task 5.3 'Promotion activities to encourage the formation of a pilot group of training institutions in partner states willing to use and evaluate the programme developed'. These tasks aimed at confronting the proposed model with institutions involved in education in conservation-restoration and science based conservation, analysing in depth their opinions and suggestions and including the proposed improvements. Deliverable 5.2 was defined as a network of training institutions, collaborating on the basis of the model programme; working actively to promote inter-institutional sharing of knowledge and experience, and encouraging researchers and professionals from participating states to take advantage of high-level opportunities for research and training outside their own countries.

The activities aiming at dissemination and implementation of the approach developed by the project and the formation of a pilot group of educational institutions in partner states willing to use and evaluate the developed Model Framework for Advanced Education are described in part 1 of this report. It was decided that to attain impact within the European field of advanced education in conservation and heritage science two stakeholder groups should be taken into consideration - institutions funding and managing education and science and institutions providing education.

Further implementation of workpackage 5 consisted in the organisation of short conferences and pilot courses following the approaches proposed by the project. Two main events organised are presented in detail in part 2 and 3 of this report:

- international workshop 'Heritage science education in a changing world', Warsaw, Poland, 6th April 2011,
- international workshop 'Science and cultural heritage in European training', Rome, Italy, 21st September 2011,

and other promotional activities are described in part 4.

1. Promotion activities aimed at the successful dissemination and implementation of the approach developed by the Net-Heritage project and the formation of a pilot group of training institutions in partner states willing to use and evaluate the developed Model Framework for Advanced Education

It was decided that to attain impact within the European field of advanced education in conservation and heritage science two stakeholder groups should be taken into consideration - institutions funding and managing education and science and institutions providing education.

## 1.1 Promotional activities aimed at decision makers

It was decided by the project partners that the most efficient way to inform about and implement the Model Framework for Advanced Education would be to acquire support of Ministries, funding agencies and other relevant institutions in the partner states responsible for funding and managing culture, education and research through signing a Declaration of Support prepared by the Workpackage leader in collaboration with the task leader MIBAC. All partners approved the Declaration of Support during the London Meeting in September 2010. The text of the Declaration is presented below.

## DECLARATION OF SUPPORT

The recommendations forming the Framework for Advanced Education in the field of conservation-restoration and science for conservation developed within the NET-HERITAGE project are essential to encourage opportunities to carry out advanced study and research in a broadest possible range of disciplines of the heritage field and thereby to meet better the many challenges to the long-term preservation of European cultural heritage. The framework will improve opportunities of advanced study and research, enable the development of a more effective cadre and ensure sustainable public access and protection of cultural heritage. It is also essential for the competitiveness of the European heritage sector, knowledge export and the leadership of Europe in this area.

Therefore, I, ...., representing the ..... declare my support for the Net-Heritage initiative.

(Stamp, signature)

10 Institutions returned the signed Declarations:

- Belgium The Declaration was signed by Myriam Serck-Dewaide the Director of the Royal Institute for Cultural Heritage.
- Germany The Declaration was signed by Lutz Töpfer the Head of the Environment and Cultural Assets Division at the DBU (German Federal Foundation for the Environment).
- Island The Declaration was signed by Katrin Jakobsdottir the Minister of Education, Science and Culture.
- Italy The declaration was signed by Antonia Recchia General Director of the Ministry of Cultural Heritage and Activities.
- Latvia The declaration was signed by Ints Dalderis the Minister for Culture of the Republic of Latvia.
- Poland The declaration was signed by Bogdan Zdrojewski the Minister of Culture and National Heritage.
- Slovenia The declaration was signed by Majda Sirca the Minister of Culture and Franci Demsar the Director of the Slovenian Research Agency.
- Spain The declaration was signed by Anibal Gonzalez Perez General Directorate for Research and Management of R&D Plan of the Ministry of Science and Innovation.
- UK The declaration was signed by Shearer West the Director of Research of the Arts and Humanities Research Council.

#### 1.2 Promotional activities aimed at educational institutions

To reach the educational institutions, it was decided that the accepted Framework will be presented to ENCORE, the European Network for Conservation-Restoration Education. The ENCORE is a network organisation of higher educational institutions in the field of conservation – restoration and currently has 42 members from 20 countries and 26 partners. A main objective of ENCORE is to promote research and education in the field of conservation and restoration of cultural heritage. The Net-Heritage project, the WP5 report and recommendations were presented to the ENCORE by the WP leader, who took part in the ENCORE general assembly in Vienna, on 27 September 2010.

The ENCoRE signed the Declaration of Support and decided to promote the Net-Heritage approach.

EUROPEAN NETWORK FOR CONSERVATION RESTORATION EDUCATION

# **ENCoRE**

27. September 2010

The recommendations forming the Framework for Advanced Education in the field of conservation-restoration and science for conservation developed within the NET-HERITAGE project are essential to encourage opportunities to carry out advanced study and research in a broadest possible range of disciplines of the heritage field and thereby to meet better the many challenges to the long-term preservation of European cultural heritage. The framework will improve opportunities of advanced study and research, enable the development of a more effective cadre and ensure sustainable public access and protection of cultural heritage. It is also essential for the competitiveness of the European heritage sector, knowledge export and the leadership of Europe in this area.

To complement the appendices of the report, ENCoRE points to its members as a rich potential of additional institutions offering opportunities in advanced education in conservation-restoration and science for conservation in Europe.

The members of the ENCORE declare the support for the Net-Heritage initiative as the basis for future initiatives such as JPI CulHer and the development in general in this area of the cultural heritage field.

Ami Baser

On behalf of the 8<sup>th</sup> General Assembly of ENCoRE René Larsen Chairman

ENCoRE, School of Conservation, Esplanaden 34, dk-1263 Copenhagen K, Denmark, mail: encore@encore-edu.org

Additionally an agreement on information exchange was concluded between the Net-Heritage project and ENCoRE. The 'Report on the opportunities in advanced education in conservation-restoration and science for conservation in Europe' was prepared on the basis of a survey carried out within the Net-Heritage project. Gathering information at the national level within the project was carried out by project partners using a questionnaire prepared by the WP leader. As the result, almost no information on the educational offer of countries from outside of the consortium has been available in the report. Therefore, it was decided that ENCoRE would supplement the report with information on courses provided by the ENCoRE members which had not been covered by the Net-Heritage survey. It will make the data-base developed within WP5 more exhaustive. As the Net-Heritage project will use the ENCoRE databases and ENCoRE is very much interested in the information collected within the Net-Heritage, it was decided to sign an agreement on the information exchange. The agreement has officially enabled the flow of information. The text of the agreement is available below:

# AGREEMENT ON THE INFORMATION EXCHANGE BETWEEN ENCORE AND NET-HERITAGE

This AGREEMENT is made on October 11, 2010

between

the NET-HERITAGE project 'European Network on Research Programme Applied to the Protection of Tangible Cultural Heritage' (NET-HERITAGE), 7th Framework Programme of the European Commission, represented by Ms Antonia P. Recchia, the Coordinator

and

the European Network for Conservation-Restoration Education (ENCoRE), represented by Mr Wolfgang Baatz, the Chairman.

Whereas NET HERITAGE and ENCORE collaborate on the development of the Model Framework for Advanced Education in Conservation-Restoration and Science for Conservation in Europe, they agree:

- to exchange information on the education opportunities in conservationrestoration and science for conservation, gathered by the NET-HERITAGE within the survey of existing training options in the project partner countries, and collected by the ENCoRE or included in its databases,
- to mutually transfer rights to use the exchanged data by the members of the ENCoRE and the partners of the NET-HERITAGE for non-commercial purposes.

Antonia P. Recchia	Wolfgang Baatz
NET-HERITAGE project coordinator	Chairman of ENCoRE
Signature:	Signature:
Date:	Date:

As Italy is not a member of ENCoRE, the Declaration of Support was submitted to the Italian Chemical Society (SCI) at 'XII Congresso Nazionale di Chimica dell'Ambiente e dei Beni Culturali', 'La Scienza Chimica per un'armonica interazione tra Ambiente e Beni Culturali', Taormina, 30th September 2010. Declaration of Support has been recognised by the Italian Chemical Society (SCI) and the signed document is presented below.

SOCIETÀ CHIMICA ITALIANA Divisione di Chimica dell'Ambiente e dei Beni Culturali Viale Liegi, 48/C - 00198 ROMA

**Il Presidente** 

#### DECLARATION OF SUPPORT

The recommendations forming the Framework for Advanced Education in the field of conservation-restoration and science for conservation developed within the NET-HERITAGE project are essential to encourage opportunities to carry out advanced study and research in a broadest possible range of disciplines of the heritage field and thereby to meet better the many challenges to the long-term preservation of European cultural heritage. The framework will improve opportunities of advanced study and research, enable the development of a more effective cadre and ensure sustainable public access and protection of cultural heritage. It is also essential for the competitiveness of the European heritage sector, knowledge export and the leadership of Europe in this area.

Therefore, I undersigned, Corrado Sarzanini, representing the Environmental Chemistry and Cultural Heritage Division of the Italian Chemical Society in quality of President, declare my support for the Net-Heritage initiative.

Corrado Sarzanini Cousdo Jasai

Prof. dr. Corrado Sarzanini CChem MRSC University of Torino Department of Analytical Chemistry Via P. Giuria 5 – 10125 Torino Italy

# 2. International workshop 'Heritage science education in a changing world', Warsaw, Poland, 6th April 2011

An international workshop 'Heritage science in a changing world' was organised in the Copernicus Science Centre in Warsaw, Poland. The detailed programme of the workshop is presented below. The workshop was divided into two parts – the short conference in the morning session contained general lectures concerning heritage science and education, the afternoon session comprised of two pilot courses presenting the approach recommended by the Net-Heritage project. The event was attended by over 100 participants from across Europe.

The conference was opened by Piotr Żuchowski, Secretary of State at the Ministry of Culture and National Heritage. The special guest of the event was Baroness Sharp of Guildford, the Chair of the Inquiry of the House of Lords Science and Technology Committee into 'Science and Heritage' who gave a lecture on the background and impact of the Inquiry. The House of Lords Science and Technology Inquiry on Science and Heritage is a document widely known and discussed in the research and conservation community and it provides fascinating insight into the desirable relation between cutting edge research, conservation practice and advanced education.

Łukasz Bratasz presented the 'Report on the opportunities in advanced education in conservation restoration and science for conservation in Europe' – the deliverable 5.1 of the Net-Heritage project. He described in detail the seven recommendations developed by the project experts on the basis on the analysis of the available training options. These recommendations form the model framework for advanced education in conservation-restoration and science for conservation in Europe, one of the key outcomes of the Net-Heritage project.

A considerable part of the model framework focused on study and research for a doctoral degree. The Net-Heritage survey revealed two basic approaches to educating students at the doctoral level: one bases education on the research work of a student supplemented by a limited training component, the other puts greater emphasis on a strong set training component. The education programmes leading to a doctoral degree differed in proportion of time ascribed to the set training component from 15% to an estimated 40-50%. Additionally, the emphasis put on the doctoral thesis varied similarly from 85% of a student's time in a science-oriented doctoral programme to merely 15% of a student's activity in a programme strongly oriented to training in management.

It may be perceived that the two systems produce professionals of diverse backgrounds: on the one hand, researchers providing high-quality, frontier research in the field, and on the other, professionals capable of managing heritage resources in the high-level administrative and service sector. Net-Heritage found the first stream of researchoriented doctoral education in the field predominant, fostering the leadership of Europe in maintaining the science base for conservation not only when applying natural or engineering sciences to the heritage field but also in the area of conservation and heritage management.

Therefore, one of the key project recommendations promoted doctoral studies with a strong research component and limited set courses. Additionally it underlined that development of generic skills should be embedded into the PhD training to develop

competences of both future researchers and professionals managing heritage resources or entering the high-level administrative and service sector.

Professor Peter Brimblecombe, Director of the Science Graduate School of the University of East Anglia, continued in this vein by presenting an ideal profile of the 21<sup>st</sup> century PhD student basing his lecture on the experiences of the PhD Programme of his University. The University implemented the recommendations of 'The report of Sir Gareth Roberts' Review'. This national review was commissioned as part of the Government's productivity and innovation strategy to look into the supply of people with science, technology, engineering and mathematics skills in the UK. The Review underlined that graduates had difficulty in applying technical knowledge in a practical environment and lack transferable skills. The same aspect was highlighted by the experts of the Net-Heritage project concerning young researchers carrying out the research works in the heritage field.

The morning lectures set background to two parallel knowledge exchange workshops of the afternoon. The survey carried out within task one of the Net-Heritage project has clearly demonstrated that short courses are the primary way in which new knowledge and practical skills, especially the findings of the current research projects, can be effectively presented and disseminated to professionals working in the field. Indeed, short courses are targeted predominantly at cultural-heritage stakeholders: curators of historic buildings and collections, public policymakers and heritage organisations at various levels – local, regional or national, conservation practitioners and enterprises engaged in diagnosing conserving, and protecting heritage, though obviously teaching staff and students of the departments working on the conservation subjects also participate. Lack of time is the principal barrier in undertaking longer courses by conservation practitioners.

A particularly interesting category of high-level short courses identified by the 'Report on the opportunities in advanced education in conservation restoration and science for conservation in Europe' were international knowledge exchange workshops organised at the end of research projects funded within the European Commission Framework Programmes. The workshops have become an almost obligatory tool for the promotion and dissemination of novel results, materials, diagnostic methods and technologies in the professional community engaged in the care and protection of cultural heritage. One of the recommendations of the Net-Heritage project encouraged national agencies funding research to support such workshops as a way of disseminating the outcome of the projects.

The two pilot knowledge exchange workshops of the Net-Heritage project operated in parallel. Topics of the courses covered two different areas - architecture, conservation of outdoor materials and management of heritage sites on one hand and management of indoor collections on the other.

The workshop led by Professor Peter Brimblecombe 'Managing heritage and access in an uncertain future' examined the impact of global climate change on architecture and conservation of outdoor materials. Global climate change may also affect the visitors' habits and preferences. This social change can in turn influence the use patterns of heritage and therefore impact economics and management. Lectures were followed by an interactive heritage game for the workshop participants to explore the potential impact of climate change on European cultural heritage.

The workshop led by Dr. Matija Strlič 'E=MC<sup>2</sup>: Efficiency is Micro-Climate Control'

presented micro-climate control as an alternative to environmental management of large indoor environments. The workshop introduced the principles of microclimate (MC) management and potential benefits of anoxia, a specialised form of MC frames with lowoxygen environment. The hands-on workshop examined the objects, the anoxic encasements, as well as the interaction of objects with closed environments, including the 'smell' of historic objects. A collections care decision-making process was discussed through case studies.

The experts of the Net-Heritage project underlined that although the survey carried out within the Net-Heritage project demonstrated clearly that short Continuous Professional Development (CPD) courses are of great value especially to practitioners for whom it is important to gain new knowledge and skills, but who can afford to invest only little time in training, the value of CPDs depends on the quality of the pedagogy. Therefore, one of the recommendations proposed that the organisers of each CPD course articulate learning objectives and outcomes explicitly in the publicity material of each course.

Professor Peter Brimblecome and Dr Matija Strlič prepared summaries of the learning objectives and expected outcomes of the workshops, which are presented below.

## Managing heritage and access in an uncertain future

Peter Brimblecombe School of Environmental Sciences University of East Anglia Norwich UK

## Introduction

The session will begin with a lecture on the nature of future air pollution and climate and the way it is likely to affect our material heritage. It will focus on environmental pressure particularly likely to damage heritage in the future. This will be followed by a practical exercise that will explore five archetypical historic sites in Europe. Participants will be asked to explore the likely impact of future climate change on these sites using the content of lecture. They will be expected to consider likely social and historical frameworks for the sites and to define their vision for managing the environmental pressures. This is important because the way visitors utilise sites (e.g. on very hot days) and their expectations and choices about a visit are likely to alter under a changed climate.

## Learning objectives

A range of ideas will develop skills of the team as they

- evaluate the complexity of current and future risks at a site,
- balance priorities for the various threats to the site,
- consider underlying social and historical issues,
- develop a plan for the long term management of the site,
- utilise the abilities inherent in the team to develop the best presentation.

#### **Description of the workshop**

To begin we will outline the structure of the exercise, *Climate Myths* along with an introduction to the five archetypical historic sites. The five teams will then assemble and be given site descriptions and copies of the, The Atlas of Climate Change Impact on European Cultural Heritage: Scientific Analysis and Management Strategies, The Anthem-European Union Series (2010). This atlas should give some input to the development of management plans, but time will be limited so the teams will have to divide their activities to assess the types of climate change and threats ST MATHEW'S CATHEDRAL, ONE OF THE



at sites and begin to generate a list of key issues requiring FIVE SITES USED IN CLIMATE MYTHS management. New ways tourists approach a site visit will be an additional element for future management, with considerations of the relative impact of social and climate change. The teams will have to make 5-minute presentations to entire workshop at the end of the session.

#### Learning outcomes

- ability to develop a set of key variables likely to affect heritage,
- a view of the complexity of issues and risks at sites,
- learn about prioritization of threats,
- a sense of the relevance of social and historical issues in management, .
- thoughts on strategic management of heritage sites, .
- experience of working rapidly in a multidisciplinary team.

#### E=mc2 - Efficiency is Micro Climate Control

Matija Strlič Centre for Sustainable Heritage The Bartlett School of Graduate Studies University College London London, UK

Jacob Thomas Laboratorium Analiz i Nieniszczących Badań Obiektów Zabytkowych - LANBOZ Muzeum Narodowego w Krakowie Krakow, Poland

#### Introduction

This workshop showcases the results of a successful PhD project in collaboration between Tate and University College London, and later developments. Micro-climate control is an alternative to environmental management of large indoor environments. The workshop will introduce the principles of microclimate management and potential benefits of anoxia, a specialised form of MC frames. The technical details of the characterisation of objects prior to anoxic encasement, frame construction and the effects of anoxia on pigments and dyes as well as potential risks due to the accumulation of volatile organic compounds will be discussed. A collection care decision making

process will be presented through case studies. The workshop will be given in the form of presentations, practical demonstrations and case studies.

## Learning objectives

- To evaluate the benefits of microclimate control in display and storage of heritage objects
- To understand the influence of oxygen and pollutants in microenvironments
- To evaluate the benefits of anoxic frames .
- To develop decision making skills regarding the use of microclimate frames
- To develop group working and presentation skills

#### **Description of the workshop**

The workshop will start with a series of short presentations on the background and technical details considered in the development of anoxic enclosures. A short review of potential benefits will be given. The workshop will continue in two breakout sessions, each 30 min, to consider the technical details of anoxic frame construction and to discuss the emissions from "smell") accumulating objects (their in microenvironments. This will be followed by a 30-min decision-making group exercise, followed by short presentations. The workshop will be concluded with a **TESTING OF AN OBJECT PRIOR TO ANOXIC** 



short presentation of the dissemination and knowledge **FRAMING**. transfer aspects of the successful project.

#### Learning outcomes

- Ability to evaluate the benefits of micro-environmental control for various types of . objects
- Understand interactions between objects and the immediate environment .
- Develop the knowledge of testing and construction of anoxic frames
- Ability to make decisions on whether to consider anoxic framing
- Understand the wider impacts on access and energy consumption .
- Ability to communicate and work in a team

The topic of the workshop led by Matija Strlic was chosen to present a practical application of the recommendations concerning doctoral training.

Recommendation 1 of the Model Framework for Advanced Education promoted research oriented doctoral education. The survey carried out within the Net-Heritage project demonstrated that doctoral projects covered rich and diverse areas of scientific research at the frontier of the conservation field producing excellent end-user-value research. The workshop was based on the outcome of research of Dr. Matija Strlič and Jacob Thomas his PhD Student at University College London. The PhD project was carried out in collaboration between the University College London and the Tate Gallery and concerned evaluating the

anoxic framing of watercolours.

- Recommendation 2 of the Model Framework for Advanced Education pointed out that the field of conservation science is being perceived as an artistic domain which therefore needs lower funding. However, adequate funding of doctoral research should be ensured in the area where humanities and sciences overlap. During the workshop sophisticated pieces of scientific equipment were presented. Jacob Thomas concentrated on microfadeometry and how it can be used to survey colorants on paper, parchment and textiles and contribute to the risk assessment process prior to anoxic framing. The workshop also clearly showed that heritage science is a difficult and specific area where scientific competences must be combined with understanding of artistic, humanistic and ethical dimensions of the heritage preservation.
- Recommendation 3 of the Model Framework for Advanced Education concentrates on the continuity of funding to create a long-term commitment by talented, enthusiastic PhD students and early-stage post-doctoral researchers for the heritage field. The survey carried out within the Net-Heritage project revealed that doctoral studies are a very important element in sustaining research. This is due to the strong enthusiasm and interest of the PhD students but also additional funding coming from doctoral training funding schemes. The PhD project on which the workshop was based was possible due to the funding provided by the end-user institution the Tate Gallery.

Heritage science education in a changing world





Copernicus Science Centre in Warsaw ul. Wybrzeże Kościuszkowskie 20

# Workshop programme

#### 9.00-10.00 Registration

Registration

# 10.00-10.15

Welcome – Piotr Żuchowski, Secretary of State, Ministry of Culture and National Heritage

The Ministry of Culture and National Heritage coordinates heritage protection in Poland. It supports not only heritage institutions but also the advanced education within the heritage field. The Ministry participates in the Net-Heritage project, which is the first significant initiative which has set out to coordinate national RTD programmes of European countries, and support European programmes in research applied to the protection of tangible cultural heritage.

# 10.15-10.35

House of Lords Science and Technology Inquiry on Science and Heritage – Baroness Sharp of Guildford

Baroness Sharp of Guildford, Chairman of the House of Lords Science and Technology Inquiry on Science and Heritage will speak on the background and impact of the Inquiry.

# **10.35–11.00** Coffee break

# 11.00-11.40

Profile of the 21st century PhD student – Professor Peter Brimblecombe

Peter Brimblecombe will present the implementation of the recommendations of 'The report of Sir Gareth Roberts' Review' at East Anglia University. This national review was commissioned as part of the Government's productivity and innovation strategy to look into the supply of people with science, technology, engineering and mathematics skills in the UK.

# 11.40-12.20

The Net-Heritage project and introduction to the afternoon session – Dr. Łukasz Bratasz

Łukasz Bratasz will present the Net-Heritage project and one of its main outcomes, a set of recommendations forming the Framework for Advanced Education in the field of conservation-restoration and science for conservation. He will also introduce the afternoon workshops which will serve as model examples of knowledge transfer between research and heritage field.

**12.20–12.50** Refreshments

# 12.50–15.30 Knowledge Exchange Workshops

Knowledge exchange workshops have been identified as the most important and effective way of transferring research results to the practitioners working in the field. Two pilot workshops of the Net-Heritage project will operate in parallel to demonstrate this.

1**5.30** Lunch

# Knowledge exchange workshops

Professor Peter Brimblecombe – Managing heritage and access in an uncertain future

The workshop will examine the impact of global climate change on architecture and conservation of outdoor materials. Global climate change may also affect the visitors' habits and preferences. This social change can in turn influence the use patterns of heritage and therefore impact economics and management. Lectures will be followed by an interactive heritage game for the workshop participants that should allow them to explore the potential impact of climate change on European cultural heritage.

Peter Brimblecombe is a Professor in Atmospheric Chemistry in the School of Environmental Sciences, and Director of the Science Graduate School that offers training to the PhD Programme at University of East Anglia and was appointed senior editor of Atmospheric Environment in 1990. He has been involved in European Commission cultural heritage projects in FP4, FP5 and FP6 including the NOAH's ARK looking at impact of climate change on heritage. He has advised the Council of Europe, the European Parliament and the House of Lords on heritage science. Peter Brimblecombe has extensive experience in delivering workshops aimed at knowledge transfer between research and heritage practice.

Dr. Matija Strlič – E=MC<sup>2</sup>: Efficiency is Micro-Climate Control

Micro-climate control is an alternative to environmental management of large indoor environments. The workshop will introduce the principles of microclimate (MC) management and potential benefits of anoxia, a specialised form of MC frames with low-oxygen environment. The hands-on workshop will examine the objects, the anoxic encasements, as well as the interaction of objects with closed environments, including the 'smell' of historic objects. A collections care decision-making process will be discussed through case studies.

Matija Strlič is Senior Lecturer at the Centre for Sustainable Heritage, University College London. He is an editor of e-Preservation Science and several books on preservation of heritage materials. He has been involved in many European Commission projects, including FP5, FP6 and FP7 and coordinated two. He is the Principal Investigator of the UK AHRC/ **EPSRC Science and Heritage Programme** project Collections Demography (2010-2013) and a Co-Investigator on Heritage Smells! (2010-2013). Matija Strlič organised a number of workshops for conser--vators and scientists, and is the Course Director of the MRes in Heritage Science at University College London, Centre for Sustainable Heritage.

Net-Heritage – European Network on Research Programme Applied to the Protection of Tangible Cultural Heritage.

The International Workshop – Heritage science education in a changing world – is organised to disseminate the approach developed by the Net-Heritage project.

# **Organisers:**

Ministry of Culture and National Heritage, Poland The National Museum in Krakow, Poland

# Net-Heritage project coordinator:

• Ministry for Cultural Heritage and Activities (MiBAC), Italy

# Net-Heritage project partners:

- Ministry of Education, University and Research (MIUR), Italy
- Belgian Federal Science Policy (BFSP), Belgium
- Ministry of Education and Science (MES), Bulgaria

- Ministry of Culture and Communication (MCC), France
- German Federal Foundation for the Environment (DBU), Germany
- Hellenic Ministry of Culture (HMC), Greece
- Archaeological Heritage Agency of Iceland (MCI), Iceland
- The State Inspection for Heritage Protection (VKPAI), Latvia
- Heritage Malta (HM), Malta
- Ministry of Culture and National Heritage (MKDN), Poland
- National Centre for Programme Management (CNMP), Romania
- Ministry of Culture (MK), Slovenia
- Ministry of Education (MEC), Spain
- Arts and Humanities Research Council (AHRC), United Kingdom

The Net-Heritage project is supported by the European Commission under the Seventh Framework Programme



# 3. International Workshop 'Science and cultural heritage in European training', Rome, Italy, 21st September 2011

The short conference 'Science and cultural heritage in European training', was organised in Rome, Italy as a part of the Net-Heritage final meeting to promote the project's vision of how advanced education and research should be organised effectively.

The Workshop was aimed to the dissemination and sharing of the Work Package 5 outcomes. The methodological approach on conservation and restoration of cultural heritage emerged during the WP5 activities has been summarized in Recommendations forming the Framework for Advanced Education in the field of conservation-restoration and science for conservation. These Recommendations are essential to encourage opportunities to carry out advanced study and research in a broadest possible range of disciplines of the heritage field and thereby to meet better the many challenges to the long-term preservation of European Cultural Heritage.

The workshop has been held at Sala dello Stenditoio, Complesso Monumentale di San Michele a Ripa, Ministero per I Beni e le Attività Culturali.

The programme included an introductory part during which information on the project and, in particular, the outcome of the activities of WP5 will be presented by the project leaders. Two experts will give opening lectures introducing the topic of the short conference – science and cultural heritage in European training.

- Antonia Recchia, project coordinator introduction of the Net-Heritage project
- Cristina Sabbioni 'The impact of Net-Heritage Project: new perspectives in RTD'
- Lidia Laura Rissotto 'The role of Restoration and Conservation Advanced Schools training restorers'
- Luigi Campanella 'Education and research in Sciences applied to Cultural Heritage'

The introductory part will be followed by six key-note presentations focusing on various areas of conservation science and the transfer of innovative solutions and methodologies into the practical conservation sector.

# **1.** 'Model Framework for Advanced Education in Conservation and Science for Conservation'

May Cassar, a member of the Net-Heritage panel of experts and the Director of the Centre for Sustainable Heritage, University College London will present the model framework developed by the Net-Heritage project and set a frame for further presentations and discussion of the conference.

## Abstract

NET-HERITAGE – The European Network on Research Programme Applied to the Protection of Tangible Cultural Heritage is the first significant initiative of the European Union to coordinate national research and advanced education programmes.

The consortium carried out a Europe-wide survey of opportunities for advanced education in conservation-restoration and science for conservation. The survey demonstrated that there are educational instruments for developing professionals, managers and researchers working in the cultural heritage field including doctoral study and research, long courses not leading to PhD degree, and short courses. It also revealed that strong links and coordination exist between university based research and museums and heritage organisations with matching research needs, providing rich examples of excellent, end-user valued research.

A report analysing the results and presenting the conclusions of the survey was prepared. A Panel of Experts, representing diverse European geographical areas, and traditions with different professional backgrounds, was set up to identify gaps and barriers to the development and strengthening of the conservation profession and the efficient use of the potential of the field. The Experts proposed a number of recommendations to improve opportunities of advanced study and research, enable the development of a more effective cadre and ensure sustainable public access and protection of cultural heritage. The recommendations form a model framework for the advanced education which meets needs of XXI century professionals working in the cultural heritage field.

The model framework for advance education was supported by 10 ministries of the memeber states and other reputable international organisations.

# 2. Science and Cultural Heritage at the Getty Conservation Institute'

Giacomo Chiari, the Chief Scientist at the Getty Conservation Institute will survey the progress in transferring innovative non-destructive instrumental techniques to the conservation field so that they can be used in analysis and diagnosis of a wide range historic materials and objects and in tracing directly physical micro-damage to ensure their safe preservation.

# Abstract

Major research projects carried out in the Science Department of the GCI are described, with particular emphasis given to newly developed techniques applied to both collections of objects and archaeological sites. The use of non-invasive portable instrumentation is preferred, but the taking of samples is almost always a necessity if one wishes to fully understand a problem. Analytical imaging (the art of mapping situations similar to each other from the chemical-physical point of view) is of tremendous help in minimizing the number of samples and allowing one to collect the few that are needed in an intelligent way. The procedures described include: portable XRD/XRF, CT-scan for medium-large bronzes, laser speckle interferometry to detect plaster detachments, VIL (visually induced luminescence) that captures only Egyptian Blue in an image, and microfoedometry to assess the resistance to light of colorants.

The objects analyzed range from illuminated manuscripts to contemporary art, to mural paintings at Ercolano and Tutankhamen's tomb, to Roman bronze statues.

# **3.** 'The Art of Nanoscience for the Conservation of Art'

Luigi Dei, associate professor of physical chemistry at the Department of Chemistry of the University of Florence will demonstrate how nanoscience and nanotechnology are revolutionising the approach to conservation by providing materials tailored to the specific requirements of the conservation treatments.

## Abstract

In the recent decades nanoscience and nanotechnology have played an increasing and fundamental role in developing and improving the various techniques of cultural heritage conservation. The conservation of an artistic masterpiece requires several very delicate procedures where the correct choice of a suitable material is one of the most crucial and important steps.

The present contribution deals with the story of how the art of nanoscience and nanotechnology is succeeding in the last years in revolutionizing the approach to the conservation of art, namely the wonderful wall paintings decorating many marvellous churches and historical buildings and easel paintings shown in Museums around the world.

At the CSGI Consortium Laboratories, c/o the Chemistry Department "Ugo Schiff" of the University of Florence, we started at the end of '80 to pursue the research strategy of developing nanomaterials [Ca(OH)2] that are able to consolidate wall paintings introducing in the ancient paintings only the original binder used by the artist, i.e. slaked lime. Moreover, in recent years we succeeded in setting up aqueous polymeric dispersions of poly(vinyl alcohol) (PVA) able to incorporate considerable amounts of organic solvents and having very peculiar viscoelastic properties to make them very promising for selective cleaning of easel paintings surfaces.

The speech will cover the topics of the recent advances in nanomaterials chemistry aimed at achieving the recovery of the mechanical properties of degraded frescoes and selective cleaning of easel paintings by means of the above mentioned nanotechnological systems. Synthesis, characterisation, and case studies of application of Ca(OH)2 nanoparticles in famous fresco paintings, and of nanostructured PVA systems for cleaning panel and canvas paintings will be illustrated with particular emphasis on the materials science potentialities in the general field of art conservation.

# 4. 'Mathematical models of stone damage'

Roberto Natalini, Research Director at the IAC-CNR will draw attention to role of mathematics in providing effective tools to simulate the deterioration processes. Scientific understanding and modelling of how changes in environmental conditions ultimately affect heritage is crucial to the development of rational guidelines for responsible and economic maintaining and managing heritage objects of different nature and exposure to environmental impacts.

## Abstract

There is an extensive literature about the deterioration mechanisms of natural building stones, both in connection with problems concerning modern and historical buildings. Acidity in the air is essentially caused by pollutants, such as sulphur and nitrogen oxides, which are emitted into the atmosphere by sources related to industry, transportation and heating. Although in recent years we have assisted to a decay of the levels of pollution in the urban areas in Europe, we have still consistent levels of HNO3 and other aggressive species as sulphur dioxide and ozone. As is well-known, SO2 and NOx react with calcium carbonate stones to form sulphates and nitrates, which, due to their solubility in water,

may be drained away or, if protected from the rain, may form crusts, that eventually exfoliate. Effective mathematcal simulation tools will be crucial in considering the fine scale evolution of reaction pathways, possibly in complex geometries, as requested by an improved policy of prevention and monitoring of chemical damage on historical monuments. For instance, it should be important to assist stakeholders to assign a degree of priority for an optimal scheduling of cleaning operations, also taking into account the local geometry and the exposure of the concerned stones.

In this lecture, we shall present a mathematical models, which arise to assist the restoration and the conservation of natural stones used in ancient monuments and artifacts. The model describes the growth of the gypsum crust on the surface of marble stones, under the aggression of pollution (atmospheric sulphur dioxide), taking into account both swelling of the external gypsum layer and the influence of humidity. We have intensively studied this model from an analytical and numerical side, obtaining a precise description of the qualitative behavior of solutions and an efficient numerical approximation. Extensive tests of this model have been performed in the last years, both in situ and in lab, in collaboration with the Istituto Superiore per la Conservazione e il Restauro and the CISTEC of the University of Rome "La Sapienza", in the framework of the Vittoriano Project.

# **5.** 'International experiences in education for Cultural Heritage'

Mario Micheli, Associate Professor of Museology & art and restoration criticism at Roma Tre University will speak about new developments in education for conservation in the international context.

## Abstract

In the second half of the twentieth century, commencing with some pioneering initiatives, such as in Italy the creation of the School of Restoration within the Central Institute for Restoration, model training courses for professionals in the field of tangible cultural heritage conservation and restoration were developed and refined. Such models constituted fundamental reference points throughout the successive decades, during which national training systems were launched and consolidated.

In the last ten years or so, contemporaneous with transformations that have taken place in European countries in relation to the training of cultural heritage conservation and restoration professionals, some interesting educational experiments have been conducted in a number of developing countries, encouraged by the initiatives of various international cooperation institutions.

Such experimental work has been closely analyzed and discussed, and has led to the emergence of training models that can be replicated in many geographical areas or countries which, in the field cultural heritage, count a wide range of already well-structured traditional practices

# **6.** 'Research results applied to practical conservation-restoration within the area of leather and parchment'

Rene Larsen, Rector of School of Conservation of the Royal Danish Academy of Fine Arts will use science based conservation-restoration of leather and parchment to illustrate how by means of knowledge transfer workshops and courses the conservation

practitioners can be provided with an updated picture of the chemical and physical nature of heritage materials, their ageing processes and susceptibility to deterioration caused by environment. The necessity to use adequate techniques to evaluate the state of preservation of materials and guide their preservation will be demonstrated.

#### Abstract

From the beginning practical conservation and restoration of leather and parchment in the form of books and manuscripts was based on craftsmanship. This practice was later supplemented by knowledge and methods gained from research and scientific experiments. However, the crafts approach to conservation and restoration is still the most prevailing in many archives and libraries throughout Europe. This is the case both in terms of techniques and materials, and not least in terms of a lack of systematic assessment and diagnosis in relation to the processing and storage of books and manuscripts. A change of this culture is only possible through the development of methods of assessment and diagnosis, in close cooperation with end users in practical conservation-restoration. A further condition is that these methods are simple micro-and non-destructive and provides adequate information on the status and type of degradation. Last but not least, this should be accompanied by dissemination of knowledge from recent research on the causes and mechanisms of deterioration and the effect of the influence of environmental factors and interventions on the object materials.

It has been shown that data on vegetable tanned leather and parchment obtained by simple visual and microscopic methods correlate well with those obtained by advanced measurements on the mesoscopic, nanoscopic and molecular level and that they are useful to categorize the materials in their various states of deterioration. Furthermore, with the help of these simple methods it has been shown that the effect of moisture and damp treatments on leather and parchment, as well as the condition under which these materials are normally stored and exhibited is so great that these must be questioned. This has recently been tested successfully on a workshop on assessment of parchment, which helped making the benefits and the need for a research-based scientific approach into practical conservation-restoration even more obvious to the participants.



Ministero per i Beni e le Attività Culturali Complesso Monumentale di San Michele a Ripa Sala dello Stenditoio Via di San Michele 22. Roma

Seventh Framework Programme September 21st, 2011

9.00 – 9.30 Registration

Chairman Lukasz Bratasz

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science and cultural heritage in European training 9.30 - 9.40Antonia P. Recchia - Coordinator NET-HERITAGE Project 9.40 - 9.50 Cristina Sabbioni - ISAC-CNR 9.50 - 10.00Lidia Laura Rissotto - ISCR-MiBAC 10.00 - 10.10 Luigi Campanella - Università degli Studi di Roma 'Sapienza' 10.10 - 10.40 Coffee break 10.40 - 11.00Model Framework for Advance Education in Conservation and Science for Conservation May Cassar - University College of London 11.00 - 11.20Science and Cultural Heritage at the Getty Conservation Institute Giacomo Chiari - The Getty Conservation Institute 11.20 - 11.40 The Art of Nanoscience for the Conservation of Art Luigi Dei - Università degli Studi Firenze 11.40 - 12.00 Mathematical models of stone damage Roberto Natalini - IAC-CNR 12.00 - 12.20International experiences in education for Cultural Heritage Mario Micheli - Università degli Studi 'Roma Tre' 12.20 - 12.40Research results applied to practical conservation-restoration within the area of leather and parchment René Larsen - The Royal Danish Academy of Fine Arts 12.40 - 13.00 Discussion 13.00 Lunch

ORGANIZING COMMITTEE: Annamaria Glovagnoli, Stefania Celentino, Valentina Di Lonardo, Alessandra Paradisi era-net@beniculturali.lt heritage-workshop@beniculturali.lt

# 4. Other promotional activities

The Model Framework for Advanced Education was additionally presented during the following meetings and conferences:

- Giornata di Studi, Istituto Superiore per la Conservazione e il Restauro, Rome, Italy, 7 April 2010,
- International Congress 'Chemistry for Cultural Heritage' (ChemCH) Alma Mater Studiorum University of Bologna, Ravenna, Italy, 1-3 July 2010,
- International Conference 'Increasing Europe's competitiveness through cultural heritage research. An initiative of the EU project NET-HERITAGE', Brussels, 24 March 2011,
- International conference 'New Approaches in Book and Paper Conservation-Restoration in Europe', European Research Centre for Book and Paper Conservation-Restoration, Horn, Austria, 9 May 2011,
- Meeting of the Technical Committee 'Conservation of Cultural Property' of the Polish Normative Committee, Krakow, Poland, 12 September 2011.
- Giornata di studio "I beni culturali e ambientali: interdisciplinarità e internazionalizzazione", Alma Mater Studiorum, Bologna University, Italy, 5 October 2011.