SAW Conference:
Mathematical Practices in relation to the Astral Sciences

March 26-27-28 and 30-31, 2015

The conference is organised by Karine Chemla (Sphère, CNRS & University Paris Diderot, SAW Project), Matthieu Husson (CNRS, SYRTE, Observatoire de Paris & SAW Project), Agathe Keller (Sphère, CNRS & University Paris Diderot, SAW Project), Christine Proust (Sphère, CNRS & University Paris Diderot, SAW Project) and the SAW group.

Venue: Paris Diderot University, Condorcet Building

Room 366 A

9.30 am-5.30 pm

I. Presentation

The conference “Mathematical Practices in relation to the astral sciences” is the final conference of the Phase 2 of the SAW Project. It follows upon the conference Cultures of computation and quantification in the ancient world, held two years ago, which concluded the Phase 1 (http://sawerc.hypotheses.org/workshop-cultures-of-computation-and-quantification/conference-cultures-of-computation-and-quantification-in-the-ancient-world).

The conference aims at describing specific “mathematical cultures” that took shape in the context of astral sciences. Moreover, it intends to highlight contrasts between cultures identified in these contexts and mathematical cultures to which other documents testify. We hope to go on with our exploration of “cultures of computation,” aiming at understanding better what a “culture of computation” can be and which features are most relevant to perceive and char-
acterize it. We also hope to widen our scope and explore how other facets of mathematical activities, e.g. geometrical practices, practice with instruments or practices of reasoning, carried out in the context of astral sciences could fruitfully lend themselves to a description in terms of “culture,” and highlight diversity inside and among mathematical cultures.

II. Programme

March 26, 2015

Quantities and Measurements Units

9.30 am-11.00 am

Alexander Jones (New York University, USA)
Approximate results and recursive algorithms in Greek astronomy

Commentators: Sho Hirose and Daniel Morgan

11.00 am-11.30 am: Break

11.30 am-1 pm

Wang Xiaohu (School of Public Administration, South China Normal University, China)
Simulating Clepsydra: Two Methods of Time Measurement for Military in Ancient China

Commentators: Daniel Morgan and John Steele

1 pm-2 pm: Lunch Break

Progressions and ordered lists of numbers

2.15 pm-3.45 pm

Michio Yano (Kyoto Sangyo University, Japan)
Geometrical model and observation in Indian astronomy
Commentators: Zhihui Chen and Christine Proust

3.45pm-4pm: Break

4 pm-5.30 pm

Steve Shnider (Bar Ilan University, Israel)

*Difference schemes and their relation to interpolation rules in Babylonian lunar ephemerides*

Commentators: Pierre Chaigneau and Karine Chemla

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March 27, 2015

**Progressions and ordered lists of numbers (continued)**

9.30 am-11am

Karine Chemla (Sphère, CNRS & University Paris Diderot, SAW Project) and Li Liang (Institute for the History of Natural Sciences, Chinese Academy of Sciences, China & SAW Project)

*Progressions, motions and changes in the astral sciences of ancient China*

Commentators: Mathieu Ossendrijver and Martina Schneider

11 am-11.30 am: Break

**Mathematical Reasonings 1**

11.30 am-1pm

Sho Hirose (Sphère, CNRS & University Paris Diderot, SAW Project)

*Explanations on planes, explanations in space: the usage of the armillary sphere in Parameśvara's Goladīpikā*

Commentators: Matthieu Husson and Nathan Sidoli
1 pm-2pm: Lunch Break

2.15 pm-3.45 pm

Setsuro Ikeyama (Kyoto Sangyo University, Japan)
Practical Trigonometry in Indian Astronomy

Commentators: Agathe Keller and Li Liang

3.45 pm-4 pm: Break

4 pm-5.30 pm

Chen Zhihui (Sphère, CNRS & University Paris Diderot, SAW Project)
How Did Mid-Qing (late 1790s) Scholars Use Ancient Calendrical Methods to Calculate Dates of Events Mentioned in Confucian Canons? -- A Study Focusing on Li Rui’s (1768-1817) Zhaogao Riming Kao (Research on the Names of the Days in the Announcement by the Duke of Zhao, ca. 1800)

Commentators: Clemency Montelle and Zhou Xiaohan

March 28, 2015

Mathematical Reasonings 2

9.30 am-11 am

Hermann Hunger (University of Vienna, Austria)
Reasoning involving mathematics in schematic Babylonian astronomy

Commentators: Magali Dessagnes and Matthieu Husson

11 am-11.30 am: Break
11.30 am-1 pm  

**Karine Chemla** (Sphère, CNRS & University Paris Diderot, SAW Project)  
*Conjunctions between the sun and the moon, and pursuit problems. Mathematical reasoning in Chinese writings on astral sciences*  
Commentators: Baptiste Mélès and Clemency Montelle

1 pm-2 pm: Lunch Break

2.15 pm-3.45 pm  

**Glenn Van Brummelen** (Quest University, Canada)  
*Al-Kashi’s Two Methods of Determining sin(1 degree): Finding Roots and Changing Paths*  
Commentators: Pierre Chaigneau and Sho Hirose

3.45 pm-4 pm: Break

4pm-5.30 pm

**Clemency Montelle** (University of Canterbury, New Zealand & SAW Project)  
*What can numerical data reveal about approximation? Trigonometry and the associated interpolation rules in Brahmagupta’s Khaṇḍakhādyaka*  
Commentators: Li Liang and Christine Proust

March 30, 2015

**Mathematical Practices: Contrasts**

9.30 am-11 am

**Mathieu Ossendrijver** (Humboldt University, Germany & SAW Project)  
*Mathematical Practices in Late Babylonian Mathematical Astronomy*  
Commentators: Li Liang and Martina Schneider
11 am-11.30 am: Break

11.30 am-1 pm

Nathan Sidoli (Waseda University, Japan & SAW Project)
*Geometrical analysis and trigonometry in Greco-Roman mathematics*

Commentators: Karine Chemla and Clemency Montelle

1pm-2 pm: Lunch Break

2.15 pm-3.45 pm

Daniel Morgan (Sphère, CNRS & University Paris Diderot, SAW Project)
*By Process of Elimination: Further Remarks on the Operation chu 除 in Early Imperial Mathematical Astronomy*

Commentators: John Steele and Zhou Xiaohan

3.45 pm-4 pm: Break

4 pm-5.30 pm

Agathe Keller (Sphère, CNRS & University Paris Diderot, SAW Project)
*Understanding the vikala, Prthūdaka's interpretation of Brahmagupta's rules on quantities with sexagesimal parts*

Commentators: Zhihui Chen and Charlotte de Varent
March 31, 2015

Mathematical Practices: Synthesis

9.30 am-11 am

**Matthieu Husson** (CNRS, SYRTE, Observatoire de Paris & SAW Project)
*Operations on sexagesimal numbers outside and inside astronomical texts: a comparison*

Commentators: Mathieu Ossendrijver and Charlotte de Varent

11 am-11.30 am: Break

11.30 am-1 pm

**John Steele** (Brown University, USA & SAW Project)
*Babylonian Shadow-Length Schemes: Between Mathematics and Astronomy*

Commentators: Magali Dessagnes and Nathan Sidoli

1 pm-2 pm: Lunch Break

2.15 pm-3.45 pm

**Zhu Yiwen** (Sun Yatsen University, China)
*Uncovering Astronomical Procedures Using Counting-diagrams: The Case of Qin Jiushao’s Writing on Chinese Remainder Theorem*

Commentators: Agathe Keller and Baptiste Méès

3.45 pm-4 pm: Break

4. pm-5.30 pm

**Taro Mimura** (University of Manchester, UK)
*The Formation of Zījs in the Integration of Indian and Greek Mathematical Tools*

Commentators: Guillaume Loizelet and Emilie Villey