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Szkoła IN : Thursday 21 of May 2015, g. 13:00-14:00, room 0.48 ("Akwarium"), Pasteura 5, Faculty of Physics University of Warsaw

Nanotechnologies allow today many applications for the architectural sector through the presence on the market of innovative products for the treatment of surfaces and smart materials for building construction. In the recent years, various valid applications of nanotechnology for the conservation and restoration of cultural heritage have also emerged, revolutionizing the traditional methods.

The state of the art of the ongoing researches and of existing nanostructured products will be presented, illustrating the main principles and characteristics of interventions on historical materials through the use of nanotechnologies. These innovative technologies appear as groundbreaking and promising tools, able to improve the procedures for intervention, overcoming the major deficiencies that characterize some of the traditional techniques currently used, also allowing a more reliable and sustainable preservation of artifacts. In particular, will be discussed formulations based on the use of substances aimed at the consolidation of mural paintings and stone surfaces, such as those using CaOH, showing high compatibility with historical matters. Other examples describe nanostructured cleaning systems for the removal of polymeric coatings previously applied and high retention gels for treatments with organic solvents.

The main advantages of using nanostructured products in architecture and cultural heritage preservation fields are also pointed out, in terms of greater reliability over time and sustainability, being non-toxic and environmentally friendly treatments, also considering the reduction of the environmental footprint of the built environment throughout the efficient use of resources.

Finally, this contribution underlines that, even if these nanomaterials are contributing to a significant change in our life, we must ensure that the potential risks are identified and controlled, through developing new appropriate standards and codes for their application.

Ph.D. Arch. Federica Fernandez is now Technical Responsible and Member of the International Scientific Committee of the Master on “Nanotechnology and Nanomaterials for Cultural Heritage” at the University of Palermo. Degree in Architecture, specialized in “Restoration of historic architecture, innovative materials and technologies for Cultural Heritage”. PhD in "Recovery and Exploitation of Ancient Contexts", was the holder of a Research Fellowship in "Application of nanostructured products for the conservation of stone materials in archaeological structures" at the University of Palermo. From 2005 she has carried out teaching assignments on "Pathologies and decay of materials" at the University of Agrigento, on "Conservative issues of Cultural Heritage and diagnostics" and "Nanotechnologies and Nanomaterials", “Diagnostic investigations for Cultural Heritage” at the Master's Degree in "Expert on nanotechnology for Cultural Heritage" held at the University of Palermo. Since 2013 she is Invited Professor at the University of Cadiz (Spain) as part of the PhD "Nanoscience and Technology of Materials" with the topic of *Nanostructured Materials for Novel Technologies*. Since 2013 she is Research and Development Advisor of the innovative Start Up on nanotechnology products Gretec s.r.l, Catania (Italy).

She planned and supervised more than 40 Phd and Master thesis projects, in the field of technological innovation applied to Cultural Heritage. She has been invited to hold didactic seminars in various foreign Universities, including Peking University in China, Gotland University of Visby in Sweden and the University of Cadiz in Spain. She has been involved in more than 20 international projects (competitive calls) in the field of conservation of cultural heritage and the application of innovative technologies for their preservation and enhancement, with various international research groups. She presented the results of her research activities in many international events, such as workshops and conferences, publishing over 70 articles in books, journals and proceedings.

Szkoła odbywa się dzięki wsparciu projektu POKL UDA – POKL.04.01.01-00-100/10 "Chemia, fizyka i biologia na potrzeby społeczeństwa XXI wieku: nowe makrokierunki

studiów I, II i III stopnia" prowadzonemu na Wydziale Chemii UW.