

# BUILT HERITAGE IN CYPRUS

by Alessandro Camiz, Carmine Canaletti and Zeynep Ceylanlı



Fig. 1 - View of the Church in the Acheropoietos Monastery, QR code to a video about the workshop 2014(<https://youtu.be/5mGgEla-npc>).

The two workshops held in Cyprus in collaboration with the Girne American University and the Ozyegin University, Istanbul, were aimed to the documentation and rethinking of new uses for the historical Built Heritage of the Acheiropoietos Monastery, in 2014, and of the Kyrenia Castle, in 2018. They were the first activities of this kind and showed how teaching, documentation and research can be applied all together in complex cultural heritage environments.

## FIRST WORKSHOP IN CYPRUS: ACHEROPOIETOS MONASTERY

The first one was held in the Monastery called “Παναγία Αχειροποίητος” which gets the name from the presence of a sacred icon said to be «made without hands» which was one of the main relics in the church (Enlart, 1899). In this artwork there was the representation of the Virgin Mary, a work which was consi-

dered as created in a “miraculous” way, and thus protected from any possible iconoclasm. The date of its foundation is not known, thus, the katholikon appears to have been built during the XIth or early XIIth century (Canaletti & Camiz, 2016). The first written references to the monastery are no older than the XVth century. The analysis of the building revealed the presence of several consecutive construction phases: for first relevant architecture is a central plan church covered with a dome, probably built in the late-Byzantine period on the ruins of a paleo-Christian basilica, characterized by three-naves, then extended with three narthexes, this transformation changed the general aspect of the plan layout into the one of a longitudinal basilica. The construction of an enclosure wall around the church marked the limits of the monastery, this intervention was done in a series of phases, following a variety of expansions, demolitions and restorations. The monastery settlement is quite isolated from the modern town of Λάμπουσα (Lambousa, the resplendent), and stands on the northern waterfront of Cyprus.

The inclusion of the complex into a military barracks in the Seventies included the transformation of some parts and the addition of service structures. In the analysis made during the workshop, the one on the masonry types was capable in outlining the phases of construction for various parts of the original complex. The church in itself is not suffering from specific structural issues, even if it has lost a large part of internal finishing and artwork, the massive walls and vaults are still capable in showing an ar-

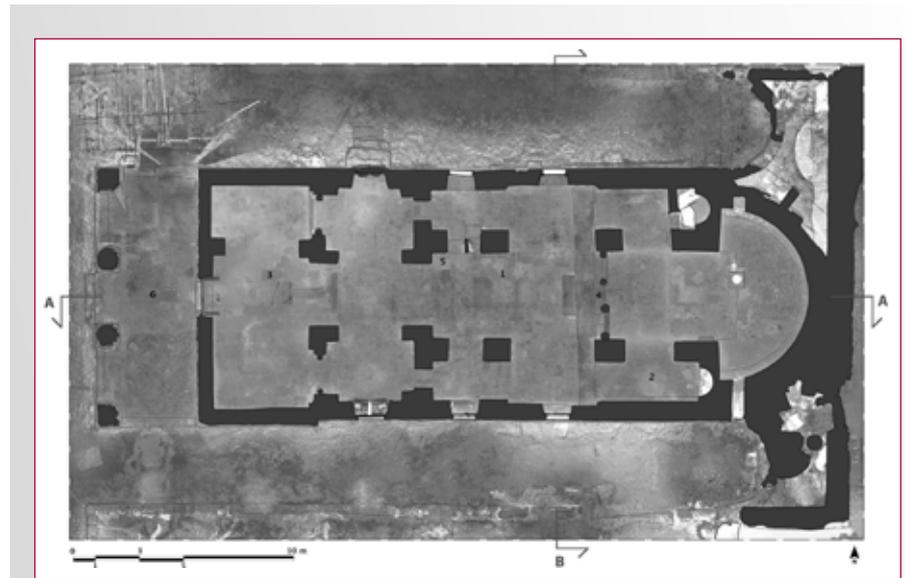


Fig. 2- Plan view of the Church, extracted from 3D Laser Scanner Survey 2018.

ticulated layout and interesting architectural features. The situation is a little worse for the northern wing of the monastery,

which suffered a heavy structural damage and was stabilized with some scaffoldings.

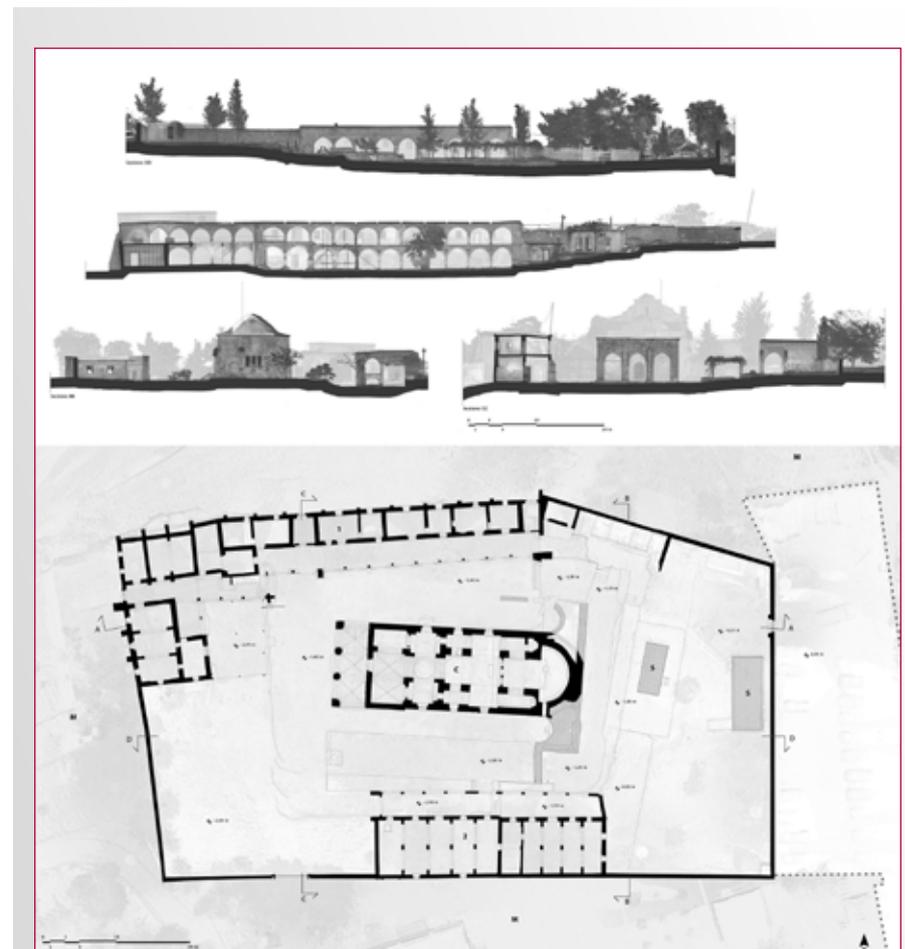


Fig. 3 - Plan view and fronts of the Monastery from 3D Laser Scanner Survey 2018.



Fig. 4 - View from the sea of the Kyrenia Castle and QR code to access a video about the workshop 2018. (<https://youtu.be/1MCzjde3m8>).

## SECOND WORKSHOP IN CYPRUS: KYRENIA CASTLE

The second workshop in Cyprus was held in the Kyrenia Castle, which represents the main historical architecture on the waterfront of this area, presenting a very articulated transformation through time, evolving accordingly to the changes in weaponry technologies and the wills of its different owners (Camiz et al., 2016). The Kyrenia Castle shows three main periods of architectural development, representing a significant example of the evolution from a medieval castle to a fortress developed for using and resisting more modern weapons (Scott Petre, 2010). The three periods traceable in the architecture of the fortifications are Byzantine (330-1192), Lusignan (1192-1472) and Venetian (1472-1570) (Enlart, 1899). The special position of this fortification, with its strategic importance, dominating on the seafront, is underlined by archaeological evidence in the castle area. Indeed it is possible to refer to remains of Roman mosaics and catacombs that suggest the presence of even earlier settlements. To this archaeological presence it is possible to match the “Kyrenia Shipwreck”, which is the common name indicating the

important finding of a ship from the IVth century BC in the waters in front of Kyrenia (Katzev, 1981). This important relic, representing one of the very first underwater archaeology interventions, is currently visible inside the castle museum (Katzev, 2008).

In both workshop cases, the digital survey intervention was conducted using a Z+F 5006h imager 3D laser scanner unit with the integration of photogrammetries for the most interesting parts and artworks and to give a more complete and detailed consistency to the digitalization of these two architectures. In 2014, the aim was to produce a complete documentation of the religious settlement with a proper level of details, supporting further reading and offering a first complete description of the Church and monastery. In this, the collaboration with the local archaeologists turned out for the most positive results, with an extended sampling of mural stratigraphies then connected to the pointcloud derived from the lasergrammetry and helpful in supporting the construction phase hypothesis.

In 2018, Kyrenia Castle was extensively surveyed with a specific attention to the spaces of relevant historical importance,

and with a specific series of photogrammetry on the exhibited hull from the shipwreck and also on a specific mural element. In fact, in the same room where the ancient ship is kept, the top part of the internal wall shows a large part of plaster characterized by a series of graffiti representing ships and boats (Şevketoğlu, 2017). In most of the situations, assigning a date and correctly identifying the ship type in the graffiti is not a simple or certain task. However, as they are often on the walls of a building, on castle cisterns or churches, the building they are made on represents the terminus post quem, the date after which the graffiti was made.

## CONCLUSIONS

Therefore, in this case it is possible to give only an estimated date standing in a wide span of time, probably between the XIIth and the XVIth century. In the same way producing an appropriate photogrammetry of this artwork was quite challenging. The difficult light condition as well as the vibrations coming from the platform giving access to the graffiti required some specific shrewdness for completing a well usable photogrammetry. Following, the resulting



Fig. 5 - Digital 3d models of the shipwreck plaster with and links to access the models in sketchfab.com (<https://skfb.ly/6WyRA> and <https://skfb.ly/oqFIQ>) plus a video about the graffiti (<https://youtu.be/Yqw1ZrdWH1A>).

3D digital model allowed an accurate tool for better studying and visualizing the set of nautical representations exploiting virtual light solutions and then putting in evidence all the traces still existing on the surface of the plaster (Bertocci et al., 2020). In addition to the laser-grammetry survey of the castle, in the 2018 workshop, it was possible to operate a drone flight, which was a significant contribution to the completion and integration of the digital survey. The UAV unit available was a DJI Spark, equipped with a 12 Mp camera, conducting a series of flights and then producing a sub-selection of the best 1303 shots, covering the roofs and almost all the top parts of the walls, making it possible to generate an extensive, accurately detailed 3D model of the entire exterior of the castle and its adjacent area. The workshop in the Kyrenia Castle was the occasion to establish an operative base of knowledge and to gather a significant amount of data about a castle that represents a challenging monument in the Mediterranean scenario. The first digitalization of this fortification is the starting point of a series of studies. In between, a certain number of Master Degree and Specialization Thesis which included the development of an HBIM for some parts of the castle (Capparelli & Camiz, 2019). Among the various studies, a specific attention was addressed to proposals for a new museum, encompassing a strategic restoration plan and the improved display of key artefacts, most notably the Kyrenia Ship and multiple graffiti, supported by contemporary digital and virtual museum technologies (Ceylanlı et al., 2019). The historical value of the subject and the technically advanced intervention, mixed with professional and academic competencies has brought to a high-quality teaching moment, capable of putting in evidence historical values and specific features of a valuable built heritage.

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#### ABSTRACT

*This paper presents two workshops in Cyprus focused on documenting and rethinking the use of historical built heritage: the Acheiropietos Monastery (2014) and Kyrenia Castle (2018). Using 3D laser scanning, photogrammetry, and UAV surveys, the projects revealed multiple construction phases, structural features, and historical layers. Special attention was given to the Kyrenia Shipwreck and wall graffiti. The resulting digital models supported architectural analysis, conservation strategies, HBIM development, and museum enhancement proposals. These workshops demonstrate how interdisciplinary approaches and advanced digital methods can effectively study, preserve, and valorize cultural heritage.*

#### KEYWORDS

**HBIM; KYRENIA CASTLE; 3D LASER SCANNING; PHOTOGRAMMETRY; DIGITAL SURVEY, ACHEIROPIETOS MONASTERY; CONSERVATION;**

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# I georadar svelano un antico segreto ...



*Sembrava una leggenda.  
Oggi arriva la conferma:  
tra il Castello Sforzesco  
e Santa Maria delle Grazie  
c'è un passaggio segreto.*

La rete di gallerie sotterranee disegnata da Leonardo è stata individuata grazie un'indagine tecnologica realizzata dal Politecnico di Milano insieme al Castello Sforzesco e con il supporto tecnico di Codevintec, con l'utilizzo delle tecnologie georadar e laser scanner.

VIDEO



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