

RAA 2013

Final Scientific Programme

Monday, September 02

09:00 Congress opening and welcome speeches

Dr. Jelka Pirkovič

Director General, Institute for the Protection of Cultural Heritage of Slovenia

Dr. Franci Demšar

Director, Slovenian Research Agency

Špela Spanžel

Acting Director-General, Cultural Heritage Directorate, Ministry of Culture of Slovenia

09:30 ORAL SESSION 1 Deterioration studies and organic materials

Chairman: Peter Vandenabeele

09:30 Plenary Lecture 1 (PL1): Howell G.M. Edwards. *Raman Spectroscopy of Extremophilic Biodeterioration: An Interface between Archaeology and the Preservation of Cultural Heritage*

10:20 OP1: Annalaura Casanova Municchia, Giulia Caneva, Maria Antonietta Ricci, Armida Sodo. *Identification of endolithic survival strategies on stone monuments*

10:40 OP2: Katja Kavkler, Andrej Demšar. *FT-Raman analysis of historical cellulosic fibres infected by fungi*

11:00 Coffee & Tea

11:30 ORAL SESSION 1

Deterioration studies and organic materials

Chairman: Danilo Bersani

- 11:30 **OP3:** Anuradha Pallipurath, Jonathan Skelton, Spike Bucklow, Stephen R. Elliott. *Combined FT-Raman and Fibre-Optic Reflectance Spectroscopic Characterisation of Simulated Medieval Paint Films: a Chemometric Study of the Effects of Natural and UV-Accelerated Ageing*
- 11:50 **OP4:** Tanja Špec, Klara Retko, Polonca Ropret, Janez Bernard. Study of malachite degradation in easel (model) paintings by spectroscopic analysis
- 12:10 **OP5:** Juan Manuel Madariaga, Maite Maguregui, Silvia Fdez-Ortiz de Vallejuelo, Africa Pitarch, Ulla Knuutinen, Kepa Castro, Irantzu Martinez-Arkarazo, Anastasia Giakoumaki. *Portable and laboratory analysis to diagnose the formation of efflorescence on walls and wall paintings of Insula IX, 3 (Pompeii, Italy)*
- 12:30 **OP6:** Ayora-Cañada María José, Domínguez Vidal, Ana, de la Torre López María José, Campos Suñol María José, Rubio Domene Ramón. *Decorated plasterwork in the Alhambra investigated by Raman spectroscopy: field and laboratory comparative study*
- 12:50 **OP7:** Céline Daher, Ludovic Bellot-Gurlet, Céline Paris, Juliette Langlois, Yannick Vandenberghe, Jean Bleton, Anne Forray-Carliet, Anne-Solenn Le Hô. *Multi-technical approach for the study of French Decorative Arts furniture and luxury objects*
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13:10 Lunch

14:30–15:45 POSTER SESSION 1

(Including 5 highest rating poster contributions as 5 min oral presentations)

Chairman: Marta S. Maier

- 14:30 **P1:** Ilaria Costantini, Antonella Casoli, Daniele Pontiroli, Danilo Bersani, Pier Paolo Lottici. *Deterioration of lead based pigments on a fresco: a micro-Raman investigation*
- 14:35 **P2:** Klara Retko, Tanja Špec, Polonca Ropret. *Investigation of colour layers in easel (model) paintings influenced by different ageing processes*
- 14:40 **P3:** Vanessa Otero, Diogo Sanches, Cristina Montagner, Márcia Vilarigues, Leslie Carlyle, Maria J. Melo. *Identification of copper azelate in 19th century Portuguese oil paintings: Characterisation of metal soaps by Raman Spectroscopy*

14:45 **P4:** Alessia Coccato, Nathalie De Laet, Sylvia Lycke, Jolien Van Pevenage, Luc Moens, Peter Vandenabeele. *Raman study of pigment degradation due to acetic acid vapours*

14:50 **P5:** Thiago Sevilhano Puglieri, Dalva Lúcia Araújo de Faria, Luiz Antônio Cruz Souza. *Investigating the sources of degradation in corroded lead sculptures from Oratory Museum (Museu do Oratório), Brazil*

POSTER SESSION 1

P6: Tânia Rosado, Andreia Reis, António Candeias, José Mirão, Peter Vandenabeele, Ana Teresa Caldeira. *Evora Cathedral: Pink! Why not?*

P7: Héctor Morillas, Maite Maguregui, Josu Trebolazabala, Isabel Salcedo, Juan Manuel Madariaga. *Study of red biopatina composition on sandstone from a historical war Fort in La Galea (Biscay, north of Spain) by means of single point focusing Raman analysis and Raman Imaging combined with microscopic observation*

P8: Céline Daher, Ludovic Bellot-Gurlet, Stéphane Vaiedelich, Jean-Philippe Echard. *Raman and non-invasive IR analyses of natural organic coatings: application to historical violin varnishes*

P9: Carlotta Santoro, Anne-Solenn Le Hô, Sigrid Mirabaud, François Mirambet, Sandrine Pagès-Camagna, Pascal Griesmar, Nadège Lubin-Germain, Michel Menu. *Characterization of green copper organometallic pigments and understanding of their degradation process in European easel paintings*

P10: Ewa Pięta, Justyna Olszewska-Świetlik, Edyta Proniewicz. *Optical Microscopy and Micro-Raman studies of The Hans Memling's Triptych "The Last Judgment"*

P11: Pietro Baraldi, Davide Gasparotto, Claudia Pelosi, Paolo Zannini. *Non-destructive micro-Raman and XRF investigation on parade saddles of italian renaissance*

P12: Cecilia Baraldi, Giada Freguglia, Elsa Van Elslande, Pamela Toti, Pietro Baraldi, Maria Cristina Gamberini, Claudia Pelosi. *Phoenicians preferred red pigments: micro-Raman investigation on some cosmetics found in Sicily archaeological sites*

P13: Pietro Baraldi, Paolo Bensi, Alessandro Muscillo, Fabrizio Paolucci, Andrea Rossi, Paolo Zannini. *Raman microscopy and X-ray fluorescence for the rediscovering of polychromy and gilding on classical statuary in the Galleria degli Uffizi*

P14: Alessia Coccato, Peter Vandenabeele, Luc Moens. *Raman spectroscopic investigation of black pigments*

P15: Kepa Castro, Maite Maguregui, Silvia Fdez- Ortiz de Vallejuelo, Raili Laakso,² Ulla Knuutinen, Juan Manuel Madariaga. *Raman Spectroscopy and SEM-EDS Studies Revealing Treatment History and Pigments of the Government Palace Tower Clock in Helsinki Empire Senate Square*

P16: Mohsen Ghanooni, Hamid Motahari, Rasoul Malekfar, Ehsan Talebian. *Feasibility Study of Portable Raman Spectroscopy for Characterization of Ground Material of Easel Paintings (Case Study: Sradar As'ad-e Bakhtiary Painting of Kamal-al Molk)*

P17: Marta S. Maier, Fernando Marte, Valeria P. Careaga, Dalva L. A. de Faria. *The Sibyls from the church of San Pedro Telmo: a spectroscopic investigation*

P18: Debbie Lauwers, Vincent Cattersel, Annabel Van Eester, Ine Craenhals, Jitske Van Groenland, Luc Moens, Peter Vandenabeele. *Pigment identification of illuminated medieval manuscripts by means of a new, portable Raman equipment*

P19: Petra Bešlagić, Martina Lesar Kikelj. *Micro-Raman identification of pigments on wall paintings: characterisation of Langus and Sternen's palettes*

15:45 Coffee & Tea

16:15 ORAL SESSION 2 Advancements in Raman instrumentation

Chairman: Polonca Ropret

16:15 **OP8:** RENISHAW: Josef Sedlmeier, Alan Brooker, Kenneth Williams. *New Methods in Raman Spectroscopy – Combining Other Microscopes for mineral and pigment analysis*

16:35 **OP9:** HORIBA JOBIN YVON: Romain Bruder. *Horiba Jobin Yvon advances in Raman instrumentation: explore new boundaries in art and archaeology*

16:55 **OP10:** NORDTEST: Alessandro Crivelli, Maurizio Aceto, Pietro Baraldi, Maurizio Bruni, Angelo Agostino, Gaia Fenoglio. *A portable 1064 nm Raman spectrometer for analysis of cultural heritage items*

17:15 **OP11:** BAYSPEC: Lin Chandler, Jack Qian, Owen Wu, Daniel Thomas. *Novel 1064 nm Dispersive Raman Spectrometer and Raman Microscope for Non-invasive Pigment Analysis*

17:35 End of first day

20:00 Welcome reception at the City Hall, Red Hall

Mag. Mateja Demšič, Head of the Department for Culture of the City of Ljubljana

Tuesday, September 03

9:10 ORAL SESSION 3

Surface enhanced Raman spectroscopy in art and archaeology

Chairman: *Francesca Casadio*

09:10 **Plenary Lecture 2 (PL2)**: Marco Leona. *Surface-enhanced Raman spectroscopy in Art and Archaeology*

10:00 **OP12**: Maria Vega Cañamares, David A. Reagan, Marco Leona. *TLC-SERS of mauve, the first synthetic dye*

10:20 **OP13**: Klara Retko, Polonca Ropret, Romana Cerc Korošec. *New photoreduced substrate for SERS analysis of organic colorants*

10:40 **OP14**: Pablo S. Londero, John R. Lombardi, Marco Leona. *Laser Ablation Surface-enhanced Raman Microspectroscopy*

11:00 **Coffee & Tea**

11:30 ORAL SESSION 3

Surface Enhanced Raman Spectroscopy in Art and Archaeology

Chairman: *Marco Leona*

11:30 **OP15**: Ambra Idone, Monica Gulmini, Francesca Casadio, Lisa Backus, Lauren Chang, Lorenzo Appolonia, Richard P. Van Duyne, Nilam Shah. *Silver colloidal pastes for the analysis via Surface Enhanced Raman Scattering of colored historical textile fibers: some morphological and spectroscopic considerations*

11:50 **OP16**: Brenda Doherty, Brunetto Giovanni Brunetti, Antonio Sgamellotti, Costanza Miliani. *Surface enhanced Raman spectroscopy for dyes and pigments - Can non-invasive investigations become a reality?*

12:10 **OP17**: N. R. Agarwal, M. Tommasini, P. M. Ossi, E. Fazio, F. Neri, S. Trusso, R.C. Ponterio. *Surface Enhanced Raman Scattering of organic dyes on gold substrates prepared by pulsed laser ablation*

12:30 **OP18**: Rita Castro, Maria J. Melo, Federica Pozzi, Marco Leona, João Lopes. *Combining SERS with chemometrics: a promising technique to assess historical samples with historically accurate reconstructions*

12:50 **OP19:** María Lorena Roldan, Silvia A. Centeno, Adriana Rizzo. *Characterization and Identification of Asphalts in Works of Art by SERS complemented by GC-MS, FTIR and XRF*

13:10 **OP20:** Francesca Rosi, Catia Clementi, Marco Paolantoni, Aldo Romani, Roberto Pellegrino, Brunetto Giovanni Brunetti, Witold Novik, Costanza Miliani. *Study of Raman scattering and luminescence properties of orchil dye for its nondestructive identification on artworks*

13:30 Lunch

14:40–15:55 POSTER SESSION 2

(Including 5 highest rating poster contributions as 5 min oral presentations)

Chairman: *Maria Vega Cañamares*

14:40 **P20:** Ambra Idone, Maurizio Aceto, Eliano Diana, Lorenzo Appolonia, Monica Gulmini. *Application to historical samples of in situ, extractionless SERS for dye analysis*

14:45 **P21:** Federica Pozzi, Francesca Casadio. *Application of surface-enhanced Raman spectroscopy (SERS) to the analysis of red lakes in French Impressionist and Post-Impressionist paintings*

15:00 **P22:** Chiara Zaffino, Silvia Bruni, Vittoria Guglielmi. *Surface-Enhanced Raman Spectroscopy (SERS) of historical dyes on textile fibers: evaluation of an extractionless treatment of samples*

14:50 **P23:** Elena Platania, Marco Leona, John R. Lombardi, Cristiana Lofrumento, Marilena Ricci, Maurizio Becucci, Emilio Castellucci. *Suitability of Ag-agar gel for the micro-extraction of organic dyes on different substrates: the case study of wool, silk, printed cotton and panel painting mock-ups*

14:55 **P24:** Jolien Van Pevenage, Cathérine Defeyt, Luc Moens, David Strivay, Peter Vandenabeele. *PB15 polymorphic distinction in paint samples by combining micro-Raman spectroscopy and chemometrical analysis*

POSTER SESSION 2

P25: Oana-Mara Gui, Simona Cînta-Pînzaru. *First identification of the painting technique in 18th Century Transylvanian oil paintings using micro-Raman and SERS*

P26: Oana-Mara Gui, Simona Cînta-Pînzaru. *Organic materials in oil paintings and canvas revealed by SERS*

P27: Marta Anghelone, Dubravka Jembrih-Simbürger, Manfred Schreiner. *Characterization of SOPs in acrylic and alkyd paints by means of μ -Raman spectroscopy*

- P28:** Margarita San Andrés, Valentín G. Baonza, Oscar R. Montoro, Adrián Bouzas, Ruth Chércoles, Mercedes Taravillo, José Manuel de la Roja. *Synthetic Polymers and Cultural Heritage. Analytical approach by Raman spectroscopy*
- P29:** L. de Ferri, A. Lorenzi, P.P. Lottici, A. Montenero. *Raman monitoring of the sol-gel process on OTES/TEOS hybrid sols for the protection of historical glasses*
- P30:** A. R. De Torres, S. Ruiz-Moreno, A. López-Gil, P. Ferrer, M. C. Chillón. *Possible differentiation with Raman spectroscopy between synthetic and natural ultramarine blues. Comparative analysis with the blue pigment of a painting of R. Casas (1866-1932)*
- P31:** Laura Bergamonti, Claudia Graiff, Clelia Isca, Giovanni Predieri, Danilo Bersani, Pier Paolo Lottici. *Raman monitoring of the polymerization reaction of a hybrid protective for wood and paper*
- P32:** Iwona Żmuda-Trzebiatowska, Mirosław Wachowiak, Mirosław Sawczak, Gerard Śliwiński. *Reference Raman data of the artist palette – tool for in-situ investigation of J. Matejko (1838-1893) paintings*
- P33:** Cristina Barrocas Dias, Ana Claro, Sara Valadas, Lília Esteves, Maria José Mexia, Jorge Oliveira, Teresa Ferreira, António Candeias. *Material analysis of the Manueline Foral Charters of Lousã and Marvão*
- P34:** Ana Domínguez-Vidal, María José de la Torre López, Domene Ramón Rubio, María José Campos Suñol, Ulrich Schade, María José Ayora-Cañada. *Materials and gilding techniques on plasterwork in the Alhambra (Granada, Spain)*
- P35:** Vanessa Antunes, António Candeias, Stéphane Longelin, Ana Isabel Seruya, Maria Luísa Carvalho,³ Maria José Oliveira, João Coroado, Luís Dias, Vitor Serrão. *Characterization of gypsum and anhydrite ground layers on 15th and 16th centuries Portuguese painting by Raman Spectroscopy, Micro X-ray diffraction and SEM-EDS*
- P36:** Katja Kavkler, Ajda Mladenovič, Ana Mladenovič. *Identification of deteriorated pigments on wall paintings from Lutrovska klet, Sevnica, Slovenia, using Raman spectroscopy and SEM-EDS*
- P37:** Marco Veneranda, Mireia Irazola, Marta Díez, Ane Iturregui, Julene Aramendia, Kepa Castro, Juan Manuel Madariaga. *Characterization of middle age mural paintings: in situ Raman spectroscopy associated with different techniques*
- P38:** Maja Gutman, Sabina Kramar, Ajda Mladenović, Vlasta Čobal Sedmak, Martina Lesar Kikelj. *Raman microspectroscopic identification of pigments of newly discovered gothic wall paintings from the Dominican Monastery in Ptuj (Slovenia)*
- P39:** J. J. González-Vidal, R. Pérez-Pueyo, M. J. Soneira, S. Ruiz-Moreno. *Shot Noise Reduction through Principal Components Analysis*
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15:55 Coffee & Tea

16:25 ORAL SESSION 4
Raman for characterisation of metal artefacts

Chairman: Francesca Rosi

16:25 **OP21:** Tadeja Kosec, Polonca Ropret. *Raman investigation of artificial patinas on recent bronze, protected by differentazole type inhibitors in outdoor environment*

16:45 **OP22:** Giorgia Ghiara, Serena Campodonico, Paolo Piccardo, Carla Martini, Patrick Storme, Valeria Bongiorno. *MicroRaman Investigation on corrosion of Pb-Based Alloy Replicas*

17:05 **OP23:** Julene Aramendia, Leticia Gomez-Nubla, Ludovic Bellot-Gurlet, Kepa Castro, Céline Paris, Philippe Colombar, Juan Manuel Madariaga. *Conservation diagnosis of weathering steel sculptures using a new Raman quantification imaging approach*

17:25 **OP24:** Marco Veneranda, Julene Aramendia, Silvia Fdez-Ortiz de Vallejuelo, Laura García, Mikel Neira, Kepa Castro, Iñaki García, Agustín Azkarate, Juan Manuel Madariaga. *Raman study of the salts attack in archaeological metallic objects of the Middle Age: The case of Ereñozar castle (Bizkaia, Spain)*

17:45 End of second day

18:00 Opening of the art photography exhibition at the Ljubljana Castle
Nino Vranič – memories of heritage, Ars Sloveniae 1967-1970
dr. sc. Andrea Zlatar Viočić, Croatian Minister of Culture

dr. Uroš Grilc, Slovenian Minister of Culture

dr. Jelka Pirkovič, Director General of the Institute for the Protection of Cultural Heritage of Slovenia

Jernej Hudolin, Head of Restoration Centre, Institute for the Protection of Cultural Heritage

20:00 Cocktail party, City Museum Ljubljana
Blaž Peršin, Director of Museum and Galleries of Ljubljana

Guided tour through the exhibition *THE WHEEL – 5,200 Years*

Wednesday, September 04

Conference Excursion

Trailing conservation-restoration projects of the IPCHS, Restoration Centre in Lower Carniola region

Thursday, September 05

9:10 ORAL SESSION 5 Raman spectroscopy in archaeometry

Chairman: *Howell G. M. Edwards*

09:10 **Plenary lecture 3 (PL3):** Juan Manuel Madariaga. *The Contribution of Archaeometry to Understanding of the Past Effects and Future Changes in the World Heritage Site of Pompeii (Italy)*

10:00 **OP25:** Paulo T. C. Freire, Francisco E. Sousa-Filho, João H. Silva, Bruno T.O. Abagaro, Bartolomeu C. Viana, Gilberto D. Saraiva, Olga A. Barros, Antonio A.F. Saraiva. *Raman spectroscopy applied to the study of Cretaceous fossils from Araripe Basin, Northeast of Brazil*

10:20 **OP26:** Linda C. Prinsloo, Lyn Wadley, Marlize Lombard. *Raman spectroscopic analyses of ~75 000 year old stone tools from Middle Stone Age deposits in Sibudu Cave, KZN, South Africa*

10:40 **OP27:** Peter Vandenabeele, Luc Moens. *Raman spectroscopy in archaeometry: multi-method approaches and in situ investigations: advantages and drawbacks*

11:00 Coffee & Tea

11:30 ORAL SESSION 5 Raman spectroscopy in archaeometry

Chairman: *Lucia Burgio*

11:30 **OP28:** Jolien Van Pevenage, Debbie Lauwers, Davy Herremans, Eddy Verhaeven, Bart Vekemans, Wim De Clercq, Laszlo Vincze, Luc Moens, Peter Vandenabeele. *Spectroscopic Analysis of Chinese Porcelain Excavated in Clairefontaine (Belgium): Pigment Identification and Dating*

11:50 **OP29:** Laura Medeghini, Pier Paolo Lottici, Caterina De Vito, Silvano Mignardi, Danilo Bersani, Mariangela Turetta, Jennifer Costantini, Elena Bacchini, Maura Sala, Lorenzo Nigro. *Characterization of ancient ceramic using micro-Raman spectroscopy: the cases of Motya (Italy) and Khirbetal-Batrawy (Jordan)*

12:10 **OP30:** Maria Cristina Caggiani, Pasquale Acquafredda, Philippe Colomban, Annarosa Mangone. *The blue colour of glass and glazes in Swabian contexts (South of Italy): an open question*

12:30 **OP31:** Antonio Hernanz, Juan F. Ruiz-López, Juan Manuel Madariaga, Egor Gavrilenko, Maite Maguregui, Silvia Fdez-Ortiz de Vallejuelo, Irantzu Martínez,

Ramiro Alloza-Izquierdo, Vicente Baldellou-Martínez, Ramón Viñas-Vallverdú, Albert Rubio i Mora, África Pitarch, Anastasia Giakoumaki. *Spectroscopic characterisation of crusts interstratified with prehistoric paintings preserved in open-air rock art shelters*

12:50 Lunch

14:30 – 15:45 POSTER SESSION 3

(Including 5 highest rating poster contributions as 5 min oral presentations)

Chairman: Pietro Baraldi

14:30 **P40:** Claudia Invernizzi, Elena Basso, Marco Malagodi, Marco Francesco La Russa, Danilo Bersani, Pier Paolo Lottici. *Micro-Raman on Roman glass mosaic tesserae*

14:35 **P41:** Doris Möncke, Eleni Palamara, Dimitri Palles, Efstratios I. Kamitsos, Nikos Zacharias, Lothar Wondraczek: *Raman and IR Spectroscopic Study of Vitreous Artefacts from the Mycenaean to Roman Period: Glassy Matrix & Crystalline Pigments*

14:40 **P42:** Irene Aliatis, Claudia Conti, Geneviève Massonnet, Cyril Muehlethaler, Tommaso Poli, Matteo Positano, Elena Possenti, Jana Striova. *The detection of Copper Resinate pigment in works of art: contribution from Raman spectroscopy*

14:45 **P43:** Claudia Pelosi, Giorgia Agresti, Maria Andaloro, Pietro Baraldi, Paola Pogliani, Ulderico Santamaria. *Micro-Raman and internal micro-stratigraphic analysis of the paintings materials in the rock-hewn church of the Forty Martyrs in Şahinefendi, Cappadocia (Turkey)*

14:50 **P44:** Erica Lambruschi, Danilo Bersani, Pier Paolo Lottici, Giacomo Diego Gatta, Ilaria Adamo. *Vibrational characterization of the new gemstone Pezzottaite*

POSTER SESSION 3

P45: Mohamed Abd El Hady, Hussein Marey Mahmoud. *Preliminary investigations by Raman microscopy, FTIR-ATR and ESEM of wall paintings from the tomb of Amenemnet (TT277), Qurnet Murai necropolis, Luxor, Egypt*

P46: Mohamed Abd El Hady, A. Abdel-Motelib, Rabea Radi, Shaimaa Sayed. *Physico-chemical characteristics of Predynastic pottery objects from Maadi – Egypt*

P47: Serena Campodonico, Giorgia Ghiara, Paolo Piccardo, Maria Maddalena Carnasciali. *Raman Database of Corrosion Products as a powerful tool in art and archaeology*

- P48:** Serena Campodonico, Giorgia Ghiara, Maria Maddalena Carnasciali, Camilla De Palma. *Micro-Raman as a powerful non-destructive technique to characterize ethonological objects from D'Albertis Castle Museum of World Cultures in Genova*
- P49:** Céline Paris, Anita Quiles, Ludovic Bellot-Gurlet, Emmanuelle Delqué-Količ, Cathy Vieillescazes, Matthieu Ménager, Clothilde Comby-Zerbino, Karine Madrigal. *Micro ATR-IR study of pollutions affecting radiocarbon dating of ancient Egyptian mummies*
- P50:** Arie Shaus, Barak Sober, Omer Tzang, Zvi Loffe, Ori Cheshnovsky, Israel Finkelstein, Eliezer Piasetzky. *Raman Scanning of Biblical Period Ostraca*
- P51:** Cristina Aibéo, Stefan Simon, Diana Georgova, Veska Kameranova, Ivelina Pavlova, Angel Pavlov. *Analyses of pigments from 4th century B.C. the Shushmanets tombs in Bulgaria*
- P52:** Oscar R. Montoro, Mercedes Taravillo, Margarita San Andrés, José Manuel de la Roja, Alejandro F. Barrero, Pilar Arteaga, Valentín G. Baonza. *Raman Spectroscopic Study of the Formation of Fossil Resins Analogs*
- P53:** Dalva Lúcia Araújo de Faria, Gianella Pacheco, Denise Pozzi-Escot, Marta S. Maier, Valeria Careaga. *Pigments from Templo Pintado (Pachacamac, Perú) investigated by Raman Microscopy*
- P54:** Sonia Murcia-Mascaros, Clodoaldo Roldan, Valentin Villaverde, Aleix Eixea, Jorgelina Carballo. *Lithic tools raw materials recognition by Raman spectroscopy of Palaeolithic artifacts*
- P55:** Dorotea Fontana, Anna Maria Gueli, Giuseppe Stella, Sebastiano Olindo Troja, Maria Brai, Jorge Dinis, Luis Almeida, Lilia Basílio, Miguel Almeida. *Raman characterization on historical mortar. Crossing data with XRD and Color Measurements*
- P56:** Elisa Adorni, Danilo Bersani, Pier Paolo Lottici, Talisa Cerasoli, Lorenzo Sambo, Irene Aliatis, Manuela Catarsi. *Roman ceramics from Vicofertile (Parma, Italy): micro-Raman study of the heat diffusion during the production process*
- P57:** Krit Won-in, Yatima Thongkam, Pisutti Dararutana. *Raman spectroscopic study on ancient glass beads found in Thailand archaeological sites*
- P58:** Alessia Coccato, Stefanos Karampelas, Marie Wörle, Samuel van Willingen, Pierre Pétrequin. *Identification of Neolithic jade found in Switzerland studied using Raman spectroscopy: Jadeite - vs. Omphacite – jade*
- P59:** Germana Barone, Danilo Bersani, Vincenza Crupi, Francesca Longo, Ugo Longobardo, Domenico Majolino, Paolo Mazzoleni, Simona Raneri, Valentina Venuti. *Raman Spectroscopy as useful tools for the gemmological certification and provenance determination of sapphires*
- P60:** Maurizio Aceto, Alessandro Crivelli, Pietro Baraldi, Maurizio Bruni, Angelo Agostino, Gaia Fenoglio, *Authentication of ivory by means of 1064 nm Raman spectroscopy and X-ray fluorescence spectrometry*
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15:45 Coffee & Tea

16:15 ORAL SESSION 6

Characterisation of gems and forensic applications

Chairman: Costanza Miliani

16:15 **OP32:** Danilo Bersani, Pier Paolo Lottici, Emma Salvioli-Mariani, Erica Lambruschi, Alessandro Francioli, Giulia Azzi, Germana Barone, Paolo Mazzoleni, Ugo Longobardo. *Characterization of emeralds by micro-Raman spectroscopy*

16:35 **OP33:** Miha Jeršek, Sabina Kramar. *Raman micro spectroscopy of inclusions in gemstones from a chalice made in 1732*

16:55 **OP34:** Maria Francesca Aru, Lucia Burgio, Mike Rumsey. *Spectroscopic investigation: impurities in azurite as provenance markers*

17:15 **OP35:** Barbara Łydzba-Kopczyńska, Marcin Ciba, Grzegorz Rusek. *Implementation of scientific methods of fine art authentication into forensics procedures: the case study of "Bolko II Świdnicki" by J.J Knechtel*

17:35 **OP36:** Danny Lambert, Cyril Muehlethaler, Line Gueissaz, Geneviève Massonnet. *Raman analysis of multilayer automotive paints in forensic science: measurement variability and depth profile*

17:55 End of fourth day

20:00 Conference dinner
Grand Hotel Union, Ljubljana

Friday, September 06

9:10 ORAL SESSION 7 Non-invasive Raman investigation

Chairman: Juan Manuel Madariaga

09:10 **Plenary Lecture 4:** Costanza Miliani. *The Art of non-invasive in situ Raman spectroscopy: identification of chromate pigments on Van Gogh paintings*

10:00 **OP37:** Debbie Lauwers, Anna Garcia Hurtado, Vinka Tanevska, Luc Moens, Danillo Bersani, Peter Vandenabeele. *Characterisation of a new mobile Raman spectrometer for in-situ analysis*

10:20 **OP38:** Martin A. Ziemann. *On-site high-resolution Raman spectroscopy on minerals and pigments*

10:40 **OP39:** Odile Madden, Kim Cullen Cobb, Alex Spencer. *Molecular characterization and technical study of historic aircraft windows and head gear using portable Raman spectroscopy*

11:00 Coffee & Tea

11:30 ROUND TABLE – Raman spectral database

11:30 **Plenary Lecture 5 (PL5):** Beth A. Price, Boris Pretzel, Suzanne Quillen Lomax, Marcello Picollo, Charles Davis, Andrew Lins, Haddon Dine, Gabriel Richards. *The Infrared and Raman Users Group Web-based Raman Spectral Database*

Scientific Committee and all participants

12:30 **Concluding remarks.** Polonca Ropret
