Tech4Culture

UNIVERSITÀ DEGLI STUDI DI TORINO

Basic skills courses

November, 29 – December, 20, 2018

29 November 2018 – h. 9:00-13:00

Classroom: Auletta I, Chemistry Department, Via Giuria 7

Eliano Diana, Roberto Giustetto

Surface investigation and beyond: a combined XRD, FT-IR and Raman approach

Most of the aesthetic value of an artistic artefact is represented by the manufacture and decoration of its surfaces. A thorough characterization of the constituent materials adorning the painted and/or carved surfaces becomes therefore of paramount importance, for what concerns both the knowledge of the manufacturing techniques and an apt conservation/restoration of the artefacts.

X-ray diffraction (XRD) and spectroscopic techniques (such as FT-IR and micro-Raman) represent simple, direct and micro-invasive methodologies for an accurate investigation of the material composition. In this lecture, a general survey about the capability and applicability of both techniques will be introduced, including some specific archaeometric application involving – for example – the characterization of historical pigments as well as the nature of the decorations on prehistoric pottery, with the related discrimination of all constituent materials (e.g., mineral phases, bones, coral) and related degradation byproducts.

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4 December 2018 – h. 14:00-18:00

Classroom: Aula 21, Palazzo Nuovo, Via S. Ottavio 20

Stefano de Martino

The Materiality of Cuneiform Tablets

Archaeomoetric analysis of ancient cuneiform tablets is a new and very productive research field. Both physical (Petrography) and chemical investigations (Instrumental Neutron Activation Analyses), already available in the 1970s, have become more frequent, since the introduction of portable X-Ray flourescence analysers; in fact, this apparatus can easily be carried to any place, where the cuneiform tablets are preserved, and does not have the need for any destructive process. These analyses are particularly useful for the identification of the places, where the tablets may have been written; in fact, sometimes the tablets preserve the name of city, where the tablet was produced, but its exact location is unknown. Furthermore, integrate methods for visualization, interactive 3D script feature extraction, script analysis and virtual fragment joining are now available. This paper also to present and discuss the approach of philologists to the new archaeometric research methods and results.

5 December 2018 – h. 9:00 – 13:00

Classroom: to be defined

Marco Giardino

Nature and Culture in the Anthropocene: a geomorphological perspective

Man is a morphogenetic agent. Its ability to modify the terrestrial environment has increased in human history, to the point of conditioning the same processes that regulate the functioning of our planet. From a theoretical-scientific point of view this fact has been assimilated into the concept of Anthropocene: a new geological epoch in which the human signal is registered at a global level in the layers that tell-and will tell in the future- the history of the Earth. From a practical-applicative point of view, today's problem is to understand what changes will be imposed by man and his activities on the biosphere and the geosphere.
This basic skill course proposes a "geomorphological" perspective to analyze the fundamental components of nature that change during the human history. Landforms, materials and terrestrial processes will first be presented in a space-time framework useful for understanding the dimensions of their change. Subsequently, the mutual relationships between man and the geological environment (active and passive, respectively) will be analyzed, presenting case studies illustrating a conceptual picture of "juxtapositions" including: a) environmental dynamics-hazard-risk-vulnerability; b) geodiversity-georesources- anthropic activities-impacts

5 December 2018 – h. 14:00-18:00

Classroom: Sala Rappresentanza, Chemistry Department (V floor), Via Giuria 9

Dominique Scalarone

Polymers in contemporary art and in conservation: a 360 degree presence (h. 14:00-16:00)

Synthetic polymers are a class of extremely 'young' materials. Originally used to produce common objects and to replace more expensive traditional materials, polymers quickly emerged in a number of different fields, not least that of art and conservation.
The artists of the European avant-gardes immediately sensed the enormous expressive potential of plastic materials which were able to satisfy the strong demand of innovation and aesthetic experimentation of that time. Already in the first decades of the last century many artists opted for the new synthesis products of the chemical industry because of their unique features and low cost. For these same reasons, and for the great versatility of polymeric materials, these were immediately tested also in restoration interventions as adhesives, paints, consolidants, protective coatings, etc.
However, like all organic substances, even polymers undergo environmental aging, possibly resulting in the loss of aesthetic, chemical and mechanical properties. It is therefore important not only to know how to recognize the polymeric materials present in a work of art or used in a conservative intervention, but also to know how to identify and interpret the degradation processes that affect them, so as to guide the choices of restorers, on the one hand , and the development of new, more performing products, on the other.

Identification of organic materials in art and archaeology (h. 16:00-18:00)

The identification of organic substances found in archaeological and art objects represents a very difficult and at the same time stimulating challenge for the scientist who deals with Cultural Heritage. A variety of organic compounds, ranging from synthetic polymers to biomolecules, pigments and additives, can be found in such objects, for example varnishes, protective coatings, binding media and paints, adhesives and finishing layers. All organic substances are complex mixtures of different molecules. Moreover the samples to be analysed are usually very small, in an advanced stage of degradation and contaminated by extraneous substances. This lecture briefly describes the main analytical techniques used for identifying unknown organic materials and illustrates their potential in the Cultural Heritage field through the description of case studies ranging from Egyptian funerary masks to contemporary murals.

6 December 2018 – h. 9:00-16:00

Classroom:
h. 9:00-13:00 Aula Avogadro, Chemistry Department, Via Giuria 7
h. 14:00-16:00 Aula D1, Chemistry Department, Via Giuria 9

Paolo de Vingo (2 h) – Monica Gulmini (4 h)

Integrated approaches for the investigation of archaeological pottery

The lecture will start with an archaeological introduction dealing with a specific case-study: the classification of pottery produced in Central-Northern Italy between Late antiquity and early Middle Ages, with particular attention to the production process of the individual Ligurian-Piedmontese manufactories. It will be possible to propose a framework in which the individual forms can also connect their functionality to understand how maintenance or innovation phenomena developed with respect to older Roman ceramic productions and therefore if and how transport methods changed, in the period examined, preparation, preservation and cooking of foods.

The same case-study will be than considered in view of a materials science approach. The connection between the archaeological problem and the way in which the technical studies are conducted will be discussed. Further relevant case-studies will be considered in order to highlight the merits of micro- morphological (through optical microscopy and scanning electron microscopy) and compositional features of the pottery in responding archaeological questions. Issues related the production of compositional data (obtained by non-invasive and invasive elemental analytical techniques) and their significance in the broad frame of the organization of pottery production and trade will be discussed.

7 December 2018, h. 9:00-13:00

Classroom: Sala dello Zodiaco, Castello del Valentino, Politecnico di Torino, Viale Mattioli 25.

https://www.polito.it/ateneo/sedi/index.php?bl_id=TO_CAS01&fl_id=XP02&rm_id=I004&lang=it

Fulvio Rinaudo, Vito Messina

Fulvio Rinaudo (2 h)

Digital documentation for monitoring endangered Heritage

- **Basics of Geomatics**
  Geomatics groups a set of 3D measurement techniques, which allow the realisation of 3D model of existing (existed) assets. The measurements have to be documented in terms of quality (precision and accuracy) to be able to use them in different application.
  Today trends in Geomatics consider the automatic generation of point clouds that are transformed into 3D models (topologically defined) by considering the specific use of them.
- **Geomatic monitoring strategies**
  The monitoring of 3D shape changes over a certain period could offer important information about the conservation actions to be activated on specific contexts. The monitoring consists in the difference between two shape of the same object surveyed in two or more times but the affordability of these differences strictly depends on the precision of the different used 3D models.

Vito Messina (2 h)

- **Basics of rock art and archaeology**
  Rock art is one of the most important forms of expression of ancient Iran: stone sculptures and rock carvings can be found in the main archaeological sites of the Country and span from the end of the 3rd millennium BC to the Sasanian period. Their documentation for scientific and preservation purposes is an urgent task in the close future.
- **Case study: the experience of the Iranian Italian Joint Expedition in Khuzestan (Iran) in monitoring surface decay of ancient rock carvings**
  A joint Iranian-Italian expedition worked for years on the digital documentation of the rock carvings in the highlands of present-day Khuzestan (South West Iran). Laser-scanning and digital photogrammetry were conducted in a multidisciplinary approach bringing together archaeologists and geomatics expertsto obtain 3D digital models of the scanned surfaces. In addition, other digital products were produced on purpose.

7 December 2018, h. 15:00-17:00

Classroom: Aula 24, Palazzo Nuovo, Via S. Ottavio 20

Paolo De Vingo

Cataloging, classifying and understanding. A new database of Roman and post-Roman materials unearthed at the Baths of *Albintimilium* (Imperia – ITALY)

The project was born in the laboratory of Christian and Medieval Archaeology of the Department of Historical Studies of the University of Turin as an educational and training experience for students of 2nd degrees in Archaeology and Ancient History. The activity involved the study and reclassification of Roman and late Roman manufactures from the excavations of the western Baths of *Albintimilium* based on computerization of data and a cataloging methodology that had to combine the first interpretative reading of the same materials, created in the 1950s of the last century, with a modern classification able to provide an update of the chronotypology of the materials themselves and the transfer of data revised on computer support.

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10 December 2018, h. 9:00-11:00

Classroom: Sala Rappresentanza, Chemistry Department (V floor), Via Giuria 9.

Paola Rizzi

Archaeometallurgy: ancient production techniques, conservation state and preservation strategies.

The study of ancient metals has to be declined starting from an in-depth knowledge of modern materials, their synthesis techniques, properties and methods of characterization. It is in fact thanks to this knowledge that it is possible to interpret information on production techniques that remain trapped in an ancient object and bring them to light through advanced analysis techniques. Moreover, it is possible to establish the conservation status of ancient materials, propose conservation strategies and devise innovative survey techniques that adapt to the needs of materials that must be preserved as far as possible by invasive and destructive investigations. In this project, different case studies will be proposed with the aim of describing the information that can be obtained from ancient metallic materials from a scientific point of view.

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12 December 2018, h. 9:00-13:00

Classroom: to be defined

Vincenzo Lombardo

Computing for cultural heritage studies

The cross-disciplinary activities that are carried out in cultural heritage studies have received a digital representation and an algorithmic processing along the last decades. Issues of representation formats concern both numerical data and symbolic categories; algorithms proceed from low-level analyses for data to high-level interpretation processes.

This seminar will provide the basics of digital modeling for cultural heritage items, that results into the representation for data and algorithmic writing for low-to-high level representation and low-to-high intelligent processes, respectively. In particular, we will address the notion of abstraction for modeling, providing examples from a wide range of cultural heritage items.

Hands-on training (bring your laptop)

Introduction to Linked data in digital collections of Cultural Heritage items

– Linked Data basics through

---- the use of shared, formally defined, vocabularies with unambiguous meaning terms, that can be understood by both humans and machines

---- cloud of connected, machine interpretable data encoded in RDF format

– Case study of creation and management of digital collections on Omeka-S platform.

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18 December 2018, h. 14:00-18:00

Classroom: Aula Disegno, Chemistry Department, Via Giuria 7

Maurizio Aceto

The contribution of UV-visible diffuse reflectance spectrophotometry to the study of cultural heritage materials

UV-visible diffuse reflectance spectrophotometry is a technique commonly used in the characterisation of coloured artworks. It is very useful as preliminary survey in order to address further in-depth examinations with more powerful techniques. Particularly useful is the configuration exploiting fibre optics, also known as FORS, which allows carrying out reflectance measurements in all instances and on all kinds of materials. The pros and cons of FORS will be discussed with a main focus on the characterisation of paintings, gemstones and glass artworks. The lesson will include practical execution of measurements with a portable system on selected case studies.

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19 December 2018, h. 10:00-12:00

Classroom: to be defined

Simona Fratianni

Climate-Controlling factors

Since climate represents the biospheric characteristics at a location or area, it chiefly results from the varying solar and atmospheric moisture and circulation conditions over space and time. Climate at any space or time level is represented by certain expressions of the various atmospheric elements. Climate is also governed by various factors of a cosmic and geographical nature that have important effect on environmental conditions.

Climate data series

Long period and high-quality climatic instrumental time series are essential for the production of reliable assessments of the global climate system with a view to better understand, detect, predict and respond to global climate variability and change. For this purpose, methodological approach of the rescue and analysis of climate series will be discussed and will be presented some case studies. Such key datasets are not only of immense scientific value, they also ultimately offer political, social and economic advantages, and they are required in order to place extreme events in a longer-term context and to improve adaptation to climate change impacts.

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19 December 2018, h. 14:00-18:00

Classroom: Sala Castagnoli, Physics Department, Via Giuria 1.

Alessandro Lo Giudice (2 h), Alessandro Re (2 h)

X-ray and nuclear techniques for material characterization in heritage science

Nuclear physics applications in medicine and energy are well known and widely reported. Less well known are the many important nuclear and related techniques used for the study, characterization, assessment and preservation of cultural heritage. There has been an enormous progress in this field in recent years. The basic concept is to use nuclear radiations of various kinds (X-ray, γ-ray, electron, neutron and ion beams) to investigate the elemental, structural and/or isotopic composition of an object. Information obtained are useful for many purposes, in particular to know the realization techniques and the conservation state of the objects, to identify the provenance of the raw materials, to authenticate works of art and to date materials.

Reference

https://www.edp-open.org/images/stories/books/fulldl/Nuclear-physics-for-cultural-heritage.pdf

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20 December 2018 – h. 10:00-12:00

Classroom: Aula E, Computer Science Department, Corso Svizzera 185

Liliana Ardissono

Personalization for Cultural Heritage exploration

Over the last twenty years, cultural heritage has been a favoured domain for personalization research. For years, researchers have experimented with the cutting edge technology of the day; now, with the convergence of internet and wireless technology, and the increasing adoption of the Web as a platform for the publication of information, the visitor is able to exploit cultural heritage material before, during and after the visit, having different goals and requirements in each phase. However, cultural heritage sites have a huge amount of information to present, which must be filtered and personalized in order to enable the individual user to easily access it.

Personalization of cultural heritage information requires a system that is able to model the user (e.g., interest, knowledge and other personal characteristics), as well as contextual aspects, select the most appropriate content, and deliver it in the most suitable way. It should be noted that achieving this result is extremely challenging in the case of first-time users, such as tourists who visit a cultural heritage site for the first time (and maybe the only time in their life). In addition, as tourism is a social activity, adapting to the individual is not enough because groups and communities have to be modeled and supported as well, taking into account their mutual interests, previous mutual experience, and requirements.

How to model and represent the user(s) and the context of the visit and how to reason with regard to the information that is available are the challenges faced by researchers in personalization of cultural heritage. In this lecture, I will survey the research in this area. Starting from the earlier systems, which presented cultural heritage information in kiosks, I will summarize the evolution of personalization techniques in museum web sites, virtual collections and mobile guides, until recent extension of cultural heritage toward the semantic and social web.

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20 December 2018, h. 14:00-16:00

Classroom: to be defined

Alessandro Morandotti

Adventures in the History of Art. Discoveries and disillusions

The complex job of cataloguing paintings, sculptures and works of art eradicated from the original context is still one of the fascinating aspects in art history research.
Someone thinks that all art works in museums have a precise date, well-known provenance and consolidated attribution.
It's not true, and even today it is possible to discover forgotten masterpieces in museums deposits or in sacred buildings all over the world.
The talk will present some of the resounding rediscoveries of the last century and current times, in some cases just mirages of researchers, in other intuitions to be validated.
It will also show how art historians can benefit from restorers' and scientists' support.

20 December 2018, h. 16:00-18:00

Classroom: to be defined

The project "La vita delle opere"

Maria Beatrice Failla (Università degli Studi di Torino)

The project Artwork stories: from primary sources to digital technology. Pilot project for research and communication of the conservation history of artworks in museums stems from the need to make visible to the public the long history every work of art has gone through during its lifetime. Works of art, indeed, did not originally appear as we see them today and were not made for the museums where they are currently on display. Rather, they have been transformed and relocated over time, subject to interventions and alterations on the part of artists, custodians, restorers, scholars, collectors, dealers, thieves, conservators: generations of people who have written the artworks' biography and enabled its transmission to the present. The goal is to compose a storytelling focused on what happens once works of art are completed: what occurs in the period of time between when they emerge from the artist's workshop and the moment when we see them on exhibition in their current location? What tools can be used to decipher the traces left on their surface as they move through time?
Visitors often think such questions cannot even be posed. Integrations, restorations, additions, frames are just perceived at times as visual inconsistencies but never questioned. The perception is that museums and their artworks are entities immutable over time rather than the result of interventions and choices gradually implemented and constantly reformulated, choices that can be narrated and contextualized in time revealing what happens behind the scenes of museum institutions.