Montelibretti 31/05/2018

To the kind attention To His Excellency Dr. Monther Jamhawi,
Director of the Department of Antiquities
Amman (Jordan)

Mr. Akhtam Oweidi
Director of the Archaeological Missions.
Amman (Jordan)

AREA DELLA RICERCA DI ROMA Via salaria, km. 29,300 – C.P. 10 – Monterotondo St. (RM)

Dear Directors,

I would like to inform you that the research project on the site of Umm ar-Rasas is becoming wider through new collaborations between Italian institutions. These institutions are: University of Perugia; University of Rome - Tor Vergata; University of Ancona; Italian Ministry of Environment; Higher Institute for Environmental Protection and Research (ISPRA) and the second most important public research institution in Italy (ENEA).

The project will be developed in three years and will consider several different activities.
The activities are intertwined to each other and every activity is aimed at studying particular aspects of the archaeological complex: from the topographical point of view to the enhancement of the site through the use of 3D Laser Scanning and photogrammetric techniques.
The main activities will be focused on the area between the *Castrum* and the complex of the two byzantine churches. In this area laser scanning and photogrammetric surveys will be performed on the extant structures. Topographical surveys will be conducted using the GPS and remote sensing tools. To achieve better results we would also ask for the permission to fly over the site with the aid of a drone provided by a local service company. The study and the analysis of the topographical surveys are fundamental to produce the site map and to design touristic paths.
Geophysical prospections will be performed in the area between the churches and the Stylite Tower that could be particularly interesting from an archaeological point of view.
These prospections are aimed at detecting possible anomalies, which would show the presence of underground structures. Where anomalies are found, archaeological soundings will be carried out to explore the potential extent of the urban area.
Furthermore, geophysical analyses will be run also on other sectors of the site in order to study the hydraulic network, since some water tanks and wells have been located during the last survey campaign at Umm ar-Rasas in December 2017.
Thanks to all these activities we will be able to study and identify the ancient city's road network.
A specific technical study will be carried out on the Stylite Tower. An interdisciplinary team composed by engineers and architects with different fields of expertise will work together to analyse the static and seismic issues affecting the stability of the Tower. Computer simulations will be performed to estimate the potential damages caused by weathering and

earthquakes. This study is aimed also at designing a future restoration intervention for the monument's conservation.
Lastly, petrographic analyses will be made on the ancient masonries (stone blocks and mortars) of the churches, the residential buildings, their adjacent structures and the Tower. These analyses are fundamental to deepen the knowledge on the construction techniques used at Umm ar-Rasas from the Roman to the Early Islamic period.

I am pleased to inform you about the beginning of a new important collaboration with the Faculty of IT and Computer Science of the Yarmuk University. The main purpose of this partnership is to develop integrated survey methods to create virtual representations for the enhancement of Jordanian and Italian archaeological sites. This collaboration is part of a bilateral project between Italian National Research Council (CNR-ITABC) and the Higher Council for Science and Technology in Amman (HCST) called "A guide for archaeological sites that use Augmented Reality and Digital Storytelling".

We are currently choosing an eligible site in Italy for the application of these technologies; in Jordan, instead, we would ask for permission to improve our activities on Umm ar-Rasas in cooperation with Yarmuk University. Indeed, our research team has already been working on the site during the last 4 years, producing documentation that could be widened through further multidisciplinary research studies.

The expected outcomes of the project are:

- The collection of all the results achieved during the entire project (information and documents); all this material could be also archived in a Geographic Information System (GIS) database useful for your Institution and UNESCO.
- Enhancement and public access improvement of Umm ar-Rasas through the development of proper museum facilities (touristic paths, panels, displays and exhibitions).
- Training activities for students and DoA staff concerning the application of new survey technologies for the enhancement of the Jordanian Cultural Heritage.

The data acquired during every campaign will be spread through the Facebook page named "Kastrum Project-CNR/DOA/MAECI: Enhancement of the Unesco site Umm ar-Rasas". This page was created in 2015 and now has reached 279 followers.

You can find a brief summary of the scheduled activities for the next three years listed below:

YEAR 1

Study area: city between the *castrum* and the church + preliminary investigation on the area between the church and the Stylite Tower

- Laser scanning and photogrammetric surveys (CNR-ITABC)
- Site map (University of Perugia-Dept. of Humanities, Ancient and Modern Languages, Literature and Cultures; CNR-ITABC)
- Topographical surveys (GPS + Drone + remote sensing) to produce a site map (CNR-ITABC)
- Geophysical prospections (road access, water tanks and archaeological soundings) (CNR-ITABC)
- Computer simulation on existent data about the Tower (CNR-ITABC; ISPRA; ENEA)
- Didactics (all)
- Training for University students and/or DoA staff (all)

YEAR 2

Study area: between the church and the tower

- Laser scanning and photogrammetric surveys (CNR-ITABC)
- Touristic paths (University of Perugia-Dept. of Humanities, Ancient and Modern Languages, Literature and Cultures; CNR-ITABC)
- Archaeological excavations (University of Perugia-Dept. of Humanities, Ancient and Modern Languages, Literature and Cultures)
- Petrographic analyses (CNR-ITABC)
- Tower analyses and materials samplings (masonries, structures, materials) (CNR-ITABC; ISPRA; ENEA)
- Didactics (all)
- Training for University students and/or DoA staff (all)

YEAR 3

- Laser scanning and photogrammetric surveys (CNR-ITABC)
- Exhibition of the project scientific results (all)
- Touristic information panels (all)
- Research on the historical roads (Geophysical prospections) (CNR-ITABC)
- Restoration and conservation plan for the Tower (CNR-ITABC; ISPRA; ENEA)
- Didactics (all)
- Training for University students and/or DoA staff (all)

We value very much this project and we hope to continue working in partnership with your Institution.

The team of the next missions will be composed by:

- Roberto Gabrielli (Project Director, Researcher, CNR-ITABC)
- Donatella Scortecci (Medieval Archaeologist, University of Perugia - Dept. of Humanities, Ancient and Modern Languages, Literature and Cultures)
- Roberto Franchi (Geologist expert in Petrography, CNR-ITABC)
- Alessandra Lazzari (Archaeologist, Database expert, CNR-ITABC)
- Antonio Salvatori (Archaeologist and Topographer, expert in ancient building techniques, CNR-ITABC)
- Alessio Pascolini (Medieval Archaeologist, University of Perugia - Dept. of Humanities, Ancient and Modern Languages, Literature and Cultures)
- Marilena Cozzolino (Researcher, Geophysicist, CNR-ITABC)
- Giovanni Caruso (Engineer, CNR-ITABC)
- Giuseppe Del Monaco (Geologist, ISPRA)
- Paolo Clemente (Civil engineer, ENEA)
- Giovanni Cangi (Civil engineer, CNR-ITABC)
- Eva Malinverni (Architect, Marche Polytechnic University)
- Luigi Gobbi (Technician expert in Scanning Electron Microscopy SEM, Marche Polytechnic University)
- Pasquale Galatà (IT Technician, CNR-ITABC)
- Giorgia Greco (Intern, CNR-ITABC)
- Eleonora Russo (Expert in UNESCO legislation, CNR-ITABC)
- Maddalena Scattini (Intern, CNR-ITABC)
- Eleonora Scopinaro (Intern, CNR-ITABC)

The presence on the field of the people will depend on the scheduled activities for each year, therefore the various researchers will not be working all together in the same period.

The next mission would be scheduled for October 2018 with your permission.

Kind regards,

Dott. Roberto Gabrielli

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