



Ca' Foscari
University
of Venice

PROJECT ACRONYM AND TITLE: APACHE - Active & intelligent PAckaging materials and display cases as a tool for preventive conservation of Cultural Heritage

FUNDING PROGRAMME: H2020 NMPB

CALL: NMBP-33-2018 - Innovative and affordable solutions for the preventive conservation of cultural heritage

SCIENTIFIC FIELDS: Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing, and Biotechnology

HOST DEPARTMENT: DAIS – Department of Environmental Sciences, Informatics and Statistics

SCIENTIFIC RESPONSIBLE: Antonio Marcomini

FINANCIAL DATA:

Project total costs	Overall funding assigned to UNIVE
€ 7.913.811,25	€ 349.875,00

ABSTRACT:

Most Cultural Heritage objects housed by museums are often stored under unsuitable climate conditions. APACHE will develop a cutting edge technology to control and prevent the degradation of such patrimony. The novel approach is based on three pillars: 1) advanced sensing and absorbing materials to control the artifacts' environment; 2) modeling to define the threshold of artifacts' degradation and to discriminate between the need for preventive or remedial conservation; 3) remote control of the works of art stressors. The unique combination of these pillars will reduce to the lowest possible level the costs actually 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 aforementioned 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 art objects. Multiscale models integrated in an open simulation environment will be used to predict the degradation of artefacts 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. For instance, the Venice Peggy Guggenheim Collection features one of the most important collections of modern/contemporary art, which experiences highly unfavorable environmental conditions, difficult to control with conventional tools. Centre Pompidou and National Museum of Hungary possess a vast amount of artefacts stored in deposits (e.g. in crates and boxes). Moreover, a decision-making tool composed by a modular set of decision trees will be offered to end-users to guide them through the best solutions.

Planned Start date1st January 2019**Planned End date**30th June 2022**PARTNERSHIP:**

1. Consorzio interuniversitario per lo sviluppo dei sistemi a grande interfase	Italy	Coordinatore
2. Ca' Foscari University	Italy	Partner
3. University college cork - national University of Ireland	Ireland	Partner
4. Consiglio Nazionale delle Ricerche	Italy	Partner
5. University college of London	United Kingdom	Partner
6. Foundation for research and technology Hellas	Greece	Partner
7. Chalmers tekniska hoegskola ab	Sweden	Partner
8. National technical university of Athens	Greece	Partner
9. Universidade federal do rio grande do sul	Brazil	Partner
10. Zfb zentrum fur bucherhaltung gmbh	Germany	Partner
11. Ionfly vacuum and plasma technology srl	Italy	Partner
12. Univerza v ljubljani	Slovenia	Partner
13. Max-planck-gesellschaft zur forderung Der wissenschaften ev	Germany	Partner
14. Fraunhofer gesellschaft zur foerderung Der angewandten forschung e.v.	Germany	Partner
15. Bewarrant	Belgium	Partner
16. Mirabile antonio	France	Partner
17. Goppion s.p.a.	Italy	Partner
18. Akzo nobel pulp and performance Chemicals ab	Sweden	Partner
19. Ericsson ab	Sweden	Partner
20. International centre for the study of The preservation and restoration of cultural property	Italy	Partner
21. Ministero per i beni e le attivita culturali	Italy	Partner
22. Centre national d'art et de culture Georges-pompidou	France	Partner
23. Narodni muzej slovenije	Slovenia	Partner
24. Magyar nemzeti muzeum	Hungary	Partner
25. Fondazione scienza e tecnica	Italy	Partner
26. Solomon r guggenheim foundation	United States of America	Partner