

BLOOD AND SAND – THE LIFE AND DEATH OF GLADIATORS IN ROMAN AUSTRIA SCHOOL OF GLADIATORS DISCOVERED AT ROMAN CARNUNTUM, AUSTRIA

An international team of archaeologists, geophysicists and computer specialists from the Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology (LBI-ArchPro) is using the latest non-invasive technology to reveal archaeological remains hidden beneath the soil in unprecedented detail. The team's work attracted international attention last year after locating a new wooden henge only 900 m from the great stone circle at Stonehenge, and recent finds using ground penetrating radar includes burial mounds and settlements dating from the Viking Age in Norway and Sweden. Now, the interdisciplinary team has discovered a unique Roman building complex at Roman Carnuntum, 20 km east of Vienna in Austria and this will shed new light on how Roman gladiators lived and died in the provinces alongside the river Danube.

The geophysical systems, developed and used by LBI-ArchPro and its partners, provide detailed information on the nature and location of archaeological remains and imagery of features meters below the ground. At Roman Carnuntum, one of the largest preserved archaeological landscapes of its type in Europe, the team used a novel motorized multi-antenna ground penetrating radar to explore interesting features identified on aerial photographs. The suspicious area lay to the west of the amphitheatre, which was built in the first half of the second century AD and excavated from 1923 to 1930. Following survey of this area archaeologists were astounded when the new sensors revealed an extensive building complex interpreted as a school for gladiators (latin - *ludus*).

The Roman amphitheatre at Carnuntum held around 13000 spectators and contemporary inscriptions claimed that it was the fourth largest amphitheatre in the Roman Empire and frequently used for gladiatorial games. Despite the extensive excavations surrounding the amphitheatre the area that contained the school of gladiators attracted little attention and the first hints that there was an important building here came from recent analysis of aerial photographs. These photographs showed the main road leading from the town towards the amphitheatre with buildings hosting shops and inns (*taberna*) on the eastern side. The western side generally showed no structures at all but some photographs hinted at the existence of a large building. The LBI-ArchPro team decided to investigate these shadowy traces using a high-resolution ground penetrating radar system which could cover the area in a matter of hours. The exceptional building, identified through this rapid survey as the school for gladiators, is almost unique in the Roman Empire for its size and completeness.

The gladiatorial school at Carnuntum was set within a massive compound enclosing an area of 2800 m² and set at the eastern end of a 11000 m² land parcel surrounded by a wall. The school buildings were arranged around a central inner court where ground penetrating radar revealed a circular training arena, 19 m in diameter, enclosed by a wooden stand for spectators. The foundations of a 100 m² heated training hall, an extended bath complex, the 300 m² administration and living complex of the owner of the school can be seen in the detailed images produced by radar. In contrast, the gladiators appear to have been given cells that were as little as 5 m² in size. The image of this unique building is so clear that water pipes, sewers and the remains of the floor heating system can be seen clearly, along with the access roads to the amphitheatre, entrances and the foundations of mausolea. The archaeologists believe that they have also located the gladiators' cemetery, immediately behind a building associated with large grave monuments, stone sarcophagi and other, simpler, graves.

In scale the new detected *ludus* is comparable to the *ludus magnus*, the great School of Gladiators behind the coliseum (*amphitheatrum flavium*) in Rome. The sensational image of the newly discovered School of Gladiators, provided by this new technology, is so complete that it has allowed the LBI-ArchPro team to digitally recreate this unique find without digging. The result can be explored by the software Wikitude World

Browser, an augmented reality application which visualizes the school of gladiators on your ipad, android, blackberry or symbian device right on site.

Additional information: archpro.lbg.ac.at

The Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology is a research institute of the Ludwig Boltzmann Gesellschaft (www.lbg.ac.at) and was founded in 2010. The institute carries out its research activities together with several international partner organizations and aims to create a network of archaeological scientists supporting interdisciplinary research programmes for the development of large scale, efficient, non-invasive technologies for the discovery, documentation, visualisation and interpretation of Europe's archaeological heritage. The lead partners of the institute based in Vienna, are the University of Vienna (A), the Vienna University of Technology (A), the Austrian Central Institute for Meteorology and Geodynamics (A), the Province of Lower Austria (A), Airborne Technologies (A), RGZM-Roman-Germanic Central Museum Mainz (D), RAÄ-Swedish National Heritage Board (S); IBM VISTA-University of Birmingham (GB) and NIKU-Norwegian Institute for Cultural Heritage Research (N).