Active & intelligent PAckaging materials and display cases as a tool for preventive conservation of Cultural Heritage.

APACHE School

24 - 26 May 2022

Auditorium Sant' Apollonia
Florence, Italy

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 814496

Objective

The Apache School has the aim of contributing to the professional development of targeting students and technicians coming especially from small and medium sized museums with a focus on new materials and tools for preventive conservation. The school will offer keynote lectures, presentation and practical demonstrations from high level professionals and researchers which are part of the project.

Target:

- PhD Students
- Master Graduated students
- Early-Stage researchers
- Restorers
- Technicians from museums

The project

APACHE is a project which aim is to find a solution to the long-term preservation questions raised by billions of objects collected in museum, library, and archive storages by developing a cutting-edge technology to control and prevent the degradation of such patrimony. The novel approach proposed by the project is based on three pillars: 1) advanced sensing and absorbing materials to control the cultural objects' environment; 2) modelling to define the threshold of cultural objects degradation and to discriminate between the need for preventive or remedial conservation; 3) remote control of the cultural objects' stressors. The unique combination of these pillars will reduce to the lowest possible level the costs required by conventional technology for art conservation. New generation of active and intelligent display cases, crates, and storage boxes will be implemented thanks to i) The unique APACHE partnership, comprising the most important experts in the three pillars; ii) The development of easy-to-use sensing devices able to communicate through Wireless Sensor Networks and Radio Frequency Identification Devices thanks to Industry 4.0-5.0 ICT technologies, granting the optimal environmental conditions around the cultural objects. Multiscale models integrated in an open simulation environment will be used to predict the degradation of cultural objects and set the properties of sensors (detection limits) and polyfunctional absorbents.
APACHE includes small, medium, and large museums exhibiting representative variety of display and storage conditions.

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APACHE SCHOOL Agenda

Day 1 - TUESDAY, MAY 24th, 2022

Materials developed in the project to influence the environment

9:00 – 17:00

Auditorium Sant'Apollonia (Firenze)

8:30 – 8:50	**Registration**	
9:00 – 9:05	**Welcome**	*Sara Attanà, Stefania Melandri (beWarrant)*
9.05 – 9:15	**Introduction and presentation**	*Patrick Berriotto (Warrant Hub)*
9:15 – 10:00	**APACHE project: objectives and first results**	*Piero Baglioni (CSGI), Antonio Mirabile*
10:00 – 10:05	Question time	
10:05 – 10:40	**Multifunctional materials based on chitosan for the sustainable conservation of metal cultural objects in museum environments**	*Gabriella Di Carlo CNR*
10:40 – 10:45	Question time	

10:45 – 11:15	**Coffee break**

11:15 - 12:00	**Monitoring protocols for pollutants in museums**	*Ida Kraševec (University of Ljubljana)*
12:00 – 12:05	Question time	
12:05 – 12:50	**Cellulose-based composites for museums and archives air quality management**	*Romain Bordes (CHALMERS)*
12:50 – 12:55	Question time	
	Closing	*Sara Attanà, Stefania Melandri (beWarrant)*

13:00 – 14:00	**Lunch break**

14:00 – 17:00	***PRACTICAL DEMONSTRATIONS by Piero Baglioni (CSGI) and Romain Bordes (CHALMERS)***

18:00 – 19:00 "Firenze from Arno River"

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Day 2 - WEDNESDAY, MAY 25th, 2022

ICT Tools

9:00 – 17:00

Auditorium Sant'Apollonia (Firenze)

8:30 – 8:50	**Registration**	
9:00 – 9:05	**Welcome and introduction**	*Sara Attanà, Stefania Melandri (beWarrant)*
9:05 – 9:35	**Sensor Platforms for Monitoring of Cultural objects**	*Eoghan Vaughan (Tyndall National Institute Cork)*
9:35 – 9:40	Question time	
9:40 – 10:10	**Sensitive and selective electrochemical sensors for monitoring the atmosphere of display cases and crates in museums**	*Valerio Serpente (CNR)*
10:10 – 10:15	Question time	

10:15 – 10:45	**Coffee break**

10:45 – 11:15	**Ontology-driven approach to leverage data management for Cultural Heritage preservation**	*Tobias Huschle (FRAUNHOFER IWM)*
11:15 – 11:20	Question time	
11:20 – 11:50	**Indoor air quality in museum showcases: material interactions, off-gassing, impacts**	*Oscar Chiantore (Goppion)*
11:50 – 11:55	Question time	
11:55 – 12:25	**Apache Decision Support System supporting preventive conservation actions**	*Giacomo Chiarot (UNIVE)*
12:25 – 12:30	Question time	
	Closing	*Sara Attanà, Stefania Melandri (beWarrant)*

12:45 – 14:00	**Lunch break**

14:00 – 17:00	***PRACTICAL DEMONSTRATIONS by Eoghan Vaughan (Tyndall National Institute Cork) and Giacomo Chiarot (UNIVE)***

17:30 – 19:30: Guided tour "The secret Florence"

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Day 3 - THURSDAY, MAY 26th, 2022

NETWORKING H2020

9:00 – 14:30 (CEST)

Auditorium Sant'Apollonia (Firenze)

8:30 – 8:50	**Registration**	
9:00 – 9:05	**Welcome and introduction**	*Sara Attanà, Stefania Melandri (beWarrant)*
9:05 – 9:50	**Cultural Heritage: funding opportunities in the new framework programme for research and innovation, Horizon Europe (2021-2027)**	*Isella Vicini (beWarrant)*
9:50 – 9:55	Question time	
9:55 – 10:10	**ECHOES: the European Cluster of Cultural Heritage**	*Piero Baglioni (CSGI)*
10:10 – 10:15	Question time	

10:15 – 10.45	**Coffee break**

10:45 - 11:30	**Short cluster project presentation: Collection Care, Nemosine, SensMat**	***CollectionCare**:* • *Ángel Perles, CollectionCare coordinator, UPV - Universitat Politècnica de València, Spain* • *Jaime Laborda, Electronic engineer, UPV - Universitat Politècnica de València, Spain* • *Matteo Rossi, CBC - Conservazione Beni Culturali, Italy* ***Nemosine**: online contribution* ***SensMat**:* • *Juergen Frick - Materials Testing Institute (MPA) University of Stuttgart*
11:30 - 12:15	**Round table**	*Rodorico Giorgi/David Chelazzi (CSGI),* *Stefania Melandri (beWarrant)*
12:15 – 12:30	Question time	
12:30 – 13:00	**Graduation and closing**	*Isella Vicini (beWarrant),* *Piero Baglioni (CSGI)*

13:00 – 14:00	**Lunch break**

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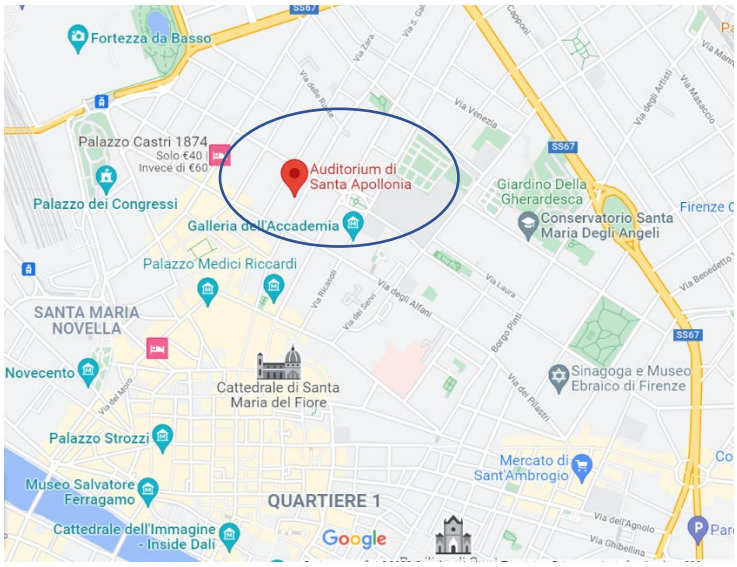
Some Useful Information for You:

WHERE IS IT LOCATED?

Lessons will be held in the **Sant'Apollonia Auditorium**



Via S. Gallo, 25, 50129 Firenze FI

We suggest you searching for accommodation in the historic centre area to easily enjoy the school.

WHAT IS REQUIRED?

- Identification document
- Punctuality
- Motivation and desire of having fun.

WHAT IS INCLUDED?

- 3 mornings of lessons and presentations related to Apache project
- 3 coffee breaks and 3 light lunches
- 2 afternoons characterized by practical demonstrations of the materials and tools delivered by the project
- 2 networking activities to visit and discover Florence with us.

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PRACTICAL ACTIVITIES

People will be divided into two groups that will alternates between the activities

> TUESDAY, MAY 24th, 2022| 14:00-17:00

1. *CSGI will show the potential utilisation of the newly developed materials in the context of pollutants absorbers and in particular on new hybrid organogels for the removal of acetic acids and other pollutants. The most important features and how to handle the gels will be shown during the session and some samples will be available to the participants.*
2. *Romain Bordes will show the potential utilization of the newly developed materials in the context of stargate, both for archives and museums, using storage prototype solutions provided by ZFB, which is also part of APACHE. Features of the adsorbing foams can then be discussed and challenged against different utilizations. The spin-off company Adsrobi will also be presented.*

> WEDNESDAY, MAY 25th, 2022 | 14:00 - 17:00

1. *Practical activity performed by Eoghan Vaughan (Tyndall National Institute Cork)*
2. *Giacomo Chiarot will do the APACHE DSS demo, in more detail:*
    - *Registration / login and management of user profile preferences.*
    - *Navigation of tier 1 of the DSS containing general information on preventive measures*
    - *Registration of a new collection for tier 2 for active monitoring of collections*
    - *Addition of new locations, and works of art within a collection*
    - *Upload and display of sensor data*
    - *Exploring the preventative measures suggested for a particular collection*
    - *Exploration of the alerts generated by the DSS*

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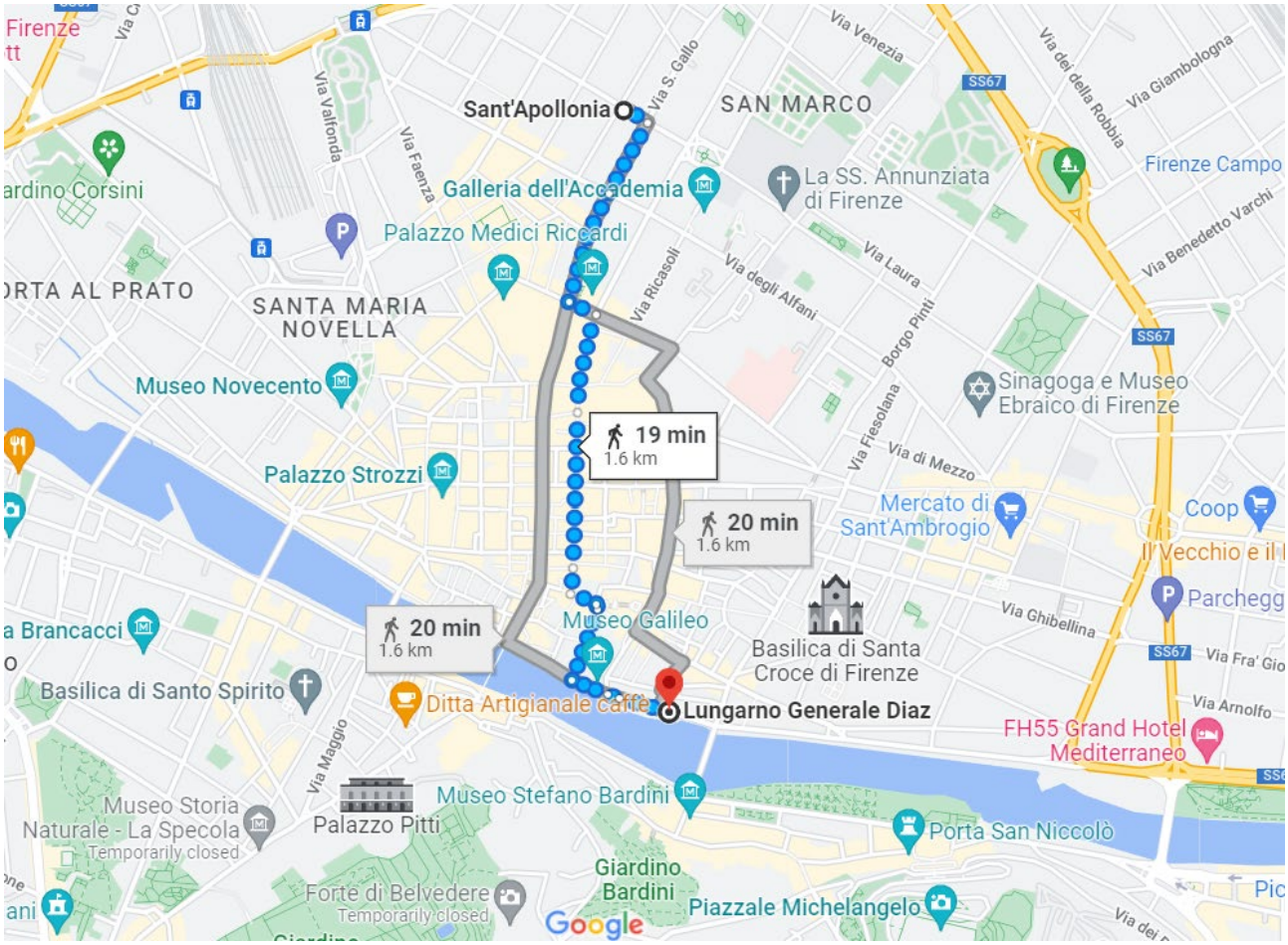
LEISURE ACTIVITIES

> TUESDAY, MAY 24th, 2022| 18:00-19:00

Have you ever seen Florence from the Arno River? Participate in "**Firenze from Arno River**" and sail with us: on board the small boats made available and guided by the historic renaioli, we will sail on the Arno at sunset, seeing Florence from an unusual and suggestive perspective.

Boarding point: Lungarno Diaz **at 17:45**

Boarding time: 18:00



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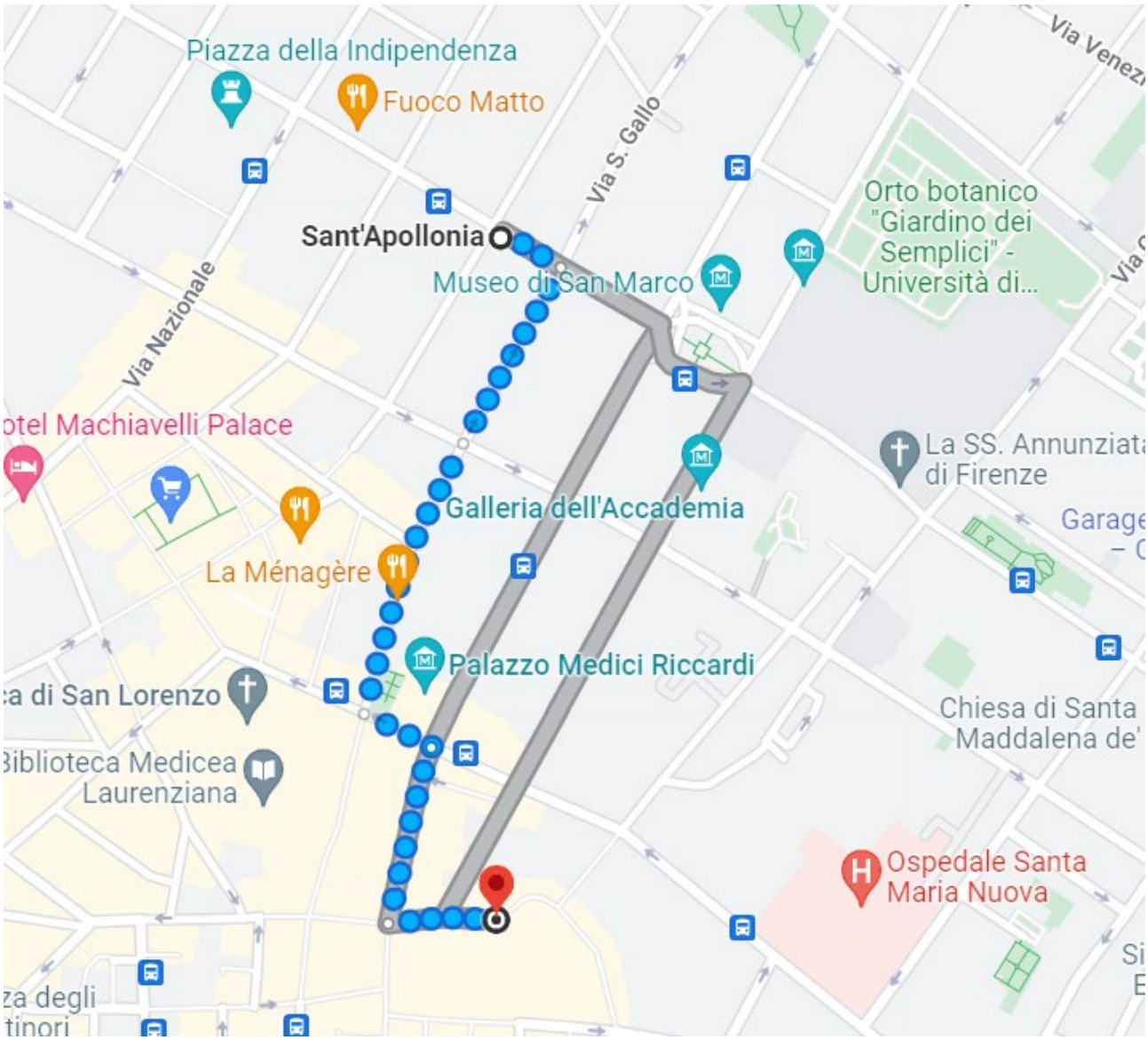
> WEDNESDAY, MAY 25th, 2022 | 17:30 - 19:30

We will discover the beauty of Florence and the most secret side of the town with an unusual city visit entitled "**The secret Florence**": anecdotes, curiosities and everything you never knew about this wonderful city.

The guided tour will **start at 17:30 at Piazza Duomo** and it will **finish at about 19:30 at Piazza Santa Croce**.



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