Secrets Beneath the Surface: Using Today’s Technology to Discover Vulci’s Past

Katherine McCusker¹, Maurizio Forte, PhD²

¹Art, Art History and Visual Studies, PhD Candidate
²Departments of AAHVS and Classical Studies

The Project
This project, from the Bass Connections team “Smart Archaeology,” shows the results of targeted excavation at the Etruscan-Roman site of Vulci (Viterbo, Italy) as well as additional wide-spread remote sensing surveys for higher resolution data. Previous Bass Connections projects provided the base off of which this project launched.

Ground Penetrating Radar (GPR) Survey
During the summer of 2018, we worked in conjunction with a specialized GPR team from the Ludwig Boltzmann Institute of Archaeological Prospection and Virtual Archaeology in Austria to complete a resistivity survey as well as collect new GPR data.

Spatial Analysis
The layering of previous remote sensing data, historical data, excavation information and new GPR data, details about the layout and development of the urban space of Vulci have begun to emerge. Below details several of the most prominent conclusions from our spatial analysis.

What is GPR?
Ground Penetrating Radar (aka GPR) is a technology that sends pulses of radar energy into the ground. This signal is reflected by dense materials to a receiving antenna, which records the elapsed time and strength of the returning signal. Results vary based on frequency and geology.

Conclusions: This new information paints a picture of a quarter of wealthy domestic structures aligned to the pre-existing Etruscan street network

Future Research
During Summer 2019, the Vulci 3000 team returns to the field to continue excavation. This year the team will be utilizing a new archaeorobot (below left) and drone sensors (below right), which will scan and map additional areas of the site. Thanks to a Student Continuing Research Grant from Bass Connections, this summer I will be doing a more detailed analysis of our growing volume of geospatial data using a specialized computer program, Pix 4D.

Excavation Update
Part of our Bass Connection team focuses on excavation and field surveys of the archaeological site of Vulci. Thanks to previous years of Bass Connection’s projects, we were able to choose an excavation location focused on a particular building in the Western Forum area of Vulci’s urban center. The team has uncovered an Augustan-age building (pictured below) with an Etruscan cistern hidden underneath the travertine floor.

Below is a map illustrating the area of the archaeological park that were covered by the various technologies and frequencies. Our surveys remain focused on the center of city, a hub for public and private life in ancient times.

What is GPR?
Ground Penetrating Radar (aka GPR) is a technology that sends pulses of radar energy into the ground. This signal is reflected by dense materials to a receiving antenna, which records the elapsed time and strength of the returning signal. Results vary based on frequency and geology.

Pictured above is the 16-channel 400 MHz MALA Imaging Radar Array, onsite at Vulci, used to collect the new GPR data.

Nevio Danelon, PhD; Antonio LoPiano, PhD Student; Vulci Archaeological Park; Vulci 3000 Excavation Team; Ludwig Boltzmann Institute of Archaeological Prospection and Virtual Archaeology; Department of AAHVS; Department of Classical Studies; Soprintenza Archeologia del Lazio e dell’Etruria Meridionale; Fondazione Rovati