

出國報告

(出國類別：國際會議)

「非破壞暨顯微分析技術在藝術與文化遺產之應用」國際研討會

服務機關：國立故宮博物院
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派赴國家：義大利
出國期間：104.4.25-5.6
報告日期：104.8.3

公務出國報告提要

出國報告名稱：「非破壞暨顯微分析技術在藝術與文化遺產之應用」國際研討會

頁數 27 含附件：是

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出國類別：國際會議

出國期間：104 年 4 月 25 日~104 年 5 月 6 日

出國地區：義大利卡塔尼亞

報告日期：104 年 8 月 3 日

分類號/目：

關鍵詞：科學檢測、非破壞、文物保存、文化遺產、TECHNART

摘要：

TECHNART「非破壞暨顯微分析技術在藝術與文化遺產之應用」會議為目前有關藝術與文化遺產科學檢測領域最重要的國際會議之一，過去曾在里斯本、雅典、柏林及阿姆斯特丹舉行，而 TECHNART 2015 則於義大利的卡塔尼亞盛大舉辦，聚集了全世界各博物館、大學、研究機構和文物保存中心的文物科學分析及文物保存相關專家學者及學生近千人，發表了共近 500 篇論文，為此領域有史以來最大規模的國際會議。此次本院出席會議共發表包括文物 X 光電腦斷層掃描及青瓷的 X 光吸收光譜研究共 2 篇論文。出席會議之目的除了發表論文外，主要是能與各國專家學者面對面討論交流，了解文物科學分析技術和應用之最前沿的發展和相關議題，同時也讓其他國家了解本院在此一領域的研究成果，並建立交流網絡。

目 次

一、目的.....	4
二、過程.....	4
三、心得.....	14
四、建議.....	14

一、 目的

本院近年來因執行「文物高精密科學檢測技術研發應用暨實驗室建置計畫」之政府科技發展計畫，在文物科學實驗室硬體建置與實際的應用方面，皆已有初步成果。為在國際上展現本院既有成果，積極參與國際上文物保存社群之活動，同時扮演重要一份子，乃有必要出席國際上重要之文物科學保存或文物分析研究之相關會議。104年配合實驗室建置發展進程，出席了「非破壞暨顯微分析技術在藝術與文化遺產之應用」(TECHNART 2015)國際研討會。TECHNART 會議為目前國際上有關藝術與文化遺產科學檢測領域最重要的國際會議之一，參與者皆為世界上各博物館文物科學保存領域之相關專業人員。本次出席會議，除發表論文外，也和與會各國專家學者廣泛交流，了解文物科學分析技術和應用之最前沿的發展和相關議題，吸收相關知識。

二、 過程

(一)行程表

日期	地點	工作紀要
4/25 (六)	台北— 卡塔尼亞	台北出發飛卡塔尼亞 (Catania) (配合航班時間，搭乘華航於於羅馬轉機)
4/26(日)- 5/1 (五)	卡塔尼亞	出席 TECHNART 2015 國際研討會暨參訪活動。
5/2 (六) - 5/5 (二)	羅馬	參訪羅馬博物館、梵諦岡博物館。 參訪羅馬中央修復研究所。
5/6 (三)	羅馬—台北	返抵台北

(二)會議內容

TECHNART「非破壞暨顯微分析技術在藝術與文化遺產之應用」(Non-destructive and microanalytical techniques in art and cultural heritage)國際研討會，過去曾在里斯本(2007)、雅典(2009)、柏林(2011)、阿姆斯特丹(2013)舉行，TECHNART 2015 則於義大利的卡塔尼亞(Catania)盛大舉辦，與會人士近千人，發表共 498 篇論文(口頭報告 137 篇、海報論文 361 篇)，堪稱是此一領域有史以來最大規模的國際會議。會議內容包含以下主題：

- X 光顯微分析(XRF, PIXE, XRD, SED-EDX)
- 共軛焦 X 光顯微術 (3D micro-XRF, 3D micro-PIXE)
- 基於同步輻射、離子束及中子之分析技術
- FT-IR 及拉曼光譜術
- 紫外光-可見光及近紅外光吸收/反射及螢光光譜
- 基於雷射之分析技術
- 磁共振技術
- 色譜儀及質譜儀分析技術
- 光學影像及同調技術
- 可移動光譜術及遙測技術

上述主題在技術層面涵蓋了目前使用於文化資產領域所使用的分析技術；在應用層面則包含顏料、染料、玉石、金屬、玻璃、陶瓷、紙類及織品纖維、墨水、樹脂等各類有機及無機文物材料。會議議程共四天，由於發表者眾，除了大會演講外，其餘論文依各類不同主題同時利用二個場地進行口頭報告。

第一天(4/27)的大會主題演講由紐約大都會博物館科學研究部門主任 Marco Leona 博士擔任主講人，講題為”Synthetic dyes in the woodblock prints of Meiji Japan”。Leona 博士的團隊近年來利用表面增強拉曼散射光譜技術(SERS)進行了很多染料方面的研究，不論在技術開發和實際應用方面皆有豐碩的成果，值得借鏡。

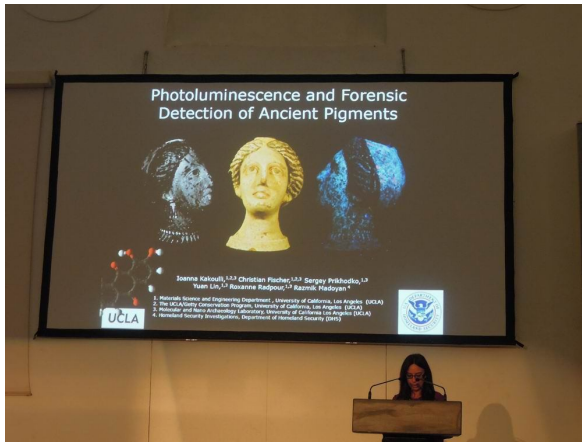
其他專題演講共 28 場，主題包括：分子光譜 I、II、III、IV 及 V；可攜式及非侵入方法 I 及 II；繪畫及顏料複合分析方法 I。此外，海報論文第一梯次共 179 篇，亦於第一天展示。



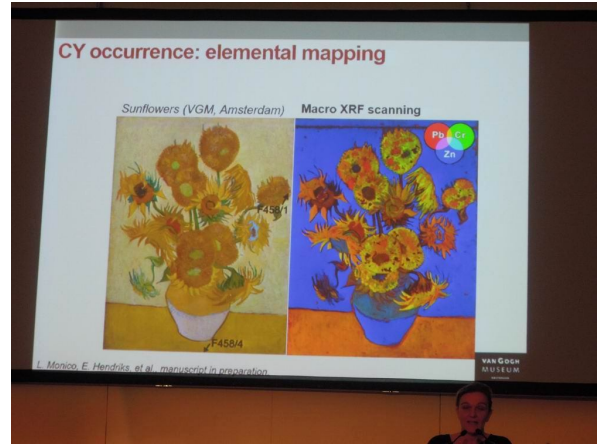
TECHNART 2015 國際研討會現場 ©A. Castagna



大會主題演講現場：紐約大都會博物館科學研究部門主任 Marco Leona 博士主講有關日本雕版印刷染料之分析



加州大學洛杉磯分校(UCLA)Kakoulli 發表古代顏料的 PL 光譜分析



義大利 Perugia 大學 Monico 等人發表有關 LED 燈照明對鉛黃顏料變色之影響



海報論文展示 ©A. Castagna

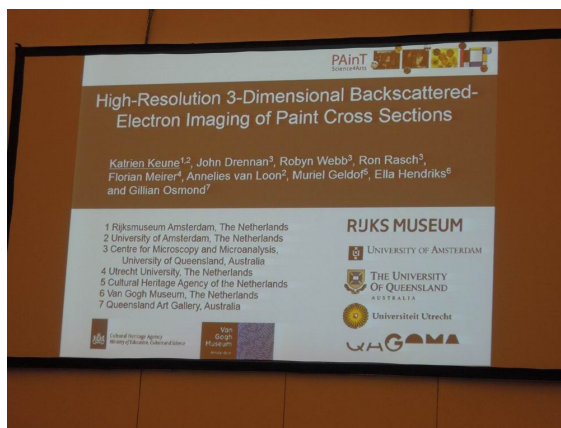


第二天(4/28)的大會主題演講由華盛頓 DC National Gallery of Art 的 John K. Delaney 博士主講”Visible and infrared imaging spectroscopy of paintings”，主要介紹可見光與紅外光影像暨光譜術在油畫分析上的應用。高光譜技術近幾年來廣泛應用於文物特別是繪畫的檢視分析，Delaney 博士在此一領域中不論是技術層面或應用面都有重要的貢獻。

其他專題演講共 35 場，包括影像及同調技術 I、II、III 及 IV；質譜術與色譜術 I 及 II；繪畫及顏料複合分析方法 II 及 III。



華盛頓DC National Gallery of Art的John K. Delaney 博士主講可見光與紅外光影像技術在繪畫上的應用



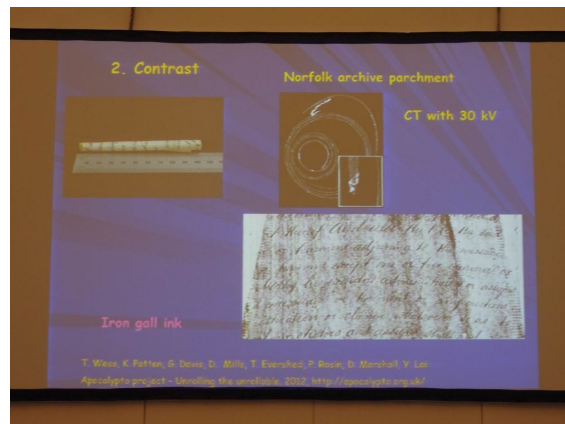
荷蘭國家博物館 K. Keune 等人發表三維背向散射電子影像術應用於顏料分析之論文



波蘭哥白尼大學 P. Targowski 介紹有關 OCT 光學同調斷層掃描術在油畫應用之例子



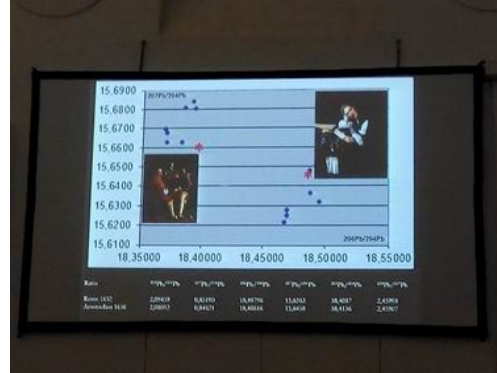
英國諾丁漢-特倫大學梁海達教授介紹應用藝術作品分析的新一代 OCT 技術



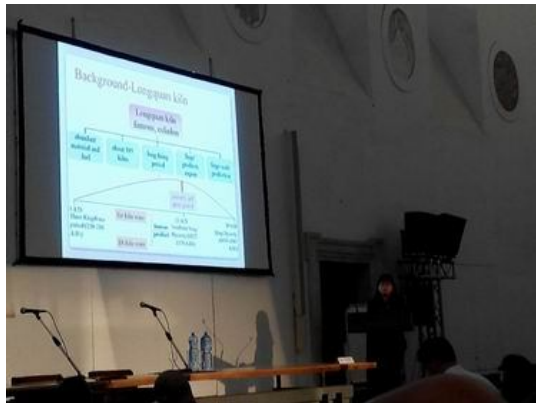
德國柏林大學 H. E. Mahnke 教授介紹利用 X-ray CT 檢視隱藏於莎草紙中的文字

第三天(4/29)的大會主題演講邀請了荷蘭阿姆斯特丹國家博物館 Rijksmuseum 的 A. Wallert 主講” Examination of stable isotope ratios: consequences for art history”，主要介紹利用鉛同位素(^{204}Pb 、 ^{206}Pb 、 ^{207}Pb 及 ^{208}Pb)在顏料(主要是鉛白)中的不同比例來進行繪畫年代、真偽及畫家身分判定。

其他的專題演講共 33 場，內容包括 X 光顯微分析；基於同步輻射、離子束及中子之分析技術 I、II 及 III；墨水、紙及羊皮紙複合分析方法 I；老化現象分析 I；分子光譜 VI 及廠商新產品介紹。第二梯次的海報論文亦於第三天張貼展示，共有 182 篇。



荷蘭阿姆斯特丹 Rijksmuseum 國家博物館 A. Wallert 主講顏料中穩定同位素之分析



北京故宮博物院段鴻鶯女士發表龍泉窯分析論文

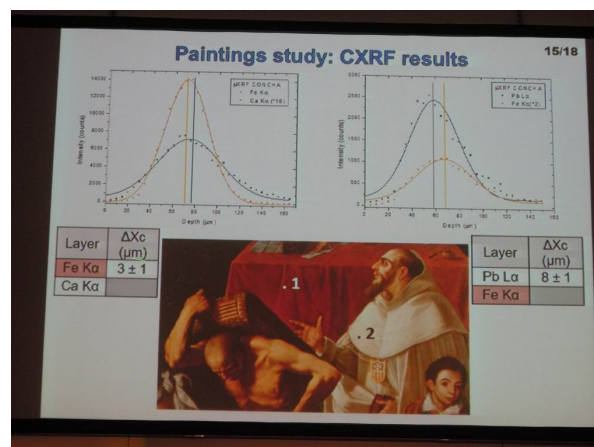
Getty 保存研究所退休之 G. Chiari 博士介紹 XRD/XRF 耦合分析技術

第四天(4/30)的大會主題演講邀請芝加哥藝術研究所的 Francesca Casadio 主講”Non-invasive analysis of modern and contemporary collections: paints, coatings and plastics”。相較於傳統的顏料或繪畫材料，現代藝術作品使用的創作材料相當複雜而多元，相關的分析研究也相對較為缺乏。Casadio 博士廣泛介紹並討論了包括 Roy Lichtenstein、Pablo Picasso 及 Laszlo Moholy-Nagy 等人藝術作品中所使用的材料之分析結果。

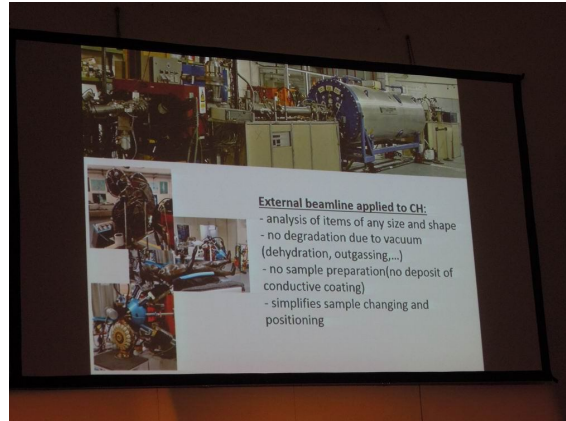
其他專題演講共 37 場，主題包括可攜式及非侵入方法 III；基於同步輻射、離子束及中子之分析技術 IV 及 V；金屬、陶器及釉之複合分析方法 I、II 及 III；繪畫及顏料複合分析方法 IV；老化現象分析 II。



芝加哥藝術研究所的 Francesca Casadio 博士主講有關現代藝術作品的材料分析



西班牙 Seville 大學國家加速器中心 K.Laclavetine 介紹共軛焦顯微 XRF 技術在繪畫分析之應用



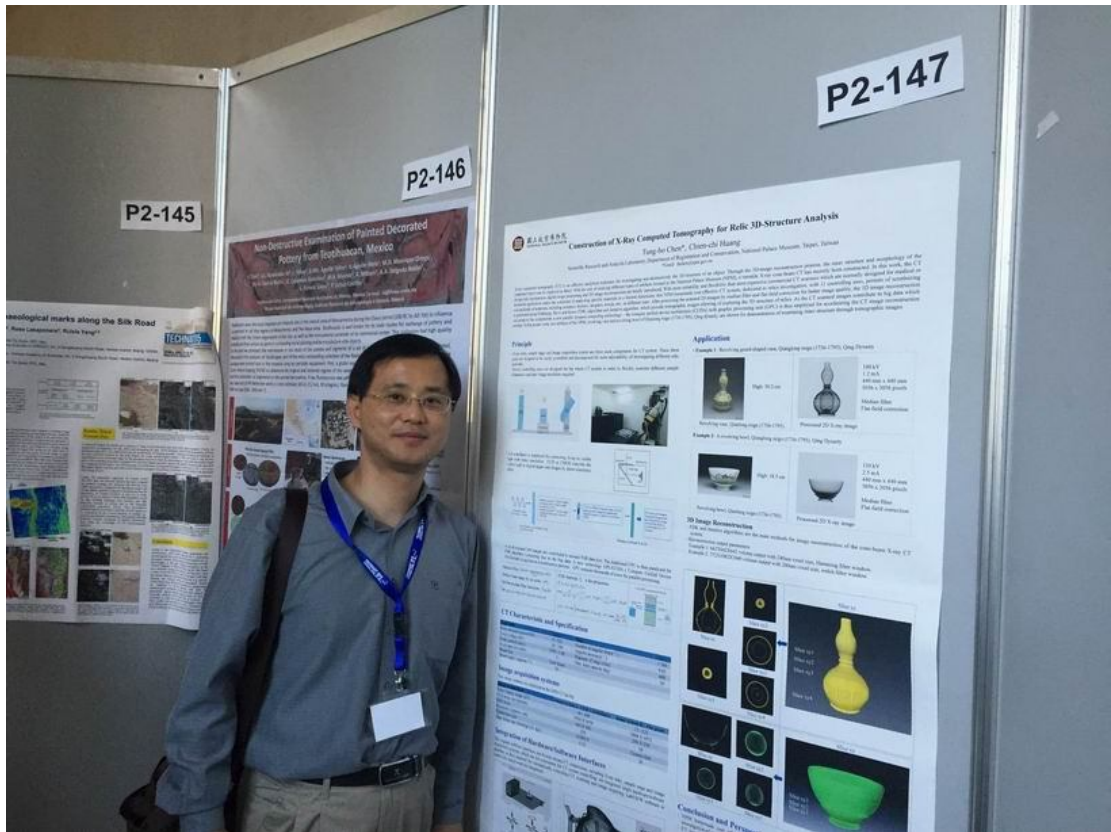
位於羅浮宮的法國博物館研究與修復中心的 Claire Pacheco 介紹實驗室中 AGLAE 加速器功能與技術提升計畫

筆者此次出席會議共發表了兩篇海報論文：

1. Application of X-ray computed tomography to cultural relics study ;
2. Investigation of the oxidation states of iron in Song Celadon glazes by X-ray absorption spectroscopy .

第一篇論文內容介紹本院近年來自行設計建造的 X 光電腦斷層掃描儀(X-ray CT scanner)系統及其在文物非破壞檢測之應用，重點包括影像系統及軟體控制介面的建置、FDK 演算法、運用 GPU/CUDA 於影像重建，以及以本院轉心瓶為例之實際的拍攝成果。

第二篇論文主要是與國家同步輻射研究中心(NSRRC)合作，利用同步輻射的 X 光吸收光譜，分析宋代汝窯、官窯、鈞窯、耀州窯、張公巷窯及高麗青瓷等釉中所含鐵離子的氧化態與電子結構。由於青瓷釉的顏色與其中所含鐵的含量和氧化態緊密相關，此項分析結果可以進一步探究青瓷釉色細微變化之成因以及釉之配方與燒造工藝。



筆者與介紹本院自行建造的 X 光電腦斷層掃描系統之海報論文

(二)參訪交流

會議之外，也參與了大會安排的參訪行程，包括參觀會議舉行地點本篤會修道院 Monastero dei Benedettini 及 Taormina 古城和 Etna 火山。卡塔尼亞本篤會修道院已被聯合國教科文組織列為世界文化遺產。此一巴洛克晚期之古蹟，始建於十六世紀，不過由於隨後不斷有修建工程，因此建築本身融合了各時代之風格。



卡塔尼亞本篤會修道院 Monastero dei Benedettini。右圖為地窖。

此外，由於此次行程於羅馬轉機，因此也赴羅馬中央修復研究所短暫交流參訪，並參觀羅馬多間博物館和梵諦岡博物館。特別也就近了解梵諦岡博物館利用 CT 分析文物及中央檔案與圖書修復保存研究所(ICRCPAL)有關紙張分析研究之情形。

三、心得

TECHNART 2015 國際會議聚集了全世界各博物館、大學、研究機構和文物保存中心的文物科學分析及文物保存相關專家學者及學生，發表了有關文化資產及藝術品的各類檢測技術和應用共近 500 篇論文，是此一領域有史以來最大規模的會議。由於科技日新月異，不論在影像、化學或結構分析技術，皆有長足的進步，過去無法獲取的隱藏於藝術作品中的影像或材料訊息，現在透過各類技術的綜合應用，都可以一一取得，對藝術品的保存、修復、定年、真偽鑑定、來源、工藝史研究等，皆有直接或間接的幫助。

此行最大的收穫是能直接與許多專家面對面交流，同時了解文物科學分析領域最前沿的發展和相關議題，吸收有關的知識，對本院正在建置發展中的技術有提升作用。另一方面，透過出席此一國際會議，發表論文，與各國專家學者討論交流，也讓其他國家了解本院在此一領域的研究成果，此乃建立交流網絡重要的一環。

四、建議

目前在歐美國家的博物館中，有關文物科學分析研究的成果，特別是許多突破性的發現，多列為重要的績效指標。相對於歐美，台灣在文化遺產及文物科學分析研究領域所投入的人力和技術發展資源都相當有限，整體而言，不論在質或量方面，皆有許多努力的空間。本院作為世界級的博物館，在展覽、圖錄出版、文創行銷、數位多媒體教育展示等，皆有豐碩的成績。在文物保存方面，預防性保存及文物修復也累積了多年的成果。而有關文物科學分析領域，雖然近幾年因為建置文物科學實驗室計畫而逐步提昇，惟在制度上和人才進用方面，受限於政府既有的規定和現有的博物館制度，乃跟不上計畫發展的節奏，以致於專業人力仍明顯不足。因此，若要整體提昇我們的實力，除了設備和經費外，更重要的是在人力(包括人才培育)和制度層面作一結構性的調整，才有辦法迎頭趕上，真正躋身世界級的博物館之林。



International
Year of Light
2015

TECHNART2015

Non-destructive and microanalytical techniques
in art and cultural heritage

CATANIA, APRIL 27-30, 2015
MONASTERO DEI BENEDETTINI

CONFERENCE PROGRAMME

Organized by



Istituto Nazionale
di Fisica Nucleare
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EXSA



INTERNATIONAL COUNCIL OF MUSEUMS
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Divisione di Chimica del Patrimonio e del Restauro Culturale



Museo Archeologico Regionale
Paolo Orsi Siracusa

Partnered with



Day 1 - Monday, 27 April 2015

08.00 - 09.00		Registration and check-in at "Monastero dei Benedettini"	
09.00 - 09.30		Opening Ceremony	
Plenary Lecture 1 (Auditorium Santo Mazzarino - Room A)			
09:30 - 10.00		Synthetic Dyes in the Woodblock Prints of the Meiji Japan. Marco Leona (INV1)	
Room A: Auditorium "Santo Mazzarino"		Room B: Auditorium "Coro di Notte"	
10.10 - 11.10 MOLECULAR SPECTROSCOPIES I (Session Chair: Marta Castillejo)		10.10 - 11.10 MOBILE AND NON-INVASIVE METHODS I (Session Chair: Pier Andrea Mandò)	
10:10 - 10.30	Listening to Artists' Pigments: Application of Photoacoustic Infrared Spectroscopy in the Forensic Identification of Selected Inorganic and Organic Artists' Pigments. Ian Butler	O1	10:10 - 10.30 Macroscopically non-destructive sampling using a portable laser ablation instrument coupled with multi-isotope ratio determinations for artefact provenance. Janne Koornneef , Alice Knaf, Debora Käser, Joachim Koch, Günther Detlef and Gareth Davies
10:30 - 10.50	A non-invasive technological investigation of the Hunt Frieze in the Tomb of Philip II at Aigai (Vergina), Greece. Hariclia Brecoulaki , Andeas Germanos Karydas and Giovanni Verri	O2	10:30 - 10.50 Characterization of ancient mirrors from 18th to 19th c: new advance in mobile specular reflectance spectroscopy. Aurélie Tournié, Christine Andraud , Christophe Meslin, Nathalie Morette and Bertrand Lavédrine
10:50 - 11.10	Non-destructive study of parchment degradation by nonlinear optical microscopy and IR nanospectroscopy. Laurianne Robinet , Gaël Latour, Alexandre Dazzi, Ariane Deniset-Besseau and Marie-Claire Schanne-Klein	O3	10:50 - 11.10 A new portable LED μ SF device for fragile artworks analyses: applications on medieval pigments. Aurélie Mounier , Sylvain Lazare and Floréal Daniel
11.10 - 11.50 COFFE BREAK		11.10 - 11.50 COFFE BREAK	
11.50 -13.00 MOLECULAR SPECTROSCOPIES II (Session Chair: Koen Janssens)		11.50 - 13.10 MOLECULAR SPECTROSCOPIES III (Session Chair: Marco Martini)	
11.50 - 12.20	Photoluminescence and forensic detection of ancient pigments. Ioanna Kakoulli	INV2	11.50 - 12.10 Elemental and molecular mapping techniques for the study of hidden details on illuminated manuscripts. Sara Mosca , Sara Bellei, Valentina Capogrosso, Austin Nevin, Gianluca Valentini, Roberto Alberti, Tommaso Frizzi, Luca Bombelli, Marzia Pontone, Isabella Fiorentini and Daniela Comelli
12.20 - 12.40	New insights into the visible light effects on the darkening of chrome yellows and a first evidence of Cr(V)-species. Letizia Monico, Koen Janssens, Marine Cotte, Aldo Romani, Lorenzo Sorace, Chiara Grazia, Bruno Brunetti and Costanza Miliani	O7	12.10 - 12.30 An advanced surface-enhanced vibrational active film for chromatigraphic analysis of dyes. Giorgia Sciutto , Silvia Prati, Irene Bonacini, Lucio Litti, Moreno Meneghetti and Rocco Mazzeo
12.40 - 13.00	UV Laser Ablation-SERS for the detection of dyes. Anna Cesaratto , Pablo Londero, John Lombardi and Marco Leona	O8	12.30 - 12.50 Identification of organic compound in polychrome works of art by micro-sampling with Ag-gel matrix associated with SERS analysis. Livia Lombardi , Marcella Guiso, Ulderico Santamaria and Armandodoriano Bianco

12.50-13.10 **Spectroscopic study of Semiconductor Quantum Dots in Glass Matrix: CdS_xSe_{1-x}.** [Cristina Fornacelli](#), Philippe Colombar, Susanna Bracci, Isabella Memmi and Marcello Picollo O12

13.00 - 14.30 LUNCH

13.10 - 14.30 LUNCH

14.30 - 16.00 **MOLECULAR SPECTROSCOPIES IV (Session Chair: Demetrios Anglos)**

14.30 - 16.10 **MOBILE AND NON-INVASIVE METHODS II (Session Chair: Izumi Nakai)**

14.30 - 15.00 **Nuclear Magnetic Resonance in cultural heritage: recent development.** [Donatella Capitani](#) INV3

14.30 - 14.50 **A non-destructive in-situ approach to monitor corrosion inside historical brass instruments.** [Bernhard Elsener](#), Marion Alter, Tiziana Lombardo, Martin Ledergerber, Marie Wörle, Federica Cocco, Marzia Fantauzzi and Antonella Rossi O16

15.00 - 15.20 **A quick and easy assessment of the photocatalytic activity of TiO₂ pigments - From lab to conservation studio!** [Birgit Anne van Driel](#), Patricia Kooyman, Klaas Jan van den Berg, Andreas Schmidt-Ott and Joris Dik O13

14.50 - 15.10 **X-ray fluorescence applied to yellow pigments based on lead, tin and antimony: a comparison of laboratory and portable instrumentation.** G. Agresti, G. Bonifazi, G. Capobianco, [Claudia Pelosi](#), U. Santamaria and S. Serranti O17

15.20 - 15.40 **Vibrational and structural study of CdS-based pigments: implication for their identification on modern paintings.** [Francesca Rosi](#), [Francesca Gabrieli](#), Chiara Grazia, Aldo Romani, Marco Paolantoni, Riccardo Vivani, Brunetto Giovanni Brunetti, Philippe Colombar and Costanza Miliani O14

15.10 - 15.30 **An application of portable X-Ray fluorescence spectroscopy for in situ analysis of rock art and red ochre pigment sources: an example from the southern Canadian Shield.** [Brandi Lee MacDonald](#), Fiona McNeill and Joanne O'Meara O18

15.40 -16.00 **Spectroscopic assessment of the UV laser removal of varnishes on paint substrates.** [Daniele Ciofini](#), Mohamed Oujja, Maria Vega Cañamares, Salvatore Siano and Marta Castillejo O15

15.30 -15.50 **Non Invasive Study of Mesoamerican Green Stone Artifacts by a New Simultaneous X-Ray Diffraction and X-ray Fluorescence System (ADIS).** [Valentina Aguilar-Melo](#), [Jose Luis Ruvalcaba-Sil](#) and Lauro Bucio-Galindo O19

15.50 -16.10 **Bernardino Luini: pigments and painting techniques.** [Anna Gallj](#), Letizia Bonizzoni, Marco Gargano and Marco Martini O20

16.00 - 16.40 COFFE BREAK

16.10 - 16.40 COFFE BREAK

16.40 - 17.40 **MOLECULAR SPECTROSCOPIES V (Session Chair: Austin Nevin)**

16.40 - 17.40 **COMBINED METHODS FOR PAINTS AND PIGMENTS I (Session Chair: Arie Wallert)**

16.40 -17.00 **High-resolution 1H solid-state NMR and non-invasive unilateral NMR of Asger Jorn's paint.** [Cindie Kehlet](#), Filiz Kuvvetli, Amelia Catalano and Jens Dittmer O21

16.40 -17.00 **Study of oil paintings by Candido Portinari with EDXRF and Raman portable equipment.** [Marcia De Almeida Rizzutto](#), Paula R P Allegro, Jessica F Curado, Adriana V Duarte and Florence M W Vera O24

17.00 - 17.20	Multivariate analysis of combined micro-Raman and reflectance FT-NIR spectra for the analysis of binder materials and simulated mixtures. Serena Carlesi , Marilena Ricci, Cristiana Lofrumento, Costanza Cucci, Marcello Picollo and Maurizio Becucci	O22	17.00 - 17.20	Hyperspectral imaging applied to the analysis of Goya paintings in the Museum of Zaragoza (Spain). Floréal Daniel , Aurélie Mounier, Josefina Pérez-Arategui, Nagore Prieto-Taboada, Silvia Fdez-Ortiz de Vallejuelo and Kepa Castro	O25
17.20 - 17.40	Selective functional group transformation to increase the spectral selectivity of FTIR spectroscopy – derivatisation of bioorganic compounds using gaseous sulfur tetrafluoride. Stefan Zumbühl and Nadim Scherrer	O23	17.20 - 17.40	Scientific investigation of the materials and techniques used in one of the pharaoh Tutankhamen 's decorated sticks. Ahmed Abdrabou , Medhat Abdallah and Eman Nabil	O26

17.40 - 19.00

POSTER SESSION I

Day 2 -Tuesday, 28 April 2015

Plenary Lecture 2 (Room A: Auditorium "Santo Mazzarino")

08:50 - 9.20

Visible and Infrared Imaging Spectroscopy of Paintings. John Delaney (INV4)

Room A: Auditorium "Santo Mazzarino"

09.30 - 10.50 IMAGING AND COHERENCE TECHNIQUES I (Session Chair: Costanza Miliani)

09:30 - 09.50 **Non-invasive investigation of panel paintings by Vis-NIR and THz imaging devices: a few considerations.** Marcello Picollo, Andrea Casini, Costanza Cucci, Lorenzo Stefani, Corinna Ludovica Koch Dandolo and Peter Uhd Jepsen O27

09.50 - 10.10 **High-Resolution 3-Dimensional Backscattered-Electron Imaging of Paint Cross Sections.** Katrien Keune, Annelies van Loon, John Drennan, Robyn Webb, Ron Rasch, Florian Meirer, Ella Hendriks and Gillian Osmond O28

10.10 - 10.30 **UV/visible photoluminescence multispectral imaging of archaeological copper-based artefacts.** Tatiana Severin-Fabiani, Mathieu Thoury, Luc Robbiola, Benoît Mille, Matthieu Réfrégiers and Loïc Bertrand O29

10.30 - 10.50 **Aging studies of dammar and mastic varnishes by employing nonlinear imaging microscopy techniques.** Filippidis George, Meropi Mari, Lambrini Kelegkouri, Aggelos Philippidis, Aleksandros Selimis, Kristallia Melessanaki, Maria Sygletou and Costas Fotakis O30

10.50 - 11.20 COFFE BREAK

11.20 - 13.10 IMAGING AND COHERENCE TECHNIQUES II (Session Chair: Giacomo Chiari)

11.20 -11.50 **Optical Coherence Tomography (OCT) – a novel tool for examination of artworks.** Piotr Targowski INV5

11.50 -12.10 **Further thoughts and case studies on 'Virtual Cleaning'.** Giorgio Trumpy, John Delaney and Marcello Picollo O35

12.10 -12.30 **New generation of optical coherence tomography for art.** Haida Liang, Chi Shing Cheung, Masaki Tokurakawa, Jae Daniel, W Andy Clarkson and Marika Spring O36

Room B: Auditorium "Coro di Notte"

09.30 - 10.50 MASS SPECTROMETRY AND CHROMATOGRAPHY I (Session Chair: Giuseppe Spoto)

09:30 - 09.50 **The Maya Did Not Just Drink Cacao.** Mattanjah de Vries, Shawn Owens, Jacob Berenbeim, Stuart Tyson-Smith, Greg Wilson and Anabel Ford O31

09.50 - 10.10 **Proteomics and cultural heritage: from bones to paintings.** Roberto Vinciguerra, Addolorata De Chiaro, Gennaro Marino, Piero Pucci and Leila Birolo O32

10.10 - 10.30 **Analysis of Old Master Paintings by Direct Temperature-Resolved Time-of-Flight Mass Spectrometry.** Annelies van Loon, Wim Genuit, Susan Smelt and Carol Pottasch O33

10.30 - 10.50 **A Pyrolysis-Gas Chromatography-Mass Spectrometry investigation of Sicilian Amber.** Inez Dorothé van der Werf, Giuseppe E. De Benedetto and Luigia Sabbatini O34

10.50 - 11.20 COFFE BREAK

11.20 - 13.10 MASS SPECTROMETRY AND CHROMATOGRAPHY II (Session Chair: Bruno Brunetti)

11.20 -11.40 **The use of GC/MS as a principal analytical method for identifying binding media used in late medieval and early modern wall paintings in the Low Countries.** Karin Keutgens, Anna Lluveras-Tenorio, Maria Perla Colombini, Peter Vandenabeele and Anna Bergmans O39

11.40 -12.00 **Spectroscopic and chromatographic monitoring of oil-resin varnish drying.** Sophie Tirat, Jean-Philippe Echard, Agnès Lattuati-Derieux, Jean-Yves Le Huérou and Stéphane Serfaty O40

12.00 -12.20 **Making proteins in artists' paints visible: ovalbumin as a case study.** Tanja Špec, Sebastijan Peljhan, Jana Vidic, Marko Fonovic, Crtomir Tavzes and Polonca Ropret O41

12.30 -12.50	Terahertz Imaging for Painting Analysis. Marco Barucci, Rene Camblor, Hamdi Dibeklioglu, George Hotopan, Marcos Fernandez Diaz, Miguel Fernandez, Raffaella Fontana, <u>Marta Florez Igual</u> , Javier Gutierrez Meana, Andreea Hadarig, Wouter Kouw, Fernando Las Heras, Laurens Van Der Maaten, Carlos Vazquez and Samuel Ver Hoeye	O37	12.20 -12.40	Chemical analysis of degraded wood by Py-GC/MS and ICP-AES. <u>Diego Tamburini</u> , Susan Braovac, Jeannette Jacqueline Lucejko, Francesca Modugno, Caitlin McQueen, Hartmut Kutzke and Maria Perla Colombini	O42
12.50 -13.10	Identification of hidden texts in folded and rolled papyri. <u>Heinz-Eberhard Mahnke</u> , Myriam Krutzsch, Verena Lepper and Kristin Mahlow	O38	12.40 -13.00	A multianalytical study of oil binding media and pigments using GC-MS, micro-Raman spectroscopy, FTIR, SEM-EDS and histochemical analyses on Bohemian Panel Paintings from the first half of the 14th century. <u>Radka Šefcu</u> , Václav Pitthard, Štěpánka Chlumská and Ivana Turková	O43
13.10 - 14.30 LUNCH			13.00 - 14.30 LUNCH		
14.30 - 16.00 IMAGING AND COHERENCE TECHNIQUES III (Session Chair: John Delaney)			14.30 - 16.10 COMBINED METHODS FOR PAINTS AND PIGMENTS II (Session Chair: Ioanna Kakoulli)		
14.30 - 15.00	MA-XRF scanning: a new and efficient analytical imaging technique for the characterization of stained-glass panels. <u>Geert Van der Snickt</u>	INV6	14.30 - 14.50	A multi-analytical approach to the study of the mural paintings in the Presbyterian area of Santa Maria Antiqua al Foro Romano in Rome. <u>Silvia Rita Amato</u> , Danilo Bersani, Pier Paolo Lottici, Claudia Pelosi and Paola Pogliani.	O47
15.00 - 15.20	Reading ancient manuscripts with conventional X-ray sources. <u>Fauzia Albertin</u> , Alberto Astolfo, Marco Stampanoni, Eva Peccenini, Yeukuang Hwu, Tsung-Tse Li, Edwin B.L. Ong, Jung Ho Je, Frederic Kaplan and Giorgio Margaritondo	O44	14.50 - 15.10	Microanalysis of clay-based pigments by XRD techniques. <u>David Hradil</u> , P. Bezdicka and J. Hradilova	O48
15.20 - 15.40	Micro-XRF imaging and WD-XRF imaging. <u>Kouichi Tsuji</u> , Kazuhiko Nakano, Masaki Yamanashi, Ryota Yagi, Shuichi Kato, Naoki Kawahara, Takashi Yamada and Takashi Shoji	O45	15.10 - 15.30	Imaging study of the “La Muta” of Raffaello by a portable XRF spectrometer. <u>Chiara Ruberto</u> , Anna Mazzinghi, Lisa Castelli, Caroline Czelusniak, Lara Palla, Nicla Gelli, Lorenzo Giuntini, Matteo Bettuzzi, Anna Impallaria, Rossella Brancaccio and Eva Peccenini	O49
15.40 -16.00	A novel approach to macro-XRF technique employing a large area position sensitive detector. <u>Bartsoz Mindur</u> , T. Fiutowski, A. Zielinska and W. Dabrowski	O46	15.30 -15.50	Characterization & Identification of Painted Wall Plasters From Sabratha, Libya: Using Different Analytical Techniques. <u>Safaa Abd El Salam</u>	O50
16.00 - 16.40 COFFE BREAK			16.10 - 16.40 COFFE BREAK		
16.40 - 17.40 IMAGING AND COHERENCE TECHNIQUES IV (Session Chair: Luisa de Carvalho)			16.40 - 17.40 COMBINED METHODS FOR PAINTS AND PIGMENTS III (Session Chair: Oliver Hahn)		
16.40 -17.00	Hybrid linear and non-linear fitting of X-ray fluorescence spectroscopic images using bAxil. Ana Cabal, Vicente Osorio and <u>Piet Van Espen</u>	O52	16.40 -17.00	Microscopic techniques (OM, ESEM) and a multi-analytical approach (EDX, FTIR, XRD, TGA-DTA) to assess the fire damage on the painted stuccoes from the Petruzzelli theatre (Bari, Southern Italy). <u>Angela Calia</u> , Donato Colangiuli, Mariateresa Lettieri, Maurizio Masieri and Giovanni Quarta	O56

<p>17.00 - 17.20 The Centre of Image and Material Analysis in Cultural Heritage (CIMA) in Vienna, Austria. <u>Manfred Schreiner</u>, Heinz Miklas, Claudia Rapp, Robert Sablatnig, Bernadette Fruehmann and Fabian Hollaus</p>	<p>O53</p>	<p>17.00 - 17.20 CT investigation of “La Muta” by Raffaello Sanzio. <u>Eva Peccenini</u>, Matteo Bettuzzi, Rosa Brancaccio, Franco Casali, Maria Pia Morigi, Francesco Taccetti, Lisa Castelli, Anna Mazzinghi, Chiara Ruberto, Alessandro Re and Alessandro Lo Giudice</p>	<p>O57</p>
<p>17.20 - 17.40 K-edge differential radiography for works of art. Giovanni Di Domenico, Mauro Gambaccini, <u>Anna Impallaria</u>, Ferruccio Petrucci and Flavia Tisato</p>	<p>O54</p>	<p>17.20 - 17.40 The color palette used for catacomb decorations. An insight on the “Villagrazia di Carini” catacomb by non-destructive techniques. <u>Delia Chillura Martino</u>, Stefano Ridolfi, Ilaria Carocci, Eugenio Caponetti and Rosa Maria Carra</p>	<p>O58</p>
<p>17.40 - 18.00 Combined use of film x-radiography and spectro-chemical techniques to analyze a portrait from Rubens’ workshop. <u>Nenagh Hathaway</u>, Brandi Lee MacDonald, Fiona McNeill, Alison Murray, Gianfranco Pocobene, Carol Podedworny and Ron Spronk</p>	<p>O55</p>	<p>17.40-18.00 “Il Velario” of Bivona: a useful case study on the use of portable non-invasive techniques for in situ analyses. <u>Stefano Ridolfi</u>, Ilaria Carocci, Eugenio Caponetti, Delia Chillura Martino and Bernardo Agrò</p>	<p>O59</p>

18.00 - 19.00

EXSA GENERAL ASSEMBLY

Day 3 - Wednesday, 29 April 2015

Plenary Lecture 3 (Auditorium Santo Mazzarino - Room A)

08:50 - 9.20

Examination of stable isotope ratios: consequences for Art History. Arie Wallert (INV 7)

Room A: Auditorium "Santo Mazzarino"

09.30 - 10.50 X-RAY MICROANALYSIS (Session Chair: Renè Van Grieken)

09:30 - 09.50 Non-conventional applications of a portable noninvasive XRD/XRF instrument. Giacomo Chiari and P. Sarrazin O60

09.50 - 10.10 The mystery of mercury-layers on ancient coins – a multianalytical study on the Sasanian coins under the reign of Khusro II. Katharina Uhlir, R. Padilla-Alvarez, A. Migliori, A.G. Karydas, I. Božicevic, M. Jaksic, R. Lehmann, N. Schindel, M. Alram and M. Griesser O61

10.10 - 10.30 Degraded smalt in 17th C. paintings: an investigation at multiple length scales. G. Nuyts, A. Botteon, F. Vanmeert, M. Alfeld, G. Van der Snickt, W. De Nolf, Koen Janssens, J. Titanah, D. Lamoen, H. Tan, J. Verbeeck, A. Van Loon, P. Noble and J. Dik O62

10.30 - 10.50 Comparative research of black body celadon and gray body celadon excavated from Wayaoyang kiln in Longquan, China. Hongying Duan, Dongge Ji, Yinzhong Ding, Guangyao Wang, Jianming Zheng, Guanggui Zhou and Jianmin Miao O63

10.50 - 11.20 COFFE BREAK

11.20 - 13.10 SYNCHROTRON, ION BEAM AND NEUTRON-BASED TECHNIQUES I (Session Chair: Andrea Karydas)

11.20 -11.50 Do not kill Schrödinger's Cat! Synchrotron imaging for the non-destructive investigation of fossils. Paul Tafforeau INV8

11.50 -12.10 Cultural heritage and archaeology materials at Elettra. Franco Zanini, Diane Eichert, Alessandra Gianoncelli, Andrea Lausi, Luca Olivi and Lisa Vaccari O68

12.10 -12.30 Quick X-ray absorption spectroscopy to study Prussian blue-containing photographic materials. Marie-Angélique Languille, Gervais Claire, Chantal Garnier, Solenn Reguer and Valérie Briois O69

Room B: Auditorium "Coro di Notte"

09.30 - 10.50 COMBINED METHODS FOR INKS, PAPERS AND PARCHMENTS I (Session Chair: Francesca Casadio)

09:30 - 09.50 Discoveries and oddities in library materials. Marina Bicchieri and Flavia Pinzari O64

09.50 - 10.10 Rethinking the application of micro-analytical techniques: an interdisciplinary approach to the study of Islamic inks. Claudia Colini, Ira Rabin and Oliver Hahn O65

10.10 - 10.30 Non-invasive in situ analytical techniques working in synergy: the application on graduals held in the Certosa di Pavia. Letizia Bonizzoni, Silvia Bruni, Anna Galli, Marco Gargano, Vittoria Guglielmi, Nicola Ludwig, Letizia Lodi and Marco Martini O66

10.30 - 10.50 Non-destructive identification and quantification of chromophores in two masterpieces of Leonardo da Vinci. Mauro Missori, Olivia Pulci, Lorenzo Teodonio, Paola Salvi, Maria Cristina Misi, Joanna Lojewska, Claudia Violante and Adriano Mosca Conte O67

10.50 - 11.20 COFFE BREAK

11.20 - 13.10 ANALYSIS OF DEGRADATION PHENOMENA I (Session Chair: Salvatore Siano)

11.20 -11.40 Identification of degradation products in paintings of different techniques and periods. Sophia Sotiropoulou and Zoi Eirini Papliaka. O72

11.40 -12.00 Optical devices provide unprecedented insights into the laser cleaning of calcium oxalate layers. Jana Striova, Raffaella Fontana, Alberto Felici, Marco Barucci, Eleonora Marconi, Cristiano Riminesi, Enrico Pampaloni and Rachele Manganelli Del Fà O73

12.00 -12.20 Study of the corrosion processes on Roman and Byzantine glasses from Northern Tunisia. Paola Fermo, Martina Andreoli, Letizia Bonizzoni, Giulia Giubertoni, Nicola Ludwig, Marzia Fantauzzi, Davide Atzei, Antonella Rossi, Donatella Barca and Mauro La Russa O74

12.30 -12.50 **The characterization of historic mortars: a comparison between powder diffraction and synchrotron radiation based X-ray absorption spectroscopy** Josef Hormes, Anja Diekamp, Wantana Klysubun and Norbert Boerste 070

12.50 -13.10 **Neutron imaging of the moisture absorption and drying of canvas paintings and relation to the moisture properties of their components.** Roel Hendrickx, Guylaine Desmarais, Mannes David, Kaestner Anders, Markus Weder, Max Aeberhard, Dominique Derome and Ester S.B. Ferreira 071

13.10 - 14.30 LUNCH

14.30 - 16.00 SYNCHROTRON, ION BEAM AND NEUTRON-BASED TECHNIQUES II (*Session Chair: Robert Van Langh*)

14.30 - 15.00 **Analysis of ancient gold objects with SRXRF at the BAMline.** Martin Radtke INV9

15.00 - 15.20 **Study of composition and degradation of modelling materials conserved on Auguste Rodin's sculptures.** Marine Cotte, Nathalie Balcar, Juliette Langlois, Yannick Vandenberghe, H  l  ne Bluzat, Agn  s Cascio and Guylaine Mary 077

15.20 - 15.40 **Grazing Incidence XRF and XANES nondestructive analysis of the Attic pottery black gloss and its imitations manufactured in South Italy (V-IV cent. B.C.).** Claudia Caliri, R. Catalano, A. D'Amicis, M. Bogovac, A. Dell'Aglio, M.T. Giannotta, A.G. Karydas, G. Lamagna, J.J. Leani, A.M. Manenti, A. Migliori, J. Os  n, L. Pappalardo, F. Rizzo and H.C. Santos 078

15.40 -16.00 **Neutron diffraction for cultural heritage studies: the Italian Neutron Experimental Station INES@ISIS.** Antonella Scherillo 079

16.10 - 16.40 COFFE BREAK

16.40 - 17.40 INDUSTRIAL SESSION (*Session Chair: Gianluca Valentini*)

16.40 -17.00 **Handheld and micro imaging FTIR analysis for the conservation and restoration of fine art and historical objects.** P. Scardina, F. Higgins, M. Kansiz by Agilent Technologies C1

12.20 -12.40 **Tracing the effects of pollution on ancient buildings by chemical analyses and light stable isotopes.** Jorge Sanjurjo S  nchez and Carlos Alves 075

12.40 -13.00 **Nanoparticle-based conservation treatment of cellulose and collagen-based materials.** Marianne Odlyha, Laurent Bozec, Angelica Bartolleti, Elena Gonzalez, Piero Baglioni, David Chelazzi, Rodorico Giorgi and Stephen Hackney. 076

13.10 - 14.30 LUNCH

14.30 - 16.10 SYNCHROTRON, ION BEAM AND NEUTRON-BASED TECHNIQUES III (*Session Chair: Franco Zanini*)

14.30 - 14.50 **Analysis of composition and microstructure of the lead white pigment in Masters paintings using HR Synchrotron diffraction.** Victor Gonzalez, Thomas Calligaro, Myriam Eveno, Michel Menu and Gilles Wallez 080

14.50 - 15.10 **A non destructive view into Neolithic and early Bronze Age metal axes.** Leif Glaser, Mechtild Freudenberg and Andre Rothkirch 081

15.10 - 15.30 **MeV SIMS - a novel method for the identification and characterization of modern and contemporary art paints.** Dubravka Jembrih-Simb  rger, Nikola Markovic, Zdravko Siketic, Marta Anghelone and Iva Bogdanovic Radovic 082

15.30 -15.50 **Terahertz, X-ray and neutron computed tomography of an Eighteenth Dynasty Egyptian sealed pottery.** Emmanuel Abraham, M. Bessou, A. Zi  gl  , M.C. Herv  , L. Szentmikl  si, Zs. Kasztovszky, Z. Kis and M. Menu 083

15.50 -16.10 **X-ray Absorption Near-Edge Spectroscopy Analysis of discolouration ultramarine blue in 20th century oil paintings.** Eleanor Cato, Ester S.B. Ferreira, Thomas Huthwelker and Camelia Borca 084

16.10 - 16.40 COFFE BREAK

16.40 - 17.40 MOLECULAR SPECTROSCOPIES VI (*Session Chair: Marco Leona*)

16.40 -17.00 **A multi-analytical approach towards the investigation of Subarctic Athapaskan colouring of quillwork and its sensitivity to photo-degradation.** Lore Troalen, Stefan R  hrs, Simon Kunz, Thomas Calligaro, Claire Pacheco, Julio M. Del Hoyo-Mel  ndez and Alison N. Hulme 085

17.00 - 17.20 **XGLab and its Portable Analysis Instruments: When Science meets Art.** Tommaso Frizzi, Roberto Alberti, Michele Gironda by XGLAB

C2

17.00 - 17.20 **The noninvasive FTIR characterization of brass varnishes of historical scientific instruments.** Giancarlo Lanterna and Anna Giatti

O86

17.20 - 17.40 **Fiber Optics Reflectance Spectra (FORS) for pigment identification, using portable and smart spectrometers.** Davide Manzini, Daniel Barchwitz by BWTEK

C3

17.20 - 17.40 **On the fiber" SERS detection of synthetic dyes employing laser photoreduced Ag nanoparticles.** Irene Bonacini, Francesca Gallazzi, Maria Vega Cañamares, Silvia Prati, Giorgia Scitutto, Santiago Sanchez-Cortes and Rocco Mazzeo

O87

17.40 - 19.00

POSTER SESSION II

20.30 - 23.00

SOCIAL DINNER

Day 4 - Thursday, 30 April 2015

Plenary Lecture 4 (Auditorium Santo Mazzarino - Room A)

08:50 - 9.20 Non-invasive analysis of modern and contemporary collections: paints, coatings and plastics. Francesca Casadio (INV 10)

Room A: Auditorium "Santo Mazzarino"

09.30 - 10.50 MOBILE AND NON INVASIVE METHODS III (Session Chair: Chris McGlinchey)

09:30 - 09.50 Near-infrared fluorescence spectroscopy for the identification of artists' pigments. Chiara Grazia, Aldo Romani, Riccardo Vivani and Costanza Miliani 088

09.50 - 10.10 In situ Confocal micro X-Ray Fluorescence (CXRF) analysis of easel paintings. Kilian Laclavetine, F.J. Ager, M.V. Muñoz, M.Vega and M.A. Respaldiza 089

10.10 - 10.30 In situ analysis of archaeological objects: application and optimization of a mobile lab. Georgios Karagiannis, Sophia Sotiropoulou, Ifigeneia Grigoriadou, Christos Salpistis, Dimitrios Tsiafis, Dimitrios Minasidis 090

10.30 - 10.50 A multi-technique approach, based on mobile laser instruments, for the in-situ, integrated study of artworks. Panayiotis Siozos, Aggelos Philipidis, Zoi Eirini Papliaka and Demetrios Anglos 091

10.50 - 11.20 COFFE BREAK

11.20 - 13.10 SYNCHROTRON, ION BEAM AND NEUTRON-BASED TECHNIQUES V (Session Chair: Martin Radtke)

11.20 -11.50 The new IBA/XRF elemental imaging at LABEC. Francesco Taccetti INV11

11.50 -12.10 Characterization of gold leaves on Hellenistic terracotta artifacts: a PIXE-RBS mapping study. Chloé Fourdrin, Sandrine Pagès-Camagna, Claire Pacheco, Marie Radepont, Quentin Lemasson, Brice Moignard, Laurent Pichon, Brigitte Bourgeois and Violaine Jeammet 096

Room B: Auditorium "Coro di Notte"

09.30 - 10.50 SYNCHROTRON, ION BEAM AND NEUTRON-BASED TECHNIQUES IV (Session Chair: Marine Cotte)

09:30 - 09.50 Near Edge X-Ray Absorption Fine Structure (NEXAFS) Imaging of Artists' Acrylic Paint Films. Elizabeth Willneff, Bronwyn Ormsby, Cherno Jaye, Daniel Fischer and Sven Schroeder 092

09.50 - 10.10 Non-invasive archaeometallurgical approach to the investigations of bronze figurines using neutron, laser and X-ray techniques. Juri Agresti, Iacopo Osticioli, Maria Cristina Guidotti, Nikolay Kardjilov and Salvatore Siano 093

10.10 - 10.30 The stability of the ZnAl₂O₄:Cr pigment in enamels from the "Manufacture of Sèvres". Louisiane Verger, Laurent Cormier, Olivier Dargaud, Gwenaëlle Rouse and Marine Cotte 094

10.30 - 10.50 Resonant X-ray emission as a tool of Prussian Blue studies. Elena Nazarenko, M. Nachtegaal, D. Grolimund, G. Smolentsev, J. Szlachetko and C. Gervais 095

10.50 - 11.20 COFFE BREAK

11.20 - 13.10 COMBINED METHODS FOR METALS, POTTERY AND GLAZES I (Session Chair: Piotr Targowski)

11.20 -11.40 New insights into the manufacturing technique and corrosion of high leaded antique bronze coins. Martina Griesser, Winfried Kockelmann, Klaudia Hradil and René Traum 0100

11.40 -12.00 p-XRF analysis of corroded copper surfaces and investigation of factors affecting its accuracy. Stavroula Golfomitsou, M. Georgakopoulou and J. Saunders 0101

12.10 -12.30	The New AGLAE project: last and future improvements of the AGLAE facility. <u>Claire Pacheco</u> , Quentin Lemasson, Brice Moignard and Laurent Pichon	O97	12.00 -12.20	Analysis of jeweled Silver Crown of Fukukensaku Kannon, Todai-ji Temple, Nara, a national treasure of Japan. <u>Izumi Nakai</u> , Yoshinari Abe, Mayumi Matsuzaki and Akiko Inoue	O102
12.30 -12.50	Study of Zinc based paints using Synchrotron microscopies and complementary analytical techniques. <u>Valentina Capogrosso</u> , Daniela Comelli, Austin Nevin, Sara Bellei, Sara Mosca, Lisa Vaccari, Elisa Mitri, Francesca Gabrieli, Laura Cartechini, Francesca Rosi and Gianluca Valentini	O98	12.20 -12.40	Casting Cores: an under-explored witness of the Fabrication of early modern Bronze Statues. <u>Manon Castelle</u> , Y . Coquinot and D. Bourgarit	O103
12.50 -13.10	CEDAD: a growing facility for dating and cultural heritage diagnostics by nuclear methods. <u>Lucio Calcagnile</u> , Gianluca Quarta, Marisa D'Elia, Lucio Maruccio, Eugenia Braione and Maria Macchia	O99	12.40 -13.00	Analysis of Elements, Compounds and Isotopes in ancient bronze coins of the Mediterranean basin. <u>Torrisi Lorenzo</u> , Cutroneo Mariapompea, Italiano Antonino and Torrisi Alfio	O104
13.10 - 14.30 LUNCH			13.10 - 14.30 LUNCH		
14.30 - 16.00 COMBINED METHODS FOR PAINTS AND PIGMENTS IV (Session Chair: Barbara Berrie)			14.30 - 16.10 COMBINED METHODS FOR METALS, POTTERY AND GLAZES II (Session Chair: Bronwyn Ormsby)		
14.30 - 15.00	Colour degradation in medieval manuscripts: a holistic and transdisciplinary approach. <u>Maria João Melo</u> , Rita Araújo and Rita Castro.	INV12	14.30 - 14.50	Non destructive investigation on Greek and Roman jewelry collection at the Paolo Orsi Regional Museum in Siracusa using mobile Raman equipment. Germana Barone, <u>Danilo Bersani</u> , Jan Jehlicka, Gioconda Lamagna, Pier Paolo Lottici, Maria Angela Manenti, Paolo Mazzoleni, Simona Raneri and Peter Vandenabeele	O108
15.00 - 15.20	Analysis and conservation issues related to Caves 260 and 263 at the Mogao Grottoes, Dunhuang, China. <u>Giovanni Verri</u> , Bomin Su, Lisa Shekede and Lin-Yi Zhao	O105	14.50 - 15.10	The magnificent art of the inlay: study and materials characterization of Antonio Stradivari "Hellier" violin. Alessia Daveri, Claudia Invernizzi, Maurizio Licchelli, Manuela Vagnini, <u>Marco Malagodi</u> , Tommaso Rovetta and Fausto Cacciatori	O109
15.20 - 15.40	The technical examination of a Virgin and Child, questions of attribution. Arie Wallert, <u>Elsemieke van Rietschoten</u> and Francesco Paolo Romano	O106	15.10 - 15.30	Provenance and technology issues of Byzantine glazed pottery from Corinth, Greece. <u>Eleni Palamara</u> , Nikolaos Zacharias, Maria Xanthopoulou, Zsolt Kasztovszky, Imre Kovacs, Dimitrios Palles and Efstratios Kamitsos	O110
15.40 -16.00	Raman and FTIR Analysis of Paints applied on ceremonial objects of the Highlands of Papua New Guinea. <u>Lynn Chua</u> , Kerry Head, Paul Thomas and Barbara Stuart.	O107	15.30 -15.50	Characterization of applied brocades from Savoie duchy, France, by means of combined micro-analytical techniques. <u>Emeline Pouvet</u> , Thomas Guiblain and Sophie Cersoy	O111
			15.50 -16.10	Identification of poorly crystalline and amorphous phases on pre Hispanic Mexican earth bricks. <u>Nora Perez</u> , Lauro Bucio, Enrique Lima, Enrique Soto and Carlos Cedillo	O112

16.10 - 16.40 COFFE BREAK**16.40 - 18.00 COMBINED METHODS FOR METALS, POTTERY AND GLAZES III (Session Chair: Heinz-Eberhard Mahnke)**

16.40 - 17.00 **Analytical and Technological Examination of Glass Tesserae from Hagia Sophia.** Antonia Moropoulou, Nikos Zacharias, Ekaterini T. Delegou, Zsolt Kasztovszky and Boglarka Maróti O113

17.00 - 17.20 **Radiometric Dating of Metals.** Joao Cruz, Elin Figueiredo, Penka Girginova, Victoria Corregidor, Carlos Cruz, Rui Silva and Ioannis Liritzis O114

17.20 - 17.40 **X-Ray induced luminescence as a tool for material characterization in art and archaeology.** Alessandro Re, A. Lo Giudice, D. Angelici, M. Zangirolami, M. Bettuzzi, L. Castelli, R. Brancaccio, L. Giuntini, M. Massi, A. Mazzinghi, M.P. Morigi, E. Peccenini, F. Petrucci and C. Ruberto O115

17.40 - 18.00 **Complementary Analytical Methods for Analysis of Ag-Plated Cultural Heritage Objects.** Matthew Carl and Marcus L. Young O116

17.40 - 18.00 **Microtomography studies on metal-imitating pottery.** Raffaele Giuseppe Agostino, Sandro Donato, Tommaso Caruso, Franco Zanini, Alessandro D'Alessio and Armando Taliano Grasso O117

16.10 - 16.40 COFFE BREAK**16.40 - 18.00 ANALYSIS OF DEGRADATION PHENOMENA II (Session Chair: Giovanni Verri)**

16.40 - 17.00 **Conserving a Tudor warship: analysis of problematic sulfur.** Eleanor Schofield, Mark Jones, Fred Mosselmans, Giannantonio Cibin and Alan Chadwick O118

17.00 - 17.20 **Self-cleaning SiO₂ - nano TiO₂ treatments for the conservation of stone built heritage.** Francesca Gherardi, Annalisa Colombo, Sara Goidanich and Lucia Toniolo O119

17.20 - 17.40 **Gel Cleaning: What is happening at the interface?** Lora Angelova, Nishad Dhopatkar, Barbara Berrie, Bronwyn Ormsby, Ali Dhinojwala and Emma Richardson O120

17.40 - 18.00 **Alterations in wall paintings: the case of the 14th century paintings from the Royal Monastery of Pedralbes in Barcelona.** Nati Salvadó, Salvador Buti, Trinitat Pradell, Lúdia Font and Rosa Senserrich O121

18.00-18.20 **In situ classification and identification of inorganic efflorescence salts by means of Fourier transform infrared spectroscopy and chemometric tools.** Iker Arrizabalaga, Ilaria Costantini, Gorka Arana and Juan Manuel Madariaga O122

18.20- 19.00**CLOSING CEREMONY (Auditorium Santo Mazzarino - Room A)**