

HERACLES NEWSLETTER

N°1 - July 2016

HERACLES

This project has received funding from the European Union's Framework Programme for Research and Innovation HORIZON 2020 under Grant Agreement 700395

Funding 6.564.313.75 Euro
Starting date 1st May 2016



CASE STUDIES

CRETE, GREECE:

1. *Minoan Knossos Palace*
2. *Venetian coastal fortress of Koules*

GUBBIO, ITALY

3. *Medieval Wall and High Town*

QUICK OVERVIEW OF THE HERACLES PROJECT

HERACLES main objective is to design, validate and promote responsive systems/solutions for effective resilience of Cultural Heritage (CH) against climate change effects, considering a holistic, multidisciplinary approach through the involvement of end-users, industry/SMEs, scientists, conservators/restorators, social experts, decision and policy makers.

HERACLES will develop a system exploiting an ICT platform to collect and integrate multisource information to effectively provide complete and updated situational awareness and support for improving CH resilience, including new solutions for maintenance and conservation and to define the materials able to be integrated in the platform for proper maintenance, remediation and restoration actions.

Heracles will elaborate climate forecast models to anticipate problems and to back up the required solutions, exploiting operational protocols for overall CH risk cycle management which include proper remote geo sensing for mapping and preventing geo-hazards. Moreover Heracles will back up all the progress and exploit results to other scenarios through an established advisory board that includes relevant personalities.

The strength of HERACLES solutions is their flexibility in evaluating a large quantity of different information that can be changed and tailored to specific CH assets needs, guaranteeing a general applicability.

HERACLES system will be designed and developed taking into account the economic sustainability and future acceptance by the market and the social and economic impact for public and local communities while respecting the integrity of CH and the value it hold for communities.

HERACLES envisages effective technological transfer of outcomes to large companies, SMEs and end users.

HERACLES expects wide audience awareness through suitable dissemination, communication, education and training activities to share vision and progresses obtained to different communities.

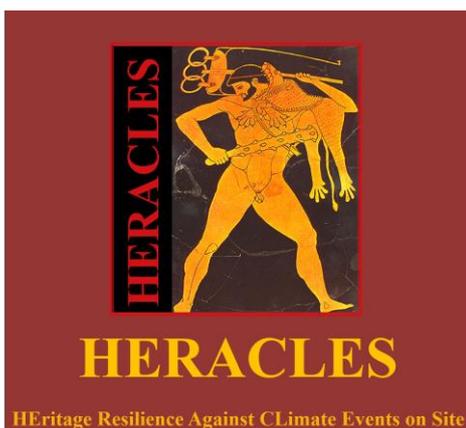
Horizon 2020 Call: H2020-DRS-2015

Topic: DRS-11-2015

Mitigating the impacts of climate change and natural hazards on cultural heritage sites, structures and artefacts

Scope

Develop eco-innovative solutions to help mitigate the effects of climate change and natural hazards on cultural heritage sites, structures and artefacts taking into account the values they hold for people and respecting their historic and cultural integrity. Effective adaptation strategies, systems and technologies for better risk management of vulnerable heritage materials and for mitigating damage to cultural heritage assets. Innovative environmental assessment methodologies, integrated monitoring technologies and systems, improved non-invasive and non-destructive methods of surveying and diagnosis including wide area surveillance, cost-effective conservation and restoration techniques,





Welcome address from Prof. Filippo M. Stirati, Major of Gubbio.

risk management, disaster prevention and quick damage assessment when catastrophes occur.

KICK OFF MEETING

26TH- 27TH OF MAY 2016, GUBBIO, ITALY

52 Delegates from the 16 partners that constitute the HERACLES Consortium and the EU representative met in Gubbio, Italy on the 26th and 27th of May for the Kick off Meeting to discuss the project workplan for the manifold activities of HERACLES.

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After the welcome address from the Gubbio Tawn Hall Major (*Filippo Stirati*) and the Umbrian Region Authority (*Anna Ascani*), the end users (Ephorate and Gubbio) presented their requirements from the project and the EU representative (*Christophe Coudun*) explained the H2020 contractual framework.

After an the overall workplan presentation by the coordinator (*Giuseppina Padeletti*), workpackages leaders presented in detail the workflow and workpackages.

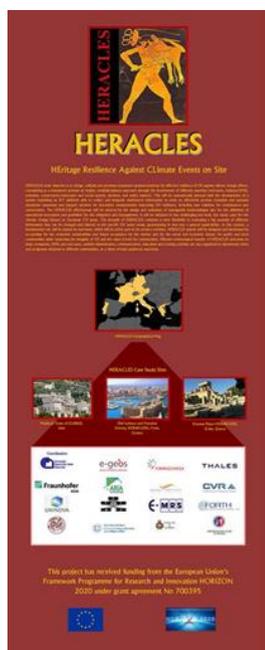
At the end of the first day a field trip was organized to evaluate the different monuments that the Town of Gubbio would like to see addressed. The visit included the medieval City walls, the Consul's Palace, the Town Hall and the Palace of the Dukes of Montefeltro, where we were able to evaluate the state of limestone, travertine, sandstone, plasters, binders and mortars used in the monuments and subsequent restorations that suffer of increased deterioration due to climate change effects coupled with pollution. The excelent dinner offered by CVR allowed for a healthy discussion to strengthen and expand the internal network of project participants generating new ideas and concepts.

During the morning of the second day workpackage presentations continued before preparation for the next actions and concluding remarks. Suggestions were made for immediate arrangements concerning increased communication lines between different WPs according to interconnections evidenced during the KoM and a reminder of the first deliverables to be met in the forthcoming months. Dissemination actions already accomplished were also divulged such as actions durig the E-MRS 2016 Spring Meeting.



E-MRS 2016 Spring Meeting

BANNER AND HERACLES STAND, LILLE GRAND PALAIS, 2ND -6TH MAY 2016, FRANCE



The E-MRS annual spring meeting is the largest conference on material science and engineering in Europe. The event attracted more than 2700 scientists from all over the globe who presented more than 4000 papers spread over 31 parallel symposia and 3 thematic workshops. Moreover, a scientific exhibition hall with more than 73 booths attracted the presence of a corresponding number of companies presenting their recent technological advances in all fields of materials science and applications. The Heracles project partners that were present for the spring meeting had the opportunity to communicate the project objectives and its goals to this large scientific community. A display banner was produced and presented together with printed information material listing the project scope and target work.

Participation in the “EUROPE in MOTION” workshop

E-MRS 2016 Spring Meeting thematic workshop aiming to show to the International Materials Community that Europe is very present in key and cutting edge topics at scientific and technological levels through a number of initiatives, such as platforms, networks, committees from industry, research institutions and academia.

Symposium FF participation in the E-MRS spring meeting

During the works of Symposium FF on “Sustainable knowledge and preservation of Cultural Heritage for future generations” a HERACLES Project communication took place by the coordinator (G.Padeletti) showing the activities related to HERACLES expertise/partners. The project coordinator was one of the Symposium FF organizers on “Sustainable knowledge and preservation of Cultural Heritage for future generations”.



Heracles Stand at E-MRS 2016 Spring Meeting

Presentation of the Heracles consortium

The Consortium is constituted by 16 entities from 7 countries.



The Consiglio Nazionale delle Ricerche (CNR), Italy, has a duty to promote research activities for the scientific, technological, economic and social development of Italy. Institutes involved are: the Institute of Nanostructured Materials, ISMN (chemistry, materials science and nano-technologies applied to CH), the Institute for Electromagnetic Sensing of the Environment, IREA (remote sensing, diagnostics and monitoring environmental risks) and the Institute of Research on Population and Social Policies, IRPPS, (demography & migration, welfare, social policies, higher education and dissemination of knowledge and information technology). <https://www.cnr.it>



e-GEOS, Italy, an ASI/Telespazio, is a leading international player in the geo-spatial business. e-GEOS offers a complete range of products and services in the Earth Observation and in the geo-spatial application domains, based on both optical and radar satellites as well as on aerial surveys. As the European hub for VHR (Very High Resolution) data, e-GEOS grants unique access

to the COSMO-SkyMed and distributes also GeoEye-1, IKONOS, Radarsat, QuickBird and WorldView and IRS satellites.<http://www.e-geos.it/>



Leonardo, Italy, is a global high-tech company and a key player in the Aerospace, Defence and Security sectors. Experts in international information management, sensors and systems integration. In leveraging collective strengths, and capitalizing on the synergies across major business areas, Leonardo exploits world-class systems, ICT and smart services to deliver robust, high-integrity mission-critical solutions across different sectors and domains.<http://www.leonardocompany.com>



Thales, France, is a world leader for critical information systems, with activities in aerospace (with all major aircraft manufacturers as customers), defence, and security (including ground transportation solutions). It provides its customers with all the key functions in the critical information loop, from detection and processing to transmission and distribution. Thales develops its strategic capabilities in component, software and system engineering and architectures through its R&T organisation.<https://www.thalesgroup.com>



Fraunhofer, Germany, is a leading organisation of institutes of applied research in Germany, undertaking contract research on behalf of industry, the service sector and the government. Fraunhofer IOSB core expertise comprises information and knowledge management, software architectures and object-oriented systems, signal and image processing, optronics and image exploitation, system technologies, modelling and optimisation.<http://www.iosb.fraunhofer.de>



ARIA Technologies SA, France, is a consulting and software development company, fully dedicated to the study of the atmospheric environment. ARIA is a leading supplier of computerized modelling systems for the purpose of managing air quality resources and offers a wide range of tools at all spatial scales, from building scale to continental scale. The technical solutions offered by ARIA are in daily operation in several countries worldwide, for studies and for the management of air quality resources.<http://www.aria.fr/>



SISTEMA GmbH, Austria, offers products and services based on Remote Sensing analysis techniques for environmental monitoring and soil management. R&D activities in direct contact with Universities, Research Centers, Customers and End-users mainly focus on meteo-climatic data processing, climate data services, solar radiation mapping, multi-spectral and multi-temporal analysis, geo-spatial data infrastructures implementation for time series access and visualization and standardization of processes.<http://www.sistema.at>



CVR, Italy, is a SME for the design, development and production of glues, plasters, plasterboards, mortars, gypsum and cement based materials for innovative and sustainable constructions. Smart products for the construction, the renovation and the historical preservation of buildings represent a key business of CVR. Through cooperation with academic institutions, CVR became market leader for hi-tech production systems and sustainable, smart and energy efficient materials for building and urban improvement.<http://www.cvr.it/>



Uninova, Portugal, is an institute devoted to the development and application of new technologies. CEMOP has expertise in thin-film technologies and development of advanced materials. CENIMAT is devoted to R&D+ Innovation in advanced materials science & engineering, nanomaterials and nanotechnologies, including semiconductors, biotechnology, polymers, thin film coatings, dielectrics, metals, ceramics and composite materials, covering all the scientific & technological aspects of processing and characterization.<http://www.uninova.pt/>



TIEMS, Belgium, is a Global Forum for Education, Training, Certification and Policy in Emergency and Disaster Management, dedicated to developing and bringing the benefits of modern emergency management tools, techniques and good industry practices to society for a safer world. This is accomplished through the exchange of information, methodology innovations and new

technologies, to improve society's ability to avoid, mitigate, respond to, and recover from natural and man-made disasters.<http://tiems.info/>



European Materials Research Society (E-MRS), France, has as mission to promote advocacy and outreach of advanced materials science and technology towards industry and policy makers, to provide reports on education and research prospective on advanced materials to assist or help national, European authorities and industries, encouraging discussions among researchers and key players of science and technology, to establish strong links with other scientific societies worldwide.<http://www.european-mrs.com/>



The Foundation for Research and Technology Hellas (FORTH), Greece, is one of the largest research centres of Greece. The Institute of Electronic Structure and Laser (IESL) is the main laser research centre in Greece, including atto-science, micro/nano-electronics, polymer science, materials science and astrophysics. IESL pioneered in the use of advanced laser technology in diagnostics and conservation, laser cleaning and analysis of works of art and monuments. The Institute of Applied and Computational Mathematics (IACM) specializes in research on numerical simulation and monitoring of environmental, engineering and physiological processes.
<http://forth.gr/>



The Department of Chemistry at the University of Crete, Greece, was founded as a research-driven entity with a vibrant and strong research environment that has succeeded in attracting the highest quality researchers and is having ever-increasing success at bringing in a diverse range of funding. The department has devoted much effort to establishing collaborative relationships with other institutions both at the national and international level, maximizing its international profile, exchanging knowledge, disseminating its findings, and building a growing network of productive research relationships.
<http://eilotas.chemistry.uoc.gr/uocchem/>



The Ephorate of Antiquities of Heraklion (EphAH), Greece, is responsible for the Antiquities from the Prehistoric to the Ottoman Period in the District of Heraklion in Crete. The responsibilities of EphAH span from Archaeological research and studies to architectural preservation and surface conservation interventions on the monuments that belong to its supervision. EphAH is responsible for the two unique monuments of different archaeological eras to be studied in HERACLES: a) The Palace of Knossos (located to the South-East of the city) and b) The Venetian Sea-Fortress of "Koules" (Rocca a Mare) in Heraklion port (located to the North of the city).
<http://www.culture.gr>



Gubbio, Italy, is the capital of a municipality, among the largest in Italy (the seventh "commune" in Italy). The town is located in the middle of a wide territory located approximately 200 km North from Rome and 200 km South East from Florence. The historic city centre has many medieval buildings and major monuments: an urban space miraculously intact in its plant with churches, convents, palaces, public and private buildings, ancient walls, squares, streets, fountains, shops, orchards and gardens. Gubbio is responsible for one of the sites to be analysed in the HERACLES project.
<http://www.comune.gubbio.pg.it/>



UNIVERSITÀ DEGLI STUDI
DI PERUGIA

The University of Perugia and the researchers affiliated to the Department of Civil and Environmental Engineering, and to the CIRIAF Interuniversity Research Center on Pollution and Environment "M. Felli" of the Department of Engineering have renowned expertise in carrying out continuous structural health monitoring and rapid post-earthquake and post-disaster assessment of historic constructions using techniques such as vibration measurements, automated operational modal and statistical process control analysis.
<http://www.unipg.it>



Sbandieratori di Gubbio– Traditional flag throwers of Gubbio kindly arranged a show for HERACLES at the KoM