Book of **Abstracts**

NETWORK **E**VOLUTIONS

18-20 January 2017

Organised by
Rubina Raja, Aarhus Universitet
Søren M. Sindbæk, Aarhus University

Hosted by UrbNet, Aarhus University, Denmark

UrbNet
CENTRE FOR URBAN NETWORK EVOLUTIONS
The Danish National Research Foundation

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OUTLINE

Urbanism is a catalyst of ways of life marked by social complexity and networks of wider, ultimately global interdependence. Networks are increasingly seen as a defining dynamic of this process. The conference *Network Evolutions: Conceptual Agendas in Urban Archaeology* aims to explore how scientific techniques can be integrated with contextual archaeological and historical approaches to form a "High Definition" view of urban dynamics in the past.

A network approach to urban evolutions asks how modes of connectivity might convey agency by accommodating, catalysing or transferring changes and continuities. Network analysis has proven potential in archaeological and historical research, but refined data is often lacking. Emerging applications of isotopic, biomolecular and geoarchaeological techniques expand the potential for archaeology to refine the precision of dates, contexts and provenance ascribed to excavated materials. We invite contributions which explore evolving urban networks based on archaeological, historical or scientific data, and which address the following questions:

-   How can network theory and concepts inform research on urban societies in the past?
-   How are archaeological and historical questions productively framed as network problems?
-   How is network data identified and processed in urban archaeology and history?
-   How are incomplete data sets and uncertainties managed in different research traditions?
-   How can formal analysis methods, together with qualitative, contextual approaches, contribute to elucidate and interpret network structure, dynamics and change in the archaeology and history of urban societies?

Urban networks is the second of three conceptual conferences aimed to inspire and challenge the theoretical and methodological development of concepts and models which inform contemporary archaeological approaches to the urban past, and thus the work of UrbNet. Together with the first conference (*Biographies of Place*, held in January 2016) and the third one (*High-Definition Narratives*, planned for 2018), the conference will form the basis of a three-volume thematic publication, aiming to develop a perspective of urbanisation as a pattern of evolving social and spatial networks.

We are aiming to bring together approaches that might point the way as to how a better knowledge of the material provenance of objects can inform an understanding of urban practices and interactions, and how contextual interpretations of network data may clarify the structure, dynamics and agency of urban connectivity. Inspired by complex systems theory, we propose to assess network models according to qualitative and quantitative data. From the perspective of past people, we ask: what were the relational and interaction-based opportunities, constraints and abilities, which caused urban places and communities to emerge, endure or cease as recognisably similar patterns from a diversity of practices and situations?

The conference shall explore how new forms of data can be harnessed to test, challenge and revise narratives of particular urban sites and fundamental assumptions about trajectories, dynamics and causal conditions of urbanisation in the pre-modern past. Furthermore, the conference will also explore concepts of urbanism and themes relating to urbanism in a historiographical perspective which will inform us about the ways in which scholarship has been shaped by directions in research.

PROGRAMME

WEDNESDAY 18 JANUARY 2017: NETWORK APPROACHES	
13:30-14:00	Registration
14:00-14:10	**Welcome and introduction** Rubina Raja and Søren M. Sindbæk
14:10-14:15	**Commentary** Nicholas Purcell
14:15-14:45	**Incorporating geographical imagination into early demographic estimates** Peter Taylor
14:45-15:10	Discussion
15:10-15:40	**The urban taxonomic conundrum: And a way out** Roland Fletcher
15:40-16:05	Discussion
16:05-16:30	Break
16:30-17:00	**The right tool for the job: Reflections on how to approach the numismatic material in an urban context** Olav E. Gundersen
17:00-17:25	Discussion
17:25-17:55	**The potential of network science for archaeology and history: Illustrated through a network model of the Roman economy** Tom Brughmans
17:55-18:20	Disscussion
18:45	Dinner at UrbNet for speakers and UrbNet employees

THURSDAY 19 JANUARY 2017: SITES AND REGIONS	
9:00-9:30	Coffee and breadrolls
9:30-10:00	**Gerasa (Jordan): Pottery production and trade networks in Roman to Early Islamic times** Heike Möller
10:00-10:25	Discussion
10:25-10:55	**A network of resources: Resource networks** Kirstine Haase and Neeke Hammers
10:55-11:20	Discussion
11:20-11:50	**Intra-urban networks: The streets of medieval Ribe** Morten Søvsø
11:50-12:15	Discussion
12:15-14:30	Lunch and free time for museum visit

PROGRAMME
- CONTINUED

THURSDAY 19 JANUARY 2017: SITES AND REGIONS	
14:30-15:00	**Intramuros: Investigating relations between cross-industry practices and networks in 6th-century Sagalassos** Elizabeth Murphy
15:00-15:25	Discussion
15:25-15:55	**Gotham at the Bosporus: Networks of urban metabolism, imperial ecology and spatial practices in medieval Constantinople** Johannes Preiser-Kapeller
15:55-16:20	Discussion
16:20-16:45	Break
16:45-17:15	**Thinking in networks in ancient Hauran: From soft archaeological factors to grand historical narratives?** Anna-Katharina Rieger
17:15-17:40	Discussion
18:30	**Speakers´ dinner in town** Departure from Moesgaard at 18:00

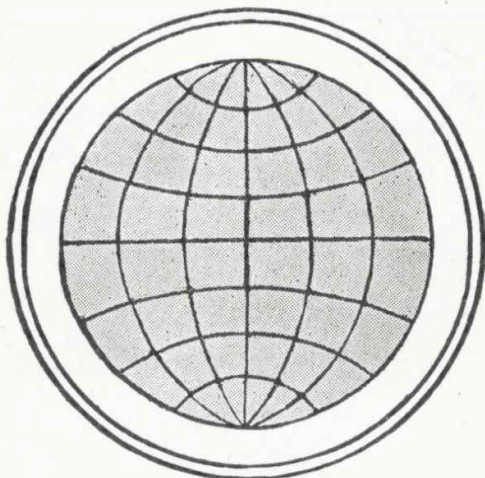| FRIDAY 20 JANUARY 2017: GLOBAL FLOWS	
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8:30-9:00	**Networks of authority and networks of things in the western Indian ocean** Stephanie Wynne-Jones
9:00-9:25	Discussion
9:25-9:55	**On the interface of two worlds: The early medieval town of Dzhankent (Kazakhstan)** Irina Aržhantseva and Heinrich Härke
9:55-10:20	Discussion
10:20-10:40	Break
10:40-11:10	**Srivijaya: A maritime polity at the intersection of multiple networks** Pierre-Yves Manguin
11:10-11:35	Discussion
11:35-12:05	**Stimulus, cue, action, result and response: How to conceptualise interaction in urban networks of the Roman Near East** Eivind Heldaas Seland
12:05-12:30	Discussion
12:30-13:30	**Final discussion** Moderator: Nicholas Purcell
13:30	End of conference and lunch

ABSTRACTS

Incorporating geographical imagination into early demographic estimates

Peter Taylor (Loughborough University)
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We cannot know the sizes of populations over the last eight thousand years, either globally or at a range of constituent scales. Early estimates are available that use data on land clearances for agriculture assuming a rural landscape. But what if this supposed farming landscape was never simply rural. Quite separately, there are early population estimates for cities based upon site size. But the vast majority of early cities are not known and will never be known. In such a situation, the gaps in the landscape can only be filled in theoretically; that is to say, you need a geographical imagination. This talk discusses an approach that uses an understanding of city process as urban demand. Combining central place theory and central flow theory to build settlement geographies enables new estimates of populations to be made.

Not surprisingly, these turn out to be much larger than estimates based upon land-use clearance, but the degree of difference is quite remarkable. It opens up possibilities for revising how we think about these early consumers and producers and their environmental impacts.

EARLY MAP OF THE WESTERN HEMISPHERE

© Hereford, O. (1919). This Giddy Globe. New York: George H. Doran Company.

The urban taxonomic conundrum: And a way out

Roland Fletcher (University of Sydney)
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The labels urban, city and town have been either meticulously and partially defined or comprehensively and vaguely described. Both approaches have led to a situation where urban means everything and not very much, is regionally incomparable and retains enormous cachet. We have now reached a situation where we are using the term urban as a meaningful category of extreme generality. We risk asking non-equivalent questions about different kinds of places under an umbrella of all-encompassing social generality. However, we do still know what we are talking about, and we are confronting a profoundly real set of phenomena. Somehow, we have to encompass the diverse range of characteristics of "urbanism" which many definitions and descriptions leave out, such as mobile cities and unbounded and low-density cities. Once we do, what becomes apparent is that we are referring to several different trajectories of settlement growth and decline under an inconsistently applied universal category. Once we recognise different scales of settlement size and different occupation densities, the information on the disparate places we are discussing can be organised into different yet general trajectories which incorporate profoundly meaningful unique histories.

Angkor Wat and Greater Angkor (© Mike Coe).

The right tool for the job: Reflections on how to approach the numismatic material in an urban context

Olav E. Gundersen (Aarhus University)
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This paper explores different ways of approaching the numismatic material with a focus on urban sites, and on choosing an approach that fits the research questions by looking at some possibilities offered by considering the networks the coins represent, as well as by contrasting two general methodologies, which I have chosen to call "micro" and "macro" approaches, that can profitably be applied to the numismatic material. The aim is to make the numismatic material become a more natural part of the discourse on urban economics and urban networks rather than something one finds in the appendix. Case studies of urban sites provide some examples of how one might proceed to put the ideas presented in this paper into practice. The question of how much money a person would actually carry with him is raised and contrasted with results from macro studies that estimate the general number of coins per capita in a society. In this way, we might get closer to the reality of day-to-day economic transactions and possibly get some sense of differences between urban populations and rural ones with respect to how much coin they would carry.

Coin find from Rørvig, Denmark, possibly reflecting a purse lost or deposited in the late 13th century (© Rørvig By og Land).

The potential of network science for archaeology and history: Illustrated through a network model of the Roman economy

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How do we productively frame archaeological and historical questions as network problems? And what determines the usefulness of particular formal network methods for scholars studying past human behaviour? Is it the convenient representation of entities such as cities, objects, humans, sites and the past interactions between them as dots and lines? Or is it the good fit between the past phenomena we are interested in (like trade, transportation and communication), with their abstraction as network concepts? In this presentation, I will argue that although these reasons might be sufficient to lead scholars to consider using formal network methods for addressing their research aims, they are not sufficient to motivate the adoption of specific network techniques. Instead, I will argue that scholars should evaluate whether network data is an appropriate representation of their data or hypotheses, and that their archaeological/historical theories and hypotheses should inform the formulation of assumptions about how relationships affect each other: exactly how a relationship can affect the existence of another relationship.

I will illustrate this through a network model of the Roman economy. An agent-based network model was designed to represent hypotheses of the degree of market integration and the structure of social networks connecting Roman traders, through which commercial information and goods flowed. Results of this model will be compared to distributions of Hellenistic and Roman tableware in the Eastern Mediterranean. A key conclusion of this work is the role of large urban centres as a driving force of the Roman economy, by exercising a gravitational pulling force on resources and acting as hubs in commercial social networks.

Gerasa (Jordan): Pottery production and trade networks in Roman to Early Islamic times

Heike Möller (Aarhus University)
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Gerasa, modern Jerash, is famous for its high-scale pottery production from Hellenistic and Roman to Early Islamic times. In all periods, this "mass" production is characterised by a very rough and simple treatment of vessels, putting only as much effort as necessary into their making. Whether this pottery was made only for a local market or meant to be exported, and to what regional extent, will be discussed in the first part of the paper. To clarify production and distribution patterns of Gerasa's ceramics, excavated in the framework of the Danish-German Jerash Northwest Quarter Project, the employment of ethno-archaeological approaches and scientific methods will be tested. To which extent can we use the fact of rough production as an indicator for a (mostly?) local-market-oriented production? And how can interdisciplinary research help to narrow down and refine our data set? Where do these methods reach their limits?

In a second part, the focus is set on imported wares to understand the network structures beyond the local/regional exchange in comparison with the locally made pieces. The interaction of local capacities on one hand and imports on the other will result in insights of micro- and macro-market-oriented exchange and illuminate network structures from different angles, using different analytical methods to get refined data for one of the biggest pottery production sites in northern Jordan.

A modern kilnsite in Edfina/Delta/Egypt (© Heike Möller.)

A network of resources: Resource networks

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This paper argues that through an integrated dialogue between a contextualised analysis of the archaeological record and a high-definition analysis of the plant macrofossil record, both local and long-distance networks of the medieval town Odense in Denmark and their role in societal change can be studied. Deposits that contain plant macrofossils have often been studied as isolated objects, but combining their testimony with the contextual information and comparing the plant macrofossil record from several deposits from the same site both in a spatial and chronological perspective, this rich source of information will add new details to the knowledge of the networks of medieval Odense. The combination of the contextualised analysis and plant macrofossil analysis will allow a study of change, both on an individual or household level and of more general traits as they are expressed through the material culture and food economy in Odense. This is demonstrated by analysing the content of 12 latrines and other deposits with traces of latrine waste from six phases stretching from the 12th to the 16th century.

The latrines and deposits themselves and the artefacts related to them also show a change in the use of space and social practices over time that may also be expressions of local and long-distance network in their own right. The example will show how a high-definition approach with a close collaboration between the contextual and plant macrofossil analysis can offer a new and more detailed interpretation of the local and long-distance networks of medieval Odense and illuminate how they may have served as a catalyst for societal change.

Latrine barrels from the late 14th century (© Odense City Museums).

Intra-urban networks: The streets of medieval Ribe

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In the well-preserved medieval town of Ribe in Jutland, archaeological excavations in the old streets have been carried out since the 1980s. Most of the work was rescue excavations, and the combined effort has provided us with an extensive and, at the same time, detailed insight into the development, upkeep and use of the town's public space – the infrastructure.

The street grid was established in the late 11th century, and identical sequences from all over town of pavements consisting of animal bone, wattle lattice, oak planks and cobble stones, combined with a long series of dendrochronological datings, leave no doubt that the upkeep of the street system was controlled by the town lord and from an early point in time must have been a display of order and cityness.

The paper also touches upon the road networks connecting the town with its hinterland and how the main thoroughfare is easily identified in the archaeological record.

Excavation in front of Ribe Cathedral (© Morten Søvsø).

Intramuros: Investigating relations between cross-industry practices and networks in 6th-century Sagalassos

Elizabeth Murphy (New York University)
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Late Antiquity has been seen as a period of significant change in urban development across Asia Minor. A central feature used to characterize the late antique city in this region has been the appearance of industrial activities within the urban core, often in what were once public spaces. Moreover, these industries have been characterized in terms of technological 'stagnation' with a reliance on recycled materials and have too readily been couched in narratives of economic 'decline' or 'crisis'. This paper by contrast takes a more nuanced and highly localized view on these large-scale processes of urban economic development through the case of Sagalassos (SW Turkey). Instead of focusing on the study of any single industry, however, this paper looks at the organization of sixth-century production activities from the vantage of cross-craft studies in order to investigate the relationship between contemporary industries and to reconstruct economic decision-making based on shared production practices and networks of raw material acquisition.

Saga cartoon (© Joris Snaet and the Sagalassos Archaeological Research Project).

Gotham at the Bosporus: Networks of urban metabolism, imperial ecology and spatial practices in medieval Constantinople

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As most resilient materialisation of the traditions of ancient Mediterranean urbanism, Constantinople from the 5th until the 12th century CE constituted one of the largest cities across Afro-Eurasia. Similar to other "mega-cities" of the time (such as Chang´an, Baghdad or Cairo), its urban metabolism depended on the flows of resources and humans within a larger-scale imperial formation. Also spatial practices within the city served its functions, needs and representation as self-perceived centre of the "Oecumene".

Based on written, archaeological and palaeo-environmental evidence, aspects of this interplay between the dynamics of Byzantium´s imperial ecology and the spatial organisation of its capital are analysed with the help of GIS-based network models. In addition, textual analysis and narrative networks are employed in order to survey the mental mapping of Constantinople´s complex socio-economic, political and cultural entanglements and interdependencies within and beyond its walls. Furthermore, comparable phenomena from contemporaneous imperial centres of similar scale are taken into consideration. Equally, the potential and pitfalls of various methods and the challenges of respective data sets are discussed. The aim is to present large scale urbanism of this kind as emerging from a multiplexity of overlaying networks between places and individuals from the local to the global perspective.
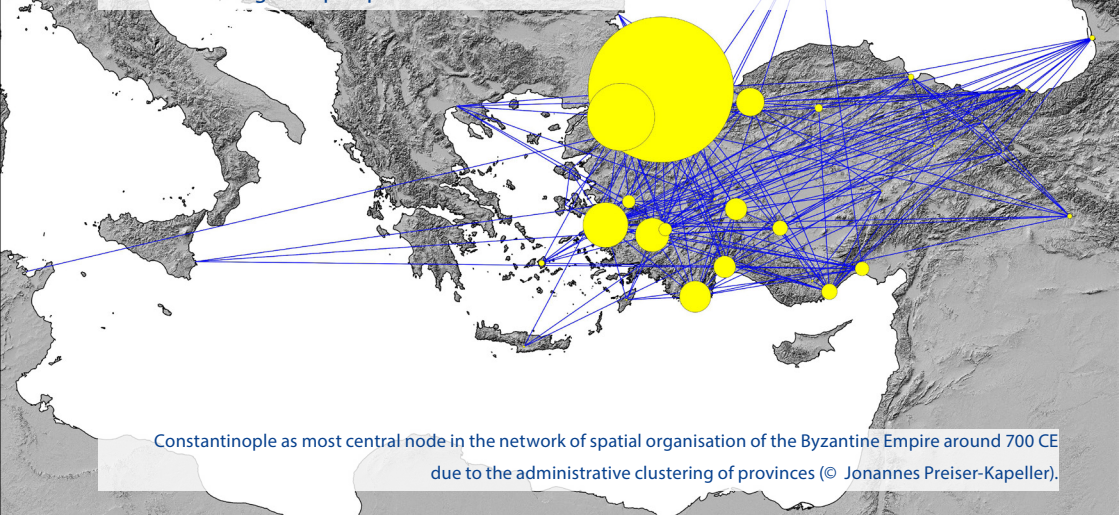
Constantinople as most central node in the network of spatial organisation of the Byzantine Empire around 700 CE due to the administrative clustering of provinces (© Jonannes Preiser-Kapeller).

Thinking in networks in ancient Hauran: From soft archaeological factors to grand historical narratives?

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Ancient Hauran is a geographically defined region in today's Southern Syria and Northern Jordan, densely inhabited in a pattern of smaller to larger rural settlements and cities. Embedded into system of connections to places (Damascus/Bosra) or areas (Arabian Desert, Mediterranean), Hauran is often studied as a region of provincial resistance, agrarian production, or particular cultural expressions. The paper explores whether an approach informed by network analysis can be employed to better understand the practices and interactions of people in the Hauran as represented in the archaeological remains. It aims to analyse societies, groups and people living or active there not only under a certain aspect, but in their dynamic interrelations that produced expressions in architecture, objects, inscriptions and statuary – "hard" archaeological data.

My approach departs from the difficulty to master complex but – or because of – fragmented data. The argument proceeds from a description of remains related to the organisation of water-availability to the implementation of the soft factor "religious interaction" to show the spatio-social relations at work in the region, which implies also a contextual interpretation of the material. Finally, the possible connections of the emerging network to others (e.g. of office holders, family ties, or military installations) are investigated to show how a network analytical approach, informed by detailed knowledge of processes, allows relating complex micro-history to grand narratives.
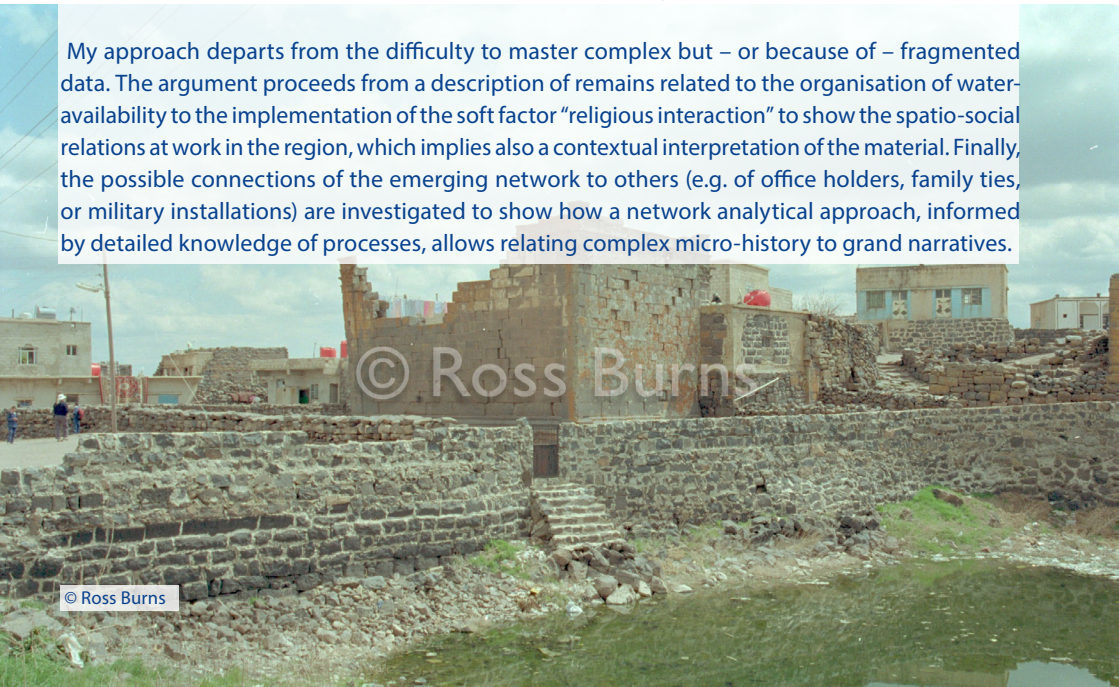
Networks of authority and networks of things in the western Indian ocean

Stephanie Wynne-Jones (University of York)
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Around the rim of the pre-colonial Indian Ocean, regions were united by networks of trade, religion, technology and authority. For archaeologists, these are now visible in the record of objects that moved around the ocean's rim. Yet these objects have tended to be quantified as an index of commerce, rather than understood in their role as mediators in networks of different kinds. This paper will focus on the urban centres of the eastern African coast, which developed from the 7th century and flourished until the 16th century CE; it will explore the role of objects as intermediaries, creating and confirming relationships and cultural connections. In particular, this paper will explore how networks of things can inform on geographies of power and authority, rather than simply signalling trading connections. These networks of authority were linked to religious and cultural connections, as well as to technologies and knowledge. Using Kilwa Kisiwani as an example, this paper will discuss how a focus on these multiple networks, and a more detailed attention to network dynamics, can provide a richer understanding of the nature of urbanism in the region.

On the interface of two worlds:
The early medieval town of Dzhankent (Kazakhstan)

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In the late first millennium AD, the region around the Aral Sea comprised two broad cultural zones: in the south the civilizations of Central Asia, in the north the steppe nomads. Thus, the 'marsh towns' in the extensive delta of the Syr-Darya (Jaxartes) had been placed on the interface of two worlds. Dzhankent is the best explored and excavated of these sites. The results of archaeological and geophysical fieldwork since 2011 demonstrate that in the 9th–11th centuries AD, this was, indeed, a fully urban settlement. New dating evidence suggests that the fortified town was built as a single complex in the 9th century, but it seems to have been raised on the site of an existing open settlement (7th–8th century or even earlier). Urban design and finds indicate close links to the south. It may, indeed, have been a Khorezmian trading emporium which was appropriated by the elite of the Oguz nomads as their capital or winter quarters.

This paper suggests Dzhankent as a case study for the application of network analysis: work there has produced some refined data which include time depth as well as evidence of regional and long-distance contacts. Dzhankent also offers comparative perspectives on the links between urbanization, state formation and trade in the Early Middle Ages.

Aerial photo of Dzhankent, with 'nomad pottery' and Bukhara coins found at the site

(© Irina Arzhantseva) .

Srivijaya: A maritime polity at the intersection of multiple networks

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In a context fraught with difficulties (historiographical as well as environmental), pioneering archaeological research carried out in the 1980s and 1990s within the modern city of Palembang (South Sumatra, Indonesia) and in the surrounding Musi River Basin produced a vast array of new data on the notorious but elusive Malay coastal polity known as Srivijaya, the first large-scale city and state of Insular Southeast Asia (7th–13th century CE). A reliable chronology based on controlled excavations, resulting stratigraphies and the detection of settlement patterns at both urban and regional levels confirmed the location and magnitude of the polity's core area. Such results, however, could only be interpreted and properly understood when other categories of data (textual and ecological) were summoned in an pluridisciplinary approach to help produce a viable structural model of Malay World coastal polities and their social space, considered as the sum of a number of interlocking networks, all of them water borne, and operating at different scales, in intimately connected political, economic and religious spheres. Parallel excavations of ship remains built following sophisticated local technologies, many of them found in or coming from Southern Sumatra, provided the necessary vectors of these networks. Ongoing research on locally borne entrepreneurship in the person of Malay shipmasters, essential actors in long distance shipping networks, returns a further measure of agency to the Malay polity.

Palembang (South Sumatra): a riparian environment (© Pierre-Yves Manguin) .

Stimulus, cue, action, result and response:
How to conceptualise interaction in urban networks of the Roman Near East

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Network approaches have transformed scholarship on the past in recent years. This 'relational turn' has altered perspectives as well as methodology. Connectivity, however, is often taken for granted, and the challenge remains of turning the static archaeological and historical data that has come down from the past into evidence of the interactive dynamics that are a defining trait of a network. In this paper, I argue by means of examples from Palmyra and other cities of the Roman Near East that in order to move from descriptive to explanatory networks we have to think carefully about what stage of interaction our data are actually remnants of.
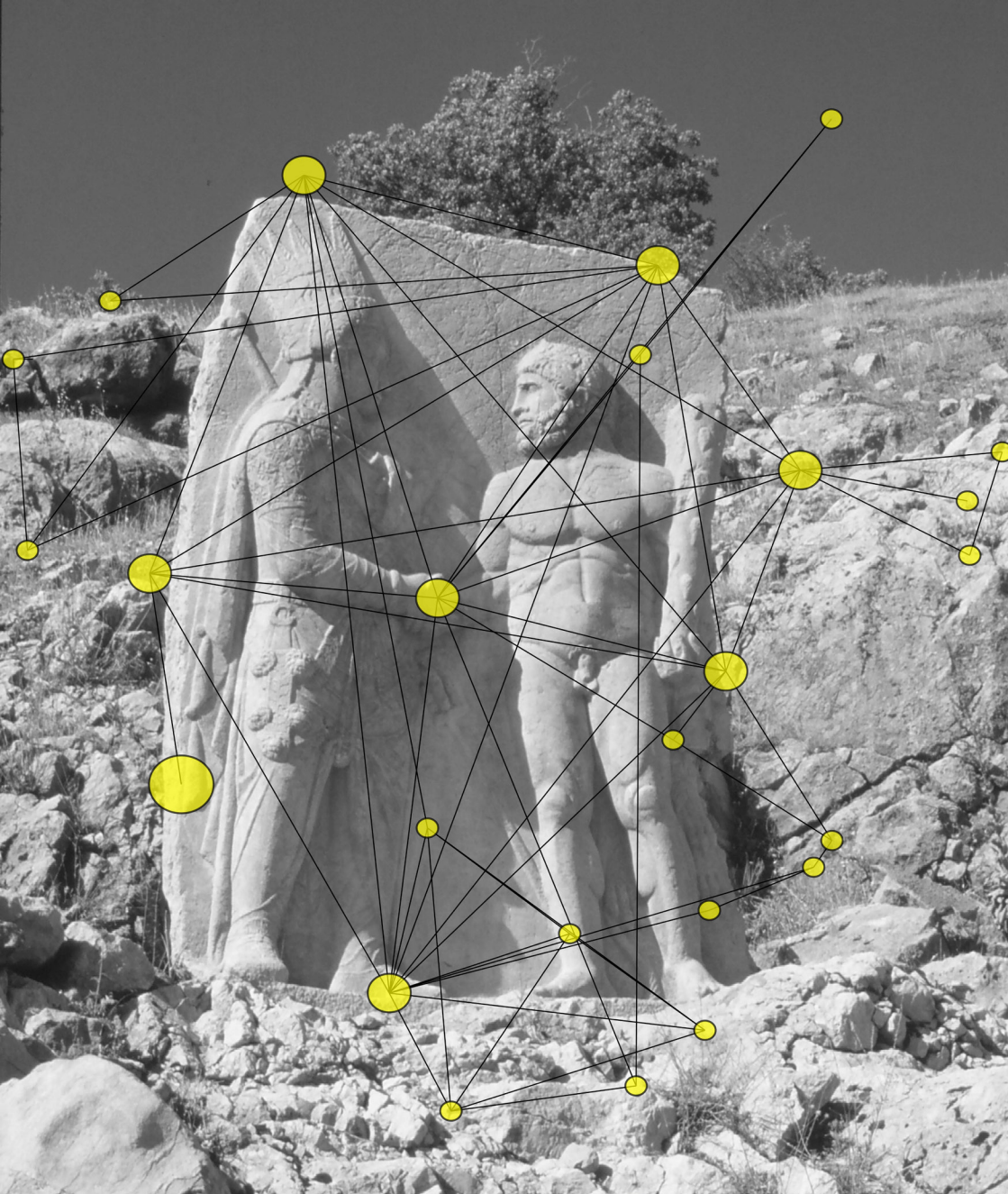
East meeting west? Antiochus of Commagene shaking hands with Heracles. Nemrut Dagi, Turkey, first century BCE
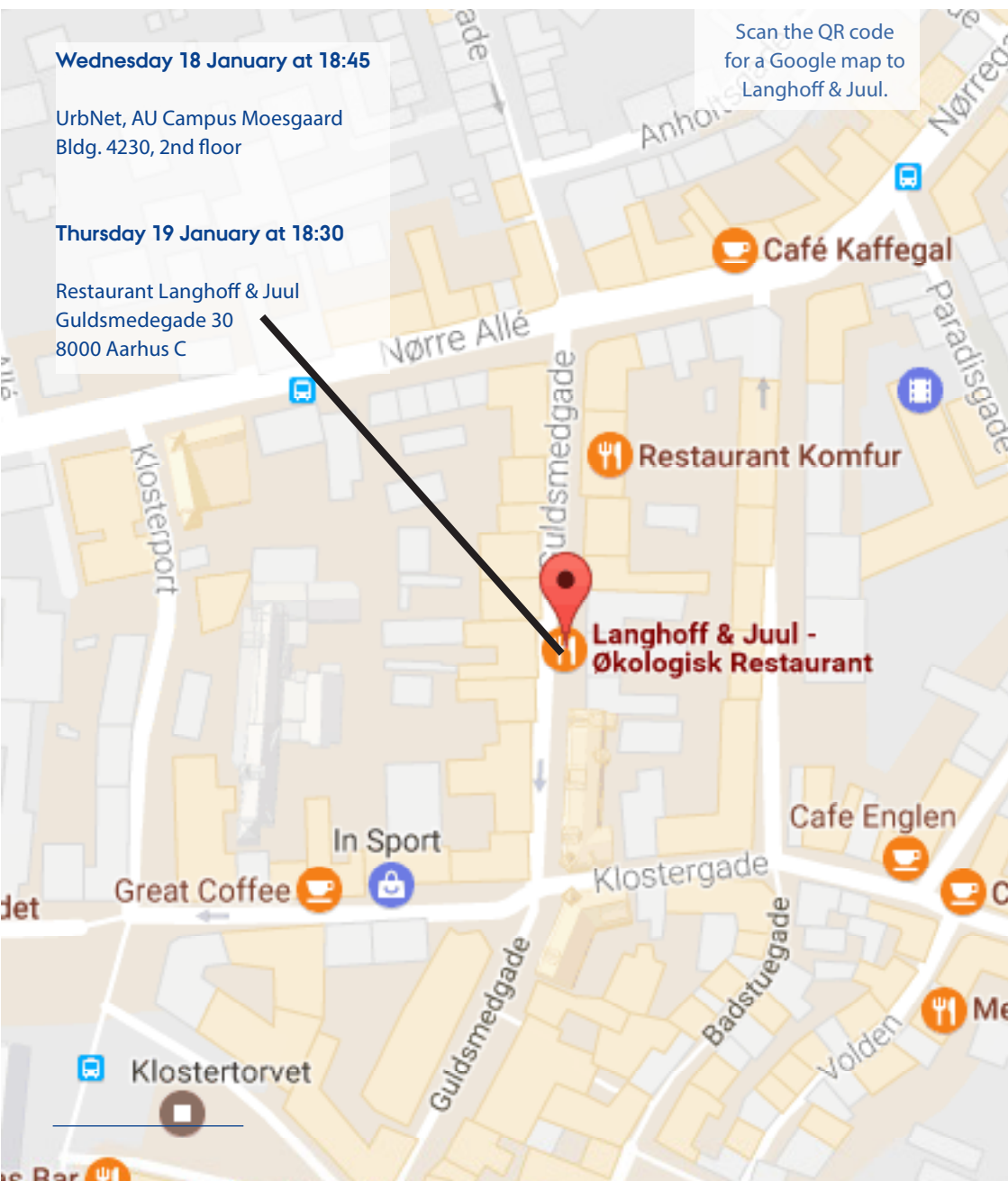
(© Jørgen Christian Meyer).

SPEAKERS' DINNERS

Wednesday 18 January at 18:45

UrbNet, AU Campus Moesgaard
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Thursday 19 January at 18:30

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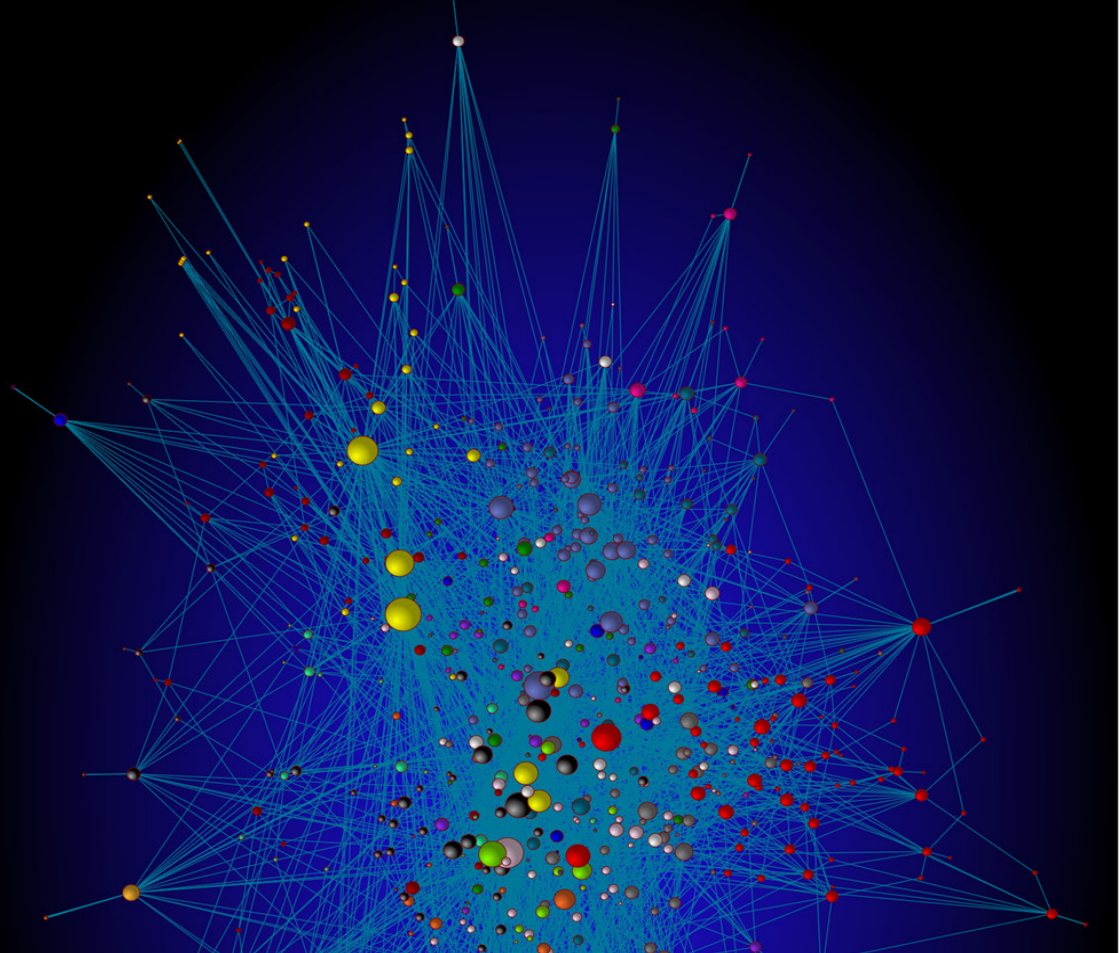Phone: +45 2718 8390
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