

Literature for the lecture on the mathematical and historical background of a newly discovered instrument for finding the direction and distance of Makka.

The instrument was published in David A. King, *World-Maps for Finding the Direction and Distance to Mecca*, Leiden: Brill, 1999, 638 pp. See for a brief introduction Dana Mackenzie, A Sine on the Road to Mecca, *American Scientist* **89** (may-june 2001). For analyses see Elly Dekker, Cartographic Grids from Iran: An Early Version of the Retro-Azimuthal Orthographic Projection? *The Cartographic Journal* **37** (2000). pp. 109-116, and J.P. Hogendijk, Middeleeuws Islamitische methoden voor de bepaling van de richting van Mekka, *Nieuwe Wiskrant* 12 (1993) no. 4, pp. 45-52.

For the analemma of al-Bīrūnī see Al-Bīrūnī, *The Determination of the Coordinates of Positions for the Correction of Distances between Cities*, (Kitāb Taḥdīd Nihāyāt al-Amākin li-Taṣḥīḥ Masāfāt al-Masākin), translated by Jamil Ali, Beirut: American University of Beirut, 1967, pp. 252-253, and E.S. Kennedy, *A commentary upon Bīrūnī's Kitāb Taḥdīd al-Amākin, An 11th Century Treatise on Mathematical Geography*, Beirut: American University of Beirut, 1973, pp. 209-211. On other analemms for finding the direction of Makka see J.L. Berggren, A Comparison of Four Analemms for Determining the Azimuth of the Qibla, *Journal for the History of Arabic Science* **4** (1980), 69-80. The manuscript of al-Khāzemī was published in F. Sezgin (ed.), *Manuscript of Arabic Mathematical and Astronomical Treatises*, Frankfurt: IGAIW, 2001, series C vol. 66.