

inART 2022

5th International Conference on
Innovation in Art Research and Technology

28th June - 1st July 2022

Paris



<https://inart2022.sciencesconf.org/>

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We also thank you the Scientific Committee for the constructive recommendations all over these long months.



Welcome introduction

The inArt 2020 conference should have taken place in April 2020 in Paris and be the 4th International Conference on Innovation in Art Research and Technology and about 200 participants were registered. The event could not be held due to the sanitary situation. However, the special issue was maintained in the EPJ+ “focus point on Scientific Research in Cultural Heritage” and 25 papers were published in this issue making this conference in any case a successful scientific event.

Previously inArt conferences took place in Evora - Portugal in 2013, in Ghent - Belgium in 2016 and in Parma - Italy in 2018. The 2022 year is a new step in the InArt conferences, and the 5th InArt (inArt 2022) takes place in Paris from **Tuesday 28 June to Friday 1st July 2022** and marks the return to a friendly face-to-face conference.

The conference inArt 2022 aims to gather professionals from all the disciplines concerned by the study and the preservation of cultural heritage materials: chemists, physicists, geologists, biologists, conservation scientists, conservators, historians, archaeologists, etc. Ancient materials require interdisciplinary approaches and the development of specific analytical methodologies due to their complexity and heterogeneity, the need for non-invasive analyses and limited sampling, or to simulate alteration processes. The conference wish to stimulate discussions between the participants around three main topics related to the scientific analysis of ancient artefacts: knowledge of the manufacturing techniques and materials; understanding of their degradation processes and the use of innovative conservation strategies; and the development of new methodologies and data treatments for their study.

The topics to be addressed within the conference sessions can be related to the following 3 main thematic sessions with various sub-themes (amongst others):

- *Comprehension of materials and techniques involved in Cultural Heritage ;*

Identification approaches, circulation of materials and manufacturing techniques, dating and chronological approaches

- *Degradation mechanisms and conservation strategies ;*

Characterisation of degradation products, impact of the environment on the degradation or protection of the objects, experimental aging simulation and modelling, diagnosis of conservation states, documentation of objects (including numerical approaches), cleaning, stabilisation and protection

- *Technological developments and data analysis ;*

In situ experiments and mobile instrumentation, imaging techniques, coupling of analytical methods and data fusion

Our heartfelt thanks to all the authors who submitted abstracts for the conference. With more than 220 submitted abstracts, this conference promises to be particularly stimulating and promising and to produce a new rich special issue depicting the scientific advances in cultural heritage.

ORAL ABSTRACTS & KEYNOTES

A multitechnique study of historical natural dyes

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A set of textile fragments from the Guggenheim collection has been studied through a multi analytical approach to identify the dyestuff and check their compatibility with both declared historical period and the origin. For most of them, an Italian manufacture was hypothesized on the bases of stylistic and technical characteristics and they were mostly dated to the XVI century.

The use of two spectroscopic techniques (Reflectance spectroscopy in the VIS interval- VISRS- and Surface Enhanced Raman Spectroscopy-SERS), together with UV reflected-false colour imaging (UVFCI) allowed for a preliminary assessment of the dyeing materials. Spectroscopic data were cross-checked in order to compare information obtainable when working in both non-invasive (VIS-Reflectance) and micro invasive (SERS) mode.

All the presented methodologies have well known limitations but they often compensate each other, as already demonstrated in past studies [1], allowing for the identification of different components co-existing in the same sample. This is particularly true when working on dyes used on historical textiles. All of tested techniques have issues with mixtures: in VISRS bands of each compound tend to overlap or to generate new bands [2]. On the other hand, SERS spectra often show only one of the existing dyes [3]. Finally, in UVFCI colours deriving from many compounds can interfere creating new shades difficultly referable to any particular dyestuff.

In some cases, equivalent results were obtained for the three tested techniques, while in others more complex situations emerged, highlighting the importance of applying a multi technique approach. Raman mainly showed cochineal in red-based artefacts and indigo in blue ones. Other interesting dyes such as orcein or annatto were identified, integrating the information previously obtained by VISRS. At the same way, VISRS allowed for the acquisition of spectra mainly affected by the presence of indigotin on green textile fragments, while in some cases SERS gave information about the yellow dye. However, yellow dyes are particularly challenging and despite the application of a multi-technique approach, in some of the fragments belonging to the Guggenheim collection it was not possible to recognize any specific compound.

"M. Guggenheim" Art High School of Venice for allowing the current study on their fabrics collection and Mr. Isam Al Salem of the "Istituto d'Istruzione Superiore Bruno Franchetti" (Venice) for helping in acquisition of the UVR images during his school-work alternation period spent at LCM (Laboratory of Materials Characterization of the University Ca' Foscari of Venice Department of Philosophy and Cultural Heritage).

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