



Third International Congress on Chemistry for Cultural Heritage

July 1 – 5, 2014
Academy of Fine Arts
Vienna, Austria

Book of Abstracts

ChemCH 2014

Third International Congress on Chemistry for Cultural Heritage

www.chemch2014.org

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Academy of Fine Arts
Schillerplatz 3
1010 Vienna, Austria



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(edited by Rita Wiesinger and Manfred Schreiner)

Dear Participants of ChemCH 2014,

Scientific research on our cultural heritage, both for the study of its material aspects and for designing and controlling conservation and preservation strategies, faces a diversity of changes due to the complexity and intrinsic value of the materials and objects. Furthermore, environmental conditions all over the world have inflicted increasing damage or at least deterioration of surfaces that were meant to be created for eternity. By conventional techniques we are able to ameliorate most of the dangers, but new approaches of high technology must be explored to preserve the heritage of human civilization as well as art works of former generations.

Chemistry for Cultural Heritage is one important discipline meeting the requirements in material analysis, evaluation of degradation phenomena, and developing conservation-restoration treatments. In consonance with the rapid development of chemical analysis and synthesis new solutions are available for the study and preservation. The biennial conferences of ChemCH serve as a valuable opportunity to meet with colleagues and share their experiences, but also discuss new developments and possibilities in our interdisciplinary field.

In this context, it is a great honor and pleasure for the members of the Institute of Science and Technology in Art of the Academy of Fine Arts Vienna to host the **Third International Conference on Chemistry for Cultural Heritage**. On behalf of the organizing committee, we are delighted to welcome all ChemCH-members and guests at ChemCH 2014. Based on more than 120 abstracts submitted for this conference, a program with oral and poster presentations could be organized with the invaluable support of the members of Board of ChemCH and the Scientific Committee.

We want to express our sincere thanks to all authors and members of the committees for their unmatched enthusiasm and dedication to make ChemCH 2014 a success meeting. Last but not least the institutions and companies are acknowledged for their support and sponsoring our meeting.

Prof. Dr. Manfred Schreiner & Dr. Rita Wiesinger
(Chair of the ChemCH 2014)

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History and Scope of ChemCH

Since the very beginning of investigation, preservation, and conservation-restoration of our cultural heritage chemistry has been playing an important role in documentation, studying ancient production of materials and art technology, understanding of degradation processes and present state of works of art, as well as developing and evaluating new materials and methods for interventions of both, movable and immovable art works. In the last decades the booming developments in chemical science, especially in analytical, organic or environmental chemistry, but also in the fields of electronics and computer sciences has brought us new instruments and methods of great perfection, which present new horizons in the analysis, diagnosis, and protection of art and cultural objects.

ChemCH 2014 is the 3rd International Congress on Chemistry for Cultural Heritage after previous symposia in Ravenna/Italy in 2010 and Istanbul/Turkey in 2012 and will particularly provide an international platform for presentation and discussion on the issues and topics

- chemo-/nanotechnology
- chemical imaging (e.g. immuno-chemistry)
- chemometrics in cultural heritage – interpretation of results for co-operation with professionals in CH
- modern materials in art and museums
- new materials and methods in conservation-restoration
- development of non-invasive techniques
- sample preparation
- degradation / corrosion: chemical interaction of environment with movable and immovable art works
- technical studies and authenticity (case studies)
- concepts and methods in chemistry education and training for professionals in CH

Themed series of papers in *Heritage Science* journal



HERITAGE SCIENCE

All presenters (oral/poster) at ChemCH2014 are invited to contribute their research for publication in *Heritage Science* (www.heritagesciencejournal.com) – a new open access journal from Chemistry Central, the open access portal for Springer chemistry. Submitted manuscripts should present original scientific research or a review in the context of chemistry related to cultural heritage, conservation science, conservation-restoration or preservation of cultural heritage.

All manuscripts are previewed by the Guest Editors and members of the ChemCH Scientific Committee and forwarded to the journal if considered suitable. All manuscripts are subsequently rigorously peer-reviewed. On publication, articles are freely and permanently accessible online, without subscription charges or registration barriers.

Members of the Editorial Board are attending ChemCH, and Heritage Science is an Exhibitor – they will be pleased to meet you at their stand.

Manuscripts have to be submitted to office@chemch2014.org by August 31, 2014.

Submission guidelines are available at:

[http:// www.heritagesciencejournal.com/authors/instructions/researcharticle](http://www.heritagesciencejournal.com/authors/instructions/researcharticle)

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Program**Tuesday, July 1st, 2014****15.00 – 17.00 Registration****Wednesday, July 2nd, 2014****8.30** Registration

10.00 **Opening: Welcome Addresses**

Manfred Schreiner, Chairman of ChemCH 2014

Rocco Mazzeo, Chairman of ChemCH in EuCheMS

Herbert Ipser, President of GÖCH

Ulrich Schubert, President of EuCheMS

Eva Blimlinger, Rector of the Academy of Fine Arts Vienna

Session 1: Analytical Methods in Cultural Heritage I

Chair: Rocco Mazzeo

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Chair: Bruno Brunetti

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Saturday, July 5th, 2014

10.00–12.00 Excursions to Museums in Vienna:

Kunsthistorisches Museum, Kunstammer

The Kunstammer Wien is the most important collection of its kind in the world. Since March 1, 2013 this unique collection is now again open to the public. From the late Middle Ages to the Baroque, Habsburg emperors and archdukes collected exotic and uncommon materials, to which they often ascribed magical powers, such as precious stones, ostrich eggs, coral, and shark’s teeth, which were considered to be dragon’s tongues. From these natural products, artists created virtuoso works of art. Among its highlights are examples of fabulous goldsmith

work such as the celebrated Saliera by Benvenuto Cellini, magnificent bronze statuettes, delicate and bizarre ivories, precious stone vessels, and much, much more.

Liechtenstein Museum – Palais Liechtenstein, Fürstengasse 1

The Liechtenstein GARDEN PALACE is home to one of the world's largest and most important private art collections, owned by the Prince von und zu Liechtenstein. Set in an extensive park, the Princely Collections contain some 1,600 paintings with masterpieces from the early Renaissance to the Biedermeier era, including works by Lucas Cranach the Elder, Raphael, Peter Paul Rubens, Anthony van Dyck, Frans Hals, and Rembrandt. Of equal art-historical importance is the collection of Italian bronzes, the focus of which lies in masterpieces of the 16th and 17th centuries. In addition to these outstanding paintings and sculptures, the Princely Collections also contain important holdings pietra dura objects, enamelwork, porcelain, tapestries, and furniture.

Upper Belvedere (Oberes Belvedere) – Prinz Eugen-Str. 27

The Upper Belvedere houses the impressive collection of Austrian art dating from the Middle Ages to the present day. At the heart of the displays of "art around 1900" is the world's largest Gustav Klimt collection. The glittering highlights are Klimt's golden pictures "The Kiss" and "Judith", and masterpieces by Egon Schiele and Oskar Kokoschka. Prominent works by the French Impressionists and the outstanding collection of the Viennese Biedermeier paintings are further attractions at the Upper Belvedere.

A MULTI-ANALYTICAL APPROACH FOR THE STUDY OF NEOLITHIC POTTERY FROM THE GREAT DOLMEN OF ZAMBUJEIRO (Évora, PORTUGAL)

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The Great Dolmen of Zambujeiro (GDZ), built between the 4th and the middle of the 3rd millennium BC, between the late Neolithic and Chalcolithic periods, is located on the right margin of Peramanca riverside, in Valverde, municipality of Évora (Portugal), and is one of the largest megalithic monuments on the Iberian Peninsula. The GDZ was identified and excavated between 1964 and 1968 by Henrique Leonor Pina and is classified as a national monument since 1974. During the 80s decade of last century, due to the monument degradation, some conservation works were carried over under the direction of Caetano Mello Beirão, and some archaeological research was also performed [1].

GDZ still preserves the grave (burial chamber and hall), much of the tomb hill, and on its periphery two large stelae-menhirs can be found. Collective inhumation was practiced in GDZ, accompanied by the deposit of articles of great quality, indicating that they were most likely a group of distinguished individuals. The collection of materials found in Great Dolmen of Zambujeiro is large and includes several lithics, like arrows, axes and schist plates, and also a large collection of pottery.

Chemical and mineralogical composition of the ceramic paste can be used as a fingerprint for provenance and production studies. Organic residue analysis can provide data on the containers usage. Mineralogical and elemental composition of the paste was accessed by optical microscopy (OM) and Scanning Electron Microscopy with Energy Dispersive X-Ray Spectroscopy (SEM-EDS), providing

information on the temper and degreasing components. For phase analysis of clays, micro X-ray Diffraction (m-XRD), Thermogravimetric Analysis (TGA) and Fourier Transform Infrared Spectroscopy (FTIR) techniques were used. X-Ray Fluorescence (XRF) *in-situ* was employed to determine the content of heavier metal elements and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) was used to evaluate lighter elements content, inaccessible by XRF analysis. Finally, for organic content evaluation of the pottery sherds and containers, samples were collected, and then extracted with organic solvents. Gas Chromatography coupled to Mass Spectrometry (GC-MS) was then performed on the samples for lipid and resinous content determination.

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[1] Soares, J.: Tavares-da-Silva, C. *Musa* 3 (2010) 83-129.