The aim of this joint paper is to present and assess the results of the Salamis Harbour Project, initiated in 2016 and supported with a substantial grant from the Honor Frost Foundation. This is a three-year (2016-2018) project of systematic underwater survey and documentation by the Hellenic Institute of Marine Archaeology in collaboration with the Ephorate of Underwater Antiquities of the Hellenic Ministry of Culture and Sports, with the involvement of the Laboratory of Marine Geology and Physical Oceanography of the University of Patras under Prof. G. Papatheodorou, and having, for the first time, as main focus the Bay of Ambelaki and adjacent areas on the eastern coast of the island of Salamis in the Saronic Gulf (Greece), opposite Piraeus. This historic bay, with many submerged ancient installations in very polluted waters, is the commercial and military harbour of the Classical, Hellenistic and Roman town of Salamis (forming an unofficial Athenian deme), certainly one of the most important harbours, next to those of Piraeus, of the city-state of Athens in the Classical period, and the plausible point of assembly of the united Greek fleet on the eve of the naval battle of 480 BC; and also found in close proximity with some famous monuments to the great sea-battle, on the long promontory of Kynosoura and on the islet of Psyttaleia (that is, the tumulus/polyandreion and the trophies).

This new underwater reconnaissance, in a seascape loaded with both traditional and modern harbour, ship-building and other industrial activities, was carried out in successive stages, in November-December 2016. Apart from traditional methods in underwater archaeological survey, current technologies in mapping, surveying, geophysical prospection and aerial photographic documentation and other fields were employed in collaboration with the team from the University of Patras.

One of the main results of the 2016 campaign (to be supplemented with new data from the 2017 survey) has been the production of a detailed topographical plan of the survey-area showing all submerged antiquities (breakwaters, piers/moles, fortification works, buildings and other constructions) visible in the innermost part of the Bay of Ambelaki, in very shallow waters (with an ever-changing water-table). These remains have been identified on the north, west and south sides of the inner harbour of the ancient town of Salamis and surveyed with the use of aerial photography, photogrammetric documentation and architectural drawing.

Of major interest is an ‘enclosed’ (fortified) area (of special function), with various remains, on the north-western side of the inner bay. It is limited, on the south, by an impressive long wall (or jetty), 160m long by ca. 4m wide, ending in a strong well-built circular tower, with a diameter of ca. 7m, closely comparable to defensive towers in well-known fortified harbour-sites; and, on the east, by a modern mole (on ancient foundation?), 47m long, built with blocks originating from ancient structures. Immediately west of the latter, part of a unit of port architecture (or a segment of the
foundation course of an important civic building?), 11.5m long, consisting of a fine row of large ashlar limestone blocks, on a North-South axis, was recognized and tentatively cleared in 2016, and certainly deserves further investigation.

Included in the material recovered from intensive surface collections, in nine (9) sectors of the survey-area, are: a large quantity of pottery, mostly ranging from Classical to Late Roman and Medieval times; two loom-weights and other clay objects and a bronze coin of Corinth of the fourth century BC. Dominant in all groups, is the pottery (both plain and Attic Black-Glazed wares) of the Classical and Hellenistic periods, apparently associated with the harbour fortifications and other installations dating from the most flourishing phases of Athenian and Salaminian history.

88. Looking for the Harbour of Classical Torone: Underwater Exploration and Geophysical Prospection

Tom Hillard (Department of Ancient History, Macquarie University, New South Wales, Australia)

Lea Beness (Department of Ancient History, Macquarie University, New South Wales, Australia)

Ancient Torone was a Bronze Age emporium and a celebrated port in the Classical, Hellenistic and Roman periods. With a privileged position at the southern tip of Sithonia in the Chalkidiki, it was frequently a point of violent contention – and remained so until 1659 when the Venetian Morosini took the Turkish fortress there. The underwater exploration of the suspected harbour area began in 1993, the ultimate result of which was the revelation of an extended part of the terrestrial site (now submerged) and the mapping of the ancient shoreline. Anchorage in the lee of the site’s distinctive promontory would have been possible (and it is almost certain that wharf facilities existed here) but was considerably more restricted than might have been imagined. In 1999, our attention shifted to the large floodplain immediately to the northeast of the Classical city and behind the modern beach-barrier. Hand-augering produced cores indicating a marine embayment in this area. ERT, undertaken in 2015 and 2016, indicates that this embayment may at one time have had a depth of around 30m in parts. Coring, proposed for 2017, will seek to reveal the chronology and the nature of the bay’s (or lagoon’s) infill.

89. New Surveys at the Patara Harbor: An Overview on the Harbor Defense Systems

Mustafa Koçak (Johannes Gutenberg-Universität Mainz, Mainz, Germany)

Erkan Dündar (Kahramammaras Sütçü İmam Üniversitesi, Onikişubat/Kahramanmaraş, Turkey)

The Lycian city Patara is located at a strategically important maritime traffic point. The sea routes between east and west, as well as north and south, cross here. This situation has left many traces, mainly in written sources. Since the harbor of Patara was well suited as a naval base, it was a locus of contention from the fourth century BC onwards among the Mediterranean powers, including the Hecatomnids and the Ptolemaic Kings, who not only controlled the city in the third century BC, but also changed its name to Arsinoe. Patara harbor was the first contact point for the Alexandrian ships that reached Asia Minor. Patara’s great military significance was diminished during the Pax Romana, but it can still be observed in the late Antique and Byzantine periods.
Scientific investigations of this now marshy harbor are relatively new. Primarily geoarchaeological and geophysical surveys are being carried out. Detailed documentation of the architectural remains accompanies these investigations. The field campaign in the summer of 2017 will focus in particular on the inner harbor, where a sea wall has been recorded over the past years along with the remains of a round building (tower?). The more than two-meter- high preserved sea wall, and the ‘tower’ of about 10m in diameter, raise new questions about the system of fortifications in the harbor. In the planned contribution, these questions will be discussed on the basis of the results of the survey and comparative examples.


Kalliopi Baika (Centre Camille Jullian, Centre national de la recherche scientifique, Aix-Marseille Université, Aix-en-Provence, France; Ephorate of Underwater Antiquities, Hellenic Ministry of Culture and Sports, Athens, Greece)

Dionysis Evangelistis (Ephorate of Underwater Antiquities, Hellenic Ministry of Culture and Sports, Athens, Greece)

Jari Pakkanen (Finnish Institute at Athens, Athens, Greece)

The paper discusses the 2013-2015 field campaigns of on-going geoarchaeological investigations and underwater excavations conducted on the ancient harbour site and Crusaders’ port of Kyllene/Glarentza, NW Peloponnese, Greece. Ancient harbour-city of Kyllene was the major port of Elis and probably one of the ports that served the sanctuary of Olympia during the Olympic Games. It was also an important naval base of the Spartan fleet in the Ionian Sea in the fifth century BC during the Peloponnesian War. Centuries later, on the same location, developed the Medieval Crusaders’ port of the city of Glarentza built by the Franks in the thirteenth century. During the Crusader period, it evolved as one of the major transhipment harbours in Western Greece connected with the ports of Genoa and Venice in the west.

The Kyllene Harbour Project (2007-2017) is a joint project of the Finnish Institute at Athens and the Ephorate of Underwater Antiquities of the Greek Ministry of Culture; it is conducted in collaboration with the Universities of Patras, Mainz and Aix-Marseille. The interdisciplinary approach so far involves archaeological underwater and coastal topographical survey, marine geophysical investigations, coastal geomorphological prospections and underwater excavation. The remains of the harbour installations of the medieval port are very extensive, including an inner and an outer harbour basin. However, the original harbour configuration is today completely altered, being partly submerged and partly silted up. Therefore, the principal objective of the research is the study of the harbour’s layout and the diachronic geoarchaeological evolution of the site in order to reconstruct the maritime façade of the harbour-city from the Classical to the Medieval period.

Since 2013, the underwater excavation has focused on deciphering the different construction phases of the harbour, as well as comprehending its layout and function during its long period of use.
91. The Harbour of Naukratis, The British Museum Fieldwork 2012-2017

Ross Thomas (Department of Greece and Rome, The British Museum, London, UK)

Alexandra Villing (Department of Greece and Rome, The British Museum, London, UK)

Naukratis was the primary Mediterranean port of Egypt from its founding in ca. 630 BC until the construction of Alexandria by Kleomenes of Naukratis, on behalf of Alexander the Great. Long after the construction of Alexandria, Naukratis remained an important city, boasting the oldest Greek sanctuaries in Egypt and an impressive industrial centre and river port on the main transport route to Memphis from the Mediterranean, along the Canopic branch of the Nile. This paper will present results from the British Museum programme of survey, auger coring, geophysics and excavation undertaken at the site since 2012. The new fieldwork has substantially changed our understanding of the site, revealing a more extensive port city than previously assumed and traces of the religious, maritime and everyday activities of the diverse population of Naukratis.

92. Underwater Excavations in the South Bay of Dor and the Development of Harbors in the Eastern Mediterranean

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Ehud Arkin (Maritime Civilizations Department, University of Haifa, Haifa, Israel)

Ayelet Gilboa (Department of Archaeology, University of Haifa, Haifa, Israel)

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Ilan Sharon (Department of Archaeology, Hebrew University of Jerusalem, Jerusalem, Israel)

The study of the remains at Dor’s south bay may prove pivotal to the ongoing discussion on the development of harbors in the eastern Mediterranean. A recent paradigm (Marriner et al. 2014) – its foundation laid by the work of Raban (1995), Frost (1995) and others – recognizes three stages in the development of harbors: (1) Bronze Age proto-harbors, based on natural anchorages with minimal or no human modifications; (2) Iron Age harbors, defined as semi-artificial, with maritime installations appended to natural features; and (3) artificial harbors of the Classical to Byzantine periods, in which significant maritime structures were built. The direct archaeological evidence for built quays and moles in the Iron Age is scarce, with examples at Tabat el-Hammam in Syria and ‘Atlit in Israel. The massive coastal structures made of ashlar blocks at Dor, on the waterline and underwater, were also previously associated by Raban with maritime construction of the Iron Age. A successful season in 2016, aimed at examining the methodology of a joint land and sea excavation strategy, led to unexpected results regarding the understanding of known coastal and underwater structures at Dor and their relation to maritime activity in the bay, and discovered new underwater structures and features: massive shoreline Iron 1b–2 structures; earlier maritime construction of ashlar (Iron 1a or Late Bronze Age?); a possible mole, made of ashlar blocks of the type used in the Iron Age; and submerged deposits of clay with ceramics dating to the Middle Bronze Age and to the late Neolithic periods. This presentation will also include the results of a
second underwater excavations season at Dor, planned for February 2017, which is co-funded by the Honor Frost Foundation.

93. Ainos: A Harbour City and Hub in the Northern Aegean

*Thomas Schmidts (Römisch-Germanisches Zentralmuseum, Mainz, Germany)*

Ainos, today Enez (TR), is located at the mouth of the river Hebros (modern Evros or Meriç). This was an advantage for the development of this Northern Aegean harbour city because Ainos became a hub between maritime and inland navigation. The river Hebros and its tributaries were navigable for a long distance into the Thracian hinterland. According to Byzantine sources, larger vessels could go up to Hadrianopolis (Edirne) and smaller ones even up to Philippopolis (Plovdiv). Ainos was founded as a Greek colony. Literary and archaeological evidence attest the importance of the city especially in the Archaic and Classical periods. The Hellenistic and Roman Imperial eras were considered as times of decline in contrast to the Late Roman and Byzantine periods.

The paper presents the results of an interdisciplinary research project, financed by the German Research Foundation, which investigates the topography and environment of the ancient and Byzantine harbour city. As the result of siltation and the advance of the Hebros delta, Ainos is today some kilometres inland. Field work has been carried out since 2012 by archaeologists, geoarchaeologists and geophysicists. The analysis of the data is not yet finished, but it is possible to define potential harbour sites and building structures which were previously unknown. As evidenced by geoarchaeological research, three most probable harbour sites could be identified which show sufficient water depths throughout the centuries of Ainos’ prime time: to the north-east of the city, near the so-called ‘Königstochter Basilica’ in the Taşaltı lagoon, and between the citadel of Ainos and the Hebros river. Therefore, Ainos was operating several harbours with advantages and disadvantages depending on the different winds and seasons. Additionally, the work on selected groups of find materials (marbles, pottery) prove commercial contacts with the Mediterranean world and the Thracian hinterland. The alleged decline in the Imperial period has to be rethought.

94. Roman ports of Istria (Croatia)

*Ida Koncani Uhač (Archaeological Museum of Pula, Pula, Croatia)*

The territory of Roman period Istria had a port system that connected cities of the Adriatic Coast with the northern regions, through the city of Aquileia. An intense development of the coastal and hinterland agglomerations on the Istrian Peninsula started in the Late Republic period, with the founding of the colony cities, *Pola* and *Parentium*. The results of this process were a rapid economic growth and the foundation of a network of ports, in order to obtain that growth. Recent investigations in Pula have given new insights into the dating, morphology and function of one part of the Roman port. These excavations provided us with the systematically collected data that was used for the reconstruction of the depositional processes. One of the best preserved examples of a port related to a *villa* in Istria is located in Verige bay (Brijuni Islands). Two separate operative embankments with piers were located in the near vicinity of the residential, as well as a separate productive part of the villa. The size of the harbour itself
indicates a strong economic importance, which probably surpassed the role of a vila port. A similar context can be seen in the Roman port at Savudrija. The investigations, carried out from 2011-2014, gave us indications of the significance of that port on the nautical route towards Aquileia.

95. The Submerged Monumental Complex of the Roman Harbour System of Fossae Marianae (Gulf of Fos, South of France)

Souen Fontaine (Department of Underwater Archaeological Research, French Ministry of Culture and Communication, Marseille, France)

Mourad El-Amouri (Ipso Facto, Marseille, France)

Frédéric Marty (Aix-Marseille-Provence Métropole, France)

Corinne Rousse (Centre Camille Jullian, National Center for Scientific Research (CNRS), Aix-Marseille Université, Aix-en-Provence, France)

In the Gulf of Fos, on the south coast of France, lie the remains of a harbour system dating to the Late Roman Republican and the Roman Imperial period. The harbour complex is situated at the extremity of the presumed river channel dug by the troops of Marius to bypass the dangerous mouth of the Rhone. Mentioned as Fossis Marianis on the map of Peutinger, this major harbour complex has been for centuries one of the main harbours of the north-western Mediterranean, ideally located as access point to the Rhone Valley. If the wealth, abundance and concentration of archaeological remains leave little doubt about the importance and the density of the port's activity during the Early Empire, the layout of Fossae Marianae, the topography of the harbour zone and of the ancient settlement, the dating and the functionality of the port facilities are still not well defined. Paradoxically, the harbour zone has been very little studied if we take into account its archaeological and historical importance and its potential in comparative studies with contemporary large-scale harbour systems. The marine geophysical prospections undertaken since 2014 and the underwater archaeological excavations have revealed extensive port facilities preserved in situ. At present, the entire Gulf of Fos and the Fossae Marianae are being studied in the framework of a new large-scale research project, conducted by a multidisciplinary team, with as main objective the interconnected studies between the harbour zone, the coastal settlement and the Marius Channel.

96. The Two Ports Ishbiliyya (Islamic Seville) and Their Islamic Shipsheds

Carlos Cabrera-Tejedor (Institute of Archaeology, University of Oxford, Oxford, UK)

Fernando Amores Carredano (Department of Prehistory and Archaeology, University of Seville, Seville, Spain)

A few discoveries of archaeological remains related to harbour installations were made in Seville during the twentieth century. Unfortunately, these were scarce, and many of them lacked proper
archaeological methodology. Recent archaeological interventions, however, have increased our knowledge about the ancient port of Seville. The paper focuses on the history and development of the ancient port of Seville during the Islamic period. From a maritime archaeology perspective, it combines terrestrial and maritime archaeological evidence, literary and epigraphic material, as well as palaeo-geomorphological and palaeo-environmental studies. The chronicles from the Islamic period inform us about the development of a comprehensive naval policy during the rule of the Umayyad Emir of Córdoba Abd al-Rahman II (reign AD 822-852). This included the construction of a military fleet and harbour infrastructures including shipsheds, with the objective of providing maritime defences to the port of Ishbiliyya, after a dramatic Viking attack on the city in AD 844. During the twelfth century, new harbour infrastructures and a new dockyard with shipsheds were constructed by order of the Almohad Caliph Abu Ya'qub (reign AD 1163-1184). Little is known of the nature and layout of the harbour infrastructures of the port of Ishbiliyya, but we now have indications of the location of the shipsheds. During the Islamic period of Seville extreme changes occurred in the hydrography and geomorphology of the meander of the Guadalquivir River that not only transformed the ancient port but the entire city of medina Ishbiliyya. By understanding the extreme fluvial transformations that occurred in this epoch, the paper deciphers the process that led to the progressive siltation of the ancient channel of the river. The study of archaeological materials in combination with other proxies, allows a chronology to be proposed for the demise and subsequent disappearance of the ancient port of Seville.

97. Enhancing the Roman Imperial Maritime Infrastructure: Nero’s Deeds and Dreams

Robert L. Hohlfelder (History Department, University of Colorado, Boulder, USA)

Any attempt to parse the life and times of the emperor Nero (b. 37 AD - d. 68 AD) requires a walk down a well-trodden and often uncomfortable path. His well-known eccentricities, depravities, and possible psychosis are not qualities that inspire commendation or redemptive efforts. His perverse historical image was fixed shortly after his death by writers like Cassius Dio, Suetonius, Tacitus, and others whose literary damnatio memoriae plunged Nero into an abyss of calumny where he remains today as a trope for autocratic madness and excess.

In spite of this shroud of darkness that veils his reign, it is possible to peer into the Neronian looking glass and see occasional flashes of responsible cognizance beyond his phantasmagoria of overindulgence and irrationality. Perhaps some of his seemingly incomprehensible decisions served a purpose beyond what is often interpreted as madness or megalomaniacal expression. When seen from a perspective untainted by the bias of his ancient detractors, it is possible to see throughout his reign coherency and consistency of purpose in disparate actions relating to res maritimae that otherwise may seem unfathomable. In other words, one can see an ambitious, if not fully realized, maritime policy in play.

This paper is not an effort to revise Neronian history or to present his entire reign in favorable terms, for neither the extant sources nor my inclinations permit such an effort. Rather its focus is on the emperor’s interest in the navy, harbours, canals, and maritime corridors to facilitate the accessibility of imports. When considered collectively, specific imperial actions suggest that the emperor did take steps to try to solve the perennial dilemmas of the logistics and imperial infrastructure relating to maritime commerce, particularly regarding the importation of grain – problems that had faced his predecessors and that would continue to vex his successors. Although we can never fully understand his motivations for actions taken in this regard, history should
recognize his efforts to enhance Rome’s maritime infrastructure and, in so doing, strength the role of the Mediterranean as an important nexus of empire.

98. Limen kleïstos: Fortified Ports and Their Evolution from the Peloponnesian War Down to the Age of Augustus

Pascal Arnaud (Université Lumière Lyon 2; Institut Universitaire de France, Lyon, France)

The development of ports has led their designers to imagine the right solutions for the coexistence of two contradictory exigencies: security and fluidity. This paper intends to examine the evolution of port design and layout at the time-scale of half a millennium, through archaeological evidence, epigraphy and literary texts.

It will first show that the first solution was that of two adjacent ports, a larger one — that could be a roadstead — and a smaller one, where the naval station was established for the protection of the main port. The larger one would be wide open, while the smaller one would be highly protected and would have limited and controlled access. The association of a larger open port and a smaller ‘closed’ port. This pattern prevailed down to the age of Alexander. By the mid-fourth century, a new pattern emerged, that prevailed down to the Roman Empire. A communication is now made between the two ports by means of a narrow, highly protected channel.

The devices used for closing ports have changed through time as well. The earliest evidence mentions kleithra or ‘closers’. These are usually interpreted as chains, but actually they were not. Epigraphic evidence and military treatises combined show that kleithra were made of wood, partially immersed, partially emerged. They were probably a kind of a door or mobile fence. Evidence for doors is found in the mid-fourth century. There is no evidence for chains before the third century in the Punic world.

Last, but not least, the development of personal power, at Halicarnassus, at Syracuse and later at Alexandria led to the close association of port and palace as part of a stronghold for the protection of the king or tyrant, not only against external foes but also against his own people.

99. Port, Place or Complex System? Rethinking Roman Mediterranean Ports in the Light of the Portuslimen (RoMP) Project

Simon Keay (Department of Archaeology, University of Southampton, Southampton, UK; British School at Rome, Rome, Italy)

Pascal Arnaud (Université Lumière Lyon 2; Institut Universitaire de France, Lyon, France)

One aim of the Portuslimen Project is to put ‘ports’ back into their proper context. We consider a ‘port’ to be a functional interface between land and sea, and understand them not so much as single large identifiable nodes, but more a spectrum of dispersed activity within permeable maritime ecosystems.

These ecosystems comprised harbours, canals, settlements, rivers, beaches, private ports, villae maritimae, landscapes, roadsteads and seaside baths. While the built-up harbours and associated settlements might seem to be the best way of coping with maritime traffic, anchorages were
arguably more efficient. While fixed ports played specific overlapping administrative, commercial and fiscal roles, they were complemented by other components of the ecosystem. Thus harbours and associated port infrastructures could be quite small even though impressive in monumental terms. This also helps us better to realize that lighters may have played a far more significant role in the trans-shipment of cargoes from larger sea-going ships at these peripheral sites than is usually assumed to be the case.

This paper firstly considers the case of Carthage, where maritime infrastructure is rather less extensive than one might initially expect, with maritime functions focused upon nearby coastal sites, as well as at the port city itself. It then goes on to look at the historical and archaeological evidence for private ports close to the inner and outer harbours of Ephesos. It then looks at the port system of Imperial Rome, focusing upon connections between Portus, Ostia, Rome, and their connections to Centumcellae in the north and Puteoli to the south, as well as the role of minor ports and landing sites such as Astura.

The paper concludes by thinking through some of the implications of the idea of ports as complex systems, for our understanding of the organization of Roman maritime shipping during the High Empire.

100. The Rock-Cut Shoreline Features of Dana Island and the Maritime Landscape of the Taşucu Gulf, Rough Cilicia

Michael R. Jones (Institute of Nautical Archaeology, Texas, USA)

Dana Island, located 2.5km from the Turkish mainland and approximately 20km west of the modern city of Silifke at the eastern end of Rough Cilicia, is the largest island in the Taşucu Gulf. Known as Pityoussa in antiquity and Provensale in the Late Medieval period, Dana Island was the focus of research in August 2016 by the Boğsak Archaeological Survey (BOGA), directed by Günder Varinlioğlu of Mimar Sinan Fine Arts University (Istanbul). Architectural remains are preserved along most of the island’s north-western shore and on a peak at its southern end. The 2016 survey identified pre-Roman to Ottoman-period pottery and artifacts, with the majority of finds dating to the Roman and Byzantine periods. In 2016 the project’s maritime archaeologists investigated rock-cut features along the island’s north-western shore. Several types of features are preserved, including foundations for stone structures, cisterns, evidence of quarrying, and approximately one dozen sloped features which were initially investigated as possible slipways for ships. While these features are relatively large, they lack many of the characteristics of previously documented naval shipsheds and slipways from antiquity; they do, however, resemble rock cuttings that have been identified as quarries at other Mediterranean coastal sites. These features and the character of the site as a whole raise questions about the nature of the island’s economic and maritime links in antiquity. This paper compares evidence for economic and maritime activity on Dana Island with material from neighboring sites in the BOGA survey area (including rock-cut slipways opposite Boğsak Island) and the surrounding region. Preliminary research suggests that Cilicia’s Roman and Byzantine inhabitants utilized Dana Island as a port, quarry, and fortress, parts of an extensive maritime network along the southern coast of Asia Minor.
101. Fortified Crusader Harbours of the Syro-Lebanese-Palestinian Coast

Patricia Antaki-Masson (Centre d'Etudes Supérieures de Civilisation Médiévale, University of Poitiers, Poitiers, France)

The Crusaders had in their possession along the Levantine coast several harbours necessary for the landing of goods, pilgrims, merchants and fleets. Of various sizes and capacities, these maritime structures offered different facilities according to their importance in terms of location and trade. Furthermore, some of these, the major ones, were fortified. Our communication will deal with these fortified places which were part of a larger network of coastal fortifications, along a coastal strip stretching from Lattakia in the north to Caesarea in the South passing through Jbeil, Beirut, Sidon, Tyre and Acre. We will consider the multiple defensive structures and protective measures set in place to counter possible enemy attacks. These include defensive walls, towers, fortresses, protected doors, entrance chains, outer harbours, the use of massive masonry sometimes built with metal cramps and with reused spolia. We will also pinpoint for each case whether these structures already existed since Antiquity or Islamic times and were thus reused or incorporated into Frankish maritime buildings or whether they were new constructions. Besides the several studies conducted on the topic, mainly monographs, our presentation will rely on the literary and iconographic documentation and primarily on the archaeological evidence that still survives in some places. The results of recent studies on fortified harbours such as the ones at Tyre will be highlighted.

102. Crusader Mooring: A View from Arsur (Israel)

Dan Mirkin (Jacob M. Alkow Department of Archaeology and Ancient Near East Cultures, Tel Aviv University, Tel Aviv, Israel)

Deborah Cvikel (Department of Maritime Civilizations, University of Haifa, Haifa, Israel)

Oren Tal (Jacob M. Alkow Department of Archaeology and Ancient Near East Cultures, Tel Aviv University, Tel Aviv, Israel)

The maritime installation, sometimes called the ‘port’ or the ‘military harbour’ of Apollonia/Arsur/Arsuf, is located at the foot of the cliff on which the Crusader castle stands, about 37km south of Caesarea, Israel. Opinions have differed as to the true nature of the site. Was it a real port or harbour? Was it just a mooring basin for small craft? Or was it an installation designed to prevent an approach from the coast to the cliff on which the castle itself stood? In attempts to elucidate these questions we have carried out investigations over the last five years, within the ‘harbour’ itself, as well as outside. Our investigation began in October 2010, with an extensive survey of the installation and its surroundings with ground-penetrating radar (GPR) which identified anomalies. These were later investigated by water-jetting, which revealed objects under the seabed at various depths. An extensive underwater excavation of the maritime installation itself was carried out in November 2013. The results of our endeavours contributed substantially to the knowledge of the structure of the breakwaters surrounding the installation and the depth. We have also compared our findings with primary historical texts relating to the installation. This
last investigation was generously supported by an HFF research grant.
The lecture will summarize our investigations and results, and will try to provide an answer to this longstanding riddle.