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EDUCATION

- ETH Zürich – Zurich, Switzerland** *Jun. 2011 – Jul. 2016*
Postdoctoral Research Fellow – Institute for Building Materials
- University of Palermo – Palermo, Italy** *Feb. 2015 – Jul. 2015*
High school teaching degree in Chemistry and Chemical Technologies, awarded with graduating marks 97 out of 100.
- University of Palermo – Palermo, Italy** *Jan. 2008 – Mar. 2011*
Ph.D. in Chemical Sciences – Advisors: Prof. Eugenio Caponetti and Prof. Dr. Delia Francesca Chillura Martino
Dissertation: *Characterization of the varnishes from historical musical instruments*
- University of Palermo – Palermo, Italy** *Sep. 2000 – Dec. 2005*
M.Sc. in Chemistry (5-years program, pre-Bologna process) – Advisors: Prof. Dr. Santino Orecchio, Mr. Cosimo Di Stefano and Dr. Maria Grazia Cicero
Awarded with graduating marks 110 out of 110 *summa cum laude* (highest achievable rank in Italy).
Thesis: *Characterization of the varnish and the glue of the Panormus double bass by Vincenzo Trusiano*

WORK EXPERIENCE

- Head of the Analytical Laboratory, Swiss Institute for Art Research (SIK-ISEA) – Zurich, Switzerland** *Since Aug. 2019*
Conservation and materials science of cultural heritage.
- Participation to the research project on Hans Emmenegger's "Maltechnik-Notizbuch" (1901-1905) (lead by Ms. Karoline Beltinger, and in collaboration with Mr. Philipp Hitz, Mr. Stefan Schreier, Ms. Carolina Zanchet Guerra from the Department of Art Technology of the Swiss Institute for Art Research and with Prof. Dr. Nadim C. Scherrer from the Bern University of Applied Sciences).
 - Participation to the SNSF-financed (n. 100016_178961/1) research project on "Le livre de voyage et de recettes d'Ulrich Daniel Metzger" (lead by Ms. Uta Bergmann and Dr. Sophie Wolf from the Vitrocentre Romont).
- Associate Professor, University of Oslo – Oslo, Norway** *Sep. 2016 – Jul. 2019*
Conservation and materials science of cultural heritage:
- Study and development of ICP-OES methods for the analysis of original paint materials (in collaboration with Prof. Dr. Tine Frøysaker and Dr. Noëlle L.W. Streeton from the Department of Archaeology, Conservation and History, and Dr. Sara Mantellato from the group of Physical Chemistry of Building Materials at ETH Zurich);
 - Development of new and green GC-MS methods for the analysis of binders in historical objects (in collaboration with Dr. Noëlle L.W. Streeton, Dr. Elena Platania, and Ms. Bettina Ebert from the Department of Archaeology, Conservation and History, and Dr. Calin Costantin Steindal from the Cultural History Museum of the University of Oslo);
 - Synthesis, characterization and application of a novel and green multi-functional nanocomposite for stone conservation (in collaboration with Dr. Antonino Cataldo

from the Italian National Institute for Nuclear Physics and Dr. Thibault Demoulin from the group of Physical Chemistry of Building Materials at ETH Zurich);

- Collaboration with Dr. Calin Costantin Steindal from the Cultural History Museum of the University of Oslo for the development of a novel consolidation treatment for waterlogged archaeological wood;
- Collaboration with Dr. Søren Handberg from the Department of Archaeology, Conservation and History and Dr. Maite Maguregui Hernando from the University of the Basque Country for the development of non-destructive chemical characterization methods for classical archaeological ceramics;
- Collaboration with the RILEM (International union of laboratories and experts in construction materials, systems and structures) technical committee on salt crystallization;
- Other research projects.

Other tasks: responsible of the health and safety issues of the Conservation section of the Department of Archaeology, Conservation and History.

Postdoctoral Research Fellow, ETH Zürich – Zurich, Switzerland

Mentor: Prof. Dr. Robert J. Flatt (D-BAUG)

Jun. 2011 – Jul. 2016

Topic 1: Basic and applied research on salt crystallization

- Co-developed and validated a chemo-mechanical model for predicting damage by salt crystallization in stones;
- Established a modern method to critically assert the validity of the milestone experiment by Correns and Steinborn on the crystallization pressure of loaded potassium alum monocrystals in their supersaturated solutions and carried out the thermodynamics modeling by PHREEQC software;
- Explored the possibility of polymer surface modification for mitigating salt weathering.

Topic 2: Consolidation of swelling clay-bearing sandstones

- Studied by design of experiments the role of temperature, relative humidity, application mode, dilution, and presence of a swelling inhibitor on the efficacy and curing time of ethyl silicate consolidants, obtaining key findings relevant to field practitioners;
- Investigated the roles of swelling inhibitor and load in stones subjected to wetting and drying cycles.

Topic 3: Characterization of cement pore solutions

- Developed an ICP-OES method for the quantification of elements in cement pore solutions (a complex matrix containing elements at very high concentration and other ones at very low concentration);
- Validated such a method by the evaluation of the figures of merit (precision, trueness, limits of detection/quantification).

Other tasks: set up of a new laboratory on stone conservation; evaluation, negotiation, and installation of analytical instrumentation; writing of various proposals relating to the preservation of cultural heritage; organization of a working and reading group on statistics and chemo-metrics for chemistry; supervision of the health and safety issues of the laboratories; member of the Chemistry Intervention Team of ETH Zürich; organization and maintenance of a chemicals database; supervision of scientific technicians; organization and realization of “Magic of Chemistry” shows for Civil Engineering B.Sc. students.

Graduate Fellow, University of Palermo – Palermo, Italy

Feb. 2011 – Apr. 2011

Coordinator: Prof. Dr. Michele Antonio Floriano

Topic: Research activity on the “Preparation and characterization of nanostructured polymeric composites” in the framework of the PRIN 2008 project.

Ph.D. Candidate, University of Palermo – Palermo, Italy

Jan. 2008 – Mar. 2011

Intern, Royal Institute for Cultural Heritage – Brussels, Belgium

Tutors: Dr. Steven Saverwyns, Dr. Marina Van Bos Jan. 2010 – Apr. 2010

Intern, Victoria and Albert Museum – London, United Kingdom

Tutor: Dr. Lucia Burgio Oct. 2009 – Nov. 2009

Advisors: Prof. Eugenio Caponetti, Prof. Dr. Delia Francesca Chillura Martino

Topic 1: Characterization of varnishes from historical musical instruments

- Established *ex novo* contacts with the “Vincenzo Bellini” Conservatory in Palermo and the “Musical Instruments Museum” in Brussels to study the varnishes of some of their stringed musical instruments;
- Carried out a micro-sampling campaign on the instruments of the “Vincenzo Bellini” Conservatory in Palermo;
- Developed a novel non-destructive (micro-XRF) and micro-destructive (GC-MS, Py-GC-MS, PLM, SEM-EDX, FTIR) approach for the study of the varnish of the instruments;
- Performed an extensive micro-XRF measurement campaign on some of the most important items of the “Musical Instruments Museum” in Brussels;
- Provided chemical and technological information useful for the conservation and restoration of the above-mentioned instruments.

Topic 2: Study of the Acqualadrona Roman ram

- Sampled both the metallic and the wooden parts;
- Carried out an extensive physico-chemical characterization (ICP-OES, ICP-MS, FTIR, ¹³C {¹H} CP MAS NMR, EDX, GC-MS, XRD) to identify the type of used bronze and the state of preservation of the wooden parts;
- Established *ex novo* contacts with Stanford University for a unique XANES and (Py-)GC-MS study of the wooden samples;
- Studied the sulfur microenvironment and the volatiles to characterize the origin and the treatment of the used wood, and to partly reconstruct the materials history over a period of 2 300 years.

Temporary Researcher, Center for Large Instrumentation – University of Palermo – Palermo, Italy Oct. 2007 – Dec. 2007

Coordinator: Prof. Eugenio Caponetti

Topic: Technical and scientific assistance for the characterization of cultural heritage artifacts by NMR, SAXS, and HRTEM.

Temporary Researcher, Institute for the Study of Nanostructured Materials – Italian National Research Council – Palermo, Italy Jan. 2006 – Jul. 2007

Mentor: Dr. Maria Pia Casaletto

Topic: Application of advanced analytical techniques (XPS, AFM, ESEM-EDX, EIS, XRD) for the conservation of archaeological metallic and ceramic artifacts and the recovering of ancient manufacturing techniques for the evaluation of the efficacy of new chemicals as inhibiting agents in the conservation and preservation of metallic objects.

Intern, R&D division of Procter & Gamble Italia S.p.A. – Pescara, Italy

Supervisor: Dr. Wolfgang Huhn

Jul. 2005 – Sep. 2005

Topic: Development of a research project on an adhesive for light soil removal.

SKILLS

- Developments of new methods, use, and maintenance for a range of analytical techniques with a particular focus on conservation science related questions;
- Study (including microsampling) of historical artifacts and their degradation mechanisms;
- Set up of new laboratories for conservation science;
- Grant writing in the field of conservation science;
- Supervision of health and safety issues, with particular attention to the chemistry ones;
- Supervision of students and technical personnel;
- Interest in applying statistics and chemo-metrics methods and software to scientific problems;
- Teaching various topics in conservation science (with a special focus on the chemistry aspects);
- Interest in new educational methods and tools;
- Organization and realization of science communication events.

AWARDS AND DISTINCTIONS

- 2015 Materials and Structures: Outstanding Paper** 2015
Awarded for the article by Y. Seguí Femenias, U. Angst, F. Caruso, B. Elsener, *Ag/AgCl ion-selective electrodes in neutral and alkaline environments containing interfering ions*
- Erasmus LLP Placement scholarship** 2009
Awarded for an internship at the Royal Institute for Cultural Heritage in Brussels (Belgium) from January to April 2010
- Best E-Chem Test in General Chemistry** 2009
Awarded at the 3rd Residential Summer School on Conservation Science held at the Aristotle University of Thessaloniki (Greece)
- Best Poster Award** 2009
Awarded at *Technart 2009. Non-destructive and Microanalytical Techniques in Art and Cultural Heritage*. Athens (Greece). For the poster by E. Caponetti, F. Caruso, D.F. Chillura Martino, C. Di Stefano, M.L. Saladino, *XRF characterisation of the varnishes of ancient stringed instruments*

EDUCATIONAL EXPERIENCE

- Associate Professor, University of Oslo** Sep. 2016 – Jul. 2019
- Course of Applied Materials Science (KONS4050, 10 ECTS) for M.A.s in Paintings and Objects Conservation, and Project-based M.A. in Conservation
 - Course of Conservation of Inorganic Materials I (KONS4038, 10 ECTS) for M.A. in Objects Conservation
 - Course of Conservation of Inorganic Materials II (KONS4039, 10 ECTS) for M.A. in Objects Conservation
 - Course of Objects Technology (KONS3060-4060, 10 ECTS) for B.A. in Cultural Heritage Preservation (KUBE) and M.A. in Archaeology
 - Course of Science for Conservators and Archaeologists I (KONS1001, 10 ECTS) for B.A. in Cultural Heritage Preservation (KUBE)
 - Course of Science for Conservators and Archaeologists II (KONS1005, 10 ECTS) for B.A. in Cultural Heritage Preservation (KUBE)
- Advisor of Ph.D. students, University of Oslo** Jan. 2017 – Jul. 2019
- Main advisor of Ms. Ariadni Kostomitsopoulou Marketou for a project in collaboration with the archaeology section of the Department of Archaeology, Conservation and History of the University of Oslo and the Hellenic Ministry of Culture and Sports (co-advisors: Dr. Søren Handberg and Dr. Kelly Kouzeli) on *An Important Colours' Workshop in the Ancient Aegean World* (Jan. 2017 – Jul. 2019)
 - Main advisor of Ms. Lena Porsmo Stoveland for a project in collaboration with Tate and the University of Amsterdam (co-advisors: Dr. Bronwyn Ormsby and Dr. Maartje Stols-Witlox) on the *Evaluation of novel dry-cleaning conservation methods for the cleaning of Edvard Munch's paintings in the University's Aula* (Sep. 2017– Jul. 2019)
 - Main advisor of Mr. Thierry Ford for a project in collaboration with the National Museum of Art of Norway, the University of Amsterdam, and the Metropolitan Museum of Art of New York (co-advisors: Prof. Dr. Ella Hendriks and Dr. Adriana Rizzo) on *Edvard Munch and varnish coatings. Non-invasive investigations into the conservation and preservation challenges facing the collection of Munch at the National Museum of Art, Norway* (Jan. 2018 – Jul. 2019)
 - Main advisor of Mr. David Hauer for a project in collaboration with the Cultural History Museum of the University of Oslo, Uppsala University and the Norwegian University of Life Sciences (co-advisors: Prof. Dr. Kristofer Gamstedt and Prof. Dr. Geir Vestøl) on *Effects of fluctuating climate on complex archaeological wooden objects. A study of the hygro-mechanical behaviour and its relation to degradation characteristics of the Oseberg and Gokstad ships* (Feb. 2018 – Jul. 2019)

Supervisor of students, University of Oslo

Aug. 2017 – Jul. 2019

Theses of Objects Conservation M.A. students

- *Evaluation of the cleaning performances of commercial products on historical varnished furniture* (Ms. Ingrid Fitje Apneseth) (Aug. 2017-Dec. 2018), final grade: B (on a scale from A to F)
- *Conservation issues and chemical study of the causes of degradation of a part of the Stave Church in Hopperstad (Norway)* (Ms. Marit Lehne) (Aug. 2017-Jan. 2019), final grade: A (on a scale from A to F)
- *Physico-chemical effects of a novel, green product for the consolidation of archaeological waterlogged wood* (Ms. Alice Sørstrand)

Teaching Assistant, ETH Zürich

2011 – 2016

Materials III for Civil Engineering B.Sc.

- Creation and teaching of a 4-hours/week-laboratory session on stone and its durability as building material.

Chemistry for Civil Engineering B.Sc.

- Design, development and presentation of live chemistry demonstrations to raise students' interest and engagement during classes.

Supervisor of students, ETH Zürich

2012 – 2016

Visiting Ph.D. student

- Trimester project on *Synthesis and characterization of polymers from natural sources for the protection and the consolidation of works of art* (Ms. Giulia Giuntoli, University of Florence, Italy)

Visiting graduate students

- Semester project on *Characterization of comb copolymers by 2D-chromatography* (Ms. Giulia Gelardi, University of Palermo, Italy)
- Year project on *Development of a new wetting/drying accelerated test for consolidated swelling clay-bearing stones* (Ms. Ylenia Praticò, Sapienza – University of Rome, Italy)

Civil Engineering M.Sc. students

- Semester project on *How to strengthen porous building stones?* (Ms. Silvana Uttinger)
- Semester project on *Effect of loading on a clay-bearing sandstone of cultural significance in Switzerland* (Mr. Jakob Melchior)

Mentor of Ph.D. students, ETH Zürich

2011 – 2016

- Two students working on issues related to stone conservation (Mr. Thibault Demoulin, Ms. Ylenia Praticò);
- Another student working on polymer synthesis and characterization by 2D-HPLC-SEC (Ms. Giulia Gelardi).

Responsible for the “Magic of Chemistry” project, University of Palermo and ETH Zürich

2004 – 2016

- Organization and realization of educational shows/demonstrations. More than 10 000 people attended the shows/demonstrations during the years;
- Development of new chemical demonstrations with reduced environmental impact and higher safety;
- Participation to national and international educational events;
- Video produced by ETH Media Service:
<http://www.video.ethz.ch/events/2016/magic.html>.

GRANTS RECEIVED

May 2018

Co-proposer (together with colleagues from 18 other EU institutions, leading institution is the Norwegian University of Science and Technology, NTNU) of the MSCA-ITN-2018 (Marie Skłodowska-Curie Innovative Training Network) EU project “Cultural Heritage Analysis for

New GEnérations (CHANGE)” (proposal number: 813789, ca. 4 070 000 € for the whole project, ca. 290 000 € for the University of Oslo).

Mar. 2018

Grant for the purchase of research equipment (optical microscopes) at the Faculty of Humanities of the University of Oslo (ca. 640 000 NOK ≈ 67 000 €).

Dec. 2017

Co-proposer (together with Ms. Douwtje L. van der Meulen from the Department of Archaeology, Conservation and History of the University of Oslo) of the educational project “Flipping conservation with iInnovative and sustainable ICT Tools (FliINT)”, financed by Norgesuniversitetet (<https://norgesuniversitetet.no/artikkel/22-prosjekter-far-stotte-for-2018>) for the years 2018-2019 (requested: ca. 1 470 000 NOK ≈ 148 000 €, granted: ca. 1 000 000 NOK ≈ 104 000 €).

Dec. 2017

Co-proposer (together with other 14 colleagues from the Department of Culture Studies and Oriental Languages, the Department of Archaeology, Conservation and History and the Norwegian Institute in Rome) of the “Heritage Experience Initiative (HEI)”, one of the five funded strategic research and training programs for the years 2019-2023 at the Faculty of Humanities of the University of Oslo (ca. 19 900 000 NOK ≈ 2 020 000 €).

Feb. 2017

Grant for the purchase of research equipment (handheld FTIR) at the Faculty of Humanities of the University of Oslo (ca. 700 000 NOK ≈ 71 000 €)

PROFESSIONAL QUALIFICATIONS

2021

Evaluator of a **Collaborative Research Project (PRC)** for the French **Agence Nationale de la Recherche**.

2021

Substitute for the committee for the **Ph.D. exam** of Ms. María González Cabrera (Universidad de Jaén, Spain)

Since 2020

Member of the **Editorial Board** of the **Egyptian Journal of Archaeological and Restoration Studies “EJARS”**, published by Sohag University Publication Center “SUPC”, Sohag University

2019

Member of the committee for the **Ph.D. exam** of Mr. Iker Marcaida Ormazabal (Universidad del País Vasco, UPV/EHU, Spain).

2019

Substitute for the committee for the **Ph.D. exam** of Ms. Morena Iorio (Universidad Carlos III de Madrid, Spain).

2017

Head of the committee for the **Ph.D. exam** of Ms. Kristin Kausland (University of Oslo, Norway).

Since 2017

Member of the **International Council of Museums** (member no. 66600).

Jan. 2017

Reviewer of the **Ph.D. dissertation** of Ms. Federica Cocco (University of Cagliari, Italy), *Sustainability in cultural heritage: from diagnosis to the development of innovative systems for monitoring and understanding corrosion inside ancient brass wind instruments*

2015

Evaluator for the Croatian **Marie Curie FP7-PEOPLE-2011-COFUND program – NEWFELPRO**.

Since 2014

Member of the **Swiss Chemical Society** (member no. 105109).

2010 – 2013

Italian delegate for the **European Young Chemists Network** (EYCN).

2010 – 2013

Member of the **Steering Committee (Division of Chemical Education)** of the **Younger Group of the Italian Chemical Society**.

May 2012

Qualification (“idoneità”) to serve as a **permanent researcher** at the **Italian National Research Council** after the public selection for the Scientific Area C.1, Chemical Sciences.

Since 2010

Referee of the following journals: Analytical Chemistry, Journal of Cultural Heritage, Studies in Conservation, Heritage Science, Analytical and Bioanalytical Chemistry, Journal of Chromatography A, Journal of Cleaner Production, Environmental Science and Pollution Research, International Biodeterioration and Biodegradation, Science of the Total Environment, Measurement, Review of Scientific Instruments, Heritage, Cement and Concrete Research, Geosciences, Coatings, ChemPlusChem, Journal of Chemical Education, Meddelelser om Konservering (MoK), Education Sciences, Modern Applied Science, Applied Physics Research.

2009-2019

Member of the **Italian Chemical Society** (member no. 16621).

Dec. 2006

Chemist professional qualification exam with marks 77 out of 100, obtained at the University of Palermo.

LANGUAGES

Italian: Native;

English: Advanced knowledge of written and spoken English. TESPIS (Testing English for Specific Purposes in Science) Certificate in Conservation Science with marks 83% after written and oral examinations;

German: Intermediate knowledge;

Spanish: Intermediate knowledge;

French: Elementary knowledge. A2 certificate by the Sprachenzentrum of the University of Zurich (UZH) and the Swiss Federal Institute of Technology (ETHZ) with marks 5 out of 6 after written and oral examinations;

Norwegian: Beginner knowledge.

IT SKILLS

Very good knowledge of the following software bundles: Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Publisher, OpenOffice.Org, Grace, Microcal Origin, qtiplot, Kaleidagraph, ChemSketch, ChemDraw and ISISDraw. Good command of Prezi presentation application. Fair knowledge of macOS and LaTeX. Medium knowledge of Ubuntu and Linux/UNIX. Basic knowledge of R statistical program, PHREEQC chemical speciation program, and Matlab.

PUBLICATIONS ON PEER-REVIEWED NATIONAL AND INTERNATIONAL JOURNALS

28. A. Kostomitsopoulou Marketou, F. Giannici, S. Handberg, W. de Nolf, M. Cotte, **F. Caruso**, "Synchrotron radiation-based micro XANES and micro XRF study of unsuccessfully produced Egyptian Blue from the late Hellenistic production site of Kos (Dodecanese, Greece)", *Analytical Chemistry* 93 (2021) 11557-11567. doi: 10.1021/acs.analchem.1c02063.
27. S. Pérez-Diez, L.J. Fernández-Menéndez, H. Morillas, A. Martellone, B. De Nigris, M. Osanna, N. Bordel, **F. Caruso**, J.M. Madariaga, M. Maguregui, "Elucidation of the Chemical Role of the Pyroclastic Materials on the State of Conservation of Mural Paintings from Pompeii", *Angewandte Chemie* 133(6) (2021) 3065-3073. doi: 10.1002/anie.202010497.
26. A. Spinella, D.F. Chillura Martino, M.L. Saladino, F. Sammartino, **F. Caruso**, E. Caponetti, "Solid state NMR investigation of the roman Acqualadroni rostrum: tenth year assessment of the consolidation treatment of the wooden part", *Cellulose* 28 (2021) 1025-1038. doi: 10.1007/s10570-020-03563-2.
25. P.D. Fredriksen, C.L. Rødsrud, **F. Caruso**, "What happened at Augland? A social chronology for the demise of a Roman Iron Age ceramic workshop in South Norway", *Oxford Journal of Archaeology* 39(4) (2020) 442-464. doi: 10.1111/ojoa.12204.
24. C.M.A. McQueen, M.N. Mortensen, **F. Caruso**, S. Mantellato, S. Braovac, "Oxidative degradation of archaeological wood and the effect of alum, iron and calcium salts", *Heritage Science* 8 (2020) 32. doi: 10.1186/s40494-020-00377-0.
23. E. Platania, N.L.W. Streeton, A. Lluveras-Tenorio, A. Vila, D. Buti, **F. Caruso**, H. Kutzke, A. Karlsson, M.P. Colombini, E. Uggerud, "Identification of green pigments and binders in late medieval painted wings from Norwegian churches", *Microchemical Journal* 156 (2020) 104811. doi: 10.1016/j.microc.2020.104811.
22. E. Platania, N.L.W. Streeton, A. Vila, D. Buti, **F. Caruso**, E. Uggerud, "Investigation of mineralization products of lead soaps in a late medieval panel painting", *Spectrochimica Acta A* 228 (2020) 117844. doi: 10.1016/j.saa.2019.117844.
21. Y. Praticò, **F. Caruso**, J. Delgado Rodrigues, F. Girardet, E. Sassoni, G.W. Scherer, V. Vêrges-Belmin, N.R. Weiss, G. Wheeler, R.J. Flatt, "Stone consolidation: a critical discussion of theoretical insights and field practice", *RILEM Technical Letters* 4 (2019) 145-153. doi: 10.21809/rilemtechlett.2019.101.
20. T. Ford, A. Rizzo, E. Hendriks, T. Frøysaker, **F. Caruso**, "A Non-Invasive Screening Study of Varnishes Applied to Three Paintings by Edvard Munch using Portable Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS)", *Heritage Science* 7 (2019) 84. doi: 10.1186/s40494-019-0327-1.
19. M. Lehne, S. Mantellato, A.M. Aguilar Sanchez, **F. Caruso**, "Conservation issues and chemical study of the causes of alteration of a part of the Stave Church in Hopperstad (Norway)", *Heritage Science* 7 (2019) 80. doi: 10.1186/s40494-019-0322-6.
18. **F. Caruso**, S. Mantellato, N.L.W. Streeton, T. Frøysaker, "Unveiling Harriet Backer: ICP-OES study for the characterisation of the colour tubes from her original paint box", *Heritage Science* 7 (2019) 1-23. doi: 10.1186/s40494-018-0244-8.
17. L. Porsmo Stoveland, T. Frøysaker, **F. Caruso**, "Irma Salo Jægers *Komposisjon Oktober 64*", *Meddelelser om Konservering (MoK)* (2018) 27-42.
16. **F. Caruso**, T. Wangler, R.J. Flatt, "Easy Illustration of Salt Damage in Stone", *Journal of Chemical Education* 95 (2018) 1615-1620. doi: 10.1021/acs.jchemed.7b00815

15. P. Bran-Anleu, **F. Caruso**, T. Wangler, E. Pomjakushina, R.J. Flatt, "Standard and sample preparation for the micro XRF quantification of chlorides in hardened cement pastes", *Microchemical Journal* 141 (2018) 382-387. doi: 10.1016/j.microc.2018.05.040
14. R.J. Flatt, N. Aly Mohamed, **F. Caruso**, H. Derluyn, J. Desarnaud, B. Lubelli, R.M. Espinosa Marzal, L. Pel, C. Rodriguez-Navarro, G.W. Scherer, N. Shahidzadeh, M. Steiger, "Predicting salt damage in practice: A theoretical insight into laboratory tests", *RILEM Technical Letters* 2 (2017) 108-118. doi: 10.21809/rilemtechlett.2017.41
13. **F. Caruso**, S. Mantellato, M. Palacios, R.J. Flatt, "A Powerful Tool to Better Understand Cement Hydration", *CHIMIA* 71(3) (2017) 131. doi: 10.2533/chimia.2017.131
12. **F. Caruso**, S. Mantellato, M. Palacios, R.J. Flatt, "ICP-OES method for the characterization of cement pore solutions and their modifications by polycarboxylate-based superplasticizers", *Cement and Concrete Research* 91C (2017) 52-60. doi: 10.1016/j.cemconres.2016.10.007
11. **F. Caruso**, "Recensione: Statistics and Chemometrics for Analytical Chemistry, 6th edition", *Chimica nella Scuola* 4 (2016) 67-69.
10. Y. Seguí Femenias, U. Angst, **F. Caruso**, B. Elsener, "Ag/AgCl ion-selective electrodes in neutral and alkaline environments containing interfering ions", *Materials and Structures* 49 (2016) 2637-2651. doi: 10.1617/s11527-015-0673-8
9. R.J. Flatt, **F. Caruso**, A.M. Aguilar Sanchez, G.W. Scherer, "Chemomechanics of salt damage in stone", *Nature Communications* 5:4823 (2014). doi: 10.1038/ncomms5823
8. **F. Caruso**, D.F. Chillura Martino, S. Saverwyns, M. Van Bos, L. Burgio, C. Di Stefano, G. Peschke, E. Caponetti "Micro-analytical identification of the components of varnishes from South Italian historical musical instruments by PLM, ESEM-EDX, microFTIR, GC-MS, and Py-GC-MS", *Microchemical Journal* 116 (2014) 31-40. doi: 10.1016/j.microc.2014.04.002
7. **F. Caruso**, G. Gelardi, B. Elsener, R.J. Flatt, "Demonstration of atomic emission from exploding hydrogen balloons for (almost) everybody", *Journal of Chemical Education* 90 (2013) 1406-1408. doi: 10.1021/ed300785q
6. P. Frank, **F. Caruso**, E. Caponetti, "Ancient Wood of the Acqualadrono Rostrum: Materials History through Gas Chromatography/Mass Spectrometry and Sulfur X-ray Absorption Spectroscopy", *Analytical Chemistry* 84 (2012) 4419-4428. doi: 10.1021/ac3001258
5. **F. Caruso**, S. Saverwyns, M. Van Bos, D.F. Chillura Martino, A.-E. Ceulemans, J. de Valck, E. Caponetti, "Micro-X-Ray Fluorescence and the *Old Masters* – Non-destructive *In Situ* Characterisation of the Varnish of Historical Low Countries Stringed Musical Instruments", *Applied Physics A* 107 (2012) 197-202. doi: 10.1007/s00339-011-6729-x
4. **F. Caruso**, E. Caponetti, D. Chillura Martino, M.A. Floriano, "Scienza e Arti Perdute: i Segreti degli Antichi Maestri Liutai", *Chimica nella Scuola* 4 (2011) 225-229.
3. **F. Caruso**, M.L. Saladino, A. Spinella, C. Di Stefano, P. Tisseyre, S. Tusa, E. Caponetti, "Physico-chemical characterization of the Acqualadrono *rostrum*", *Archaeometry* 53 (2011) 547-562. doi: 10.1111/j.1475-4754.2010.00567.x
2. **F. Caruso**, F. Giannici, F. Caruso, M.A. Floriano, "A new procedure for the lightning experiment: Mn₂O₇ and ethanol", *The Chemical Educator* 15 (2010) 108-109. doi: 10.1333/s00897102220a
1. **F. Caruso**, S. Orecchio, M.G. Cicero, C. Di Stefano, "Gas Chromatography – Mass Spectrometry characterization of the varnish and glue of an ancient 18th century double

bass”, *Journal of Chromatography A* 1147 (2007) 206-212. doi:
10.1016/j.chroma.2007.02.048

PUBLICATIONS ON PEER-REVIEWED PROCEEDINGS OF INTERNATIONAL CONFERENCES AND CONGRESSES

19. L. Porsmo Stoveland, B. Ormsby, M. Stols-Witlox, T. Frøysaker, **F. Caruso**, “Designing Paint Mock-Ups for a Study of Novel Surface Cleaning Techniques for Munch’s Unvarnished Aula Paintings”. In “Conservation of Modern Oil Paintings”. 2019. Editors: K.J. van den Berg, I. Bonaduce, A. Burnstock, B. Ormsby, M. Scharff, L. Carlyle, G. Heydenreich, K. Keune. ISBN: 978-3-030-19254-9. Pp. 553-563. doi: 10.1007/978-3-030-19254-9_41.
18. **F. Caruso**, S. Mantellato, “Conservation-oriented study of the Norwegian unique heritage by Inductively Coupled Plasma – Optical Emission Spectroscopy”. In “Archaeometry and Underwater Archaeology Summer School 2017” proceedings book. Sicily (Italy), 19-27 July 2017. Editor: E. Caponetti. ISBN: 978-88-5509-039-1. Pp. 209-211.
17. L. Porsmo Stoveland, M. Stols-Witlox, B. Ormsby, **F. Caruso**, T. Frøysaker, “Edvard Munch’s monumental Aula paintings: a review of soiling and surface cleaning issues and the search for new solutions”. In “Interactions of Water with Paintings” proceedings of the ICON Paintings Group conference 'Wet Paint - Interactions between Water and Paintings'. Edinburgh (United Kingdom), 12 October 2018. Editors: R. Clarricoates, H. Dowding, A. Wright. ISBN: 9781909492691. Pp. 85-99.
16. A. Kostomitsopoulou Marketou, S. Handberg, F. Giannici, W. de Nolf, **F. Caruso**, “Synchrotron-based μ XANES and μ XRF study of unsuccessfully produced Egyptian blue from the late Hellenistic production site of Kos (Greece)” in SAS Bulletin – Newsletter of the Society for Archaeological Sciences 42(1) (2019) 9-11.
15. A.M. Aguilar Sanchez, **F. Caruso**, F. Girardet, F. Martirena, T. Wangler, R.J. Flatt, “The Decay of the Historical Site of Malecon in Havana, Cuba: Salt Crystallization Damage at Repair Interfaces”. In “Calcined Clays for Sustainable Concrete” proceedings of the 2nd International Conference on Calcined Clays for Sustainable Concrete. Havana (Cuba), 5-7 December 2017. Editors: F. Martirena, A. Favier, K. Scrivener. ISBN: 978-94-024-1207-9. Pp. 409-414. doi: 10.1007/978-94-024-1207-9_66
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13. G. Gelardi, **F. Caruso**, R.J. Flatt, “Synthesis and characterization of polycarboxylate superplasticizers with well-defined structures”. In “Superplasticizers and other chemical admixtures in concrete – Supplementary papers”, Proceedings of the “11th International Conference on Superplasticizers and Other Chemical Admixtures in Concrete”, Ottawa (Canada), 12-15 July 2015. Editors: P.W. Gupta, P. Gupta. ISBN 978-0-9916737-4-2. Pp. 93-106.
12. M.L. Saladino, D. Chillura Martino, R. Lombardo, V. Gennaro, C. Di Stefano, **F. Caruso**, P. Livreri, E. Caponetti, “Art and technique: artistic reproduction of the ancient bronze “Il Guerriero da Petralia Sottana””. In “YOCUCU 2014 – Professionals’ Experiences in Cultural Heritage Conservation in America, Europe, and Asia” proceedings of YOCUCU 2014: Youth in the Conservation of Cultural Heritage Symposium. Agsu (Azerbaijan), 22-24 June 2014. Editors: A. Macchia, F. Prestileo, S. Cagno, F. Khalilli. ISBN 978-1-4438-8519-5. Pp. 242-255.

11. **F. Caruso**, R.J. Flatt, "Further steps towards the solution of Correns' dilemma". Proceedings of SWBSS 2014 – Third International Conference on Salt Weathering of Buildings and Stone Sculptures. Royal Institute for Cultural Heritage (KIK-IRPA). Brussels (Belgium), 14–16 October 2014. Editor: H. De Clercq. ISBN 978-2-930054-24-7. Pp. 199-209.
10. **F. Caruso**, R.J. Flatt, "Measuring crystallization pressure: can Correns' experiment be repeated?". Proceedings of the 12th International Congress on the Deterioration and Conservation of Stone. New York (United States), 22–26 October 2012.
9. **F. Caruso**, T. Wangler, A.M. Aguilar, H. Richner, J. Melchior, R.J. Flatt, "Effect of swelling inhibitors and self-restraint on the durability of ethyl silicates consolidants applied to clay-bearing stones". Proceedings of the 12th International Congress on the Deterioration and Conservation of Stone. New York (United States), 22–26 October 2012.
8. A. Spinella, **F. Caruso**, E. Caponetti, "Solid state NMR application in the cultural heritage field". Proceedings of the 2nd Residential Summer School: Chemistry and Conservation Science 2008. Palermo, 20–27 July 2008. Editors: E.A. Varella and E. Caponetti. ISBN 978-88-86208-60-4. Pp. 261-270.
7. **F. Caruso**, C. Di Stefano, M.L. Saladino, E. Caponetti, "X-Ray Fluorescence Spectroscopy applied to the study of three painted Sicilian works of art". Proceedings of the 2nd Residential Summer School: Chemistry and Conservation Science 2008. Palermo, 20–27 July 2008. Editors: E.A. Varella and E. Caponetti. ISBN 978-88-86208-60-4. Pp. 77-84.
6. **F. Caruso**, S. Orecchio, M.G. Cicero, C. Di Stefano, "Determinazione di componenti della vernice e della colla del contrabbasso "Panormo" di Vincenzo Trusiano". Science and Cultural Heritage in the Mediterranean Area. Proceedings of the III international congress "La materia e i segni della storia". Editor: Regione Siciliana. Assessorato dei Beni Culturali, Ambientali e della Pubblica Istruzione. Dipartimento dei Beni Culturali, Ambientali e dell'Educazione Permanente. Centro Regionale per la Progettazione e il Restauro. Palermo, 18– 21 October 2007. Pp. 614-620. ISBN 978-88-6164-086-3.
5. M.G. Cicero, C. Di Stefano, M.P. Casaletto, **F. Caruso**, "Un protocollo scientifico per la desalinizzazione di materiali lapidei: caso studio dei mosaici della Villa del Casale (Sicilia)". Science and Cultural Heritage in the Mediterranean Area. Proceedings of the III international congress "La materia e i segni della storia". Editor: Regione Siciliana. Assessorato dei Beni Culturali, Ambientali e della Pubblica Istruzione. Dipartimento dei Beni Culturali, Ambientali e dell'Educazione Permanente. Centro Regionale per la Progettazione e il Restauro. Palermo, 18–21 October 2007. Pp. 174-179. ISBN 978-88-6164-086-3.
4. M.P. Casaletto, **F. Caruso**, T. de Caro, G.M. Ingo, C. Riccucci, "A novel scientific approach to the conservation of archaeological copper alloys artefacts". Metal 07 Proceedings. Triennial meeting of the ICOM-CC Metal Working Group. Amsterdam (The Netherlands), 17– 21 September 2007. Vol. 2. Pp. 20-25
3. M.P. Casaletto, **F. Caruso**, G.M. Ingo, T. de Caro, C. Riccucci, "Recovering bronze metallurgy from archaeological artefacts for the production of reference materials in conservation science". Proceedings of the 2nd International Congress: Archaeometallurgy in Europe 2007. Grado (GO) and Aquileia (UD), 17– 21 June 2007. ISBN 88-85298-61-3.
2. M.P. Casaletto, A. Caruso, **F. Caruso**, G.M. Ingo, T. de Caro, C. Riccucci, "Il degrado di manufatti ceramici archeologici: sistemi diagnostici e metodologie di intervento" in "Tecniche di analisi di materiali nei Beni Culturali", proceedings volume of the international workshop "Tecniche di analisi non distruttive di materiali lapidei e naturali nei Beni Culturali", Palermo, 22 February 2007, edited by M. Brai, M.P. Casaletto, A.

Maccotta, T. Schillaci. ISBN 88-88803-29-7. Pp. 17-22.

1. M.P. Casaletto, **F. Caruso**, F. Mingoia, M.L. Testa, G.M. Ingo, T. de Caro, C. Riccucci, "Il Progetto ATENA: Applicazione di metodologie innovative per la conservazione di manufatti metallici e ceramici da scavo archeologico e per il recupero delle relative tecniche di produzione" in "Tecniche di analisi di materiali nei Beni Culturali", proceedings volume of the international workshop "Tecniche di analisi non distruttive di materiali lapidei e naturali nei Beni Culturali", Palermo, 22 February 2007, edited by M. Brai, M.P. Casaletto, A. Maccotta, T. Schillaci. ISBN 88-88803-29-7. Pp. 99-105.

SELECTED PRESENTATIONS

Heritage Science Today – From Archaeological Sites to Museums. Universidad del País Vasco. Virtual workshop. 5-6 May 2021. [Invited Lecture](#).

Possibilities and limits of (non-destructive) analysis of reverse paintings on glass. Vitrocentre Romont and SIK-ISEA. Online workshop. 12 March 2021. [Invited Lecture](#).

Annual Meeting of the Nordic Association of Conservators – Norwegian Section (NKF-N). Norwegian Museum of Science and Technology. Oslo (Norway), 5 April 2019. [Invited Lecture](#).

Laboratory of Building Materials (LMC) and Powder Technology Group at EPFL. Lausanne (Switzerland), 5-6 March 2019. [Invited Workshop](#)

ARCHMAT Summer School 2017 – Archaeometry and Underwater Archaeology. Sicily (Italy), 20-26 July 2017. [Invited Lecture](#)

Chimicarte – Corso di divulgazione della chimica attraverso i beni culturali. Palermo (Italy), 21-25 September 2015. [Invited Lecture](#)

3rd International Conference on Salt Weathering of Buildings and Stone Sculptures. Brussels (Belgium), 14-16 October 2014. [Keynote Oral Contribution](#)

5th Intensive School on Conservation Science. Istanbul (Turkey), 19-29 July 2011. [Invited Lecture](#)

Giornata Seminariale: Roma e il mare. A proposito del recente rinvenimento del rostro di Acqualadrone. Università degli Studi di Messina (Italy), 23 March 2009. [Invited Oral Contribution](#)

2nd Residential Summer School: Chemistry and Conservation Science 2008. Università degli Studi di Palermo (Italy), 20-27 July 2008. [Invited Oral Contribution](#)