

ANNUAL REPORT: Vulci 3000 2018 FIELD SCHOOL

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Digital Photogrammetry of the excavation trench in 2018.

Vulci 3000 is a National Geographic-awarded project started in 2014 with non-invasive technologies and since 2016 with archaeological excavations in the urban area of Vulci. It is the first archaeological permit released by the Italian Superintendence in the last 70 years for the excavation of the urban area. The IFR field school is as well the first one admitted to work in the area in the last one hundred years.

The 2018 field school was a great success and the contribution of all the IFR field students was outstanding, even if several of them didn't have former experiences of excavation in Classical archaeology.

They learned how to deal with the single context method of excavation, the Harris matrix, the identification and study of archaeological material, and also how to manage and integrate different technologies such as drones (wings-drones and copters), robots, laser scanners, 3D digital photogrammetry, georadar and geoelectric prospections, robotic total stations, 360 camera recording. The archaeological documentation was entirely paperless and they learned how to record digitally in the trench and in lab through the Duke local intranet system (based on one server and six tablets). By the end of the day all the datasets were saved (raster, vector, and forms) and geolocated in the local servers. All these activities helped the entire project to improve data recording and the seasonal goals of excavation. A new scientific collaboration with the LBI Pro (Ludwig Boltzmann Institute, Institute for Virtual Archaeology and Geophysical Prospections) brought to Vulci one of the top European teams in geophysical prospections and as well the best technologies available on the market. The school contributed (by a rotation of 2

students per team) substantially to every phase of data-capturing and to inventory, identification and classification of all the archaeological finds.

All the students passed brilliantly all the tests (written and oral) of the field school, showing new skills in the archaeological practicum, methods and theory.

Below an itemized description of the main activities.

Introduction to Etruscan archaeology:

- Series of lectures on pre-Roman archaeology, Romanization of Etruria and the urbanism of Southern Etruria
- Discussions in team about the main research topics of Etruscan and Roman archaeology
- Lectures in museums and on site about the archaeology of city-States, funerary architecture, urban plans, ritual objects, imported finds.
- Comparative analyses on the archaeological landscapes of Vulci, Tarquinia and Cerveteri

Archaeological excavations:

- Theoretical introduction about the Principles of Archaeological stratigraphy, supported by a presentation (power point and guidelines) focusing on
 - Archaeological stratification
 - Stratigraphical units
 - Law of Archaeological Stratification
 - Harris Matrix
 - "Single context method" recording system
- Practical fieldwork consisted of:
 - Stratigraphical units identification based on distinction criteria: color, consistency and composition
 - Physical relationships understanding, in order to identify the most recent unit to be excavated
 - Stratigraphical units' documentation: unit sheets, photos and plans based on total station measurements
 - Discussion about the interpretation of stratigraphy in relation to the archeological context.

Archaeological material

- Lectures, supported by presentations, about the main types of materials that can be found in the Vulci's excavations, their chronology and use: fine table-wares, cooking- wares, amphorae, tiles and other architectural ceramics, metals and glass tools, etc.
- Practical training on the treatment of the archaeological finds after excavation: washing, labeling, preliminary classification, inventorying and entering data into the finds-database.
- Flotation of the sediments found inside the cistern-well investigated this year and preparation of the samples for paleobotanical analysis.

Digital labs

GIS, Laser Scanner and Photogrammetry

The course on GIS and 3D recording techniques consisted of both theoretical lessons (PPT/PDF presentations) and practical training in the field. 3D recording techniques for archaeological documentation are as follows:

- Theoretical principles of photogrammetry (structure from motion) compared to laser scanning for archaeological documentation.
- Principles of terrestrial and aerial photogrammetry.
- Image Based Modeling (IBM) and Structure from Motion (SfM) photogrammetry
- Camera settings for photogrammetry
- Photo shooting techniques for the generation of 3D models
- Use of Ground Control Points for georeferencing
- Introduction to PhotoScan photogrammetric software
- Geographic Information System (GIS)
- Principles of Geodesy (coordinates systems, reference ellipsoids and geoids, projections)
- Georeferencing
- Use of GIS in archaeology
- The students were given an opportunity to experiment with Duke Dig@Lab advanced equipment including:
- Practical training with Faro Focus laser scanner (survey of three Etruscan rock cut tombs)
- Practical photogrammetric survey of the Mithraeum in Vulci

We organized several educational special trips: to Rome (Imperial Fora and the special exhibition “Traiano. Costruire l'impero, creare l'Europa”, http://www.mercatiditraiano.it/it/mostre_ed_eventi/mostre/traiano_costruire_l_impero_crea_re_l_europa), Tarquinia (necropolis and museum, <http://www.tarquinia-cerveteri.it/en/museum-and-necropolis-of-tarquinia/necropolis>) and at the Etruscan Museo of Canino (Museo della Ricerca Archeologica), the National Etruscan Museum of Vulci. The Rome exhibition is co-organized by Duke University in collaboration with the Museum of Imperial Fora. Students had a special guided tour in Rome in the Imperial Fora and in the exhibition with Dr. Danelon (Duke University) and in Tarquinia and Canino with Maurizio Forte, project's director.

We had also the visit of several local and national media (RAI national TV, Teletarquinia, Corriere di Viterbo, Corriere della Sera, Etruria Oggi), https://www.facebook.com/Vulci3000/notifications/?section=activity_feed&subsection=mention&ref=notif&target_story=S%3A_I1533554096890923%3AVK%3A2163031760609817

On July 12, all the students and the participants of the project attended the annual presentation of the result of the Vulci 3000 Project to the city of Montalto di Castro and local media with the presence of the mayor, the director of the park and the president of Fondazione Vulci.

The preliminary results of the 2018 season of Vulci 3000 will be presented at the AIA conference in San Diego in a special workshop dedicated to new methods and technologies in Etruscan archaeology. We received an invitation to publish a preliminary report also in a new book of the Cambridge University Press.

A documentary film on the Vulci 3000 Project and the excavation, entirely produced by Duke University, will be presented in the Fall 2018 at Duke and later on, in specialized film festivals.

