

APACHE

*Active & intelligent PACKaging materials and display cases
as a tool for preventive conservation of Cultural HERitage.*

Degradation of movable, tangible and indoor cultural heritage can be significantly increased by disadvantageous and unstable climate conditions, light, and intrinsic or external pollution. Preventive conservation aims to minimize aging and degradation by optimizing, among other, display and storage solutions. In the recent years, several active and intelligent packaging materials have been developed and put to use, especially in food industries. However, these materials are short-term solutions that cannot be easily adapted for cultural heritage, where long-term stability is mandatory. In the APACHE proposal, the novel combination of active novel packaging materials, developed based on materials modelling, with sensors and wireless sensor technologies (WST) provides smart, low-cost easy-to-deploy systems for storage and exhibition of cultural heritage objects. One of the main goal of APACHE is to dramatically reduce the costs of mechanical climate control and monitoring systems, by developing and customising smart and affordable novel materials, based on material science advancements and discrete and continuum modelling.

The training organized by the European project APACHE and by the Fondazione CCR "La Venaria Reale" aims to explore the consortium activities, to spread knowledge generated during the development of the project within academic, professional, potential users and industrial domains in addition to upskill key stakeholders and staff on the use of the novel materials/tools/solutions applied to the preventive conservation of cultural heritage.

THE TRAINING FOCUSES ON THREE ESSENTIAL SECTIONS:

- Five practical workshops around the application methodologies and the use of some developed technologies
- Lectures and presentations on the theoretical, research and implementation aspects of the novel materials and solutions
- A final open debate about the new materials, feedback and sharing of experience after the practical activities

Organisation:

Antonio Mirabile - APACHE Project

Marco Nervo, Selena Viel and Tiziana Cavaleri - Fondazione CCR "La Venaria Reale"

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FIRST DAY

09:00 – 09:10: Greetings

Sara Abram, CCR "La Venaria Reale", Venaria Reale, Turin.

Preventive conservation: research and practicalities.

CHAIR: FEDERICA POZZI, CCR "La Venaria Reale", Venaria Reale Turin.

09:10 – 09:30 Isella Vicini:

Cultural Heritage: funding opportunities in the new framework programme for research and innovation, Horizon Europe (2021-2027).

09:30 – 09:50 Michela Cardinali:

The CCR experience in the preventive conservation of historic house museums: knowledge, management and training for a sustainable approach.

09:50 – 10:10 Oscar Chiantore:

Indoor air quality in museums showcases: materials interactions, off-gassing, impacts.

10:10 – 10:30 Ida Kraševc:

Monitoring protocols for pollutants in museums.

10:30 – 10:45 Q&A

10:45 – 11:00 Coffee break

Modelling and decision-making.

CHAIR: RODORICO GIORGI, UNIFI, CSGI, Florence.

11:00 – 11:20 Matija Strlic:

Modelling preventive conservation outcomes.

11:20 – 11:40 Aysenur Iscen and Nancy C. Forero-Martinez:

Acrylic paints under the computational microscope.

11:40 – 12:00 Ebrahim Norouzi:

APACHE APP interfaces for cultural heritage interoperable multi-scale simulation workflows.

12:00 – 12:20 Alex Zabeo:

Apache Decision Support System supporting preventive conservation actions.

12:20 – 12:40 Q&A

12:40 – 14:00 Lunch break

Materials developed in the APACHE project to influence the environment.

CHAIR: PATRIZIA TOMASIN, CNR, Padova.

14:00 – 14:20 Piero Baglioni:

Innovative "green" gels as new pollutant absorbers in Preventive Conservation.

14:20 – 14:40 Gabriella Di Carlo:

Multifunctional materials based on chitosan for the removal of degrading species in museum storage/display environments.

14:40 – 15:00 Panagiotis Goulis and Dimitrios Dragatogiannis:

Humidity sorption study using PVA membranes and Super Absorbent Polymers.

15:00 – 15:20 Costas Galiotis:

Roll-to-roll graphene transfer as an effective tool for the protection of artworks

15:20 – 15:35 Q&A

15:35 – 15:50 Coffee break

Sensors and solutions to describe and interact with the environment.

CHAIR: STEFANO DELLA TORRE, Politecnico di Milano

15:50 – 16:10 Marco Girolami:

Sensitive and selective electrochemical sensors for monitoring of museums crate atmosphere.

16:10 – 16:30 Daniela Iacopino:

Flexible and bendable sensor platforms for monitoring of heritage artworks.

16:30 – 16:50 Dinesh R. Gawade:

A battery-less NFC sensor transponder for museum artefact monitoring.

16:50 – 17:10 Manfred Anders and Steffen Ziemann:

Converting conventional passive into novel active archive boxes.

17:10 – 17:30 Q&A

SECOND DAY

09:30 – 11:00

First cycle of practical activities.

Manfred Anders and Steffen Ziemann:

Integration and practicability of regulators and sensing devices in archive boxes.

Dinesh R. Gawade:

A battery-less NFC sensor transponder for museum artifact monitoring. Demonstration.

Piero Baglioni and David Chelazzi:

Innovative "green" gels as new pollutant absorbers in Preventive Conservation.

Alex Zabeo:

APACHE Decision Support System application in real collections case studies.

Josep Grau-Bove and Himantha Cooray:

Using a decision making-tool to select the best storage enclosure.

11:00 – 11:15 Coffee break

11:15 – 12:45

Second cycle of practical activities.

12:45 – 14:00 Lunch break

14:00 – 15:30

Third cycle of practical activities.

15:30 – 15:45 Coffee break

15:45 – 17:15

Open debate about the new materials, feedback and sharing of experience after the practical activities.

