



Innovation for Europe
Cultural Heritage
Protection and
Conservation

NEWSLETTER
November 2016

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EDITORIAL

Dear reader,

I am pleased to introduce you to the first newsletter of our Nano-Cathedral project. Inside this issue you will find a pill size introduction to the project objectives and innovation.

We will also take you to a short tour into three among our beautiful participating cathedrals. For this first issue we have chosen to show you those where we had the first technical meetings: Pisa, Vitoria and Ghent.

You will find an insider look on a selection of our past events, and an outlook on two important future appointments.

I hope you enjoy, and please don't forget to give us your feedback, it will be appreciated by the Nano-Cathedral Team.

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NANO-CATHEDRAL

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Materials-based solutions for protection or preservation of European cultural heritage

Web Site
www.nanocathedral.eu

IN THE SPOTLIGHT

EUROPEAN CATHEDRALS

NEW TECHNOLOGIES

PISA

Pisa was at the center of attention on past 6th and 7th October, when Opera della Primaziale Pisana hosted the VI international conference on European Cathedrals.

This year the focus was on **new technologies**: a rather extensive overview of new materials and new methodologies for the conservation and promotion of our cultural heritage was offered by the speakers.

Our partners participated as invited speakers to the first afternoon session, devoted to **Nano-Cathedral project** as a case-study.

The success of the conference offered a great opportunity for our project to inform and have precious feed-back from stakeholders of the culturale heritage and innovative technologies target groups.



OBJECTIVES

Cathedrals, distributed throughout Europe, are representative of the diversity of European cultural heritage. **Five different cathedrals were selected** as they may be considered as representative of both different exposure conditions and different types of stones.

In particular, the Cathedral of **Pisa**, in central Italy, and the Cathedral de Santa María of **Vitoria-Gasteiz** in Spain were selected as representative of south European “Mediterranean” climate in coastal and continental regions, respectively; the Sint-Baafs Cathedral of **Ghent**, in Belgium, the Cathedral of St. Peter and Mary in **Cologne**, Germany and the St. Stephen’s Cathedral, in **Wien**, Austria, were selected as representative of North European climate in coastal and continental regions, respectively.

Moreover, the **Oslo** Opera House, was considered as an example of a contemporary building coated with white Carrara marble.

They also represent different lithotypes such as *marble, sandstone, limestone*.

The objective is providing “key tools” for restoration and conservation:

- On representative lithotypes
- On European representative climatic areas
- With a time-scale/environmental approach
- With technology validated in relevant environment (industrial plant and monuments)
- Exploiting results also on modern stone made buildings

INNOVATION

The results of the project will provide both innovation in technology and rationalization of the conservation policy affording a renewed knowledge of the complex system “treatment/stone substrate”, and of the durability threshold of these treatments.

Innovative materials, such as nano-particle based consolidants and proper polymer nano-composites based coatings will be developed. In particular, the employment of nano-particle with different composition will allow to provide methods for consolidations, protection and pollutants decomposition, thus preventing part of the degradation and providing long-term conservation.

An environmental impact assessment of the new materials will be included, to ensure development of sustainable and compatible materials and methods.

The multidisciplinary approach is granted by the presence of expertise covering the field of geology and materials science, institutions for management and preservations of the cathedrals, restoration companies and also nano-particles and coating producers.

The multidisciplinary approach and the inclusion of industrial partners directly involved in the production processes and technology of restoration will allow the development of affordable methodologies, granting reliability of the developed chain.

THIS KIND OF SYNERGY IS NANO-CATHEDRAL’S KEY FOR INNOVATION

CATHEDRALS

CATHEDRAL OF PISA

The Cathedral of Pisa was founded in 1064 and consecrated with great pomp on September 26th 1118. It was built in two stages: one by architect Buscheto - who created the original layout with the basilican body with four aisles and one nave, a transept with one nave and two aisles and the dome on the cross vault - and one by Rainaldo, who extended the building and the façade. The building was not finally completed until the last quarter of the XII century, when Bonanno's bronze leaves were placed on the central door: a devastating fire, in 1595, destroyed them along with many medieval art works, that were replaced in the XVI century when a vast decorative plan was started.



CATHEDRAL OF VITORIA

Construction of the cathedral of Santa María in Gothic-style began in the late 13th century and continued throughout the 14th century. It was conceived as a church-fortress, with great volume and enclosed appearance, being part of the city's defences. Between 1496 and 1861, the building operated as a collegiate church, and it was that year when it was declared a cathedral. It has a Latin-cross plan, with a wide transept crossing and circular apse containing several chapels. The facade's portals are richly decorated with sculpture. The western portico is masterwork consisting of three portals: the central one consecrated to the Virgin, the left one dedicated to San Gil and the right one to the Final Judgement and Saint James.



CATHEDRAL OF GHENT

St. Bavo's Cathedral dates back to Ghent's oldest parish church, St John's Church, which was probably built in the mid-10th century. Already from 1038 onwards, this building was expanded and altered in the Romanesque style. Today, no traces are left of the original church, but large fragments of the Romanesque building can still be admired in the present day crypt. Due to an explosive growth of Ghent's population in the 13th century, the church got too small. From the end of the 13th century onwards, as the city continued to grow, the Romanesque parts were replaced step by step by new parts in the Gothic style: the choir, the radiating chapels, the transepts, a new chapter house, a new western tower, ... Finally, after three centuries of construction, in 1569, the main structure of the Cathedral as it can be seen today, was completed.



KICK OFF MEETING

4-5 June 2015
Pisa, Italy

The project NANO-CATHEDRAL aims at developing new materials, technologies and procedures for the conservation of deteriorated stones in monumental buildings and cathedrals and high value contemporary architecture, with a particular emphasis on the preservation of the originality of materials and on the development of a tailor-made approach to tackle the specific problems related to the different lithotypes. In fact the objective is providing “key tools” in terms of innovative nano-structured conservation materials, for restoration and conservation on a full European scale, thanks to the research work made onto lithotypes representative of different European geographical areas and styles and of different climate and environmental conditions.



2° TECHNICAL MEETING

23 December 2015
Vitoria-Gasteiz, Pais Vasco, Spain

The two main challenges of the NAnocathedral project are the development of nano-structured composites and the set up of nano-structured treatments for stone monuments. Nano-structured composites that will be developed shall be suitable both for surface protection and conservation.

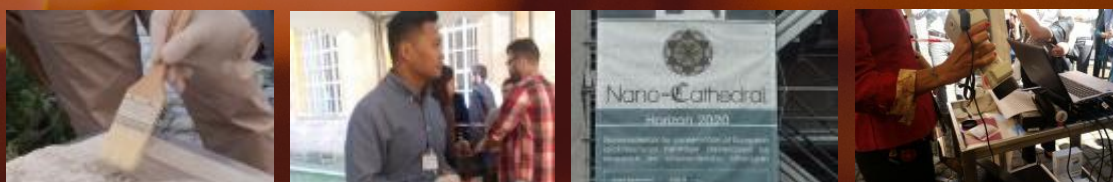
Nano-structure treatments shall be suitable for the cathedrals’ specific lithotypes as well as for the specific climatic and environmental conditions of the country where the cathedrals are located.



PARTNERS INTERNAL WORKSHOP

04-05 October 2016
Rome, Italy

During the meeting, the new innovative materials selected and developed for the project have been presented and the experience of the six cathedrals involved in the products testing has been illustrated. Experimental test methods for the control of products efficacy have been demonstrated and advantages, disadvantages and any problems encountered in their use have been discussed.



FUTURE EVENTS

LAUNCH OF ECHOES CLUSTER



During the Europeana Space 3rd International Conference **Networking Session** on November 22nd, Berlin.

ECHOES “Enabling Cultural Heritage Oriented European Strategies” is the cluster for Cultural Heritage ,created in response to the European Commission vision of merging all European stakeholders and EC financed actions within the field of Cultural Heritage. Nanocathedral is one of the starting projects of the cluster.

ECHOES is a community driven bottom-up action to connect all conservation science activities and stakeholders in Europe.

CONFERENCES

EURONANOFORUM 2017

21-23 June, Valletta, Malta

The EuroNanoForum biannual conference, now in its 8th edition, has grown since 2003 into the most significant European forum in its field for scientists, industrialists and policy makers. NF2017 will review the latest developments in nanotechnology & advanced materials and discuss their contribution to European manufacturing across all industries.

The discussion this year will also be extended to framework conditions like education, standards, regulations, IPR and safety issues, as well as entrepreneurship and industrial policy. The program includes sessions on finance and funding through European and National programs, in particular Horizon 2020, smart specialisation and public-private partnership initiatives.



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