

Title of Symposium: The Mathematical Astronomies' Exchange and Cooperation between Medieval Islam and China on the Silk Road

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From the eighth to the fourteenth centuries, most of the advances in astronomy were achieved by scholars in the Middle East, North Africa, and Moorish Spain. This work crossed religious and ethnic boundaries, with contributions from, among others, Arabs, Iranians, and Turks, and from Muslims, Jews, and Christians. In particular, Islamic astronomers began to appreciate the inadequacies of the parameters used in the *Almagest*. This led to numerous attempts to improve on Ptolemy's values so as to produce more accurate tables, and also a much greater interest in the theoretical aspects of Ptolemy's geometrical schemes.

From the thirteenth to the seventeenth centuries, Islamic astronomy, including astronomical tables, instruments, and astrological materials had been gradually introduced into China. In the Yuan Dynasty (1206-1368) the Arabs (they must, in fact, have been largely Persian and Central Asians) played a role in Chinese science and technology quiet similar to the Indians in the Tang Dynasty (618-907). Then the Persian astronomer, Jamāl al-Din ibn Muhammad al-Najjari (Zhamaluding), devised for Khubilai Khan (1215-1294) in the year of 1267 a new calendar, the *Wannian Li* (the Calendar of Ten Thousand Years), which was afterwards lost, and in any case failed in competition with the *Shoushi Li* of Gou Shoujing (1231-1316), of which the Ming calendar *Datong Li*, started in 1364, was but a modification. In the beginning of the Ming Dynasty (1368-1644), a Muslim Astronomical Bureau was set up in parallel with the ordinary Astronomical Bureau, to which, however, after a couple of years it became subordinate. In 1382, *Tianwenshu* (Astrology, Official Translation by the Imperial Edict of the Ming) consists of abundant data on positional astronomy, together with much astrological materials which were highly appreciated by the first Emperor of the Ming Dynasty. A great deal of computation must have need, however, for the solar and lunar eclipses, planetary conjunctions to the Muslim methods,

supplemented and re-issued as the *Qizheng Tuibu* (Calculations of the Motions of the Seven Luminaries) by Bei Lin (1429-1490) in 1477, which had been used as reference calendar to *Datong Li* in the Ming Dynasty for more than 270 years and still played a critical role in the quarrel between Islamic and Jesuit astronomies in the beginning period of the Qing Dynasty (1644-1911).

Having based upon the historical research achievements by the scholars from the Ming Dynasty to now, the Symposium aims to reveal the astronomical parameters, models and the formula for the 39 tables in *Qizheng Tuibu*, resumes the calculating program for the solar and lunar eclipses, and retrospect to the medieval Islamic astronomical theories which are directly related to *Qizheng Tuibu*. The mathematical research results of *Qizheng Tuibu* will be benefit to the further understanding and reviews on *Qizheng Suan*, *Waibian* (Outer Book on the Calculation of the Seven Luminaries), compiled by Korean astronomers in the first half of the fifteenth century and *Huihui Lifa*, volumes 7, 8, 9 of Calendars in *Ming Shi* (History of the Ming Dynasty), and establish one of the foundations for the development of the interweaving framework among Indian, Islamic, Jesuit and Chinese astronomies.