

Seminar SAW : Mathematical practices in the context of the Astral Sciences

Abstract :

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Summary of the *Almagest: Another Astronomical Tradition in the Days of Naṣīr Dīn Ṭūsī and its Significance in the History of Solving Problems Concerning the Diurnal Motions*

The Islamic world received Ptolemy's *Almagest* in the mid-9th CE, and Islamic scholars developed the quantitative determination of astronomical motions. They also expanded from the *Almagest* the qualitative explanation of how the universe is constructed, so that the research on cosmology became a distinctive genre of astronomy called *ilm al-hay'a*, which was canonicalized by Naṣīr Dīn Ṭūsī (1201-1274) in *Tadhkira fī 'ilm al-hay'a*. After the appearance of the *Tadhkira*, many scholars composed books on the *hay'a*.

On the other hand, an extensive examination on Arabic manuscripts of astronomical works written by scholars who were personally acquainted with Naṣīr Dīn Ṭūsī reveals that there existed another genre of astronomical books called *Summary of the Almagest*. I found the following works included in this genre:

Athīr Dīn Abhāri (d. 1262 or 1265), *Uttermost Attainment in Comprehending the Orbs (Ghāyat al-idrāk fī dirāyat al-aflāk)*;

Najm Dīn Kātībī Qazwīnī (d. 1276), *Abridgement of the Almagest (Mukhtaṣar al-Majisṭī)*;

Muḥyī Dīn Maḡribī (d. 1283), *Compendium of the Almagest (Talkhiṣ al-Majisṭī)*.

Of course these three books have different contents, but we must remark that they have the same table of contents, as follows:

Chapter 1: on spherical geometry;

Chapter 2: on how to solve problems concerning the diurnal motions

Chapter 3: on summary of the *Almagest*;

Chapter 4: on construction of astrolabe using stereographic projection.

As this table shows, the problems concerning the diurnal motions were regarded as one of the main themes in the *Summary of the Almagest*, unlike a book on the *hay'a*, where in general they were mentioned lightly.

In my paper, I will compare mathematical techniques of the three books in their chapters on the problems about the diurnal motions, and will show the importance of the genre *Summary of the Almagest* in the history of solving these problems.