

# New techniques for the non-invasive investigation of the surface and subsurface structure of heritage objects

CHARISMA workshop organized by the National Gallery, London with Nicolaus Copernicus University, Toruń, Poland

## PROGRAMME

### Monday 24 June 2013

19:00 – 21:00 **Welcome reception** – Collegium Maximum, Pl. Rapackiego 1

### Tuesday 25 June 2013

Location: Faculty of Mathematics and Computer Science, Nicolaus Copernicus University, Chopina Street 12/18, Toruń, Poland

9:30      Opening remarks

**Session chair:** Bruno Brunetti, CHARISMA project coordinator, University of Perugia

10:00      *A systematic non-invasive optical investigation of wall paintings at a UNESCO world heritage site*

**Haida Liang**<sup>1</sup>, Andrei Lucian<sup>1</sup>, Chi Shing Cheung<sup>1</sup>, Bo Min Su<sup>2</sup>

<sup>1</sup>School of Science & Technology, Nottingham Trent University, UK; <sup>2</sup>Dunhuang Academy, Gansu Province, China.

10:45      coffee break

11:15      *Thermal Quasi-Reflectography, a new imaging technique for non-invasive analysis of artworks: principles and applications*

**Claudia Daffara**<sup>1</sup>, Dario Ambrosini<sup>2</sup>, Luca Pezzati<sup>3</sup>, Paola I. Mariotti<sup>4</sup>

<sup>1</sup>Dept. of Computer Science, University of Verona, Italy; <sup>2</sup>DIIE, University of L'Aquila, Italy; <sup>3</sup>INO-CNR, National Institute of Optics, Florence, Italy; <sup>4</sup>Opificio delle Pietre Dure, Florence, Italy.

12:00      *Of MOUSE and Men: Single-sided NMR in Cultural Heritage*

**Tyler Meldrum**

Institut für Technische und Makromolekulare Chemie, RWTH Aachen University, Germany.

12:45      lunch (provided on-site)

**Session chair:** Heinz-Eberhard Mahnke

14:15      *A CHARISMA round robin; comparison of non-invasive analyses and documentation methods for integration of results from multiple techniques on a single painting*

**Marika Spring**<sup>1</sup>, Rachel Morrison<sup>1</sup>, Joseph Padfield<sup>1</sup>, Magdalena Iwanicka<sup>2</sup>, Łukasz Ćwikliński<sup>3</sup>, Raffaella Fontana<sup>4</sup>, Bernard Bluemich<sup>5</sup>, Tyler Meldrum<sup>5</sup>, Markus Kueppers<sup>5</sup>, Wasif Zia<sup>5</sup>, Paraskevi Pouli<sup>6</sup>, Kristalia Melessanaki<sup>6</sup>, Vivi Tornari<sup>6</sup>, Demetrios Anglos<sup>6</sup>

<sup>1</sup>National Gallery, London, UK, <sup>2</sup>Institute for the Study, Restoration and Conservation of Cultural Heritage, N. Copernicus University, Toruń, Poland, <sup>3</sup>Institute of Physics, N. Copernicus University, Toruń, Poland, <sup>4</sup>INO-CNR, Istituto Nazionale di Ottica, Firenze, Italy, <sup>5</sup>Institut für Technische und Makromolekulare Chemie, RWTH Aachen University, Germany, <sup>6</sup>Institute of Electronic Structure and Lasers (IESL), Foundation for Research and Technology–Hellas (FORTH), Heraklion, Crete, Greece.



CHARISMA: Cultural Heritage Advanced Research Infrastructures: Synergy for a Multidisciplinary Approach to Conservation/Restoration, Grant Agreement 228330

## New techniques for the non-invasive investigation of the surface and subsurface structure of heritage objects

15:00 *Laser tools in Cultural Heritage Science and Conservation; non-invasive analysis and management of cleaning interventions*

**Paraskevi Pouli**, Kristalia Melessanaki, Vivi Tornari, Demetrios Anglos

Institute of Electronic Structure and Lasers (IESL), Foundation for Research and Technology–Hellas (FORTH), Heraklion, Crete, Greece.

15:45 coffee break

16:15 *Mid-infrared hyperspectral imaging of painting materials*

**Costanza Miliani**<sup>1,2</sup>, Francesca Rosi<sup>1,2</sup>, Roland Harig<sup>3</sup>, René Braun<sup>3</sup>, Diego Sali<sup>4</sup>, Alessia Daveri<sup>5</sup>, Brunetto G. Brunetti<sup>1,2</sup>, Antonio Sgamellotti<sup>1,2</sup>

<sup>1</sup>CNR-ISTM c/o Chemistry Department, University of Perugia, Italy; <sup>2</sup>SMAArt, Chemistry Department, University of Perugia, Italy; <sup>3</sup>Bruker Optik GmbH, Ettlingen, Germany; <sup>4</sup>Bruker Italia S.r.l. uni personale, Milan, Italy; <sup>5</sup>Associazione laboratorio di Diagnostica per i Beni Culturali, Spoleto, Perugia, Italy.

17:00 *On site research on 'The Beanery' by Edward Kienholz with portable Fibre Optics Raman Spectroscopy*

**Suzan de Groot**<sup>1</sup>, Anna Laganà<sup>2</sup>, and Sandra Weerdenburg<sup>3</sup>, Thea van Oosten<sup>4</sup>

<sup>1</sup>Conservation scientist, Cultural Heritage Agency of the Netherlands (RCE), Amsterdam, The Netherlands; <sup>2</sup>Freelance Modern Materials Conservator; <sup>3</sup>Conservator of Modern Objects / Head of Conservation, Stedelijk Museum Amsterdam, The Netherlands; <sup>4</sup>Conservation Scientist.

17:30 END OF THE SESSION

### Wednesday 26 June 2013

Location: Faculty of Mathematics and Computer Science, Nicolaus Copernicus University, Chopina Street 12/18, Toruń, Poland

**Session chair:** Suzan de Groot

9:30 *Applications of Terahertz Imaging and Spectroscopy in Cultural Heritage*

**Gillian Walker**

School of Systems Engineering, University of Reading, UK

10:15 *Multiphoton microscopy: an efficient and promising tool for in situ study of historical artifacts*

**Gaël Latour**<sup>1\*</sup>, Jean-Philippe Echard<sup>2</sup>, Marie Didier<sup>2</sup>, Marie-Claire Schanne-Klein<sup>1</sup>

<sup>1</sup>Laboratory for Optics and Biosciences (LOB), Ecole Polytechnique, CNRS, INSERM, Palaiseau, France;

<sup>2</sup>Laboratoire de recherche et de restauration, Musée de la musique, Cité de la musique, Paris, France. \*Currently at Laboratoire Imagerie et Modélisation en Neurobiologie et Cancérologie, Université Paris Sud, CNRS, Orsay, France

11:00 coffee break

11:30 *Short poster talks*

*Time-averaged digital speckle pattern interferometry for investigation of art objects surfaces*

**Leszek Krzemień** and Michał Łukomski

Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Kraków, Poland



CHARISMA: Cultural Heritage Advanced Research Infrastructures: Synergy for a Multidisciplinary Approach to Conservation/Restoration, Grant Agreement 228330

*Analysis of Ancient Paper Structure in Transmitted Light by Application of Different Microscopic Techniques. Examples from the Collection of the Kórnik Library of the Polish Academy of Science*

**Tomasz Kozielec**

The Department of Paper and Leather Conservation, Nicolaus Copernicus University, Toruń, Poland

*Preliminary physicochemical studies on a shield handle originating from the Przeworsk culture cemetery located in Czersk*

**Ewelina Miśta<sup>1</sup>** and **Paweł Kalbarczyk<sup>2</sup>**

<sup>1</sup>National Centre for Nuclear Research, Otwock-Świerk, Poland; <sup>2</sup>Institute of Nuclear Chemistry and Technology, Warsaw, Poland.

12:30 lunch (provided on-site)

**Session chair:** Costanza Miliani

14:00 *Fusion of tomographic documentation of art objects based on electromagnetic radiation in the near and mid infrared area of the spectrum and ultrasonic microscopy. Application to Byzantine icons from Cyprus*

**Georgios Karagiannis**

ORMYLIA Foundation Diagnostic Centre, Greece

14:45 *Accelerators and X-rays in cultural heritage studies*

**Heinz-Eberhard Mahnke**

Fachbereich Physik and Excellence Cluster TOPOI, Freie Universität Berlin, Germany

15:30 coffee break

16:00 *Optical coherence tomography for vulnerability assessment of sandstone in-situ*

**Elizabeth Bemand** and Haida Liang

School of Science & Technology, Nottingham Trent University, UK

16.25 *Macroscopic X-ray fluorescence analysis, a method for non-invasive imaging of painted works of art. Comparison with other methods and some case studies.*

**Koen Janssens<sup>1</sup>**, Mathias Alfeld<sup>1</sup>, Geert van der Snickt<sup>1</sup>, Joris Dik<sup>2</sup>

<sup>1</sup>University of Antwerp, Belgium; <sup>2</sup>Delft University of Technology, The Netherlands

17:10 Final remarks

17:20 END OF THE SESSION



---

## POSTERS

---

*Time-averaged digital speckle pattern interferometry for investigation of art objects surfaces*

Leszek Krzemień and Michał Łukomski

Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Kraków, Poland

*Analysis of Ancient Paper Structure in Transmitted Light by Application of Different Microscopic Techniques. Examples from the Collection of the Kórnik Library of the Polish Academy of Science.*

Tomasz Kozielec

The Department of Paper and Leather Conservation, Institute for the Study, Restoration and Conservation of Cultural Heritage, Nicolaus Copernicus University, Toruń, Poland

*Preliminary physicochemical studies on a shield handle originating from the Przeworsk culture cemetery located in Czernik*

Ewelina Miśta<sup>1</sup> and Paweł Kalbarczyk<sup>2</sup>

<sup>1</sup>National Centre for Nuclear Research, Otwock, Poland; <sup>2</sup>Institute of Nuclear Chemistry and Technology, Warsaw, Poland.

*The technology of red lake pigments and technique of application in Anton Möller's and Hermann Han's paintings - non-invasive optical microscopy, SEM-EDX and  $\mu$ -XRD analysis on samples*

Justyna Olszewska-Świetlik, Bożena Szmelter-Fausek

Institute for the Study, Conservation and Restoration of Cultural Heritage, Nicolaus Copernicus University, Toruń, Poland.

