

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

Abstract :

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Babylonian Astronomy: prediction and calculation of the Lunar Six and eclipses

Classical western astronomy works in many respects differently from Babylonian astronomy. The use of geometric models is not documented (and not necessary) for cuneiform astronomy. Its endpoint was an elegant numerical phenomenological description of synodic phenomena. For each of the observable synodic phenomena (e.g. acronychal rising of Jupiter) the Babylonians were able to find time and location of successive phenomena of the same kind (by means of easy algorithms). We calculate the movement of sun, moon, and planets as a function of the time $\lambda = \lambda(t)$ and then we identify e.g. the lunar syzygies as the times at which $\lambda_{\odot}(t) - \lambda_{\text{D}}(t)$ equals 0° or 180° . Normally, the syzygies are not directly observable! The Babylonian astronomers observed instead time differences (the 'Lunar Six') between rising and setting of sun and moon in the days around conjunction and opposition. The talk shall give a short characterization of Babylonian astronomy and then concentrate on lunar phenomena: first the prediction of eclipses by Saros schemes and of the Lunar Six time intervals by the Goal-Year method, followed by a presentation of tabular texts calculating the same phenomena.