Channels of Transmission of Astronomical Knowledge in the Ottoman World (14th-18th Centuries)

21-24 November 2023

Istanbul, Türkiye

BOOK OF ABSTRACTS

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List of sessions

Sources of Astronomical Research in French Archives: National and Diplomatic Institutions

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Abstract

This presentation aims to give researchers working in the field of the history of astronomy a taste of the sources available in the various French national and diplomatic archives. It will also provide an overview of the collaboration between France and Turkey in terms of the exchange of archives in the field of astronomy, including scientific developments and exchanges of technical procedures over time. The application of this exchange of data also makes it possible to trace a partnership between France and the Ottoman Empire in the maritime field, particularly in the development of techniques for the construction of sailing ships and the use of maritime instruments to find one's bearings using the stars.

Keywords: Archives, France - Turkey exchanges, maritime astronomy, naval techniques.

Biographical Note(s)

Sr Archaeologist and Manager with over 20-year experience in archaeological research and excavations in the Near East with special emphasis on Turkey, where he has been living since 2001. In charge of scientific coordination of as well as administrative coordination multidisciplinary teams. Expertise in diplomatic actions and fundings related to scientific researches, R&D, innovations. Perfectly conversant with the Turkish legal framework surrounding archaeology and cultural heritage as well as the scientific and academic ones.

Presentation of the Astronomical and Cosmos Material in the Archeology Museum of Istanbul

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Abstract

The collection of the Istanbul Archeology Museums includes some astronomical artifacts such as coffin texts, inscriptions, pendants and protective charms. The purpose of this presentation is to explore the primary celestial decorations and discuss the combination of Egyptians, Mesopotamians, Byzantine art forms in these sets of astronomical-astrology representations.

The Bab el-Gasus coffins came to Istanbul in 1892, along with their own shabtis and shabti boxes, as a gift from Khedive Abbas Hilmi Pasha, who was appointed as the Khedive of Egypt by the Ottoman Empire at the age of 18. These coffins have not yet been examined in detail until the day. Although our main research on coffins has just begun, we can show some similar example coffins of Bab el-Gasus sent as gifts to different countries' museums. In addition, Ur-namu law inscriptions, Tukulti-Ninurta Pedestal, pendant with the astral lion and protective charm were exhibited in the museum and you can find them in some catalogues.

Keywords: Astrology, astronomy, museum, ancient artifacts.

Biographical Note(s)

Hülya Ataşcıoğlu Aykul is an art historian. She holds an M.A in 'Istanbul Archeology Museum, Ancient Orient Museum and The Shabti Have In Some Private Collection'. She is interested in Egyptology in Turkey, currently working on a series of publications and conferences addressing Egyptology including International Congress of Egyptologists.

An Astronomical Collection of the Turkish Historical Society Library

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Abstract

The Turkish Historical Society Library, established by the Turkish Historical Society for historical studies, was established on April 15, 1931, with the directives of Mustafa Kemal Atatürk and is one of the richest specialized libraries in our country. The library, which has approximately 250,000 volumes of books, is provided with the latest publications through exchange and purchase, and exchanges are made with 220 institutions and organizations abroad and 60 in the country. Among the books in the library, there are also primary sources for astronomy studies written in various languages, such as Ottoman Turkish, Arabic, French, and English. There are over 200 manuscripts and rare works in the library, which include calendars, atlases, zijs, books, and booklet based on astronomical observations and measurements. The Turkish Historical Society supports studies in this field not only with the works in its Library but also with its publications.

Keywords: Turkish Historical Society, manuscript, astronomy, calendar.

Biographical Note(s)

Then she got her master's degree from the Turkish Language and Literature Teaching Pedagogical Formation Program of Marmara University. She received her master's degree in Turkish Literature from İhsan Doğramacı Bilkent University with her thesis titled “From 15th to 18th Century the Portrayal and the Metaphorical Presentation of the Ideal Ottoman Sultans in Qasidas”. She completed her doctorate in 2022 with her thesis titled “Social Networks and Literary Prestige in the Ottoman Poetry of Ahmed III Era”. She is still working as a specialist at the Turkish Historical Society.

A Scientific Instrument Dedicated to Fatih Mehmet in 881 Hijra

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Abstract

A universal sundial dedicated to Sultan Mehmet II in 1476/77 has recently come to light. This is of considerable historical interest not least as it is the sole known scientific instrument made for the Sultan, renowned for his scientific interests. Previously, the two astrolabes dedicated to his son Bayezit II were the only known surviving scientific instruments made for the two rulers. Also, a unique spherical astrolabe was made in Istanbul in 1480/81, around the time of the death of Mehmet II, but without any dedication. This unique sundial of Mehmet II can serve all latitudes of the 'habited world' of historical geography (1°-48°), and the curves for the hours are curiously shaped like a snail (halazûn/salyangoz). The historical formula underlying the markings is approximate. It was popular for 1,000 years in Islamic astronomy (alongside the exact formula for timekeeping), but its history has only recently been documented. The formula gives the time in seasonal hours as a trigonometric function of observed solar altitude and meridian altitude, independent of terrestrial latitude, and it works surprisingly well for latitudes from Sanaa to Edirne, which was the reason for its popularity. The procedure for constructing such a

device is outlined the voluminous work on instruments by the Cairo astronomer al-Marrakushi (ca. 1280), which was already popular in Ottoman astronomy. We shall discuss the scientific milieu, inscriptions, markings and function of this sundial, as well as the wider historical context, from Abbasid sundial treatises to Renaissance European instruments with similar markings.

Keywords: Sundial, universal, universal sundial, halazun, Mehmet II, Bayezid II, Istanbul, approximate formula, al-Marrakushi.

Biographical Note(s)

David A. King has written extensively on the history of Islamic astronomy. From 1985 until his retirement 2007 he was Professor of the History of Science at Goethe University, Frankfurt. His major work on Islamic astronomy is In Synchrony with the Heavens (Brill, 2004-05), an overview of Islamic timekeeping and instrumentation which contains detailed studies of the approximate formula, various universal sundials, and the two astrolabes dedicated to Bayezid II.

François Charette obtained a doctorate in history of science from Frankfurt University in 2002 and has subsequently published the illustrated treatise of Najm al-Din al-Misri (ca. 1325) on 100 astronomical instruments (Brill, 2003), whose commentary can be read as a general survey of astronomical instrumentation in Islam, with special focus on the Mamluk period. His other publications cover various topics of scientific history from the 9th-century Abbasid to the 18th-century Ottoman periods. Since 2008, he has been working full-time in the software industry.

Sultan Bayezid II's Astrolabe Discovered in St. Petersburg

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Abstract

In 2005, famous researcher David King described an astrolabe made by a craftsman al-Ahmar al-Nujumi al-Rumi in 1505/1506. King wrote: «This important astrolabe is one of two known pieces dedicated to the Ottoman Sultan Bayezid II. There are no other astrolabes dedicated to an Ottoman sultan, not even in the Topkapı Sarayı Museum». However, another astrolabe of the same master, dedicated to the same Sultan, was found in an unexpected place - in the National Library of Russia in St. Petersburg. This is an incomplete astrolabe. Only the body with handle and ring are survived. But on the body there are both the master's signature and a dedication to his powerful customer. We do not know how this astrolabe ended up in the library. But we know that since the beginning of the 19th century, the Imperial Public Library has been a place of storage for many scientific instruments. In the 20th century some instruments were transferred to the museums of St. Petersburg. And the astrolabe of Sultan Bayezid II probably did not interest museum employees due to the fact that it was incomplete. A comparison of two astrolabes shows a lot of similar elements. These are the throne design, the shape of the numbers, the inscription of the dedication, and the signature of the master. The astrolabe found in St. Petersburg was made in 1500/1501, five years before the astrolabe described by King. It sheds additional light on the work of the masters of the early 16th century.

dedication, and the signature of the master. The astrolabe found in St. Petersburg was made in 1500/1501, five years before the astrolabe described by King. It sheds additional light on the work of the masters of the early 16th century.

Keywords: Astrolabe, Bayezid II, Ottoman Sultan, St. Petersburg.

Biographical Note(s)

Sergei Maslikov, PhP – professor of the Novosibirsk State University of Economics and Management, Russia. His research interests are history of astronomy and astronomical instruments. He studies historical instruments kept in Russian museums.

Islamic Arts Through Ottoman Quadrants

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Abstract

From the thirteenth century in the Mamluks, and from the fifteenth century, in the Ottomans, the astrolabe, which was the most common astronomical instrument, especially in the knowledge of timekeeping (ʿilm al-mīqāt), was replaced by the rubʿu'dāʾira. The front of the astrolabe tri-folded onto a side of the quadrant, and the sinus graph is drawn on the other side. This tool, which was constructed on brass in the Mamluk instrument-making tradition, started to be produced using wood during the Ottoman period. The oldest surviving example of rubu boards, known to have been produced and used in the Ottoman lands since the fifteenth century, was manufactured by Aḥmed al-Ayyubī in 1682/83. Rubu boards, which are important in terms of being the most widely used astronomical instrument in Ottoman astronomy, also attract attention in terms of art. The meeting of art with the scientific instrument shows the cultural infrastructure of scientific knowledge. In this study, the engravings and decorations on the rubu boards and on the cases of these tools will be discussed comparatively. The fact that most of the Ottoman rubu boards that have survived to the present day belong to the 19th century, makes it possible to deal with the traces and changes of artistic approaches over the centuries by periodic comparison.

Ayyubī's rubu board will be the focus of this research and will be examined through a few examples in which similar examples of ornamentation on this type of instrument were continued in the following centuries.

Keywords: History of Ottoman astronomy, Islamic arts, rubu board.

Biographical Note(s)

Eslem Günaydın is a PhD student and research assistant at Istanbul University, Faculty of Theology, Department of Turkish-Islamic Arts History. The subject of her master's thesis was “The Study of Early Islamic Astrolabes from the Perspective of Islamic Arts”. She still continues her studies on scientific devices on Islamic Arts.

Ibn Zunbul al-Rammal and his Astronomical Knowledge between Cairo and Istanbul

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Abstract

Ibn Zunbul was a member of the inner circle of Mamluk sultan Qansuh al-Gawriand as a witness of the Ottoman conquest of Egypt in 1517. C. Brockelmann refers to I.Z. as a "civil servant at the war division" indicating that he was receiving a salary from the diwan al-jaysh under al-Gawri. F. Babinger and, following him, S.M. Es-Seyyid and E. İhsanoğlu depict him as the astrologer of the sultan, who attended the latter's military campaigns. (d. shortly after 29 Zilhicce 930/28 October 1524) and states that he received a salary from the Ottoman army office (diwan al-jaysh) in 951/1544. Although all these authors agree that I.Z. must have died after 960/1552, D. Behrens-Abouseif argues that he lived much later and composed his chronicle at the beginning of the 17th century.

In his book Qanun, a treatise on Geography and astronomy, Ibn Zunbul refers to a dream which prefigured the assassination of the ottoman governor of Egypt Mahmud Pasha (which took place in 1567), much of his subsequent life seems to have been spent in the employ of Mahmud pasha , whom he served as a dream interpreter and, presumably, geomancer (whence his title Al-Rammal).

We also know through his books that he visited Istanbul A few times and his name reached the Ottoman court. Ibn Zunbul claimed to have written two of his works in Istanbul, and he contacted with the Ottoman Sultan Suleiman the Magnificent and

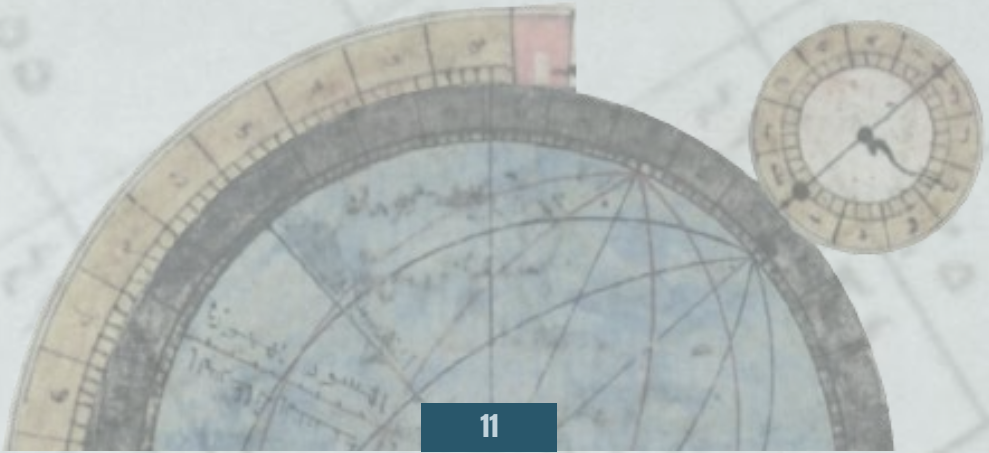
also communicated with his senior statesmen and met many scholars in the Ottoman Empire during his frequent trips to I Istanbul, due to the importance of his book Qanun. The Ottoman Sultan Murad III ordered it to be translated into the Ottoman language, and so on through his direct communication. With Turkish scholars translating many of his books into the Ottoman language, we can say that his knowledge has been transmitted and spread for years in the Ottoman lands.

This paper attempts to extrapolate How Did ibn Zunbul's frequent visits to Istanbul, his meeting with its scholars, and the translation of many of his books into the Ottoman language contributed to the transfer of astronomical knowledge of the Mamluks era to the Ottoman Empire.

Keywords: Mamluks, astrology, astronomy, Ottomans.

Biographical Note(s)

Abdelwahab Shaker Senior researcher in the academic sector at the Bibliotheca Alexandrina, a PhD student. My specialization is Ottoman history, with focus on Egypt.



Tracking The Heritage and the Impact of the 16th Century Ottoman Astronomy Through the First Artificial Language Balaibalan

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Abstract

In this study, it's proposed to introduce and analyze the first artificial language in the world called "Balaibalan" from the perspective of astronomy. In 2005, Mustafa Koç's deciprered all the details of Balaibalan, including its grammar, syntax rules, and Turkish-Balaibalan and Balaibalan-Turkish dictionary after some attempts to understand the original manuscript.

The author Muhyî, born in Edirne in 1528, is an Ottoman poet. He wrote about 200 works in the fields of history, grammar, rhetoric, politics and Islamic sciences. He also wrote on Sufism, chemistry, alchemy and medicine, but the determination of these texts hasn't been made yet. He's well-versed in Arabic, Turkish and Persian. He standardized his language, which means "life-giving language", in Balaibalan in 1574. While creating the language; he took the alphabet of Arabic by adding some extra letters, invented the grammar by himself, and created a vocabulary with the inspiration of God and with quotations from other languages. He also took notes from the words offered by his friends. With Balaibalan, Muhyî created a rich,

developable, original language with special terms that can be used in Sufi circles, as well as creating a common cultural language that can be spoken all over the world.

Although this language has a very important potential to trace the 16th century Ottoman intellectual world, it still hasn't been considered into such an analysis. It's possible to classify Balaibalan words into sub-categories to analyze their origins and usages into the next works chronologically. Indeed, Balaibalan contains tens of astronomy/science related words and the writer seems to have some strategy to find their equivalents. It should be expected if we consider he took astronomy lectures from an astronomer Cemaleddin-i Hazreci. Therefore it's proposed to trace and present the connections between the before and after Balaibalan archival records in the congress paper.

Keywords: Ottoman astronomy, artificial languages.

Biographical Note(s)

Şeyma Ceren Sanlı is a Ph.D. student in astronomy and space sciences at Istanbul University, studying the astrophysics of the gamma-ray bursts. The research topic proposed here is actually an extension of the congress paper she presented at the History of Sciences 4th Student Congress.

Distant Intellectual Neighborhood: Ulugbek and Copernicus Via Ottoman's Legacy

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Abstract

The esteemed scholar and ruler, Ulugbek, born in 1394, was a descendant of Tamerlane, the establisher of the Timurid Empire. He viewed the world not as a domain to conquer, but rather as an intellectual community or 'neighbourhood'. Ulugbek's renowned observatory housed a constellation of eminent astronomers from Dar al Islam. Nonetheless, the most distinguished figure in this impressive scientific assembly was Ali Qushji (1403–1474), Ulugbek's colleague from Samarkand. Jointly, with Ulugbek they authored one of the most consequential works in the annals of astronomy, the Zij-i Sultani, also known as the Tablets of the Sultan, in 1437.

Following the demise of Ulugbek in 1449, Ali Qushji departed from Maveranahr. By 1471, Ali Qushji had arrived in Istanbul where Sultan Mehmed II welcomed the esteemed Samarkand scholar. In the subsequent period, we see the emergence of a fresh chapter in this intellectual neighbourhood: through this honoured student of Ulugbek – Ali Qushji.

To comprehend the concept of 'intellectual neighbourhood' in the context of the conference, it is essential to remind regarding the Almagest (Ptolemy's astronomical treatise). A noteworthy Latin version was crafted by Johannes von Königsberg, also known as Regiomontanus. His publication "Epytoma in Almagestum Ptolemaei", or

"Incarnation of Ptolemy's Almagest", was disseminated in 1496. A vital aspect of that book is that Regiomontanus replicated a diagram from a manuscript initially created by Ali Qushji in Samarkand in the 1420s under Ulugbek's supervision.

In Bologna, Nicolaus Copernicus (1473-1543) obtained Regiomontanus's book. He even embarked on a dedicated journey to Padua, where Regiomontanus presented lectures on Persian astronomy. After returning to Frombork, Copernicus, having fully understood the significance of Ulugbek-Qushji's diagram, formulated one of the most influential theories in scientific history. Thus, we are justified in proposing an 'intellectual neighbourhood', brought about by the Channels of Transmission of Astronomical Knowledge from East to West via the Ottoman World (14th-18th Centuries).

Keywords: Ulugbek, Samarkand, Qushji, neigbourhood, Copernicus.

Biographical Note(s)

Hailing from Dushanbe's illustrious cultural lineage, Nargis N. is a multilingual scholar with expertise in Persian, English, Russian, and Tajik. Now gracing the International Silk Road University in Samarkand as a professor, her passion lies in exploring Central Asian culture and history.

Islamicate and East Asian Depictions of the Planets

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Abstract

The proposed paper will compare and discuss the illustrations of the planets of the Islamicate tradition and those of East Asia. The planets as anthropomorphic figures display many similarities between these two broad regions, even until early modernity, such as Venus as a musician playing a lute and Mars as a red-colored warrior. The Turkish example to consider is a copy of the 'Aja'ib al-makhluqat (Wonders of Creation) made by Muhammad ibn Muhammad Shakir Ruzmah-ʻi Nathani from 1717. These illustrations are traced back to Arabic sources, but they were not inventions of Arab scribes. The figures are similar in many ways to those of East Asia. China initially received their figures from an ostensibly Sogdian source. We are therefore left to suspect a Sasanian heritage for these types of icons. One important example, almost contemporaneous with the 1717 copy of the Wonders of Creation, is the Butsuzōzui 仏像図彙 (Buddhist Icons) published in 1690 by Tosa Hidenobu in Japan, which includes the planets among many other Buddhist figures. These can all be further compared to the Persian Daqa'iq al-haqa'iq (Degrees of Truths) by al-Nasiri of 1272. The similarities and differences between these two broad iconographies will be discussed with reference to variant traditions in India and

China. The proposed paper aims to highlight a common heritage for a body of astrological icons in both East and West Asia that has remained underrecognized. Discussion of this topic will hopefully uncover further clues regarding the original genesis of these icons.

Keywords: China, astrological iconography, planets, Islamicate astrology, Japan.

Biographical Note(s)

Jeffrey Kotyk (Leiden University, PhD, 2017) is presently a Research Associate at the University of Bologna, where he is running a project, Sino-Iran, which investigates connections between West and East Asia in late-antiquity. He has published extensively on the history of astrology in East Asia, as well as Buddhist Studies.

Astrological Iconographic Transfer to Persian, Arabic and Ottoman Manuscripts

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Abstract

Heir to Greek, Indian, Chinese, and Persian concepts and fixed in the canons of the Sui (581-618) and Tang periods (618-907), the history of the iconography of the planets in the astrological and magical traditions in the Persian, Arab, and Ottoman worlds is the result of a process of diffusion that we can still faintly understand since the ebb and flow of borrowings was so frequent, particularly between the third and seventh centuries CE.

In Central Asia, the permeability of Buddhism also provides clues to the possible iconographic transfers during the Kushan and Tang periods. As an example, the Tang court's interest in Buddhist canons of Indian origin is attested by the 16-year mission and the welcome given to the Buddhist monk Xuanzang (600-664) by the emperor Taizong (r.626-649) on his return to Chang'an (even if Xuanzang's career is colored by a hagiography that might be mostly fictional). This interest will also last under the Song (960-1279) or the Yuan (1279-1368) after them.

The Abbasid caliph al-Manṣūr (r.754-75) and his vizier Yaḥyā ibn Khālid ibn Barmak (fl. 774-803) were, among the translations they sponsored, undoubtedly the first to translate Sanskrit scientific works into Arabic, imitating the Sassanian

tradition marked by the reign of Ḫusraw I (501-579). The prominent place given to Indian tradition is, in addition to the interest shown in scientific translations, closely linked to the office of the vizier and his Buddhist Barmakid origins. As a result, historical astrology widely practised by the astrologers Māshā'allāh (740-815) and Abū Maśʿar (787-886), who, from Balkh or Baghdad, transcribed into Arabic the Sassanian astrological tradition transmitted by the knowledge of the Sabeans of Harrān or Barmakids.

This paper aims to connect the depictions of planets and their attributes described and illustrated in astrological manuscripts with the illustrated representations of these planets in the caves of China and Central Asia through two textual traditions copied from Persian into Arabic and Ottoman: the tradition of historical astrology attributed to the wise Iranian astrologer Jāmāsp and Muḥammad ibn Maḥmūd Ṭūsī's (c. XII century) / Zakariyāʾ al-Qazwīnī (d. 1283) ʿAjāyib al-makhlūqāt va-gharāyib al-mawjūdāt.

From the point of view of the history of science, and cultural and technical transmission across time and space, these astrological treatises also highlight the role of professional elites capable of mastering such skills, and show the channels of transmission and irradiation that the most learned circles could play in the dissemination of transcultural, trans-religious, and, therefore, transversal, knowledge.

Keywords: Planets, astrological iconography, Sassanian astrology, historical astrology, Islamicate astrology, history of astronomy.

Biographical Note(s)

Florence Somer holds a PhD in Anthropology and Religious History from the Paris Sciences et Lettres (PSL)/ Ecole Pratique des Hautes Etudes (EPHE), Paris (2023) and is associated researcher at the Institut Français d'Etudes Anatoliennes. Her fields of research are history and anthropology (Middle East, Central Asia), as well as the transversal history of astronomy.

Persian-influenced Magical Objects in Ottoman Manuscripts

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Abstract

This presentation explores a Persian manuscript preserved in The Walters Art Museum (Walters Ms. W.593), which contains ʿAjāyib al-makhlūqāt va gharāyib al-mawjūdāt by the 12th-century author, Muḥammad ibn Maḥmūd Ṭūsī. This manuscript distinguishes itself with its vividly illustrated pages showcasing diverse art schools and offering more comprehensive explanations compared to recent manuscripts of Ṭūsī's ʿAjāyib. It unveils the mysteries surrounding specific magical objects, magico-medicinal rituals involving mirrors, and astrological depictions of planets, particularly Saturn, whose representations pose challenges in pre-modern astrological manuscripts, often left unexplained in other texts. However, beyond its historical ambiguity and uncertain origin—whether of Safavid or Ottoman provenance - this presentation explores the manuscript's intriguing role as a witness to the exchange of magical practices and cultural elements between the Ottoman and Safavid realms.

Keywords: ʿAjāyib, astrology, magic, mirrors, Saturn.

Biographical Note(s)

Ph.D. student at Bordeaux-Montaigne University in the specialty of Islamic Art History, Aida Alavi's research deals with magical objects in Safavid Iran (1501-1722). She explores objects and works of art related to magical practices and studies original primary sources, especially manuscripts on occult sciences. Her thesis aims to show the acculturation process behind the ideological objectives of the Safavid dynasty and its promotion of Shiite religious thought.

Les Anneaux De Saturne: Tracking the Transmission of Astrological Knowledge Between the Perso-Arab and Byzantine Worlds

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Abstract

In recent years, scholarly research regarding the transmission of scientific and occult knowledge (i.e. alchemy, magic, medicine, geomancy, etc.) between the Perso-Arab and Byzantine intellectual spheres has progressed, especially in fields such as astronomy and astrology. To further examine the contact and relations between the Abbasid Caliphate and Eastern Roman Empire, this paper will focus on the astrological reception of the planet Saturn by Perso-Arab and Byzantine scholars in several astrological treatises and literary works. Arabic and Byzantine primary sources from the tenth until the twelfth century, specifically Abu Ma'shar's Great Introduction, John Tzetzes' Homeric commentaries, and Achmet the Persian's Oneirocriticon, which refer to Saturn, either extensively or briefly, in astrological terms. These will be analyzed both to prove the 'point of correspondence' between the Eastern Romans and the Arabs and to illustrate how the astrological interpretation of Saturn has both remained the same and yet been modified from the Babylonians to the Byzantines. The significance of Saturn goes beyond the long-standing astrological tradition believing the ringed celestial object bestows malice and poverty upon

unfortunate souls; Saturn also has a powerful influence over political and religious changes. This attribute has transcended from the Babylonians deeming Saturn the planet of kings to the Sassanian Persians determining the rise and fall of their rulers based on Saturn-Jupiter conjunctions: a phenomenon known by the Byzantines as attested by the Catalogus codicum astrologorum graecorum. In essence, Kronos-Zuhal can be considered a lens through which the transmission of the occult sciences between the Perso-Arabs and Byzantines can be detected. Furthermore, I aim to contribute to the growing field of shared Arabic and Byzantine divinatory practices and the slowly unraveling notion that Byzantine knowledge lagged behind its Perso-Arab counterpart.

Keywords: Saturn, Kronos, Zuhal, Byzantine astrology, Arabic astrology, intellectual transmission, Claudius Ptolemy, Vettius Valens, John Tzetzes, Abu Ma'shar, Achmet the Persian.

Biographical Note(s)

Apart from Arabic and Byzantine occult sciences, I am also interested in Byzantine art, Byzantine reception of Homer, the Sufi nuances of Persian literature, linguistic identity in the Eastern Roman Empire, and relations between various Rum populations with the Ottoman Sultanate.

In Search of Abū Maʿshar: The Attribution of Early Modern Age Treatises Titled Kitāb al-Mawālīd

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Abstract

Among the works attributed to the famous astrologer Abū Maʿshar (d. 886 CE) there is the treatise of nativities entitled Kitāb al-mawālīd. The book was published several times in Arabic as a popular edition under a range of similar titles; the first edition with the title Kitāb al-mawālīd was printed in Cairo, in 1338 H (1920/1921 CE). Besides that, there are a number of manuscripts entitled Kitāb al-mawālīd dated from 16-18th centuries of CE. My aim is to demonstrate that these works have nothing to do with the legacy of Abū Maʿshar, since they were created in a later period. Each of these aforementioned manuscripts consists of: a) introduction; b) information about every zodiacal sign with the description of appearance, character and features of a native, born at the rising of a sign (divided in three decans); c) occult recipes aimed to protect a person from the impact of an unfavourable horoscope. The textological study shows that this is not the case of a unique text, but rather a group of works sharing the same title and an identical structure, with significantly different contents. The strong mystical component as well as the dissimilarity of the texts and some of their very questionable astrological techniques suggest that these works could no more

be attributed to Abū Maʿshar; moreover, they have more magical than astrological significance. Nevertheless, these treatises are of considerable interest, being an illustrative example of the convergence of astrological and Islamic occult practices in the period of the late and early Modern era in the Islamicate world.

Keywords: Abū Maʿshar, horoscopes, magic, manuscripts.

Biographical Note(s)

Vladimir A. Rozov (PhD) is a researcher and a lecturer of Arabic and related disciplines in Saint Petersburg State University. The main sphere of interests includes Arabic as a sacred language, Islamicate Occultism and Arabic manuscripts. He also contributes in translation and edition of Arabic astrological books in Russian.

Sephardic Jews in the Ottoman Realm – The Scientific Diaspora

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Abstract

This paper is about one of the minority cultures living in the Ottoman territories, specifically, the diaspora in Ottoman lands of Jewish scholars involved in constructing and using mathematical instruments, notably astrolabes. Despite the acknowledged cultural and social impacts of this Sephardic diaspora in Ottoman Jewish and non-Jewish cultures, except for R. Morrison's studies and very few others, most of the mathematical output of these Jewish scholars in Ottoman lands remains unstudied. Moreover, their roles in transferring material and technical aspects of practical astronomy from the Iberian Peninsula to Southeast Europe and Western Asia need to be assessed. Finally, as in many disciplines, minor figures and peripheral subjects are frequently skipped or blurred vis-à-vis more valued figures and scholarly fields. My paper is built on the re-construction and appreciation of the significance and impact of the astronomical work and historical contexts of two 'minor' Jewish figures whose mathematical output in Ottoman lands has been ignored so far: Josef ben Solomon Taitazaq and his younger contemporary Moses ben Abraham de Ciudad; they both lived between the second half of the 15th and the first half of the sixteenth centuries

and settled in Salonika and Istanbul, respectively. Their careers are the occasion to explore material practices related to mathematical instruments in the Iberian Peninsula moving eastwards with Sephardic Jews and the connections between practical astronomy and mystical theories/practices in Jewish Kabbalah and astrology, highlighting the cultural and religious significance of these connections for the Jewish communities in the Ottoman Empire.

Keywords: Mathematical instruments, practical astronomy, Jewish diaspora, microhistory of astronomy.

Biographical Note(s)

Josefina Rodríguez-Arribas' research core is the intellectual history of Jews, focusing on scientific manuscripts and pre-modern science and technology (mathematical instruments and prognostication). She authored El cielo de Sefarad (2011) and co-edited Astrolabes in Medieval Cultures (2017 and 2019) and Unveiling the Hidden – Anticipating the Future: Divinatory Practices among Jews (2021).

Some Thoughts on Divination, Mysticism, and Astrology in the Early Modern Ottoman Empire

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Abstract

The existence of Ottomanic eschatological literature that intertwined with various religious apocalyptic traditions was felt more than ever in the early modern Ottoman Empire era, particularly throughout the fifteenth and sixteenth centuries, when expectations and excitements of the Islamic millennium reached an extreme level. Notwithstanding that, as I have examined the chronicles (veḳayīʿnāme), occult,and astrological manuscripts (almanacs/taqwīm, and occasional horoscopes/ṭāliʿ containing the courtlyastrologer's predictions) that refer to eschatological divinations in the fifteenth and sixteenth centuries, I have considered that apocalyptic prophecies and prognostications of courtly astrologers (munajjim) were arranged for individual and political intents. Miscellaneous factions within the empire, especially the dissidents who opposed the thought of the state of Ottoman becoming an empire, used the rearranged prophecies as an instrument of politics against the sultans, resistingthe strengthening of the Ottomanrulers sovereignty after the conquest of Constantinople at the time of Mehmed the Conqueror. On the other hand, the munajjims seen in the

Ottoman court since the reign of Mehmed II also appeared as an actor in the propheticstruggles within the empire, and they used their prognostications as a political tool in the creation of the divine image of Ottoman sultans as the expected rulers (Mahdī or ṣāḥib-qirān) as appropriate for the age of the apocalypse. This paper seeks to examine the political role of the munajjims and astrology (‘ilm aḥkām al-nujūm) in the establishment of the Ottoman imperial identity embellished with eschatological images as the required mystical atmosphere of empire against the especially heterodox orders duringthe middle of the fifteenthand the sixteenth centuries.

Keywords: Astrology, mysticism, apocalyptic, Ottoman.

Biographical Note(s)

Concentrate on the early modern Ottoman Empire era’s intellectual, cultural, and social history, Hüseyin Cahit Sarıkaya’s research includes the development of the history of divination, the munajjims, astronomy, and astrology in the early modern Ottoman world, and focuses on examining their reflections on various Ottoman areas.

Turkish Translation and Description of Kushyar Ibn Labban al-Jili's (Gilani) Mujmal al-'Usul from Arabic or Persian, an Important Sample for Astrological Treatises Transfer to Ottoman World

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Abstract

Mujamal al-'Usul fi Ahkam al-Nujum of Kushyar ibn Labban al-Jili (Gilani) a great Muslim scientist of the 10th and 11th centuries is one of the important treatises on astronomy and astrology in Islamic scientific world which had a unique position in the Islamic era's astronomy and astrology, so that during different centuries, a lot of manuscripts were always copied from it and has always been among the treatises that were studied in astronomy classes. This treatise was translated into Turkish with some additions and descriptions in the 18th century, and most of these additions were from Persian and Arabic astronomical sources for better understanding of the original text which shows the mastery of the astronomer translator of this treatise in Astrology, Arabic and Persian languages and the extent of scientific sources in various languages in the Ottoman civilization. In this article, while examining the Turkish translation of this treatise and its manuscripts, we will discuss on translator's identity and scientific

context of the translation period.

Examining this translation as a translated scientific book in Ottoman period can be a very clear example for the astrological sources and their transmission Channels in Ottoman world.

Keywords: Astrology, Ottoman science, translation, Mujamal al-'Usul fi Ahkam al-Nujum.

Biographical Note(s)

Seyyed Hadi Tabatabaei is M.Sc. in History of astronomy in Islam from University of Tehran – Iran. He is good fluent in Arabic, Persian, Turkish and English and is Cataloger of manuscripts. The transmission of science, especially modern science, between the Ottoman and Iran in the 16th to 19th centuries is one of his interests.

Ragıp Pasha's 15 Sacs of Gold: Remarks on the Occult Network Around an Ottoman Bureaucrat

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Abstract

Gevrekzade Hasan Efendi (d. 1801), the chief-physician to the Sultan Abdülhamid I, listed different types of feraset among which is the scapulimancy (ilm-i ketf). After a long description of how the scapulimancy is done, Gevrekzade narrates a memory of Ragıp Pasha (d.1763), the renowned grand vizier of Sultan Mustafa III, in Tabriz amidst the Iranian Campaign. During a feast he gave in Tabriz, Ragıp Pasha marveled that a Dagestani practitioner of scapulimancy read his fortune and guessed that he was owed 15 sacs of gold by Köprülüzade Abdullah Pasha (d.1735). The Dagestani came to Ragıp Pasha's presence through an Iranian named Mehdi Khan. According to Gevrekzade, Mehdi Khan was known for his interest in the science of stars. Mehdi Khan was known to said Ragıp Pasha that "we are after such a science that we could neither know its end nor its limit," when he was speaking of the scapulimancy. Years later, after Ragıp Pasha's death, Sultan Mustafa III sought for a treatise of astrology that Ragıp Pasha had brought from Iran and enthused about. Unable to find the astrological treatise among the books brought, the Sultan asked

the grand vizier to look again and the grand vizier replied that there was a mecmua of sorts that is signed by Mehdi Khan but it had been sent to Enderun-ı Humayun. The astrology treatise that the sultan wanted to see must have been in that mecmua that the inquiry did not continue. With careful research, this paper tries to discover which channels the dissemination of occult and other forms of knowledge in this period was ensured through Ragıp Pasha, one of the biggest sponsors of sciences in the 18th century Istanbul, and Mehdi Khan, with whom he established relations in Iran.

Keywords: Ottoman Empire, Ragıp Pasha, scapulimancy, ilm-i ketf, occultism.

Biographical Note(s)

Abdüssamet Yılmaz is a graduate student in Istanbul Technical University and he is interested in history of science in the early modern Mediterranean world. He focuses on the presence of non-Ottoman physicians in the imperial medical landscape and his research covers the vernacularization of Ottoman sciences in the 17th and 18th centuries. His works aims to combine history of science, history of political economy and intellectual history.

Investigating the Fusion of Mongol and Timurid Astronomy in Samarkand School and Observatory and Transferring Its Legacy to the Ottoman Empire

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Abstract

The rise of the Mongols revived the desire for astronomy and the idea of determinism based on astronomical knowledge. With the strengthening of this thinking, an observatory was established in Maragheh by the Mongol patriarchs. Then its achievements and those like Nasir al-Din Tusi made their way from Maragheh in the west of Iran to Samarkand, the capital of the Timurids in the east. After the construction of the Samarkand school and observatory by the Timurids, Ali Qushji, the astronomer Ulugh Beig, was able to use the knowledge of Mongol and Timurian astronomy to complete Zij Soltani. Although the efforts of Qushji and others such as Ghiyāth al-Dīn Jamshīd kashani and Salah al-Din Musa Pasha turned the Samarkand Observatory into the largest observatory in the Islamic world, however, sometime later, Qushji migrated to Osmani. And he applied his learning in the school of Ayasofia.

By describing and analyzing the data of historical sources, this research deals with

why and how Mongol and Timurid astronomy were connected in the school and observatory of Samarkand and the role of Qushji in transferring its legacy to the Ottoman Empire, relying on library studies.The results show that while Qushji's astronomical knowledge was an extension and complement of the Mongol period, it was also important in the following eras.

Keywords: Qushji, Timurid, Mongol, Iran, Ottoman, astronomy.

Biographical Note(s)

Sara Yarmahdavi; Ph.D.Candidate in History, studies of Iran after Islam. Research interests: Middle East studies, astronomy in History.

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Risālah Dar Hayʾat and Its Predecessors

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Abstract

The scholarly career of ʿAlī Qūshjī (d. 879/1474) experienced its remarkable conclusion at the Ottoman court in Istanbul. Qūshjī was invited there by Sultan Mehmed II as part of the Sultan's drive to establish institutions of learning and to recruit outstanding scholars from Ottoman and non-Ottoman lands. Though Qūshjī's time at the Ottoman court was brief, he made lasting contributions to the madrasa curricula during his residence. Qūshjī's influence in the field of astronomical education in Ottoman lands can be seen by the numerous surviving copies of a work composed prior to his arrival in Istanbul, Risālah dar hayʾat ("Epistle on the Configuration of the Spheres"). As Qūshjī states in his text, Risālah dar hayʾat was an opportunity to update some of the astronomical parameters quoted in hayʾa manuals, based on the new values found while he was a scientist at the Samarqand observatory. Writing Risālah dar hayʾat afforded Qūshjī the opportunity, as well, to consider, review, and revise earlier texts and to present hayʾa basīṭa in a freshly composed work. In this regard, scholars have noted the influence of Risāla-yi muʿīnīya by Naṣīr al-Dīn Ṭūsī (d. 672/1274), as can be seen, for instance, in the introduction of Risālah dar hayʾat and its similarity to Ṭūsī's work. As a relatively brief treatise Risālah dar hayʾat

appears to look back to other noted predecessors, as well, including al-Mulakhkhaṣ fī al- hayʾa al-basīṭa by Maḥmūd Jaghmīnī (fl. early 13th century CE), a pedagogical text greatly popular in Ottoman lands and elsewhere. Examining Qūshjī's presentation of hayʾa basīṭa in the Risālah dar hayʾat allows us to trace the influence of these earlier works in Qūshjī's work. The study allows for an examination, as well, of Qūshjī's conception for a newly composed elementary text on hayʾa basīṭa, and the manner in which this led to the success of his text on astronomy in the Ottoman madrasa system.

Keywords: Risālah dar hayʾat, Qūshjī, Risāla-yi muʿīnīya, hayʾa basīṭa.

Biographical Note(s)

Kaveh Niazi received a PhD in history of science in 2011 from Columbia University, New York. He is the author of two books on the astronomy of the Islamic world.His research interests include the astronomical and mathematical works of the Islamic world.

Tracing the Samarqand School in the Ottoman Empire: Ġulām Sinān's Fatḥ al-Fathiyya

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Abstract

ʿAlī al-Qūshjī, one of the astronomers working at the Samarqand Observatory, which was established under the patronage of Ulugh Beg. After Timurid Sultan Abū Saʿīd defeat by Uzun Ḥasan, he moved first to Iran and then to the Ottoman lands. He received a splendid welcome in Istanbul, where he wrote some of his works. Of these, al-Fatḥiyya fī ʿilm al-hayʾa is the most important work in terms of theoretical astronomy. Mehmed II appointed al-Qūshjī as a muderris at the Ayasofya Madrasa, where he taught astronomy and mathematics. His lectures were followed by a large number of students.

One of these students is Ġulām Sinān, who was the slave of one of the viziers of Murād II. After working as a muderris in Bursa, Sinān was appointed to the Ṣaḥn-i Thamān Madrasa during the reign of Bāyezīd II. He wrote a commentary on his teacher's work under the title Fatḥ al-Fatḥiyya. Besides being the first commentary to the commentary al-Fatḥiyya, which was written in 1485, it is one of the two known commentaries. In the work, the author expresses that he explains the issues that remain unclear in his teacher's work, and from time to time he settles accounts with

his teacher.

In this study, Fatḥ al-Fatḥiyya, one of the earliest theoretical astronomy books written in the Ottoman Empire, will be introduced, its similarities and differences with al-Fatḥiyya fī ʿilm al-hayʾa will be revealed, and the reception of the Samarqand astronomicial tradition in the Ottoman lands will be analyzed through one of the first examples.

Keywords: Ġulām Sinān, ʿAlī al-Qūshjī, Fatḥ al-Fatḥiyya, al-Fatḥiyya fī ʿilm al-hayʾa.

Biographical Note(s)

Ottoman astronomy, Modern astronomy, Reception of modern astronomy in the Ottoman Empire and debates in this context, sources of 19th century Ottoman astronomy.

Effort Astronomical Calculations Without the Need for a New Theory, Ulugh Beg- Qushjī's Geometric Solution for Calculating Planetary Latitude

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Abstract

It seems that designing new models for the motion of the planets was not the first choice for the astronomers of the Samarkand observatory, in contrast with their predecessors in Maragheh, they calculated their Zij based on the classical astronomical models, i.e., the Ptolemaic models. Of course, as an astronomical tradition, the books of Zij were calculated based on the Ptolemaic models, with a few exceptions, and non-Ptolemaic models did not find a way to appear in practical astronomical books and be used by calculator-astronomers. However, Ptolemy's models could not be easily used by Samarkand astronomers, whose observations were highly accurate, showing minor flaws. Ptolemy's models produce more flaws for planetary latitude (see: Swerdlow, 2005. Ptolemy's Theories of the Latitude of the Planets in the Almagest, Handy Tables, and Planetary Hypotheses), so it could not proper for the tables needed by Samarkand observers. As a result, Samarkand astronomers used new mathematical/geometrical methods, applicable to Ptolemaic models, resulting in different calculation methods. The method presented by Qushjī in his commentary on Ulugh Beg's Zij is a basic geometric solution, derived from a

particular type of Thales theorem (corresponding to the twelfth form of the first chapter of Almagest, the section on geometric theorems). Application of this tool to the planetary latitude model, allowed astronomers to calculate the sum of the first and second planet latitudes simultaneously by a simple calculation. Qushjī is the main inheritor of the Samarkand school of astronomy and played an essential role in transferring astronomical knowledge to the Ottoman world. He was an active participant in the observations in Samarkand. By the way, after the completion of Ulugh Beg's Zij, he wrote a commentary on it and brought it to the Ottoman Empire. It seems that Qushjī's astronomical report of the Samarkand school was influential in the formation of the later astronomical Ottoman tradition. Examining the details of Qushjī's commentary on Ulugh Beg's Zij can provide us with new information.

In this presentation, after getting acquainted with Samarkand's observations and Qushjī's contributions, we examine the practice of this geometric method and its differences with Ptolemy's solution for calculating planetary latitude.

Keywords: The latitude of the planets, Ulugh Beg's Zij, Alī Qushjī, planetary hypotheses.

Biographical Note(s)

The main topic of my research is astronomy in the Islamic era, focusing on astronomical tables. In particular, I work at the Samarkand Observatory. I am also interested in astronomical instruments and astronomical models and am familiar with them.

Astronomers Who Utilized the Science of Optics: The Examples of Qutb al-Dīn al-Shīrāzī and Fathallāh al-Shīrvānī

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Abstract

Throughout the history of physics in the Islamic world, narratives on the science of optics not only find a place for discussion in different schools such as peripatetic, theological, Illuminationist, and optics, but also in books from various disciplines. For example, it is possible to find optical content in an enmūzaj-type text on the classification of sciences or in a medical text. On the other hand, information on optics sometimes presented by the scholar in a text on astronomy as supporting astronomical information. An example of such a scholar is Qutb al-Dīn al-Shīrāzī (d. 710/1311), who presents narratives on lunar eclipses, solar eclipses, and shadows in his books on astronomy such as Nihāyat al-idrāq fī dirāyat al-eflāq and similar astronomy books. In his treatment of eclipses, al-Shīrāzī treats not only solar and lunar eclipses but also the observation of different phases of the moon, such as the crescent and full moon, as an optical illusion caused by light, a play of shadows. He builds his account of optics on the terminology of Ibn al-Haytham, who refers to the distinction between primary and secondary lights. Another example of an astronomer

who utilized the science of optics is Fathallah al-Shirwānī (d. 891/1486), whose voluminous and important commentary on Naṣīr al-Dīn al-Ṭūsī's al-Tazkira fī al-ḥay'e, in the tabīi`yyāt section, discusses optics in detail. After mentioning knowledge of optics as a prerequisite for astronomy, Shirwānī analyzed the eye anatomically and geometrically and explained optical phenomena such as theories of vision, reflection and refraction of light based on Ibn al-Haytham and Kamāl al-Dīn al-Fārisī. Considering that the authors and texts of many disciplines of Ottoman classical science have not yet been fully compiled, it may be possible in time to reach different scholars like Shirwānī and Shīrāzī who drew support from optics in their astronomical writings. Thus, in this study, we aim to discuss various astronomers who used optics in their writings and shed light on this field.

Keywords: Ibn al-Haytham, history of optics, history of astronomy.

Biographical Note(s)

Sena Aydın is a research assistant at Istanbul Medeniyet University, Faculty of Arts and Humanities, Department of History of Science. In September 2022, she defended her PhD thesis on the problems of rainbow, halo and color in Ottoman science (1300-1600). Her research area is the history of Ottoman physics in general and the history of optics in the Ottoman classical period in particular.

A Survey of Seydi Ali Reis's Arguments for the Immobility and Centricity of the Earth in His Khulāsat al-Hayʾa and Their Roots in Quṭb al-Dīn Shīrāzī's Works

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Abstract

Seydi Ali Reis (1498–1563) was an Ottoman navigator. He authored Khulāsat al-Hayʾa in theoretical astronomical under the influence of his predecessors, especially Quṭb al-Dīn Shīrāzī (1236–1311) who completed his trilogy in hayʾa in Anatolia (Sivas and Malatya). Seydi Ali Reis brings his arguments for the immobility and centricity of the Earth as well as his criticism of the previous arguments in the first part of the first chapter of Khulāsat al-Hayʾa. These arguments which are rooted in Ptolemy's Almagest, are based on observation and some Aristotelian pre-suppositions. In this talk, these arguments will be presented in comparison to Naṣīr al-Dīn Ṭūsī's, Shīrāzī's, as well as the commentary-writers' of Ṭūsī's Tadhkira. I introduce these arguments one by one, and show their roots in Shīrāzī's works. Nevertheless, Seydi Ali Reis brings the arguments critically: as in some cases he does not follow Shīrāzī's step and brings his own or other authors' opinions.

Keywords: Seydi Ali Reis, Quṭb al-Dīn Shīrāzī, hayʾa, Earth immobility, centricity of the Earth.

Biographical Note(s)

My PhD dissertation is about Shīrāzī's works in hayʾa. I published several papres on Shīrāzī's planetary models. I prepared a critical edition of Shīrāzī's Ikhtiyārāt Muẓaffarī that will be published in a few months.

Tradition and Innovation in the Astrolabe Treatise of Taqi al-Din Ibn Ma`ruf (1526-1585 AD)

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Abstract

The Ottoman astronomer Taqi al-Din ibn Ma`ruf (1526-1585 CE) wrote a treatise on stereographic projection and its application to astrolabe design. The extant autograph manuscript includes, as an appendix to the text, numerical tables which he computed for the almucantars of astrolabe plates for 25 geographical latitudes between 21.5 degrees (Mecca) and 66.5 degrees (arctic circle). We will discuss terminological and methodological similarities and differences between these tables and the earlier astrolabe tables by al-Farghani (ninth century CE), which Taqi al-Din seems to have known in fifteenth-century Syrian recensions. For the construction of azimuthal circles, Taqi al-Din had an innovative approach based on the following two ideas: (1) the grids of azimuthal circles are similar for all geographical latitudes, and therefore one can restrict oneself to the equator and use a scaling factor; and (2) for the plate for the equator, which is the same as the Zarqali plate, it is sufficient to know the almucantars only; the radius of any azimuthal circle on the plate is equal to the distance between the centre of a suitable almucantar and the centre of the astrolabe, and the distance between the centre of the azimuthalcircle and the centre of the astrolabe is equal to the radius of the same suitable almucantar. It can be shown

that this relationship was not used by al-Farghani and his later editors. Consequently Taqi al-Din showed how his table for almucantars for the equator can be used for the construction of azimuthal circles for all geographical latitudes.

Keywords: Astrolabe, Taqi al-Din, al-Farghani, azimuthal circle.

Biographical Note(s)

Jan P. Hogendijk is a retired professor of the history of mathematics at Utrecht University, the Netherlands. His research interests are the mathematical sciences in medieval Islamic civilisation and Greek antiquity, and mathematics in the Netherlands between 1500 and 1850. See www.jphogendijk.nl for all information.

Taqi al-Din and His Main Astronomical Work Sidrat al-Muntaha

Hüseyin Şen

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Abstract

Taqi al-Din (1526-1585) was the founder of the Istanbul astronomical observatory, which was destroyed in 1580 and which was the last observatory in the Ottoman Empire in the premodern period. He lived and worked in a time where cultural and scientific exchange between Europe and the Ottoman Empire was on the rise.

In this talk I will report about my PhD research on Taqi al-Din's most important astronomical work Sidrat al-Muntaha. I have prepared an edition of the Arabic text, with English translation and commentary, of Parts 4 and 5 of this work, on the theory of the sun and the moon, which Taqi al-Din based on observations that were made in his time, mostly by himself. Most of the text of these parts 4 and 5 is still unpublished. I will discuss the connections between Taqi al-Din and the Almagest of Ptolemy as well as works by earlier Islamic astronomers.

The Sidrat al-Muntaha is extant in a draft autograph manuscript, in which the text suddenly ends in the middle of the sentence. All other extant manuscripts are ultimately based on this autograph draft. I will discuss what this autograph draft manuscript tells us about the events in his life and about the methodology of his work.

Keywords: Taqi al-Din ibn Ma'ruf, Ottoman astronomy, Istanbul Observatory, Sidrat al-Muntaha al-Afkar.

Biographical Note(s)

Hüseyin Şen is an aerospace engineer and historian of Arabic science based in Doha, Qatar. He is currently finishing his dissertation on the Sidrat al-Muntaha of Taqi al-Din ibn Ma'ruf. His research interests include medieval Arabic astronomy, medieval scientific instruments, and the popularization of medieval Arabic science through STEM education.

On Some Parallels Between the Ottoman and Western European Astronomical Traditions in the 16th and 17th Centuries

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Abstract

The Zarqali plate, also known as the universal astrolabe, was invented in the 11th century by the Andalusian astronomer Ibn al-Zarqalluh. Ibn al-Zarqalluh himself described the geometrical construction of the plate, which was transmitted in the Alphonsine books and can also be found in later European sources.

In practice, purely geometrical methods cannot provide the required accuracy when constructing Zarqali plates, and hence numerical tables are necessary. Initially, one could use the imperfect tables which had been computed by al-Farghani in the 9th century for astrolabe plates of latitude zero. In the late 16th century, Ottoman astronomer and head of the Istanbul Observatory Taqi al-Din recomputed these numerical tables in a much more efficient way. Very similar tables, based on the same improved methodology, can be found a few decades later in the work of Dutch mathematician and astronomer Adrianus Metius. His books on the Zarqali plate (which he called astrolabium catholicum) were published in Franeker, the Netherlands, between 1610 and 1630, and contain frequent references to Istanbul.

In this talk, we present these parallels between the work of Metius and Taqi al-Din in detail and place them in a more general context of similarities between Ottoman and Western European scientific knowledge at the end of the 16th century and beginning of the 17th century. In this way, we provide motivational evidence for a deeper study of the scientific exchanges between Western Europe and the Ottoman Empire, and of the specific ways in which these exchanges could have taken place.

Keywords: Zarqali, astrolabe, Taqi al-Din, Metius.

Biographical Note(s)

Mireia Martínez i Sellarès is a PhD student in history of mathematics at Utrecht University under the supervision of Viktor Blåsjö. While the focus of her PhD project is on the history of 19th-century (affine) geometry, her research interests naturally extend to earlier periods.

'Jyahorda' – A Precursor to Modern Navigational Instruments

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Abstract

Navigation in vast landscapes such as oceans and deserts is challenging and often devoid of recognizable landmarks or established paths or directions. These lengthy voyages, however, have played a significant role in shaping civilizations and facilitating the exchange of culture, throughout history. Explorers in ancient times relied on celestial navigation not only to find out practical solutionsfor navigation but also for the advancement of astronomy, mathematics, and cartography. The development of astronomical instruments made navigation more precise, safe, simple, reliable, and efficient. The development of such instruments (referred to as 'Yantras') began in India since the Vedic Era.

The term 'Vedic Yantras' refers to the various tools and instruments mentioned in the 'Vedas' (the orally transmitted sacred teachings of ancient India).These are the oldest

Hindu scriptures, and they encompassa treasure of knowledge about a wide range of subjects, includingastronomy, astrology, mathematics, and ritual practices, etc. The 'Jyahorda' (small bow without arrows) used by 'Vratyas' is one of the earliest such tool mentioned in the Brahmanas (Vedic Literature).

This research aims to explore the significance of 'Jyahorda' as a precursor for the evolution of modern navigational instruments. Furthermore, by bridging the gap between traditional and contemporary navigation techniques, it strives to establish the chronological and technical relationship between various forms of other related instruments such as 'Ra-P-Palagai', 'Kau Kutty', Cross staff, and so on.

Keywords: Jyahorda, navigational instruments, ra-p-palagai, kau kutty, cross staff, Vedic yantras, astronomical instruments.

Biographical Note(s)

Ms. L R Krishnais a Research Scholar in IndianKnowledge Systems at IIT Guwahati. She holds Master's degree in both Computer Application and History. Currently she is working on ancient navigational methods and instruments.

Mr. Abhishek Shandilya is a Research Scholar in Indian Knowledge Systems at IIT Guwahati. He holds Master's degreein both Sanskrit and Jyotisha. Currently he is workingon astronomical instruments and temple architecture.

Prof. T. V. Bharat is Professor in Department of Civil Engineering and Centre for Indian Knowledge Systems, IIT Guwahati. His research area in Civil Engineering is unsaturated soil mechanicsand Geo-environmental engineering. He is currently working on ancient navigation, temple architecture and astronomical instruments at Centre for Indian Knowledge Systems.

The Map of di Virga from Venezia to Heidelberg and Where is It Now? --- What Can We Learn for the Evolution of Nautical Charts?

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Abstract

This talk will discussthe world map of Albertindi Virga, its origin, its "biography" and the possibleconnections to other maps. What can we learn from a map which is lost and only documented by bad photographs? The relation to thethemes of the meeting on ottoman astronomy will be described shortly at the end of this abstract.

The di Virga map was drawn by Albertin di Virga in 1411 or 1415, at least this is writtenon the map (see above). Di Virga lived in Venezia. 500 years later the map was bought by Albert Figdor in Šibenik. After Figdor's death in 1927 the map came into possession of his niece Margarete Becker- Walz, the wife of the Lord Mayor of Heidelberg ErnstWalz. Ernst Walz was Lord Mayor from 1913 till 1928. The map was offered in an auction in Luzern in June 1932 but withdrawn before the auction. A photo in the auction catalogue is the last witness we have.

A lot could have happened since then. Margarete Becker-Walz died half a year later in December of 1932. In January 1933 the Nazis came into power in Germany which might be important because the family was Jewish.Ernst Walz died in 1941. Apart from a more detaileddiscussion of the map's biographythe main focus will be to considerwhat we can learn from the photosof the map in comparison with other maps

of the time but also from the corresponding calendarand Easter tables.

The map itself has a diameterof 41 cm and can be regardedas a “compromise between the classical medieval world maps and the map of seaports” (von Wieser). As such the di Virga map can teach us to understand the early evolution of nautical maps. In this context an earlier map of di Virga of 1409 is of interest showing a traditional Portolan area stretching from the Black Sea in the East to the AtlanticIslands in the West.

Altogether it will be discussed how much a lost map and its corresponding calendar and Easter tables together with a more detailed discussion of its “biographical fate” can help in the further investigation of the evolution of nautical charts in general.

First of all, this map is part of Venetian cartography. However, the circular calendar attached to it (which is not unusual for Venetian maps) shows the connection to mathematics and astronomy, additional to the anyhow close connection of cartography and astronomy. The moon table is important for calculating Easterand for navigation. Moreover, the zodiacalcycle clearly is linked to celestial maps also.

The relation to the Ottoman cultural sphere is given by the location of Šibenik in Croatia in the regionof Venetian influenceand at the border of Ottoman and Western culturalspheres in the 15th century.

Keywords: Divirga map, Venezia (Venice), Heidelberg, cartography and astronomy, Ottoman Empire, Croatia and Bosnia.

Biographical Note(s)

Harald Gropp is a mathematician and a historian of mathematics and astronomy, in particular of calendars, discoveries, and cartography. His particular interest is in non-European calendars, in the question and discussion of the “correct” Easter date, in the history of “discoveries” in the 15th and 16th centuries, in particular in the Atlantic ocean, and in the corresponding maps. Maps are considered in the broader context of graphs and graph-like diagrams from the point of view of graph theory within mathematics.

From Invisible to Visible: Tracing Ottoman Astronomy in the Nautical Tradition Through the Manuscripts, Portolans and Calendars (16th-18th centuries)

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Abstract

Historical studies have offered valuable insights into the pivotal role of nautical astronomy across diverse maritime cultures throughout history. Despite the acknowledged significance of nautical astronomy, research is ongoing to unravel the intricacies of the techniques and tools employed and how they evolved across different cultures and periods. In the Ottoman case, the role of astronomy in nautical practices remains open-ended due to historical, linguistic, geographical, and interdisciplinary challenges, highlighting the following key points: 1) The geographical context of Ottoman navigation, encompassing specific routes and regions, likely influenced the emphasis on diverse navigational techniques, including astronomy. 2) The role of astronomy in navigation might have evolved due to advancements in nautical techniques, the introduction of new instruments, or changes in geopolitical circumstances. 3) Comprehending how Ottoman navigators utilised these techniques necessitates rigorous study and analysis because celestial navigation involves mathematical calculations, precise observations, and instrument usage. 4) Historical

record gaps impose limitations on reconstructing navigation practices in historiography. Thereby necessitating ongoing research and exploration for a comprehensive understanding.

With these critical considerations in mind, we aim to discuss methods for reconstructing the historical use of celestial navigation in Ottoman seafaring from the 16th to the 18th centuries. To achieve this, we will analyse the following examples: Circular diagrams related to calendars on Ahmed b. Süleyman et-Tancî's portolan (1416), Mürsiyeli İbrahim's portolan (1461) and el-Hacc Ebu'l Hasan's portolan(1552?); the Mediterranean Sea-Atlases of 'Ali al-Sharfi of Sfax (1551, and 1571); Piri Reis's Kitab-ı Bahriyye (Book of Navigation, 1521), Seydi Ali Reis's Kitabü'l-Muhît (Book of the Ocean, 1554); Hacı Mehmed Reis's sailing directions (copied in 1596); Katip Çelebi's Tuhfetü'l-kibar fî esfari'l-bihâr (The gift to the great ones on naval campaigns); Hezârfen Hüseyin Efendi's work on principle of Ottoman administrative organisation (1675/1676); anonoyms Ottoman perpetual calendar for the latitude of Algeria (18th century).

Keywords: Circulation of knowledge, astronomy, navigation, Ottoman world.

Biographical Note(s)

Dr. Gaye Danışan is an assistant professor in the Department of the History of Science at Istanbul University. Her research in Ottoman history encompasses calendars, portable astronomical devices, volvelles, navigation, astrology, and astrometeorology, primarily focused on the 16th and 18th centuries. She coordinated a project entitled A Comparative Study on Theoretical and Practical Aspects of Scientific Activity in the Ottoman Empire: Annual and Perpetual Calendars (1550-1710), funded by the TUBITAK between 2020-2022. Her ongoing project, Portable Astronomical Instruments: The Processes of Adaptation and Diffusion of Medieval Islamic and European Examples in the Ottoman Geography (1500-1700), is funded by the Turkish Academy of Science- Outstanding Young Scientist Awards Program.

A Case Study on Natural Phenomena: How Eclipses Were Placed in the Ottoman Munejjim Küfri Hasan Çelebi's Almanacs (1646-1660)?

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Abstract

The *Ahkâm-ı tâli'-i sâl ve takvim* (Prognostications for the Ascendant of a Year and Calendar), a key genre in Ottoman literature, contained extensive data on solar and lunar eclipses, alongside other astronomical and astrological insights. The chief astronomer (müneccimbaşı) typically prepared these calendars. They provided detailed information about upcoming solar and lunar eclipses, covering their types (total, partial, or penumbral), exact times of occurrence, and magnitude estimates. The precision of this data reflected the Ottoman Empire's astronomical expertise.

This presentation focuses on the eclipse data in nine *Ahkâm* calendars from 1056 AH (1646 CE) to 1069/70 AH (1659/60 CE), except years between AH 1060/61 (1651/52 CE) and AH 1069/70 (1659/60 CE), prepared by Küfri Hasan Çelebi (d.1660), a colourful figure in the history of Ottoman astronomy. Küfri prepared the 1056 Hijri calendar while serving as the second munejjim under chief astronomer Hüseyin Efendi, renowned for his precise calendars. Küfri's calendar, known as *Ahkām-ı Külliye* or *Takvīm al-Kavīm*, has gained recent attention due to its humorous

elements. Furthermore, eight annual calendars titled *Ahkâm-ı tâli'-i sâl ve takvim*, kept in the Library of Kandilli Observatory and Earth Research Institute (MS 165/9-16), were prepared during Küfri's chief-astronomer period and represent their official. Comparing these calendars will facilitate discussing the differing approaches to eclipses between the two Ottoman scholars and the humorous in Küfri's work. Based on this perspective, the presentation aims to illuminate our understanding of Ottoman society's cultural and scientific context regarding eclipses.

This paper was supported by the Scientific and Technological Research Council of Türkiye (project no: 119K827) under the title “A Comparative Study on the Theoretical and Practical Aspects of Scientific Activity in the Ottoman Empire: Annual and Perpetual Calendars (1550- 1710)”.

Keywords: Küfri Hasan Çelebi, calendar, solar and lunar eclipse.

Biographical Note(s)

In 2021, Solmaz Ceren Özdemir successfully defended her master's thesis titled “Eclipse calculations and observation in Ottoman astronomy (1800-1922)” under the supervision of Asst. Prof. Dr. Gaye Danışan in Istanbul University. “A Comparative Study on the Theoretical and Practical Aspects of Scientific Activity in the Ottoman Empire: Annual and Perpetual Calendars (1550-1710)” as a researcher in the TÜBİTAK project. Research Areas: History of science, history of astronomy, Ottoman astronomy, solar and lunar eclipses, astronomical phenomena.

An Englishman in the Ottoman Lands and His Pursuit of a New Calendar

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Abstract

The aim of this presentation is to provide a fresher look at the transfer of scientific knowledge between the Islamic world and the 17th-century England. It will focus on the research and works of one particular scholar: John Greaves (1602-52). He was an English scholar of mathematical sciences and a Savilian professor of astronomy in Oxford. What began as an interest in astronomy in his twenties transformed into a career and a life-long passion for Greaves. While he was tutored on astronomy by John Bainbridge, his predecessor in Savilian professorship, he also independently learned Arabic, Persian, and Turkish. He travelled to the Ottoman lands and spent more than a year in total in Istanbul, Rhodes, Alexandria, and Cairo between December 1637 and April 1639. During this period, he acquired Arabic, Persian, and Turkish books on astronomy, mathematics, and history as well as books on poems and psalms. He studied them for the rest of his life, particularly books on astronomy which contain chapters on calendars such as zījes. One of the main goals of his research was to create a perpetual and self-correcting calendar of which he managed to create and published it in a book titled Epochae ... usistatae ex traditione Ulugh Beigi in 1650. The book contains his calendar conversion tables and an instruction

manual for its use. It is one of the most concrete pieces of evidence of the continuity of influence and transfer of knowledge from the Islamic world to a post-Copernican-era England which is often neglected in the studies on knowledge transfer in the history of science.

Keywords: John Greaves, astronomy in the Islamic world, zījes, calendars, Ottoman lands.

Biographical Note(s)

Taha Yasin Arslan is a historian of science and deputy director of the Institute for the History of Science in Istanbul Medeniyet University. His works focuses on astronomical instruments in the Islamic world between the 13th-16th centuries. He also works on a project about John Greaves in St John's College, Oxford.

The Reception of an Ottoman Perpetual Calendar in 17th-Century Europe: Georg Hieronymus Welsch's "Commentarius in Ruzname Naurus"

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Abstract

An Ottoman perpetual calendar was published at Augsburg in 1676 under the title "Commentarius in Ruzname Naurus, sive, Tabulae aequinoctiales novi Persarum & Turcarum anni" along with a commentary written by Georg Hieronymus Welsch (d. 1677) on behalf of Christoph Weikmann (d. 1681), a magistrate in the Imperial Free City of Ulm. The author of the commentary, Georg Hieronymus Welsch, embarks on a quest to identify the original author of Ruzname. During this quest, he displays his general knowledge of Ottoman astronomy and the astronomical knowledge of "peoples of the Orient". Although it was notable that certain libraries and booksellers' catalogues interestingly attributed the calendar within this work to Abū'l al-Wafa' al-Būzjanī (d. 998), German orientalist and historian of Ottoman Empire Franz Babinger (d. 1967) characterised this text as an example of the Ottoman tradition. From that point of view, by revisiting the historiographical debates about

the authorship of the perpetual calendar, this study aims to find out whether Hieronymus Welsch identified the genuine author of Ruzname, his motives and how accurate his analysis was in general.

The authors gratefully acknowledge that this paper is part of a project entitled “A Comparative Study on Theoretical and Practical Aspects of Scientific Activity in the Ottoman Empire: Annual and Perpetual Calendars (1550-1710)”, which was founded by the Scientific and Technological Research Council of Türkiye from 2020 to 2022 (project no: 119K827).

Keywords: Perpetual calendar, Georg Hieronymus Welsch, Ottoman astronomy, Commentarius in Ruzname Naurus, European reception of Ottoman astronomy, seventeenth-century Europe.

Biographical Note(s)

Kutsi Aybars Çetinalp completed his undergraduate studies at Istanbul University, where he graduated from the Department of Classics in 2015 and the Department of Archaeology in 2019 within the double major programme. In 2022, he successfully defended his master's thesis titled "An Analysis of the Knowledge of Earth Sciences in Middle Byzantine Histories, Chronicles, and Military Manuals (867-1204)" under the supervision of Prof. Dr. A. M. Celâl Şengör in Istanbul Technical University. In the same year, he was appointed as a research assistant to ITU Department of Humanities and Social Sciences. Çetinalp continues his PhD at ITU, along with his studies at the intersection of military history and history of science and technology.

The Indigenization of the Middle Persian Lunar Mansions in the Islamic and Ottoman Astronomical Literature

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Abstract

The names of the lunar mansions in the Sassanid period as recorded in the various extant Middle Persian (MP) manuscripts, due to diverse scribal interventions and errors, are so defective that, despite several attempts, as yet no single scholar has been able to present an accurate, reliable reading of the whole 27 MP names – not to mention their original semantic significance. This paper primarily establishes the accurate spelling and reading of these MP lunar mansions via an examination of their various forms in the extant MP manuscripts. Then, through an etymological study, it will show how all the names of these MP lunar mansions have the same significance and meaning as their counterparts in the later Islamic literature (also present in the Ottoman astronomical manuscripts). The findings of this paper indicates that the pre-Islamic Persian astronomical tradition has not been completely eradicated after the Islamic conquests but it has been simply indigenized and transmitted to the Islamic era due to the widespread influence of Arabic language as the lingua franca of the

time. In this process, various sources of confusion and discrepancy resulting in their previous misreadings and misinterpretations in the extant literature will also be discussed.

Keywords: Astronomy, Lunar mansions, Middle Persian, Arabic, scribal errors.

Biographical Note(s)

Atefeh Sarhadi received a bachelor's degree in English teaching from Islamic Azad University of Marvdasht and a master's degree in ancient languages and cultures from Shiraz University in Iran. She was formerly a lecturer at Shiraz University of Art. Her main interests are Iranian languages, ancient astronomy/astrology, and manuscript reading.

Mohammad Reza Esna Ashari is a faculty member at the Islamic Azad University of Abadeh. He received both his bachelor's and master's degrees in Enlish languge and literature from Shiraz University in Shiraz, Iran. He is interested in literature, linguistics, textual criticism, Indo-European languages, ancient astronomy/astrology, and mythology.

The Influence of Ottoman Astronomy in Malay Sources Discovered in the Deep South of Thailand

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Abstract

During the Ottoman era, there had been commercial, diplomatic, and military relations between Ottoman Empire and the Malay world through Aceh sultanates. These relations took place mainly in the 16th and 19th centuries. This research aims to study the influence of Ottoman astronomy in Malay manuscripts discovered in the deep south of Thailand. At present, two astronomical manuscripts discovered in the area have been studied, analyzed, and disseminated the astronomical knowledge contained therein. Firstly, the astronomical textbook in Arabic was written by Patani Scholar. There are seven chapters consisting of 1) The knowledge of Arabic history 2) The history of Coptic years 3) The zodiac 4) The horoscope with the status of the sun and the moon 5) The calculation between two countries 6) The shadow and time and 7) The astronomical knowledge. Secondly, a computational astronomy textbook titled "How to Set a Time using the Quadrant (Rubu al-Mujayyab)". It was re-written by Patani Scholar Haji-Abdulkadir ibnu Haji-Wangoh in 1965 and is still used today in

some private religious schools. The study has revealed that some topic of the astronomical and astrological knowledge documented in manuscripts discovered in the deep south of Thailand closely corresponds to the knowledge disseminated during the Ottoman era, for example, in “The Book of Felicity” by Muhammad ibn Amir Hasan al-Saudi, published in 1582 in the reign of Murad III. We have hypothesized that the knowledge of astronomy in Malay manuscripts may have been transmission from the Ottomans. However, other evidence must be examined further.

Keywords: Astronomy, Ottoman era, Malay world, deep south of Thailand.

Biographical Note(s)

Nareemas Chehlaeh is a lecturer in astronomy and astrophysics who is interested in old astronomical manuscripts discovered in the Malay peninsula, particularly in Malaysia and Thailand. She is also working as a translator and researcher who study the old astronomical manuscripts written in Jawi and Arabic scripts at the Museum of Islamic Cultural Heritage and Quran Learning Center, Thaila.

Nusreen Masae is an Assistant Chief District Officer, Kathu District, Phuket, Thailand. Meanwhile, she is an independent researcher in astronomy working with Dr. Nareemas Chehlaeh at Prince of Songkla University, Pattani Campus. Nusreen is working as a translator of the old astronomical manuscripts written in Jawi and Arabic scripts.

A Comparative Analysis of Astro-Medical Context: Maṭāliʿ al-Saʿāda and Ottoman Calendars (1580-1660)

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Abstract

The concept of astromedicine, which suggests a connection between human health and celestial bodies, has a historical presence in various societies and cultures. Within the realm of astro-medical practices, the cyclical rhythms of celestial phenomena were believed to influence various aspects of human well-being, encompassing both physical and mental health. Specifically, timing, including factors such as planetary movements, lunar phases, eclipses, and the selection of auspicious moments, played a pivotal role in understanding health-related events and shaping decisions regarding medical interventions.

In this presentation, we will explore this topic by examining two distinct types of primary sources found within Ottoman literature. The first source is "Maṭāliʿ al-Saʿāda" authored by Mehmed Su'ûdî Efendi during the reign of Sultan Murad III and dedicated to Sultan Murad III's daughter, Fatma Sultan (1582).

This work represents a significant cultural and historical artefact, shedding light on the purpose and significance of its creation and gifting. The work also includes an enigmatic treatise on divination to predict one's future. The work is a unique witness

to the mysterious creatures, exotic and sumptuous world of the period in which it was written. It also influenced later nakkash and manuscripts with its miniatures.

The second source comprises Ahkâm-ı tâli'-i sâl ve takvîms, created by Ottoman chief astronomers between 1580 and 1660. These calendars were studied as part of the project entitled "A Comparative Study on the Theoretical and Practical Aspects of Scientific Activity in the Ottoman Empire: Annual and Perpetual Calendars (1550-1710)," which received support from the Scientific and Technological Research Council of Türkiye (project no: 119K827).

Through a focus on health-related data and application of a comparative case study approach using these primary sources, this research aims to elucidate the intersections between astronomy/astrology and medicine in diverse cultural contexts. Furthermore, it seeks to shed light on how Ottoman society in the past organised their daily lives and health practices based on the rhythms of time.

Keywords: Maṭāliʿ al-Saʿāda, calendar, microcosmos, macrocosmos, health.

Biographical Note(s)

Mar Rivera Colomer is a physicist by training. She completed a master's degree in history of science and scientific communication at the López-Piñero Interuniversity Institute in Valencia. She has participated in stays abroad and international congresses presenting works related to material culture of physics and different forms of scientific communication, always applying a feminist perspective.

Astronomical Works of Sawai Jai Singh in the Context of Greek, Hindu, Arab, and European Astronomy

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Abstract

Jai Singh (1688–1743), the astronomer-king of India built five astronomical observatories at Delhi, Jaipur, Mathura, Varanasi, and Ujjain to observe and update the existing medieval astronomical tables (zīzes) and named it as Ziz-i Muḥammad Sāhī after the Mughal emperor Muhammad Shah. Along with Jagganatha Pandita, he also compiled Samrāt Siddhānta meaning in Arabic as Al- Majistī (the greatest). Jai Singh was not only aware of the 'Yantrarājā' the first astronomical table of Hindu astronomer Mahendra Sūri but also of the Arabic and Persian astronomers like Naṣīr-al-Dīn al-Ṭusī and al-Gurgānī of Margha in Iran who published Ilkhānic tables. Jai Singh refers to French Scholar P. de la Hire's table Tabulae Astronmicae (1687) and John Flamsteed's two-volume work Historia Cælestis Britannica (1712) which contains descriptions of the instruments used by Tycho Brahe, Hevelius, Flamsteed and star catalogues of Ptolemy, Ulagh Beg, Tycho Brahe and British catalogue of 2935 stars. Jai Singh did not rely on the information of the books and zīzes, but sent skillfull persons like Padre Manuel, Muhammad Sharif, and Muhammad Mahdi to Europe and also invited French Jesuit astronomers like Maudit, Boudier, Calmette,

Tiffenthaler, and Don Pedro de Sylva to India. He used telescope and was aware of Copernican revolution and telescopic sight. Despite this, he used the Ptolemaic geocentric model and built five observatories. Jesuit astronomers bound by their theological belief did not present the Copernican revolution to Jai Singh in true perspective. Did Jai Singh's obsession to correct the errors creeping out of metallic astrolabes propel him to construct five observatories? Or was it the fading Mughal empire and his desire to stamp his footprints through stone observatories in the annals of Rajput rulers who otherwise had always been subservient to the Mughal kings? This paper tries to examine these unexplored aspects.

Keywords: Jai Singh, Ziz-i Muḥammad Sāhī, Geocentric model, Copernican revolution, observatories.

Biographical Note(s)

Madhvendra Narayan is Associate Editor with 12 years of experience of editing and publishing the Indian Journal of History of Science (IJHS), an interdisciplinary journal devoted to research on the development of sciences in India from historical, scientific, and technological aspects with international perspectives. Her key areas of interest include studying the material culture of India from historical perspectives.

A Drawing of a Universal Rectilinear Dial by the 18th Century Ottoman Scholar Mustafa Sıdkı

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Abstract

Mustafa Sıdkı was an 18th-century Ottoman astronomer, poet, and calligrapher who worked in Istanbul. In one of his extant manuscripts a drawing of a universal rectilinear dial is found, together with a set of construction drawings of astrolabes, sundials and other mathematical instruments. We examine the drawing of the universal rectilinear dial in detail and in combination with the other drawings in the manuscript. The drawing contains Arabic abjad numerals and exhibits certain peculiarities that are not found on similar European rectilinear dials. We reflect on whether this drawing is based on the tradition of European universal rectilinear dials attributed to Regiomontanus (1436-1476), or whether the origin of the drawing is ultimately in the Islamic scientific tradition.

Keywords: Universal rectilinear dial, Mustafa Sıdkı, Regiomontanus, Islamic scientific tradition.

Biographical Note(s)

PhD student. Interests: mathematical and astronomical instruments, astrolabes, sundials, transmission from the Islamic scientific tradition to Europe.

Outstanding Features on Astronomical Practice in Ottoman Algeria

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Abstract

Caught between two very well-anchored ideologies: the Baathist school and Orientalism, heir to the struggles of the Middle Ages, the Ottoman period in Algeria was shortchanged in a good number of aspects, particularly with regard to scientific activity.

This impression ended up being overtaken by reality. There are many cases of genius, curious and enterprising minds, who have taken big interest in science and devoted themselves to learn and use new techniques. Enough, to stop being considered exceptions but could well be considered more of a phenomenon, marginal perhaps, but we are indeed facing a phenomenon whose most important features are only just beginning to reveal themselves.

The available sources reveal the existence of an astronomical activity inherited from the past, mainly in Miqat, Instruments and Astrology. Nevertheless, the introduction of modern astronomy has been observed. The one introduced by foreign agents, mainly European, is normal and comprehensive. What attracts the most attention is the effort to appropriate knowledge by local scientists who have made the effort to

learn and to experiment by themselves. This is the case of ibn Hamadush al Jazai'ri and an unknown author whose works we will mainly present in this article.

Keywords: Ottoman Algeria, history of astronomy, Ibn Hamadush al-Jazayri.

Biographical Note(s)

The author is an astrophysicist at Algiers Observatory. Phd in Astrophysics from the University of Granada (Spain). Expert on Stellar Physics. Has more than 25 international publications and 50 publications in proceedings of scientific conferences. He is actually conducting an original investigation on the history of Astronomy in Maghrib.

Political Prophecies of Astrologers During the Safavid Dynasty

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Abstract

Studying the structures of the Safavid society based on astrology's beliefs shows the deep influence of this supernatural phenomenon in different layers of society. The Safavid era, as an important part of Iran's history, is full of rulings that astrologers and predictors have provided based on their findings for various matters; To the extent that many important military and civil matters and even people's public life are organized based on their words and decisions. What is clear is that the deep influence of astronomical beliefs in the thoughts of the Safavid dynasty and the belief of its kings in the statements of astrologers made turning to the predictions of astrologers an inseparable part of their political and non-political life; to the point where no decision can be made without the presence of astrologers. Based on this, astronomers, with their constant presence in various scenes, entered different fields and with their opinions, they were placed in advance of historical trends and played an essential role; A role that has not been paid much attention to in the study of historical incidents.

Therefore, this research seeks to investigate the role of astrology in determining political affairs and government decisions during the Safavid dynasty.

Keywords: Astrology, political prophecies, Safavid dynasty, Iran.

Biographical Note(s)

Iranian Studies, History of Islamic art, History of Ancient Iran, History of Ottoman Empire and modern Türkiye, historical geography, comparative literature.

The Perception of Astrological Elements from the Subconscious of the Ottoman People

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Abstract

The majority of research on Ottoman astronomy and astrology has chosen to focus the work of Ottoman scholars, based astronomical works, observation instruments, and scientists. Although this situation is useful for following the course of science in history, it doesn't sufficient results when it comes to understanding the mental structure and daily life of the Ottoman people. On the other hand, if we intend to bring a holistic view of period astrology, we need consider society's perception of celestial bodies. An effort in this direction will give us the opportunity to observe the basic dynamics of the mindset of the Ottoman people and thus the interaction of ordinary man with nature. In addition, this way, it will be possible to observe different connections and mechanics regarding the approach of the Ottoman intellectual to the celestial bodies. For it is conceivable that scholars, even if they are portrayed as isolated from society in many studies, are part of the same social consciousness and will have similar perceptions as other people at many points. In our study, we will first examine the astrological elements found in dreams seen and recorded by Ottoman people and focus on similarities in folk literature and art in order to make a more comprehensive analysis. Then, we will try reveal the cultural connections and

information transfer lines between these regions by comparing our findings with the Byzantine, Iranian, Anatolian and Central Asian societies with which the Ottoman subjects had direct or indirect continuity ties or were affected.

Keywords: Ottoman astrology, Ottoman astronomy, dreams, cultural interactions.

Biographical Note(s)

Cevatmert Çetin; History of Science in Prehistory and Antiquity, The Relationship Between Science and Society and Public Perception of Science in History, History of Science Narrative, Science Ethnography, Science Perception in Literature and Cinema, Urartian History.

Elif Sena Darbaz; Sociology of Science.

Between Heritage and Innovation: The Astronomical Instruments of the Istanbul Observatory (1577-1580) Through Âlât-ı Rasâdiye Li Zîc-i Şehinşâhiye (Supp. Turc 1126, BNF)

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Abstract

I am currently doing a master's degree in Pouvoir, Sociétés et Cultures at the University of Orléans. I am preparing a dissertation on the astronomical instruments of the Istanbul observatory from the treatise entitled Âlât-ı Rasâdiye Li Zîc-i Şehinşâhiye under the supervision of the historian Ms CAIOZZO Anna.

However, I would like to deal the history of astronomy & astrology in the Muslim world. I intend to devote a chapter to the period of translations of scientific manuscripts. I plan to retrace the history of observatories, particularly the observatories at Meragah and Samarkand. I will also look at the development of astronomical instruments in Islam. Before closing this chapter, I would also treat the history of Mamluk astronomy and astronomy & astrology in Anatolia before the Ottomans.

This will be followed by a chapter on the development of Ottoman astronomy and astrology. This will cover the impact of the Meragah school, Samarkand, and Mamluk astronomy on the Ottomans. I intend to look at the institutions involved in

the practice of astronomy, such as the muvakkithane and the office of muneccimbaslik, to explain the Ottoman sultans' interest in astrology.

The following chapters will trace the history of the Istanbul observatory and then look at the description and use of astronomical instruments. All this while considering ancient and medieval influences, such as the astronomical instruments of the Meragah observatory, by specifying what, in these instruments, is specific to Takiyüddin.

Keywords: Astronomy, astrology, Islam, Ottoman.

Biographical Note(s)

İbrahim Köksal is interested in Islamic art from the medieval period to the 19th century. However, he is more interested in the cultural and politique history of the Ottoman period and, as an object, and particularly in Ottoman manuscripts.

Channels of Transmission of Astronomical Knowledge in the Ottoman World (14th-18th Centuries)

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OSMANLI TAKVİMLERİ

Channels of Transmission of Astronomical Knowledge in the Ottoman World (14th-18th Centuries)

This international colloquium aims to investigate the history of the development and choice of methods and the production of astronomical techniques in the Ottoman world from the 14th to the 18th century, including the Mediterranean and all the territories that were part of the Ottoman Empire.

Aiming for a broader audience, the colloquium will welcome scholars and colleagues in Hellenic, Byzantine, Iranian, Arabic, Ottoman, and Turkish studies, as well as specialists in the history of astronomical techniques in Europe.

We wish to retrace the path of the transmission of astronomical techniques and methods through time and space and to highlight the key moments of contact between the holders of knowledge and the patrons who will ensure the historical continuity of this knowledge through an antique and medieval network going from China to Europe, assimilated then developed synthetically and extensively during the Ottoman period.

Furthermore, this conference will make accessible a series of sources in various languages, the plurality of which (Turkish [Chagatay and Ottoman], Arabic, Persian, Greek, Chinese, Syriac, Armenian, Sanskrit, Middle Persian) is yet to be adequately acknowledged and systematically analysed.

Ultimately, we wish to try to reconstruct part of the complex puzzle of the development of astronomical techniques and methods in different cultural and historical areas that contributed to the development of astronomical sciences.

To enhance the collaborative spirit and foster a fruitful exchange, we will set up round table discussions after each day of the colloquium and reduce the presentation sessions to a “classic” colloquium format.