

RITUAL, MATHEMATICS & ASTRAL SCIENCES

June 7 & 8 2016

Université Paris Diderot

conference organized

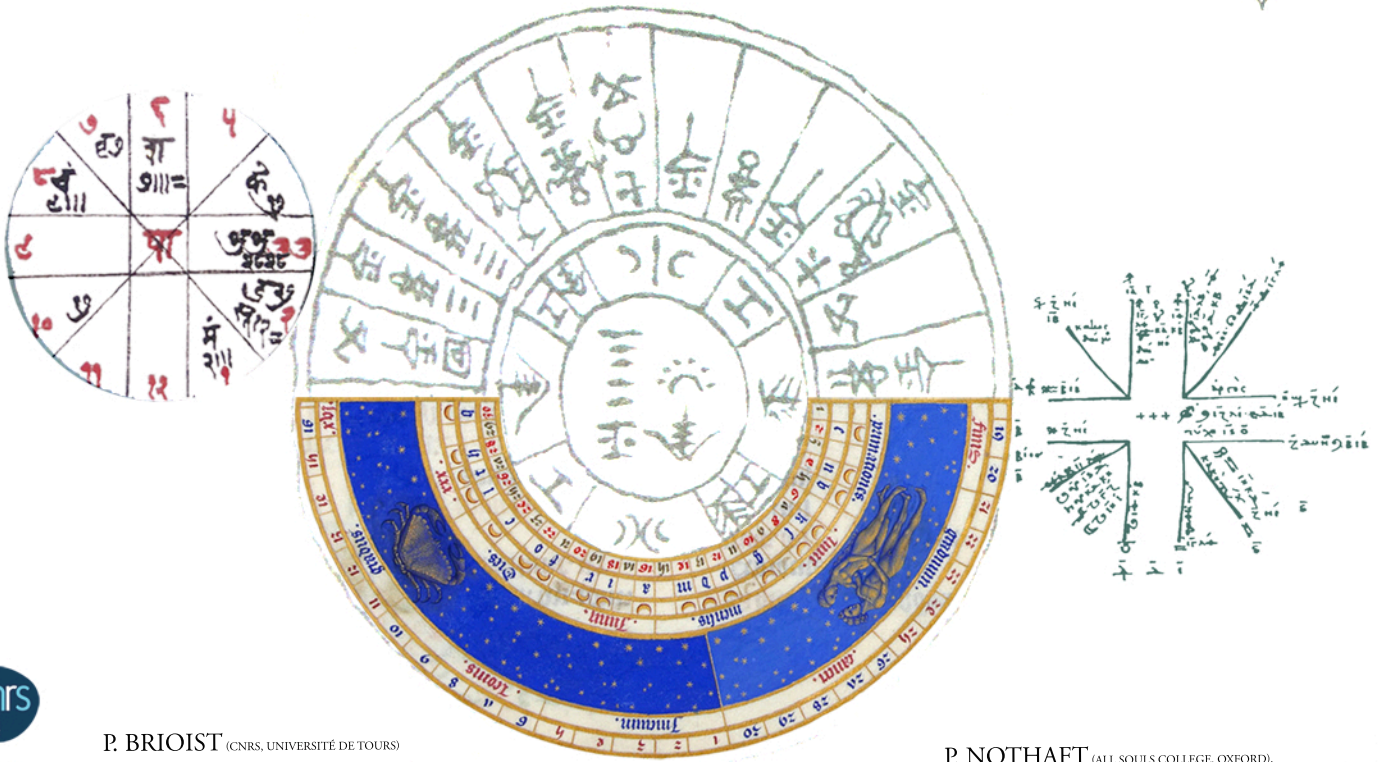
by HIROSE S., D. P. MORGAN, A. KELLER, M. HUSSON & K. CHEMLA

in the framework of the ERC project

“MATHEMATICAL SCIENCES IN THE ANCIENT WORLD” (SAW)

馬與射立丁階前海子階
 一少以能射如初一馮揚汗初
 子汝揮弓矢旋旋旋藤反位。而射猶
 衆射者繼神皆如三偶並
 漢北面蓄三小指退
 度面大順羽
 處坐熱夫無
 位三

未時五時四十分三十分二十分十分五分
 申時五時四十分三十分二十分十分五分
 酉時五時四十分三十分二十分十分五分
 戌時五時四十分三十分二十分十分五分
 亥時五時四十分三十分二十分十分五分
 子時五時四十分三十分二十分十分五分
 丑時五時四十分三十分二十分十分五分
 寅時五時四十分三十分二十分十分五分
 卯時五時四十分三十分二十分十分五分
 辰時五時四十分三十分二十分十分五分
 巳時五時四十分三十分二十分十分五分
 午時五時四十分三十分二十分十分五分



P. BRIOIST (CNRS, UNIVERSITÉ DE TOURS)
 B. DAVID (UNIVERSITÉ PARIS VINCENNES).
 C. GUENZI (CEIAS, EHESS, PARIS).
 HIROSE S. (UNIV. PARIS DIDEROT, SPHERE, & SAW)

M. HUSSON (SYRTE, CNRS - OBSERVATOIRE DE PARIS & SAW).
 A. KELLER (CNRS, SPHERE, & SAW)
 B. L'HARIDON (CRCAO, UNIVERSITÉ PARIS DIDEROT, PARIS).
 A. LEVINOVITZ (JAMES MADISON UNIVERSITY)
 D. P. MORGAN (CNRS, SPHERE, & SAW).

P. NOTHAFT (ALL SOULS COLLEGE, OXFORD).
 TESHIMA H. (KYOTO BUNKYO UNIVERSITY).
 YANO M. (KYOTO SANGYO UNIVERSITY)
 WU Y. (INNER MONGOLIA NORMAL UNIVERSITY).
 ZHU Y. (SUN YAT-SEN UNIVERSITY & SAW)



conception, réalisation : Nad. Fachard (CNRS)



RITUAL, MATHEMATICS & THE ASTRAL SCIENCES

Conference organized by
HIROSE Sho, Daniel P. MORGAN, Agathe KELLER, Karine CHEMLA
(CNRS – University Paris Diderot, SPHERE, & SAW)
& Matthieu HUSSON
(SYRTE–Observatoire de Paris)

in the framework of the ERC project
“MATHEMATICAL SCIENCES IN THE ANCIENT WORLD” (SAW)

June 7–8, 2016

&

March 19–20, 2015

Venue:

CNRS – Université Paris Diderot
Condorcet Building, Room 646A,
10 rue Alice Domon et Léonie Duquet,
75013 Paris

with the support of the European Research Council (ERC)
under the European Community's Seventh Framework Programme
(FP7/2007-2011)

the ERC SAW project is linked to the Research Unit SPHERE
(UMR 7219 – CNRS, Universities Paris Diderot & Paris Panthéon-Sorbonne)

Principal Investigator: Karine Chemla
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<http://www.sphere.univ-paris-diderot.fr>
<http://sawerc.hypotheses.org/>



Presentation

Ritual is a science of precision. Like any proper performance or game, ritual choreographs action to the beat and bounds of time, and it manipulates symbols with rigorous rules of accounting. The calendar, the timepiece, the tokens, the altars, the counts —to mathematics and the astral sciences are owed the rigor of ritual, one might say, and to ritual, one of the very meanings of these sciences. In this workshop, we will reflect upon the interdependence of ritual, mathematics, and astronomy, giving special attention to the question of astronomical and computational practices unique to the context of ritual.

Building off of an exploratory workshop held on March 19–20, 2015 (<http://www.sphere.univ-paris-diderot.fr/spip.php?article794&lang=en>), this conference will treat Chinese, Sanskrit, and Latin sources for ritual mathematics running from ancient times to the modern day, pairing historians of science with cultural historians, anthropologists, and historians of religion to supply a pluricultural and pluridisciplinary lens through which to reflect upon the topic.

At the forefront of this conference is the matter of time —the calculation of liturgical calendars and the selection of propitious moments for ritual action therein. It is here where caricatures of “science” and “religion” collapse as we watch actors approach problems of a fundamentally

theological/occult nature with observation, data, mathematical proof, and evolving theories of nature. In the papers of Michio YANO and Philipp NOTHAFT, we see this pursuit play out in second-millennium Sanskrit and Latin sources, respectively, as concerns the scientific religious timing of sacrifice and resurrection. What was at stake in the timing of these events? How did those stakes inform the methods and rigor of the astral and mathematical sciences employed to this end? What relation did *praxa* in such cases bear to the *doxa* informed by those stakes? How did this change, and how was such change negotiated over the course of time?

The matter of science, liturgical calendars, and change brings us to the papers of WU Yan and Béatrice DAVID, which explore the efforts of the twentieth-century Chinese state's top-down efforts to reconcile tradition and local festival calendars with Western "scientific" norms of modernity. The former will take us through how the KMT Nationalist Party, at the turn of the century, sought to construct a Chinese national identity by canonizing and harmonizing traditional festivals with the Gregorian calendar, while the latter will explore how the Communist Party, in turn, has attempted to enforce this globalized, hegemonic calendar onto ethnic minorities such as the Sui. How do governments decide things like the exact date of Confucius' birth? How might their determinations differ from those of individual scholars and local communities? What resistance do such efforts meet from the latter, and how does that resistance play out vis-à-vis the paradoxical demands of plurinational nationalism?

The control of time, in this case, speaks directly to the control over space, which brings us, lastly, to the use of mathematics in the construction of ritual space. For sacrifice to be effective, it depends as much on the altar and implements of sacrifice than it does the selection of the right moment, and it is to this end that Hideki TESHIMA will take us through the arithmetic/geometric prescriptions of altar-construction in the context of first-millennium Vedic ritual manuals. Coming to first-millennium China, we then move into the construction of space in the more abstract and as relates, specifically, to questions of proof. In the paper by ZHU Yiwen, we will explore how seventh-century writers treated classical prescriptions on the construction of mourning garments, bringing mathematical proof into

classical commentary, and ancient ritual into mathematical treatises. Beginning with seventh-century commentary on target geometry, the joint paper of Alan LEVINOVITZ and Daniel MORGAN will furthermore examine mathematics of ritual archery contests in the centuries prior, discussing the metric of shooting came to inform the idea of testing in an astronomical and scholastic context. How do the mathematics of scientific altar, mourning garment, and target construction differ from those we might encounter in more abstract realms like astronomy? What relation to liturgical manuals and scholastic commentary bear to real world practice, and what, if anything, do measuring units tell us about such a divide? These are the topics and the questions that we will consider over the course of our two-day conference, at the heart of which, however, is one question of singular importance to the history of mathematics: How number-manipulation, as present in cultural practices as diverse as those examined here, may speak to the diversity of mathematical cultures within a given historical time and geographic place.

TUESDAY, JUNE 7, 2016

Morning session

9:30 – 11:00

Alan LEVINOVITZ (James Madison University, USA) & **Daniel P. MORGAN**
(CNRS, SPHERE & SAW project, Paris):

*Virtue on trial: ritual archery competitions
& astronomical testing in early China* ➤

Commentator: **Pascal BRIOIST** (CNRS, CESR, Université de Tours)

Break

11:30 – 13:00

YANO Michio (Kyoto Sangyo University, Japan):

*Astrology & rituals in India
–with special references to the Muhūrtacintāmani* ➤

Commentator: **Caterina GUENZI** (CEIAS, EHESS, Paris)

Lunch Break

Afternoon session

14:30 – 16:00

Philipp NOTHAFT (All Souls College, Oxford, England):

*Calendar reform in the fourteenth & fifteenth centuries:
problems & perspectives* ➤

Commentator: **Mathieu HUSSON** (CNRS, SYRTE, & SAW project, Paris)

WEDNESDAY, JUNE 8, 2016

Morning session

9:30 – 10:30

ZHU Yiwen (Sun Yatsen University, China, & SAW project):

Commentaries on numbers of ritual through different mathematical knowledges in seventh century China ➤

Commentator: **Béatrice L'HARIDON** (CRCAO, Université Paris Diderot, Paris)

Break

11:30 – 13:00

TESHIMA Hideki (Kyoto Bunkyo University, Japan):

Vedic measure system & its application in the ritual field ➤

Commentators: **HIROSE Sho** (Univ. Paris Diderot, SPHERE, & SAW project, Paris)

& **Agathe KELLER** (CNRS, SPHERE & SAW project, Paris)

Lunch Break

Afternoon session

14:30 – 16:00

WU Yan (Inner Mongolia Normal University, China):

The replacement of traditional ceremonies in the process of the movement for "Abolishing the traditional calendar & promoting the national calendar": focusing on the memorial day of the birth of Confucius ➤

Commentator: **YANO Michio** (Kyoto Sangyo University, Japan)

16:00 – 17:30

Béatrice DAVID (Université Paris 8, Paris):

A preliminary investigation of the ritual use of the calendar & the oracular script of the Sui (Guizhou, Southwest China) ➤

Commentator: **YANO Michio** (Kyoto Sangyo University, Japan)