

# SCIENCE MUSEUM

## TIME, CULTURE AND IDENTITY: A KNOWLEDGE EXCHANGE WORKSHOP

## 时间、文化与民族特 征：知识交流研讨会

SUMMARY REPORT  
摘要报告

# SUMMARY REPORT

## 摘要报告

**Workshop date: 21–22 May 2019**

**Venue: Institute for the History of Natural Sciences,  
Chinese Academy of Sciences, Beijing**

**Organiser: Science Museum, with generous support  
from the Chinese Academy of Sciences**

**研讨会日期：2019年5月21日- 22日**

**研讨会地点：中国科学院 自然科学史研究所**

**伦敦科学博物馆主办、中国科学院协办**

## INTRODUCTION

The Science Museum hosted a two-day workshop, ‘Time, Culture and Identity: A Knowledge Exchange’, at the Institute for the History of Natural Sciences, Chinese Academy of Sciences, Beijing, on 21 and 22 May 2019. The workshop brought together ten invited experts from Britain and China, plus three Science Museum staff members, to exchange existing knowledge and research about the clocks, watches and automats exchanged between Britain and China in the 18th century. A key ambition of the workshop was to establish an international, cross-disciplinary network of experts on horological collections and to raise interesting questions for future research.

During the workshop, speakers were invited to give 20-minute presentations covering various themes, including ‘ancient Chinese timekeeping and technology transfer’, ‘British clocks and automats made for export to China’, ‘technology and mechanisms’, ‘the clock trade’ and ‘sharing horological collections with audiences in Britain and China’. Workshop participants also enjoyed a guided tour of the newly renovated Gallery of Clocks at the Palace Museum.

The presentations and discussions at the workshop are informing the development of ideas for a co-designed digital resource which invites British and Chinese audiences to explore and learn about the Palace Museum’s collection of 18th-century clocks, watches and automats and the social, cultural and technological impacts they have had in China and Britain.

## 研讨会简介

伦敦科学博物馆于2019年5月21日、22日在中国科学院自然科学史研究所举办为期两天的“时间、文化与民族特征：知识交流研讨会”。此研讨会汇集十位特别选定的中英专家学者，以及三位科学博物馆馆员，交流18世纪中英贸易下的钟表、自动机械相关知识与研究。研讨会的雄心之一是建立一个跨域的钟表藏品国际网络，针对未来钟表学研究提出值得钻研的问题。

研讨会期间，主办方邀请的专家学者作20分钟的演讲。演讲内容包括五大主题：“中国古代计时与技术传播”、“英制钟表与外销中国的钟表与自动机械”、“技术与机构”、“钟表贸易”与中英观众分享钟表藏品。参会者也参观了故宫博物院重新规划、由专人导览的钟表馆。

研讨会的演讲和讨论内容对于开发设计数字资源有极大的助益，使中英访客能够探索 and 了解故宫博物院收藏的18世纪钟表及自动机械，以及它们对中英两国社会、文化及技术所形成的影响。



# TIME, CULTURE AND IDENTITY: THE CO-CREATION OF HISTORICAL RESEARCH AND CO-DEVELOPMENT OF VISITOR EXPERIENCE IN CHINA AND THE UK

The workshop was part of the research project 'Time, Culture and Identity: The Co-Creation of Historical Research and Co-Development of Visitor Experience in China and the UK'. Uniting expertise and collections from China and the UK, the project has four core objectives:

1. Carry out and share archive research on the Palace Museum's collection of 18th-century clocks, watches and automats.
2. Examine the ways in which British and Chinese museum visitors engage with historic collections.
3. Develop a co-designed digital resource which invites British and Chinese audiences to explore and learn about the Palace Museum's collection of 18th-century clocks, watches and automats and the social, cultural and technological impacts they have had in China and Britain.
4. Explore methodologies and approaches and produce guidelines to support and enhance collaborations between academic, heritage and creative economy professionals in China and the UK.

The Science Museum was awarded a grant by the UK's Arts and Humanities Research Council (AHRC) and the Newton Fund to carry out this research project. The Palace Museum is the collections partner for this international collaborative research. Academic partners for this project include the Chinese Academy of Sciences and Beijing Jiaotong University. The project began on 1 December 2018 and will run for 15 months, concluding on 29 February 2020.

The project webpage can be found here:  
[www.sciencemuseumgroup.org.uk/project/time-culture-and-identity](http://www.sciencemuseumgroup.org.uk/project/time-culture-and-identity)

## PROJECT TEAM:

**Collection partner:** The Palace Museum  
**China Principle Investigator:** Yao Yanan, Professor, Beijing Jiaotong University  
**UK Principle Investigator:** Tilly Blyth, Head of Collection and Principle Curator, Science Museum  
**China Co-Investigator:** Huang Xing, Associate Professor, Institute for the History of Natural Sciences, Chinese Academy of Sciences  
**UK Co-Investigator:** Emma Stirling-Middleton, Project Curator: China, Science Museum  
**China-UK Research Facilitator:** Carol Chung, Science Museum

# 时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验研究项目

此研讨会是“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的一部分。“时间、文化与民族特征”研究项目集结中英两国研究实力，涵盖四个主要内容：

1. 对故宫博物院收藏的18世纪英国钟表及自动机械进行全新原创性研究，以进一步了解藏品，并探讨其对中英两国社会、文化及技术所形成的影响。
2. 考察中英两国访客参观欣赏历史藏品在方式上有何异同。
3. 合作开发设计数字资源，使中英访客能够探索 and 了解故宫博物院收藏的18世纪英国钟表及自动机械，以及它们对中英两国社会、文化及技术所形成的影响。
4. 探索方法与途径，并制定指导方针，以支持和加强中英两国学术、文物以及创意经济领域专业人员的协同与合作。

此项目为英国艺术与人文研究委员会/牛顿基金资助，由科学博物馆集团执行。故宫博物院是此国际合作项目的藏品伙伴。项目的学术伙伴包括中国科学院、北京交通大学。该项目于2018年12月1日启动，并于2020年2月29日结束，为期15个月。

项目网页请见：[www.sciencemuseumgroup.org.uk/project/time-culture-and-identity](http://www.sciencemuseumgroup.org.uk/project/time-culture-and-identity)

## 研究团队：

**藏品伙伴：**故宫博物院  
**中国项目主负责人：**姚燕安，北京交通大学教授  
**英国项目主负责人：**提莉·布里斯，伦敦科学博物馆藏品部主任及首席策展人  
**中国项目副负责人：**黄兴，中国科学院自然科学史研究所副教授  
**英国项目副负责人：**马霭琳，伦敦科学博物馆中国项目策展人  
**中英研究协调专员：**钟珞筠，伦敦科学博物馆



Workshop attendees group photo  
参会者合照



Prof. Zhang Baichun welcoming the attendees  
张柏春所长致欢迎词



Prof. Yao Yanan chairing a session  
姚燕安教授主持会议



Dr Tilly Blyth delivering introductory talk  
提莉·布里斯博士介绍项目



Site visit to the Palace Museum  
参观故宫博物院



Workshop dinner  
会议晚餐



WORKSHOP SCHEDULE

议程

<b>TUESDAY 21 MAY 2019</b> <b>DAY 1</b> <b>2019年5月21日 周二</b> <b>第一天</b>		<b>WEDNESDAY 22 MAY 2019</b> <b>DAY 2</b> <b>2019年5月22日 周三</b> <b>第二天</b>	
8.45–9.15	Registration/coffee 注册	09.00–10.30	Session 4: The clock trade 议程四: 钟表贸易
9.15–9.30	Welcome 欢迎	10.30–10.50	Group discussion 讨论
9.30–10.50	Session 1: Ancient Chinese timekeeping and technology transfer 议程一: 中国古代计时与技术传播	10.50–11.30	Session 5: Sharing horological collections with audiences in China and Britain 议程五: 与中英观众分享钟表藏品
10.50–11.10	Group discussion 讨论	11.30–12.00	Concluding group discussion 总结讨论
11.10–11.20	Tea break 茶叙	12.00–13.30	Lunch 午餐
11.20–12.40	Session 2: British clocks and automatons made for export to China 议程二: 英制钟表与外销中国的钟表与自动机械	13.30–16.30	Visit: Guided tour of the Palace Museum’s Gallery of Clocks 博物馆访问 故宫博物院钟表馆导览
12.40–13.00	Group discussion 讨论		
13.00–14.30	Lunch 午餐		
14.30–16.00	Session 3: Technology and mechanisms 议程三: 技术与机构		
16.00–16.30	Group discussion 讨论		
16.30–17.00	Concluding group discussion for day 1 总结讨论		

INTRODUCTION

研讨会简介

Dr Tilly Blyth outlined the aims of the workshop and highlighted that this was a starting point for interdisciplinary network on this collection and its interpretation. She expressed gratitude to the attendees for coming such long distances for the workshop, to the Chinese Academy of Sciences Institute for the History of Natural Sciences for hosting the event, and to our funders, the Arts and Humanities Research Council and the Newton Fund for enabling the workshop and the broader collaboration to happen. We were also grateful to our colleague Eva Xie, from UK Research and Innovation in China, for attending and supporting the workshop.

提莉·布里斯博士阐明研讨会的目标，并点明本研讨会是钟表藏品研究和演绎的跨域网络开端。她向每位远道而来的参会者、中国科学院自然科学史研究为筹办研讨会所提供的协助，以及英国艺术与人文研究理事会和牛顿基金会所提供的资金等促成本研讨会及合作交流的支持表达无限感激。我们也感谢英国研究创新署中国办公室的同事谢丹女士拨冗参会。

SUMMARY OF

PRESENTATIONS

演讲摘要

WORKSHOP DAY 1: 21 MAY 2019

研讨会第一天：2019年5月21日

SESSION 1: ANCIENT CHINESE TIMEKEEPING AND TECHNOLOGY TRANSMISSION

议程一：中国古代時計与技术传播

Chair: Dr Xing Huang, Institute for the History of Natural Sciences, Chinese Academy of Sciences, China  
主持：黄兴副研究员 (中国科学院自然科学研究所)

PAPER 1.1  
The development of ancient Chinese timekeeping instruments

Professor Lisheng Feng, Director of the Institute for History of Science and Technology and Ancient Texts, Tsinghua University, China

Professor Feng introduced the development of ancient Chinese timekeeping instruments dated before the Ming dynasty – including sundials (日晷), water clocks (漏刻) and sand clocks (沙漏) – through an examination of ancient texts and archaeological evidence. He highlighted the mechanisms of an ancient water clock (水运仪象) – a complex mechanical timekeeping device dating from the North Song dynasty – with reference to several key ancient texts, such as text from Xin Yi Xiang Fa Yao (新仪象法要) by Su Song (苏颂). He concluded with a detailed analysis of the design and mechanism of a five-wheeled sand clock (五轮沙漏) dating from the Yuan dynasty.

报告1.1  
中国古代计时仪器的发展

冯立昇教授 (清华大学科学技术暨古文献研究所所长、教授)

冯教授从古代典籍和考古文献分析，介绍中国明朝以前的古代计时仪器，包括日晷、漏刻和沙漏。他特别关注中国北宋年间的高度自动化天文观测和计时仪器 – 水运仪象台，讨论了中国古代重要技术史文献 – 苏颂的新仪象法要。他以元朝五轮沙漏的设计和机构的细节分析作为总结。

PAPER 1.2  
Technological transmission between China and Europe

Professor Baichun Zhang, Director of the Institute for the History of Natural Sciences, Chinese Academy of Sciences, China

Professor Zhang discussed the transmission of European clocks to China in the 17th and 18th centuries. He reviewed the introduction of European mechanical clocks to Chinese emperors in the Ming and Qing dynasties, and analysed the strategies adopted by Jesuit missionaries to preach in China. He concluded that clockmaking is one of the most important technologies that was successfully transmitted from Europe to China, and fully accepted and reinvented by the Chinese.

报告1.2  
中国与欧洲之间的技术传播

张柏春所长 (中国科学院自然科学史研究所所长、教授)

张教授的报告聚焦于17、18世纪欧洲钟表对中国的传播。他分析耶稣会传教士在中国的策略，讨论明清两朝欧洲机械钟如何引进中国。他总结钟表制作技术是一项成功从欧洲传播到中国，并在中国获得发展的重要技术。

SESSION 2: BRITISH CLOCKS AND AUTOMATONS MADE FOR EXPORT TO CHINA

议程二：英制钟表与外销中国的钟表与自动机械

Chair: Emma Stirling-Middleton, Science Museum, UK  
主持：马霏琳女士 (伦敦科学博物馆)

PAPER 2.1  
The Bowes Swan automaton: a case study in approaches to the conceptualisation, treatment and operation of clocks, automatons and clock-like objects

Matthew Read, Director of the Bowes Centre at the Bowes Museum, UK

Mr Read used three case studies to illustrate approaches to the conservation of historic automatons in Europe. In the first case study he gave an overview of the ‘Pagoda style clock with automata’ which belongs to the National Trust of England; in the second case study he introduced the ‘Guildford Carousel’. He then focused on the third case study of the Bowes Swan automaton project, in which the Bowes Museum’s ‘Silver Swan’ was disassembled and conserved in 2008. Mr Read advocated for a sensitive conservation approach for dynamic objects using noninvasive techniques and digital technology for maximum preservation.

报告2.1  
从博斯博物馆银天鹅钟表机械看钟表、钟表机械和类钟表物件的概念化、修复与运作

马修·李德主任 (英国博斯博物馆 博斯中心主任)

李德先生透过三个案例讨论欧洲自动机械修复的手段。他在第一个案例中介绍属于英国国民信托的佛塔造型钟自动机械；在第二个案例中介绍吉尔福德旋转钟。他在第三个案例中深入讨论博斯博物馆在2008年的修复项目 – 博斯银天鹅自动机械。李德先生在结论提倡修复动态文物应采取具敏感性的手段，比如使用非侵入式技术或数字化技术，方可达到保存的目的。

PAPER 2.2  
Researching the Anglo-Chinese clock trade: official archives and other records – their usefulness and limitations for historians, with some suggestions for further research

Roger Smith, independent historian, UK

Mr Smith discussed the challenges of studying the Anglo-Chinese clock trade using archives and other written sources. He focused on the origins of some of the 18th-century European clocks and their route to China through close examination of archives, such as that of the East India Company in Britain, and private records, such as those of individual merchants or travellers. He raised some of the key issues he has faced during his research on the subject, including difficulties with tracking down the exact volume and value of clocks imported from studying the records of the East India Company. He concluded with a list of topics of interest for future research that may help enrich understanding of the Anglo-Chinese clock trade, for example the reception of European clocks in China, the transmission of clockmaking knowledge between Beijing and Guangzhou and the fate of the clocks that did not end up in the Forbidden City.

报告2.2  
中英钟表贸易研究：官方档案与记录的可用性、对历史学研究的限制与对未来研究的建议

罗杰·史密斯先生 (英国钟表历史学家)

史密斯先生讨论运用档案文献进行中英钟表贸易研究的挑战。他聚焦于18世纪英国钟表贸易的缘起以及外销中国的路线，深入地钻研英国东印度公司的档案文献，以及商贾或旅行者的私人记录。他点出进行此类主题研究碰到的难题，包括要掌握东印度公司出口到中国的钟表实际数量和钟表真实价值等信息的困难。他在结论提出一些对将来中英钟表贸易研究有助益的课题，包括研究欧洲制钟表在中国的接受情况、制钟技术在北京和广州的传播，以及追踪未能送达紫禁城的钟表的下落。

WORKSHOP DAY 1: 21 MAY 2019

研讨会第一天：2019年5月21日

SESSION 3: TECHNOLOGY AND MECHANISMS

议程三：技术与机构

Chair: Professor Yanan Yao, Beijing Jiaotong University, China  
主持：姚燕安教授（北京交通大学）

PAPER 3.1  
Space-travelling watches

Professor Xiaoxi Wang, Professor and Director of Horological Instruments Specialism, Harbin Institute of Technology, China

Professor Wang introduced the history of the Department of Horological Instruments at the Harbin Institute of Technology. He discussed recent developments in watch design for space travel and the technical requirements of space-travelling watches. He concluded by introducing a co-development project between the Harbin Institute of Technology and Fiyta (飞亚达), which produced a new Chinese-made space-travelling watch.

报告3.1  
载人航天的手表与技术

王晓溪教授（哈尔滨工业大学计时仪器专业教授、所长）

王教授介绍哈尔滨工业大学计时仪器系的发展，并讨论航天表设计与技术发展的最新研究动态。他分享了哈尔滨工业大学与飞亚达联合开发的航天表项目，该项目预期生产出中国制的新型航天表。

PAPER 3.2  
Reconstruction research of clocks and automatons with unknown mechanisms in the Forbidden City

Dr Yuhsun Chen, Assistant Professor of the Department of Mechanical Engineering, National Taiwan University of Science and Technology, Taiwan

Dr Chen introduced the methodology of ‘reconstruction synthesis’, which involved conducting historical archive research and digital reconstruction design exercises with historical automatons. She used the example of the Palace Museum’s ‘Blossoming Flower Clock’ (自开花献桃荷花缸钟) to demonstrate the reconstruction process of an unknown mechanism design. She concluded with a reflection on the possibilities, implications and limitations of the reconstruction synthesis methodology for the study of clocks and automatons.

报告3.2  
紫禁城具不明机构之钟表与自动机的复原研究

陈羽薰助理教授（国立台湾科技大学机械工程学系助理教授）

陈博士介绍一套复原综合方法论，提倡对历史自动机械进行史料研究和数字化复原。她以故宫博物院的自开花献桃荷花缸钟为例，说明未知机构设计的复原研究历程。她在结论中反思复原综合方法论对研究钟表和自动机械的可能性、影响以及限制。

WORKSHOP DAY 2: 22 MAY 2019

研讨会第二天：2019年5月22日

SESSION 4: THE CLOCK TRADE

议程四：钟表贸易

Chair: Dr Tilly Blyth, Science Museum, UK  
主持：提莉·布里斯博士（伦敦科学博物馆）

PAPER 4.1  
Gifting, purchasing and making: the Western timepieces in Qing China and its technology transmission

Dr Xueyu Zhang, Postdoctoral Research Associate at the Department of History, Zhongshan University, Zhuhai Campus, China

Dr Zhang discussed the process through which Western timepieces entered Qing China. She focused on the infrastructure of the ‘tribute system’ (办贡制度) and the development of clockmaking facilities and techniques within the ‘imperial workshops’ (造办处) in Qing China. She explored the exchange of skills and technologies between European merchants and missionaries and Chinese merchants, officials, craftsmen and emperors. She concluded with an overview of the Imperial Court’s development of clockmaking techniques and facilities.

报告4.1  
呈进、采办与造办：清代西洋机械钟表入华与技术传播

张学渝博士（中山大学珠海校区历史学系博士后研究员）

张博士讨论清朝时期西方钟表如何传入中国，她聚焦在清朝的办贡制度以及宫廷造办处在制钟技术的发展。她谈到欧洲传教士和商人与清朝皇帝、朝廷官员、工匠和商人在制造钟表技术和人才养成方面的交流。她在结论中以“呈进、采办与造办”的历程总结清朝宫廷在钟表制造技术养成的发展。

PAPER 4.2  
On the transmission of Western timepieces to China: perspectives from imperial records in Qing China

Dr Xing Huang, Associate Researcher at the Institute for the History of Natural Sciences, Chinese Academy of Sciences, China

Dr Huang is a co-investigator on the ‘Time, Culture and Identity’ project. As part of his research for the project, he approached the topic of the trade of Western timepieces to China from the perspective of Chinese emperors from the Kangxi (康熙) period to the Daoguang (道光) period. He analysed the perceptions and attitudes of five Qing emperors towards Western timepieces, as documented in the imperial records. He concluded that the fluctuating attitudes of Qing emperors and changing perceptions of Qing China’s political status in relation to European countries had an overarching influence on the development of the Anglo-Chinese clock trade.

报告4.2  
从清廷奏谕看西方钟表入华

黄兴副研究员（中国科学院自然科学史研究所副研究员）

黄博士是“时间、文化与民族特征”的中国项目负责人，此报告呈现他在项目中负责研究的部分成果。他从康熙到道光等五位清朝皇帝的奏谕着眼，讨论西方钟表的传入。他分析宫廷档案，讨论中国皇帝对于西方钟表的态度与其转变。他在结论指出，清朝皇帝对西方钟表态度的转变以及中国相对于欧洲的政治境况改变，对于中英钟表贸易的发展产生不容小觑的影响。

WORKSHOP DAY 2: 22 MAY 2019

研讨会第二天：2019年5月22日

SESSION 5: SHARING HOROLOGICAL COLLECTIONS WITH AUDIENCES IN CHINA AND BRITAIN

议程五：与中英观众分享钟表藏品

Chair: Dr Tilly Blyth, Science Museum, UK  
主持：提莉·布里斯博士 (伦敦科学博物馆)

PAPER 5.1  
Time, culture and identity: audience research and digital interpretation in the UK and China

Emma Stirling-Middleton, China Project Curator, Science Museum, UK

Ms Stirling-Middleton is a co-investigator on the ‘Time, Culture and Identity’ project. She provided an overview of the audience research completed as part of the project. The audience research examined the ways in which British and Chinese museum visitors engage with the Palace Museum’s horological collections in three locations: Beijing, Hong Kong and London. The full audience research report is available upon request.

报告5.1  
时间、文化与民族特征：中英观众研究与数字诠释

马霭琳小姐 (英国伦敦科学博物馆中国项目策展人)

马小姐是“时间、文化与民族特征”的英国项目副负责人，此报告简述了观众调研的发现，作为项目的部分环节。观众调研主要在探究中英两国观众在欣赏故宫钟表藏品方式上的异同，接受访问的观众来自北京、香港、伦敦三地。观众调研报告已完成。

SUMMARY OF GROUP DICUSSIONS

小组讨论摘要

After each session, workshop participants engaged in a 20- to 30-minute chaired group discussion. Interesting questions were raised, which inspired further discussion on a selection of topics. Key themes emerging from group discussions included:

- Use and function of mechanical timekeeping devices in China. Workshop participants from the UK found the records and documentation exploring the reception and role of timekeeping devices in China presented during the workshop fascinating. Sharing resources and knowledge of this topic will enrich understanding of singsongs, their function and their meanings within the Chinese context. Further discussion raised questions about the purpose of mechanical clocks for the general population – an important topic for future research.
- Transmission of technology. Workshop participants had a vibrant discussion on the transmission and circulation of European mechanical clocks and automatons to China. Delegates were interested to learn more about the archives and resources held in the respective countries and it was agreed that there are important opportunities for collaborative research between scholars in China and the UK. It was suggested that certain parts of a clock or automaton could be used as a lens for comparison, for example examination and scientific analysis of the springs inside Chinese-made and British-made clocks/ automatons.
- Opportunities and challenges of using archives for horological research. Workshop participants addressed the need to coordinate sources to answer questions about the clocks. The archives of our respective nations can answer many of each other’s questions, but the barrier of language may prevent us from gaining the full picture about the trade. Cross-cultural collaboration will be vital to uncovering the full story.
- Conservation of clocks and automatons. Workshop participants discussed whether it was important for the clocks to be working in the present day. While movement can be a vital part of the clocks, learning about the philosophical, historical, emotional and cultural context of the clocks should not be neglected. These issues raise important questions about the meanings and value of dynamic objects.

- A ‘feasible design’ approach to horology. Workshop participants engaged in an exciting discussion on the methodology of ‘reconstruction synthesis’, in which historical research and mechanical reconstruction exercises were both required to study a historical automaton. Such an approach has implications for science and technology education – especially for developing the thought process among audiences of science museums.
- Engaging museum audiences with horological collections. Workshop participants learned about the significance of understanding the interests and cultural background of museum audiences in relation to exhibition planning. On meeting museum audiences’ interests and preferences, museums have a role to play in facilitating engagement with the stories about the clocks displayed in exhibitions.
- The role of digital technology. Workshop participants explored the potential of digital technology, which enables more interaction and sharing of information for museum visitors. Digital technology definitely facilitates engagement with objects without jeopardising sensitive original objects (ie historical clocks), and it can support visitors’ understanding of mechanics and engineering and the ways they relate to their everyday lives. It was agreed that the ‘Time, Culture and Identity’ research project presents an exciting opportunity for visitors to see aspects of clocks and automatons that are usually hidden from view in traditional museum displays. Possible technologies were proposed, including Smartify and photogrammetry.



SUMMARY OF GROUP DICUSSIONS

小组讨论摘要

每个议程皆有20至30分钟由议程主持人带领的的小组讨论，其中不乏有趣的提问，对未来研究方向和主题有所帮助。以下是小组讨论的重点摘要：

- 中国的机械钟表功能和使用：英国参会者特别对中国人对机械钟表的接收情况与实际功能等问题感兴趣。分享此方面的知识和资源将会增进我们对自鸣钟在中国文化脉络下的功能与意义的理解。机械钟对中国常民生活起的作用也是另一值得深入钻研的问题。
- 技术传播：参会者热烈讨论欧洲机械钟表传入中国的课题，同时对于中英两国在钟表传播上各自拥有的文献和资源非常感兴趣。参会者认为这是未来中英两国的协作研究的重点课题。特别是针对中制和英制钟表内部零件（例如发条）的科学分析可以作为中英钟表或自动机械比较研究的切入点。
- 使用历史档案作钟表学研究的机会与挑战：参会者提出协调和分享钟表学档案资源的重要性，因单一国家所拥有的历史档案仅能获得部分而非全面的理解。此外，语言也会妨碍我们取得钟表贸易的全面理解。跨国合作是揭开真相的关键。
- 钟表与自动机械的修复：参会者针对钟表藏品是否该持续运转的问题深入讨论。即使机芯运转是钟表最为关键的环节，但钟表藏品背后的哲学、历史、情感和文化脉络亦不可忽视。钟表藏品的修复确实引发我们思考动态藏品的意义和价值所在。

- 从“可行性设计”的视角看钟表学：参会者热烈讨论复原综合方法论的内涵，特别是如何透过历史研究和机械重建的方式来理解历史自动机。参会者认为此方法在科技教育层面上有重要影响，对于科学技术类博物馆在引导观众思考上特别有帮助。
- 提升观众对钟表藏品的体验：参会者体悟到深入理解博物馆观众的兴趣和文化背景对钟表展览策划的重要性。不仅要满足观众学习的兴趣和偏好，博物馆更肩负着鼓励观众全面掌握钟表展览里多条故事线的重任。
- 数字技术的重要性：参会者探索数字技术在观众互动和分享信息的可能性。数字技术能够在不威胁到历史藏品安全的前提下让观众与藏品互动，不仅协助观众取得钟表藏品的机械、工程面向的信息，且让技术与观众自身的生活有所连结。“时间、文化与民族特征”项目提供一个绝佳的机会，让观众一窥钟表在传统博物馆展示中不易见到的一面。可能使用的技术包括Smartify应用程序和摄像测量。

BIOGRAPHIES OF  
WORKSHOP PARTICIPANTS  
参会者简介



**TILLY BLYTH**  
提莉.布里斯



Dr Tilly Blyth is the Head of Collections and Principal Curator at the Science Museum in London, where she is responsible for the Curatorial, Research, and Library and Archives departments. She is a principal investigator for the AHRC-funded project ‘Time, Culture and Identity’. Her team have delivered award-winning galleries and exhibitions at the Science Museum such as Mathematics and Illuminating India. Tilly was lead curator of the Information Age gallery, which explores 200 years of information and communication networks and how they have transformed the world.

Tilly studied physics at the University of Manchester before migrating towards the social sciences, with an MSc in science policy and a PhD in the history and sociology of technology. Her particular research interest is in the history of computing, and women’s roles in the development of the computing industry.

She is currently working on a landmark project with the BBC titled The Art of Innovation, which looks at the relationship between artists and scientists across a radio series, book and exhibition. She is a member of BAFTA and a trustee of the Raspberry Pi Foundation.

提莉是伦敦科学博物馆典藏部领导与主要策展人，负责管理科学博物馆的策展、研究、图书与档案馆等部门。她是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的主负责人。她的团队曾制作获奖的展览，包括“数学”展和“点亮印度”展。提莉也是“信息时代”展的主策展人，该展览讨论了两百年来信息与沟通的网络是如何引领世界的转变。

提莉曾在曼彻斯特大学攻读物理学，她的研究转向社会科学，并取得科学政策硕士和科技社会史博士。她的研究兴趣包含计算机史、女性在计算机产业发展的角色。

提莉正在和英国广播公司合作进行一个具指标性的项目—“艺术的创新”，透过电台节目、专书和展览讨论艺术家与科学家的关系。她同时也是英国电影学会的成员、树莓派基金会的理事。

*tilly.blyth@sciencemuseum.ac.uk*

**CHEN YUHSUN**  
陈羽薰



Dr Yuhsun Chen’s research interests include aspects of both mechanism design and the history of machines science. She has been involved in projects such as ‘Reconstruction Designs of Typical Clocks and Watches in the Forbidden City’ and ‘Systematic Reconstruction Designs of Typical Automats with Music-Playing Devices’ in the Creative Machine Design Laboratory at National Cheng Kung University (Tainan, Taiwan). She is currently working at the Department of Mechanical Engineering, National Taiwan University of Science and Technology in Taipei as an assistant professor.

专业从事机械设计和制度设计、科技史，曾于成功大学机械工程系创新机械研究室参与研究案“紫禁城具代表性时钟复原设计”和“代表性演奏装置自动机之复原研究”。陈博士现任国立台湾科技大学机械工程助理教授。

*chyhsun@gmail.com*

**CAROL CHUNG**  
钟珞筠



Carol works as a UK–China Research Facilitator for the AHRC-funded project ‘Time, Culture and Identity’, based at the Science Museum, London. She received her PhD in museum studies from University College London, specialising in museum education and audience research. Carol has completed postdoctoral research at the University of Bath, studying the perception of Scotland among Chinese audiences visiting the Romantic Scotland: Castles, Land and Sea exhibition. She has worked as project officer on a Commonwealth Blue Charter research project at the Association of Commonwealth Universities, and as an evaluation officer for a Somalian exhibition at the British Museum.

现任职伦敦科学博物馆，担任英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的中英研究协调员。她取得伦敦大学学院博物馆学博士，专业为博物馆教育、观众研究。曾任职巴斯大学博士后研究员，负责“浪漫苏格兰展览：论中国观众对苏格兰的文化认知”研究项目；大英国协大学协会项目专员，负责“大英国协蓝色宪章”研究项目；大英博物馆观众研究调查员，负责索马利亚文化展观众调研。

*carol.chung@sciencemuseum.ac.uk*

**FENG LISHENG**  
冯立昇



Professor Lisheng Feng is the Director of the Institute for History of Science and Technology and Ancient Texts, Tsinghua University. His research interests are ancient mechanical devices and tools, and the history of the invention of ancient instruments. He has supervised students whose projects focus on the history of ancient mechanical devices and instruments. His research team at the Institute for History of Science and Technology and Ancient Texts have published dozens of papers on the history of ancient Chinese mechanical instruments.

清华大学科学技术暨古文献研究所所长、教授。冯教授主要研究方向为古代机械、工具与仪器发明史。他所指导研究生的论文选题都与古代机械与仪器史相关。他所上的研究人员已发表中国古代机械与仪器史研究论文数十篇。

*fls@mail.tsinghua.edu.cn*

**HUANG XING**  
**黄兴**



Dr Xing Huang is an Associate Researcher at the Institute for the History of Natural Sciences, Chinese Academy of Sciences. He is a co-investigator for the AHRC-funded project ‘Time, Culture and Identity’, and has researched as a visiting scholar in the UK at the Needham Research Institute, Cambridge University, and in Germany at the Max Planck Institute for the History of Science.

Xing’s research focuses on the history of ancient metallurgy, compasses and mechanisms, and simulation of the history of technology. He has published two monographs, ‘An Empirical Study of Ancient Chinese Compasses’ and ‘A Study of Metallurgy’, and published dozens of papers in Journal of Archaeological Science, Studies in the Histories of Natural Sciences, Journal of Dialectics of Nature and Agricultural History of China.

黄兴是中国科学院自然科学史研究所副研究员。黄博士是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的负责人。他曾任英国剑桥李约瑟研究所、德国马普学会科技史研究所访问学者。他从事古代冶金史，指南针史，机械史，技术史模拟与仿真等研究；著有《中国古代指南针实证研究》《炼铁记》等，在Journal of Archaeological Science、《自然科学史研究》、《自然辩证法通讯》、《中国农史》等刊物发表学术论文十余篇。

*huangxing@ihns.ac.cn*

**LIYEZHUO**  
**李晔卓**



Yezhuo Li is a member of the postdoctoral teaching staff at Beijing Jiaotong University. He completed an undergraduate degree in horological instruments at Harbin Institute of Technology, and is currently researching reconfigurable ground mobile systems with multiple locomotion modes, and their mechanism design. He has participated in co-developed projects at the Creative Machine Design Laboratory, Department of Mechanical Engineering, Cheng Kung University (Taiwan), published seven papers in EI/SCI journals and has been awarded 19 patents for invention.

李晔卓是北京交通大学师资博士后，本科毕业于哈尔滨工业大学，计时仪器专业。李博士目前主要从事可变形多模式地面移动系统与机构创新设计的相关研究，曾赴台湾台南成功大学，机械工程学系，创意性机器设计教研室联合培养。他已发表相关EI/SCI学术论文7篇，申请获得发明专利19项。

*liyezhuo@bjtu.edu.cn*

**MATTHEW READ**  
**马修.李德**



Matthew Read’s interest in clocks grew from his third-generation family business and his grandfather’s time-served experience as a watchmaker. After graduating with a postgraduate diploma and subsequent master’s in the conservation of clocks, he worked as Conservator and Assistant Curator at the Royal Observatory Greenwich, followed by a period of self-employment as a conservator for institutions such as the National Trust and the Museum of the History of Science, Oxford. For eight years he taught conservation of clocks and dynamic historic objects at West Dean College. Presently he is Director of the Bowes Centre at the Bowes Museum. His duties at Bowes include the treatment of the Bowes Swan automaton.

马修对钟表的兴趣来自三代经营的家族事业，以及祖父作钟表匠的经验。在拿到钟表修复的文凭和硕士学历后，马修曾在格林威治皇家天文台担任修复师和助理策展人。他随后在英国国民信托和牛津的自然史博物馆担任自由业修复师。他曾在西丁学院教了八年的钟表与动态物件修复课程。他现在担任博斯博物馆的博斯中心主任，负责修复工作，包含博斯博物馆收藏的银天鹅钟表机械。

*matthew.read@thebowesmuseum.org.uk*

**ROGER SMITH**  
**罗杰.史密斯**



Roger is an independent historian with degrees from King’s College London and the London School of Economics. He is a Fellow of the Society of Antiquaries and was awarded the Gaia Prize for Horological History in 2016 by the Musée International d’Horlogerie in Switzerland. His major field of research is the organisation of the horological trade in the 18th century and especially international aspects such as the export of clocks from Britain to China.

Roger has published and lectured extensively, and acted as historical adviser to numerous public collections including the Museum Speelklok, Utrecht, for an exhibition of clocks from the Palace Museum, Beijing, in 2010/11; the State Hermitage Museum, St Petersburg, for the history of its ‘Peacock’ automaton; and the Bowes Museum, County Durham, for its ‘Silver Swan’ automaton.

罗杰是一位历史学家，他有伦敦国王学院和伦敦政经学院的学位。他是考古学会的成员，并在2016年获得瑞士国际钟表博物馆颁发的“盖亚钟表史”奖项。

罗杰的最重要研究领域是十八世纪钟表贸易的组织，特别是国际贸易方面，例如出口中国的英制钟表。

罗杰经常发表他的研究和演讲。他曾以历史学顾问的身份访问许多博物馆，例如荷兰乌特勒支的史匹尔克博物馆；曾访问北京故宫博物院，为2010 -2011年的钟表展览提供咨询；曾访问圣彼得堡冬宫博物馆，提供“孔雀钟表机械”历史的咨询；以及访问伯纳堡的博斯博物馆，提供“银天鹅钟表机械”的咨询

*smith\_roger@btinternet.com*



## EMMA STIRLING-MIDDLETON 马霭琳



Emma Stirling-Middleton is China Project Curator at the Science Museum, London, and a co-investigator for the AHRC-funded project 'Time, Culture and Identity'. She was part of the curatorial team for the recent Hong Kong Science Museum exhibition Treasures of Time, which presented 120 of the Palace Museum clocks as well as a selection of 18th-century horological hand and machine tools from the London Science Museum. She is currently curating an exhibition of 25 of the Palace Museum clocks which will open at the Science Museum in 2020.

Before joining the Science Museum, Emma developed a number of exhibitions in collaboration with Chinese museums, including Genghis: Rise of the Mongol Khans (Inner Mongolia Museum, National Military Museum of the Netherlands) and Romantic Scotland: Castles, Land and Sea (Nanjing Museum, Historic Environment Scotland, National Galleries Scotland). Emma studied social anthropology with social history at the University of Edinburgh.

马霭琳是伦敦科学博物馆中国项目策展人。她也是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的副负责人。

马霭琳曾是香港科学博物馆“匠心独具：钟表珍宝展”策展团队的成员，该展览呈现120件故宫博物院的钟表，以及伦敦科学博物馆精选的十八世纪钟表指针和器械工具。她现在正在策划2020年在伦敦科学博物馆开的展览，预计展出二十五件故宫博物院钟表。

马霭琳在加入伦敦科学博物馆前曾经策划过许多和中国博物馆合作的展览，包含“成吉思汗：蒙古可汗的崛起”（内蒙古博物馆、荷兰国立军事博物馆）；“浪漫苏格兰：城堡、要塞和海洋”（南京博物院、苏格兰历史环境局、苏格兰国家美术馆）。马霭琳曾在爱丁堡大学攻读人类学和社会史。

[emma.stirling-middleton@sciencemuseum.ac.uk](mailto:emma.stirling-middleton@sciencemuseum.ac.uk)

## WANG XIAOXI 王晓溪



Professor Xiaoxi Wang is Director of the Institute of Horological Instruments at Harbin Institute of Technology. He is a member of National Technical Committee 160 on Horology of Standardization Administration of China, Vice Chairman of the National Light Industry Watch and Precision Manufacturing Vocational Education Group, a National Vocational Qualification Appraisal Question Database expert, Executive Director of the China Horologe Association, Director of the Chinese Society of the History of Horological Instruments, and Director of the China Committee of Horological Design and the Committee of Horological Science and Technology.

王晓溪教授是哈尔滨工业大学计时仪器专业主任，计时仪器研究所所长。王教授曾担任全国钟表标准化技术委员会委员；全国轻工业钟表与精密制造职业教育集团副理事长；国家职业技术鉴定题库命题专家；中国钟表协会常务理事；中国计时仪器史学会理事；中国钟表设计专业委员会理事；中国钟表科技委员会理事。

[wxiaoxi@hit.edu.cn](mailto:wxiaoxi@hit.edu.cn)

## YAO YANAN 姚燕安



Professor Yanan Yao is a PhD adviser and Executive Deputy Director of the Robotics Research Centre at Beijing Jiaotong University, and a principal investigator for the AHRC-funded project 'Time, Culture and Identity'. He was selected for the New Century Excellent Talents Programme by the Chinese Ministry of Education.

Yanan is a member of the Executive Council of the International Federation for the Promotion of Mechanism and Machine Science and a principal investigator for UNESCO in higher education and industry cooperation. He is also an Adjunct Professor of Beijing University of Chemical Technology and Shandong University of Science and Technology, and a part-time graduate tutor at the Central Academy of Fine Arts and the Lu Xun Academy of Fine Arts.

His original concept and design theory for the 'linked whole closed-chain mobile system' is known internationally, and he founded the Institutional Innovation and Robotics Laboratory. He has hosted more than 100 scientific research projects (including more than 40 provincial and ministerial-level ones), published 135 papers, been awarded 97 patents, supervised 65 graduate students and developed more than 50 kinds of products through technology transfer. He also proposed the concepts of 'geomobot' and 'MSEAP' (a combination of mathematics, science, engineering, art and philosophy). He was awarded a second prize for invention by the Ministry of Education and has twice won a Beijing Science and Technology Prize.

姚燕安教授是北京交通大学博士生导师。姚教授是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的主负责人。他现任职北京交通大学机器人研究中心执行副主任，获选教育部新世纪优秀人才，国际机构与机器理论联合会 (IFTOMM) 联合会执行委员会委员，联合国教科文组织高等教育与产业合作教席 (UNESCO Chair) 研究员。他同时为北京化工大学、山东科技大学兼职教授，中央美术学院、鲁迅美术学院兼职研究生导师。他在国际上提出“连杆式整体闭链移动系统”的原创概念和设计理论，创立“机构创新与机器人学实验室”。他主持承担科研项目100余项（其中省部级以上40余项），发表论文135篇；获发明专利授权97项；培养研究生65人；技术转让开发出产品50余种。他提出“几何机器人”科普概念和“MSEAP（将数学、科学、工程、艺术和哲学相融合）”教育与研究理念，主持获教育部发明二等奖1项、北京市科技奖2项。

[yayao@bjtu.edu.cn](mailto:yayao@bjtu.edu.cn)

## ZHANG BAICHUN 张柏春



Professor Baichun Zhang is Director of the Institute for the History of Natural Sciences at the Chinese Academy of Sciences, from where he received his PhD in the history of science and technology. His research focuses on the history of technology and mechanics, comparative history of knowledge transfer, and strategies of technological development. He is currently a special research fellow for the Science and Technology Think Tank at the Chinese Academy of Sciences.

Baichun is editor of a number of international journals on the history of technology, including Science in Context, East Asian Science, Technology, and Medicine and Acta Baltica Historiae et Philosophiae Scientiarum, and editor of a number of Chinese journals, among them Studies in the History of Natural Sciences, Journal of Dialectics of Nature, Science and Society and Journal of Engineering Studies. He has also edited the international book series Boston Studies in the Philosophy and History of Science. Baichun is a member of the academic committee of the Max Planck Research Library for the History and Development of Knowledge and was elected as a Fellow of the International Academy of the History of Science in May 2019.

张柏春教授是中国科学院自然科学史所长。张教授取得中国科学院科学技术史博士，研究方向包含技术史、力学史、知识传播史与比较史、科技发展战略。他担任中国科学院科技智库特聘研究员，同时也是国际科技史学术期刊 Science in Context 编委，East Asian Science, Technology, and Medicine 编委，Acta Baltica Historiae et Philosophiae Scientiarum 编委。《自然科学史研究》、《自然辩证法通讯》、《科学与社会》、《工程研究》等中国期刊的编委。国际科技史学术书系 Boston Studies in the Philosophy and History of Science 编委，Max Planck Research Library for the History and Development of Knowledge 学术委员。他在2019年5月当选总部设于巴黎的国际科学史研究所 (International Academy of the History of Science) 院士。

[zhang-office@ihns.ac.cn](mailto:zhang-office@ihns.ac.cn)



ZHANG XUEYU

张学渝



Dr Xueyu Zhang received her PhD in the history of science and technology from the University of Science and Technology, Beijing, in January 2017. She is now a Postdoctoral Research Associate at the Department of History, Zhongshan University (Zhuhai Campus). Her research focuses on the history of technology, and she is particularly interested in the social history of technology, the theory and practice of traditional craft-making, and the history of technology among minority groups.

张学渝博士于2017年1月取得北京科技大学科学技术史博士，现为中山大学历史学系（珠海）特聘副研究员、博士后。张博士主要从事技术史研究，尤其关注技术社会史、传统工艺理论与实践、少数民族科技史相关问题。

*zhangxueyu0821@163.com*

