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Cross-Cultural-ness of Astronomical Instrumentation Reconsidered

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History of science was often used as an arena for creating disassociation between regions and/or periods. This was mostly spearheaded by scholars who focused on only one side of the story, usually with an ideological perspective. The concept of ‘Islamic science’ is one of the outcomes of this endeavour. Although it sounds quite promotive of the religion of Islam, it creates a hidden but firm barrier between the knowledge in the West and the Islamic world. This panel aims to discuss the validity of this argument by first providing instruments-based evidence of what is common and what is not between the scientific knowledge of different regions from the same periods. Then it will argue that what can be offered as a solution to revamp the centuries old narrative of the disassociation of the naturally bound scientific knowledge.

Presenters: Silke Ackermann, Taha Yasin Arslan

Title of the paper: What do we mean by “Islamic Science” in museums?

Using labels and categorisations make things more comprehensible in both museum environments and academic studies. However, one has to be very careful in doing so because -as Francis Bacon said- ‘sometimes the remedy is worse than the disease.’ This may be particularly valid when it comes to the concept of ‘Islamic science’. It sounds fancy and right-to-the-point, but is it really the right label or categorisation? Or is it just a ruse to highlight independency(!) of Eurocentric scientific knowledge from its roots? There is plethora of evidence on Islam being a driving force for exact sciences. But does it make the scientific works from the Islamic world different than from other regions? For instance, isn’t a mathematical formula the same for whoever employs it? So, in a broader sense what would make science ‘Islamic’? In that regard, what should we make of the works of non-Muslim scholars in the Islamic world? These are the questions seldom discussed as if it does not cause any problem. This talk argues that understanding the association of knowledge accumulated and produced in different regions and periods would reveal the proper assessment of the development of scientific knowledge which is universal in nature.

Presenter: Afra Akyol

Title of the paper: Cross-Cultural Perspectives on the Front of the Astrolabe’s Mater

The astrolabe is the most widely used instrument among pre-modern astronomical instruments. In addition to their standard applications, such as determining time or measuring the heights of structures, astrolabes often contain drawings that reflect both the scientific and cultural tendencies of the period and geography in which they were constructed. As an example, the main part of the astrolabe, known as the mater, features a variety of drawings on the back, such as sine graph, zodiac scales, and curves for the sun’s noon altitude, a calendar, and a shadow square while the base of the front seldom engraved before the 16th century. From this point, astrolabes from both the Islamic world and the West began to show several types of engravings on the front. In the Islamic world, a geographical atlas known as gazetteer, which contains the numerical values of longitudes, latitudes, and qibla angle for selected localities, while in the West, astrolabes often featured the *Quadratum Nauticum*, which contains diagram and names of the winds, scales, and navigational tools. This presentation will discuss these drawings and time-wise similarities and application-wise differences in different cultural basins.

Presenter: Beyza Topçuoğlu

Title of the paper: Al-Shāmīla as a Sundial: Tracing Its Influence Across Civilizations

In the 13th century, al-Marrākushī classified astronomical instruments based on their functions and forms. According to his classification, instruments that are spherical in nature are three: the astrolabe, the celestial globe, and al-shāmila. While the astrolabe and celestial globe date back to antiquity, al-Shāmila was a groundbreaking invention by Abū Maḥmūd Ḥamid ibn al-Khiḍr al-Khujandī in the 10th century Islamic world. Al-Khujandī described al-shāmila as an instrument that integrates the functions of the astrolabe, sundial, and armillary sphere. This presentation explores al-shāmila specifically as a sundial, addressing several key questions: What methods can be employed to use al-Shāmila as a sundial? Did it influence later instruments such as Sanduq al-Yawāqit by Ibn al-Shāṭir or Dā'irat al-Mu'addil by al-Wafā'i? Could its influence have extended to Western astronomy? The last question is particularly important because a strikingly similar instrument emerged in the 17th century, a sundial-drawing instrument by John Rowley. While the structures of al-shāmila and Rowley's device bear remarkable resemblance, their intended uses diverge significantly. This study aims to discuss the historical and conceptual connections between these instruments, shedding light on their evolution across different civilizations.

Presenter: Feyzanur Şaşmaz Akyüz

Title of the paper: Comparative Study on Astrolabe Manuals from the 14th Century Islamic Civilisation and the West

Astrolabes are full of marvels with plenty to offer to researchers and historians of science. Many scholars provide accounts of its use with a detailed technical description and translation to specific treatises. Unfortunately, very few of them deal with the use of these instruments with a comparative approach even though more comprehensive understanding of astrolabes in historical context requires detailed examination of treatises from different regions and sometimes even from different periods. This type of study would allow the researcher to examine what is related and what is not as well as to discuss if there are any influence over each other. In this regard, this talk will deal with several treatises on the use of astrolabes both from the Islamic world and the West, all compiled in the 14th century. It aims to reveal what was the norm and research points for the use of astrolabe in different cultural basins at the same periods. For instance, treatises of 14th century Mamluk astronomers, Mizzi and Ibn al-Shāṭir and the astrolabe treatise of the English scholar Geoffrey Chaucer will be examined and compared on the basis of the topics, structure of the texts, and terminology.

Short Biography

Afra Akyol is a DPhil student in the department of History and Philosophy of Science at Istanbul Medeniyet University. She completed her master's degree in 2023 from the same department with a thesis titled "Encryption Methods in the 13th-14th Century Islamic World". While her master's research focused on cryptology in the Islamic world, recently, focus of her research shifted towards astronomical instruments in the Islamic world, particularly astrolabes. On that regard, her doctoral research examines the common features of astrolabes from the Islamic world that were not mentioned in the user manuals for astrolabes and traces the hidden knowledge in the making and using these unwritten features.

Beyzanur Topçuoğlu, she is currently a research assistant at the Institute for History of Science in Istanbul Medeniyet University, also a DPhil student in the History of Science and Technology at Istanbul Technical University. She earned her BA in Arabic Literature and Language from Istanbul University in 2020. She then completed her MA in the History and Philosophy of Science (2020–2023) at Istanbul Medeniyet University with a thesis titled 'A Comparative Analysis of Qusṭā ibn Lūqā's and Marrākushī's User Manuals for Celestial Globes' in 2023. Focus of her primary research is the astronomical instrumentation, celestial globes, history of astronomy, and timekeeping in the Islamic world. She has participated in various academic workshops and courses, including the 'Workshop for Manuscript Culture' at Fatih Sultan Mehmet University in 2022–23. She has presented some of her research at international and national conferences, including 41st Scientific Instrument Symposium in Athens, Greece in 2022, 42nd Scientific Instrument Symposium in Palermo, Italy in 2023 and the 2nd Mamluk Symposium at Istanbul University, Türkiye, also in 2023. Some of her presentations include 400 Years on the Use of the Celestial Globe: Qusṭā ibn Lūqā, Khazini and Marrākushī, Khujandī's 'Comprehensive Instrument', and The User Manuals of Celestial Globes in the Mamluks: The Case of al-Marrākushī. Her academic endeavours have been supported by scholarships, including grants from the Inter-Union Commission for History of Astronomy in 2022 and 2023.

Feyzanur Şaşmaz Akyüz, she received her BA with summa cum laude in the Department of the History of Science at Istanbul Medeniyet University in 2022. As part of her BA thesis, she completed a TUBITAK research project titled ". She worked as a research assistant in two workshops at the Manuscript Research Centre at Fatih Sultan Mehmet University. She began her masters education at the Department of the History and Philosophy of Science at Istanbul Medeniyet University in 2023. The focus of her studies is the history of classical astronomy and astronomical instrumentation in the Islamic world.

Silke Ackermann, Dr Ackermann studied History, Languages & Cultures of the Islamic World, and History of Science at Frankfurt/Main University before joining the British Museum as its first curator of European

and Islamic scientific instruments in 1995 where she served in a wide range of curatorial and managerial roles. In 2012 Silke left the UK to take up a professorship in cultural leadership in Germany, where she was later appointed president. In March 2014 Silke returned to the UK to take up the directorship of the History of Science Museum (HSM) at Oxford University and a professorial fellowship at Linacre College, combining her passion for outreach, teaching and research. She is the first female director of any of the Oxford University museums. Silke is now focused on Vision_24, her ambitious strategy to make the HSM relevant for today and the future under the strapline 'Explore Science –Discover Humanity'.

Taha Yasin Arslan is a historian of science and assistant professor at the Institute for the History of Science at Istanbul Medeniyet University. His research mostly focuses on scientific instruments -astronomical instruments in particular- in the Islamic world from the 9th to 16th centuries. Additionally, from 2020 to 2022, he was a research associate as part of a project at St John's College, Oxford which dealt with transmission of astronomical knowledge from the Islamic world to the 17th-century England via manuscripts and scholars such as John Greaves. Dr Arslan makes replicas and reproductions of historical scientific instruments and uses them in lectures as a teaching aid. He also used these replicas in hands-on astrolabe workshops all around the world, often by teaming up with Dr Silke Ackermann, the director of the History of Science Museum, Oxford. Arslan has multiple on-going projects such as replication of Taqī al-Dīn ibn Ma'rūf's optical experiments and reproduction of a spherical astrolabe based on a 15th-century treatise.

Keywords

Science in the Islamic world, cross-cultural perspectives, astronomical instruments, astrolabe, sundial

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