



China, India, and Iran

Scientific Exchange and Cultural Contact
through the First Millennium CE

October 8-9, 2021

Cambridge, UK

Workshop jointly organized by
Needham Research Institute (NRI)
Ancient India and Iran Trust (AIIT)
Faculty of Asian and Middle Eastern Studies (FAMES), Cambridge University
with support from Glorison Network and Tsz Shan Monastery



**UNIVERSITY OF
CAMBRIDGE**

Faculty of Asian and Middle Eastern Studies



NEEDHAM RESEARCH INSTITUTE

PROGRAMME

8 OCTOBER 2021

AM	9:30 - 9:45	Welcoming address Jianjun Mei (Needham Research Institute)
	9:45 - 10:30	Keynote Lecture Sam Lieu FBA (Robinson College, Cambridge) From Qin to Cathay - Names for China and the Chinese on the Silk Road
	10:30 - 11:00	Tea break
	11:00 - 11:30	Erica C.D. Hunter (SOAS, University of London) Cam. Mm-6-29 and the Transmission of Metallurgical Recipes
	11:30 - 12:00	Sally K. Church (Needham Research Institute) Interplays and Interactions on the Maritime and Overland Silk Roads in the First Millennium CE
PM	12:00 - 12:30	Discussions and Q&A Discussant: Jianjun Mei
	12:30 - 2:00	Buffet lunch
	2:00 - 2:30	Tim H. Barrett (SOAS, University of London) The Ultimate Goal of Daoism: An Iranian State of Mind?
	2:30 - 3:00	Jing Feng (University of Cambridge) Dunhuang Codices under the Cross-cultural Lens
	3:00 - 3:30	Discussions and Q&A Discussant: Imre Galambos
	3:30 - 4:00	Tea break and optional tour of NRI
	4:00 - 4:30	Dror Weil (University of Cambridge) Translating Cross-Asian Medical Experience in Tables: The Case of Taqwīm Works
	4:30 - 5:00	Flavia Xi Fang (University of Cambridge) Travelling Scents: The Transmission of Aromatics and the Reshaping of the Tang Smellscape
	5:00 - 5:30	Daniel J. Sheridan (University of Cambridge) Books from Afar: Christian Codices and Scripts in Early Medieval China
	5:30 - 6:00	Discussions and Q&A Discussant: Erica C.D. Hunter
	7:00 - 8:30	Workshop dinner

9 OCTOBER 2021

AM	9:00 - 9:15	Welcoming address Nicholas Sims-Williams (Ancient India and Iran Trust)
	9:15 - 9:45	Vincenzo Vergiani (University of Cambridge) The Introduction of Writing in Achaemenid Gandhāra and the Birth of Pāṇini's Grammar
	9:45 - 10:15	Zhan Zhang (University of Oxford) Form, Format, and Formulae of Slave Purchase Contracts in First-millennium Central Asia
	10:15 - 10:45	Discussions and Q&A Discussant: Nicholas Sims-Williams
	10:45 - 11:00	Tea break
	11:00 - 11:30	Imre Galambos (University of Cambridge) The Pothi Book Form In 10 th -century Dunhuang
	11:30 - 12:00	Bill M. Mak (Needham Research Institute, Tsz Shan Monastery Buddhist Art Museum) The Astral Science of the Persian Christians in Tang China and its Chinese Reception
PM	12:00 - 12:30	Discussions and Q&A Discussant: Tim H. Barrett
	12:30 - 2:00	Buffet lunch
	2:00 - 2:30	Thomas Benfey (University of Oxford) The Sasanian Iranian Reception of Indian Astral Science: A Reevaluation
	2:30 - 3:00	Raymond Mercier Āryabhaṭa's Astronomy and the Underlying Observations
	3:00 - 3:30	Discussions and Q&A Discussant: François de Blois (University College London)
	3:30 - 4:00	Tea break and tour of AIIT
	4:00 - 4:30	Nicholas Sims-Williams (SOAS, University of London) Bi Bo (Renmin University, Beijing) Astronomy and Astrology in a Manichaean Text from Turfan
	4:30 - 5:00	Seb Falk (University of Cambridge) Astronomical Instruments and Ideas: India, Iran and Europe
	5:00 - 5:30	Discussions and Q&A Discussant: François de Blois
	5:30 - 6:00	Closing remarks

Acknowledgement

The workshop is jointly organised by the Needham Research Institute (NRI), the Ancient India and Iran Trust (AIIT), and the Faculty of Asian and Middle Eastern Studies (FAMES), Cambridge University, with the support of the Glorisun Network. Promotional materials are sponsored by the Tsz Shan Monastery.

From Qin to Cathay: Names for China and the Chinese on the Silk Road

Sam Lieu FBA

Robinson College, University of Cambridge

In her contacts with peoples along the Silk Road, China (the Middle Kingdom) acquired a number of names for the Chinese Empire and for Chinese people which bear no etymological relation to the way in which the Chinese referred to themselves and their homeland. This lecture will examine a number of names for China and the Chinese in Central Asian documents as well as how the Chinese referred to themselves and their home nation in Chinese accounts of contacts with foreign peoples and nations.

Cam. Mm-6-29 and the Transmission of Metallurgical Recipes

Erica C.D. Hunter

SOAS, University of London

Cam. Mm.6.29 arrived at the University Library in Cambridge in 1632 CE, amongst a donation of 86 Oriental manuscripts by the widow of the Duke of Buckingham. Written in Syriac (Serto script), the unvocalised manuscript, consisting of 151 leaves, is a miscellany of philosophical and alchemical works that were translated from Greek, including part of the alchemical encyclopædia of the third century alchemist, Zosimos of Panopolis that has now been lost. The Treatises of Zosimos [f. 9 *recto* - f. 90 *recto*] comprising 12 books, discuss the properties and qualities of various metals and alloys, with recipes for their manufacture sandwiched between metaphysical sections. The paper explores the recipes for the manufacture of Corinthian bronze, an alloy more precious than gold; listings of ingredients include many Greek and Persian *termini technici*. The knowledge of the manufacture of Corinthian gold was lost in Europe but survived in Japan due to its transmission along the Silk Roads.

Interplays and Interactions on the Maritime and Overland Silk Roads in the First Millennium CE

Sally K. Church

Needham Research Institute

The articles by Rong Xinjiang included in his 2015 book, *The Silk Road and Cultural Interaction between East and West*, reveal some interesting examples of activity on the Maritime Silk Road during the First Millennium CE. These include the use of the sea routes between China and such geographical regions as Japan, Korea, India, and West Asia. This paper will discuss these references to maritime travel before, during and after the Tang dynasty in this collection of articles, by asking such questions as who sailed on the sea routes, how far these sea routes reached, why people travelled by sea instead of on land, and what the special characteristics of sea travel, as opposed to land travel, were at the time. Interactions between maritime and overland routes will receive particular attention.

The Ultimate Goal of Daoism: An Iranian State of Mind?

Tim H. Barrett

SOAS, University of London

The idea of studying Sino-Iranian contacts goes back in the United Kingdom at least two centuries, and was prompted by a translation of a story by Feng Menglong (1574-1646). Feng does mention Arsacid Persia in the course of describing Laozi's journey out of China to the West, but takes that journey to be a metaphorical account of Inner Alchemy, a mode of interpretation also applied though perhaps at a later date to the tale of the Monkey King in the Journey to the West. So his Iran cannot be accounted a real place, but rather what might be described as a meditational state. Genuine awareness of the Parthian empire as a reality in history seems to have faded over the centuries, even if the name was still attached to products similar to frankincense that continued in use up to Feng's time. By contrast the notion of a westward itinerary functioning as an 'inner trip', while it draws on much older notions of spirit journeys, appears to arrive explicitly only during the eleventh century.

Dunhuang Codices under the Cross-cultural Lens

Jing Feng

University of Cambridge

In 1900, a cave filled with manuscripts was discovered in the desert sands near the oasis town of Dunhuang in northwest China. Besides tens of thousands of scrolls, some 400 codices were unearthed from the cave. Most of them are from the tenth century when Guiyijun 歸義軍 (Return to Allegiance Circuit, 851-ca. mid-eleventh century) ruled this region. In this article, I place Dunhuang codices into their geocultural contexts and examine their physical characteristics from a cross-cultural perspective. I emphasise the non-Chinese origin of codices and argue that the appearance of this new book form in Dunhuang is closely related to the cultural contacts in this region throughout the ninth and tenth centuries. This study also deals with several codices which were possibly produced in Shuofang 朔方, attempting to offer an insight into the dissemination of codex culture along the trade and diplomatic routes between the Central Plains and the Western Regions. The last part of this article engages with religious issues and analyses the relation between the sudden rise of codex culture in Dunhuang and the secularization of Buddhism. I argue that the secular development in Buddhism and the increasing lay participation in the tenth century stimulated the adaptation and localization of codices in this region.

Translating Cross-Asian Medical Experience in Tables: The Case of Taqwīm Works

Dror Weil

University of Cambridge

The 11th century saw the rise of Arabic tabulated works on medicine and pharmaceuticals, and in particular Ibn Buṭlān's Taqwīm al-Šiḥḥa, Ibn Jazla's Taqwīm al-abdān. These texts became prototypes of tabulated works on medicine and pharmaceuticals across medieval and early modern Eurasia.

Focusing on a number of medieval Arabic texts and their translations, this talk seeks to examine some of the cognitive practices assigned to reading tabulated texts, and the ways tables represented and reproduced medical experience. It will explore the ways by which tables and rubrics of determining parameters constituted a subliminal space between rational reasoning and personal experience in the making of medieval medicine, and the multiplicity of framing of medical experience they offered to their users.

ABSTRACTS

Travelling Scents: The Transmission of Aromatics and the Reshaping of the Tang Smellscape

Flavia Xi Fang

University of Cambridge

The transmission of aromatics together with the spread of Buddhism have enriched, altered and reshaped both the smellscape and meanings attached to scents in medieval China. With the use of aromatic substances became widespread in the Tang, an element of increased sophistication was added to the art of producing and appreciating aromatic goods. Used as incense, medicine and spices, in rituals as well as in private spaces, aromatics had become an established part of secular as well as religious life. By offering a whiff of the Tang smellscape, this paper aims to underscore the value of interrogating the sensory history as a way to deepen our understanding of cultural exchanges along the Silk Roads.

Books from Afar: Christian Codices and Scripts in Early Medieval China

Daniel J. Sheridan

University of Cambridge

A growing body of scholarship has demonstrated the significant, durative presence of Christians in both Central Asia and China during the Early Medieval period. These Christians were uniquely positioned having ties to the Syriac and Greek speaking worlds (and beyond) while concurrently interacting in Turkish, Sogdian, Chinese and other spheres. The gradual spread of Christian codices offers one such example. From extant evidence, most of these Christians were from the East Syriac Church (formerly called the Nestorian Church), known for their monastic scriptoria and their preference for the codex book form. Indeed, among the ruins of a presumed monastery located in present day Western China (Xinjiang), an unexpected trove of Christian manuscripts was unearthed at the beginning of the 20th century. This multi-lingual find included the remains of Syriac and Sogdian codices such as a comparatively well-preserved late 8-9th century Syriac ‘service-book’ with binding string (MIK III 45). Elsewhere, in the famous Xi’an Stele of 781 and the Dunhuang manuscript Pelliot chinois 3847, the important role played by the sacred books brought into Tang China by the Christian missionary Aluoben is explicitly stated. Unfortunately, the materiality of these “sacred books and images brought from afar” 遠將經像 has so far received little notice in the academic literature.

This essay explores the ‘historical note’ in Pelliot chinois 3847 with its material observations on a unique book form brought by these Christians and, secondarily, considers possible references to related Christian script(s). I will also contextualize this rare Chinese observation on the materiality of these books with extant Syriac manuscripts roughly contemporary with Aluoben’s arrival at Chang-an (modern Xi’an) in 635.

The Introduction of Writing in Achaemenid Gandhāra and the Birth of Pāṇini's Grammar

Vincenzo Vergiani

University of Cambridge

There is broad consensus in recent scholarship that the beginning of literacy in South Asia is linked to the Achaemenids' conquest of north-west India in the late 6th century BCE, since Kharoṣṭhī, one of the two earliest Indian scripts, shows quite evident similarities to the Aramaic script used by the Persian administration. The exact circumstances in which this technological transfer took place are not known since no contemporary accounts survive, and we can only speculate about the conditions that made it possible. Even the archaeological traces of the Achaemenids' rule of Gandhāra and other adjacent territories in today's Pakistan are in fact tenuous. However, an ancient Indian tradition maintains that Pāṇini, the great Sanskrit grammarian, hailed from Gandhāra, and recent research tends to date him some time after the mid first millennium BCE, when the region was a Persian satrapy. In my paper I will present some of the structural and terminological features of Pāṇini's *Aṣṭādhyāyī* which suggest that it originated in a literate milieu, arguing that the script he and his fellow grammarians used was probably a form of the recently invented Kharoṣṭhī. I will also discuss some hypotheses on the social and cultural factors in the Gandhāran society of the time that may have facilitated the adoption of the new technology and led to its being quickly put to service in the production of Pāṇini's grammar, marking the beginning of a new era in the culture of ancient India.

Form, Format, and Formulae of Slave Purchase Contracts in First-millennium Central Asia

Zhan Zhang

University of Oxford

A number of slave purchase contracts in various languages from first-millennium Central Asia have been discovered, testifying to the flourishing slave trade in various communities of that region. Though some slaves, especially Sogdian female slaves, who were eagerly sought after in Chinese markets, may have traveled a long way from Central Asia to China, many more changed hands locally. Notwithstanding the overwhelmingly local nature of the slave trade, some of the slave purchase contracts display a striking degree of uniformity in terms of form, format, and formulae across linguistic boundaries, which may point to a common origin of scribal conventions.

In this presentation, I shall analyze and compare slave purchase contracts in Khotanese, Tumshuqese, Bactrian, Sogdian, Sanskrit, and Gandhari from Central Asia, and show their common features in terms of materiality (form), diplomatics (format), and wording (formulae), all of which, however, are categorically different in contracts of similar content in Chinese. Drawing on *yajñavalkya*, a third- to fifth-century Sanskrit treatise on Dharma, I argue that this shared scribal convention in Central Asia was also practiced in India, and perhaps could be traced further back to the Achaemenid period.

The Pothi Book Form in 10th-century Dunhuang

Imre Galambos

University of Cambridge

Pothi is a book form that ultimately derives from the palm-leaf books of Indian manuscript culture. During the second half of the first millennium AD, this form spreads along with Buddhist texts to the oasis cities of the Tarim Basin, where the writing material changes to paper. Among the tens of thousands of manuscripts found in the Dunhuang library cave, there are also many in pothi form; these are mostly in Tibetan but there are also some in other languages such as Sanskrit, Khotanese and Chinese. While some of the Tibetan specimens are dated, the dates are given in terms of the twelve-year animal cycle which does not allow us to document the time of the appearance of the pothi form in Dunhuang. The unambiguously dated Chinese examples are from the tenth century but these are unfortunately very few in number. The oblong shape of the pothi also became adopted as the shape of folios in concertina manuscripts, which continue to be used in East Asian Buddhist cultures to this day. Thus the pothi embodied a link from South-Asian manuscript tradition to the dominant form of Chinese Buddhist scriptures during the past millennium. This paper examines the types of innovations the pothi brought to Chinese manuscript culture and emphasises the significance of cross-cultural contacts in the history of the Chinese book, arguing against views that portray changes as purely internal improvements driven by utility and convenience.

The Astral Science of the Persian Christians in Tang China and its Chinese Reception

Bill M. Mak

Needham Research Institute,

Tsz Shan Monastery Buddhist Art Museum

The Persian Christians of the Church of the East had a conspicuous but later overlooked presence in Chinese society for about two centuries between the mid-seventh century to the mid-ninth century CE. This foreign, expatriate community is known for their expertise in medicine and astronomy, and in many ways foreshadowed the arrival of other foreigners such as the Muslims and the Jesuits, who brought with them also new scientific and technical knowledge and skills in the centuries to come. My paper consists of three parts. Firstly, I examine the synergy and rivalry between Christianity vs. Buddhism in Tang China. Secondly, some examples of the rivalry between the two religions in Tang China in the field of astral science will be examined. Finally, I will explore a further trajectory of the Christian influence from this period in the somewhat surprisingly realm of cosmology and fate calculation, and the Chinese reaction to it.

The Sasanian Iranian Reception of Indian Astral Science: A Reevaluation

Thomas Benfey

University of Oxford

According to the consensus established by E.S. Kennedy and David Pingree, the corpus of canonical Sasanian astral science works called the *Zīg ī Šahriyārān* (more typically designated, in modern scholarship, by the Arabic title *Zīj al-Shāh*, “king’s astral science handbook”) was decisively informed by two distinct Indian astronomical traditions: the Brāhmapakṣa, and Āryabhaṭa’s (fl. ca. 499 CE) Ārdharātrikapakṣa, or “midnight school.” In this paper, I reevaluate this consensus and the textual evidence in Arabic, Middle Persian and Sanskrit it rests on. I show that while the evidence that the Brāhmapakṣa had any significant impact on Sasanian astral science is not especially compelling, there is a substantial body of evidence in Middle Persian and in Arabic, unknown to or insufficiently emphasized by Kennedy and Pingree, that furnishes important further support and nuance for the reception of the Ārdharātrikapakṣa in pre-Islamic Iran.

Āryabhaṭa’s Astronomy and the Underlying Observations

Raymond Mercier

University of Cambridge

Āryabhaṭa (b. 476 AD) produced a system, which was in many ways conventional with spherical astronomy; mean longitudes; and equations for sun, moon, and planets. The astronomical quality of this work is best judged by means of the analysis created by Roger Billard in 1971. In this work it was established that the system of Āryabhaṭa agreed accurately with the true state of the heavens only in the short period 500-520 AD. From this it is clear that the system was determined by the adjustment of the parameters in the light of real observations around that time.

The problem is to discover something about the observations which had been used. The first one to recommend itself is the lunar eclipse of 498, Mar 23. From this, one can derive the principal parameters of the Moon. In this paper the analysis of this eclipse will show how this works.

Every astronomical system is created, not ab initio, but by corrections and improvements applied to a received system. In this Indian situation we really do not know what Āryabhaṭa received, and are obliged to speculate. This, in spite of the fact Varāhamihira describes five very different systems known at that time. Beyond that, I believe one can see in the Indian practice the presence of features linking this new astronomy to that of the Middle East, through Hipparchus, for example.

Astronomy and Astrology in a Manichaean Text from Turfan

Nicholas Sims-Williams

SOAS, University of London

Bi Bo

Renmin University, Beijing

Two unpublished Sogdian fragments in the Berlin Turfan collection, M2074 and M2006, are respectively the top and bottom parts of a folio from a codex written in Manichaean script; they do not join, exactly two lines of text being lost between them. The Recto side of the reconstructed folio contains an excerpt from a text concerning the movement of the sun and moon within the zodiac. This text, of which another copy is preserved in the fragment M796i, displays knowledge of both Western and Indian astronomical traditions. The Verso side contains the beginning of a text of a less scientific kind and of purely Chinese origin. Although the Sogdian text as it stands seems to consist of a series of more or less enigmatic phrases concerned with the five Chinese “elements” (wuxing 五行), it can be shown that these phrases are extracted from a table used to predict the character and fate of persons born in the years presided over by the elements concerned.

Astronomical Instruments and Ideas: India, Iran and Europe

Seb Falk

University of Cambridge

Towards the end of the first millennium CE, astronomical instruments proliferated across the Islamic world. Astronomers wrote treatises praising devices like astrolabes, emphasising their practicality and multifunctionality. In the early 9th century, al-Khwārizmī stated that the first step in the use of the astrolabe was observation of celestial altitude, while shortly after the year 1000, al-Bīrūnī began his *Taṭrīq* treatise on various kinds of astrolabe by stressing the importance of timekeeping. Bīrūnī noted, however, that Indian scholars did not use astrolabes; their timekeeping devices were, he says, based on gnomons and water-clocks, since they did not have access to Greek texts.

At the time Bīrūnī was writing, the astrolabe had already made its way from the Islamic world to Latin Christendom. Although later Christian astronomers emphasised the importance of texts about instruments, or texts as instruments, the earliest European astrolabes pre-date the earliest Latin treatises about them: they were, it seems, copies of Islamic objects, rather than made following written instructions. Christian students approached astronomy with their own motivations: philosophical, devotional, astrological. This paper will discuss what instruments – and texts about them – can tell us about the networks through which astronomy was communicated, how cultural contexts coloured the reception of new tools and techniques, and how astronomical and astrological sciences stimulated and used technology.



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