

## SAW Exploratory Workshop: Astral Sciences, Mathematics and Rituals - 2015

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*Astral sciences and rituals in India with reference to ayana*

**Abstract** – The very primitive system of the *Jyotiṣavedāṅga* turned to a well-established branch of science, namely, *jyotiḥśāstra* (‘science of stars’), and it made remarkable progress, especially after the introduction of western astronomy and astrology. We see a drastic change of Indian astrology after the *Yavanajātaka* was translated into Sanskrit some time around the 3rd or 4th century CE. Moreover, after the *Āryabhaṭīya* of Āryabhaṭa numerous texts on mathematical astronomy were produced until a quite recent time. Although the five year cycle (*yuga*) of the *Jyotiṣavedāṅga* was very crude, basic units of time were defined, namely, year, half year (*ayana*), month, half month (*pakṣa*), *tithi*, *muhūrta* (1/30 of a day), and *nāḍikā* (1/60 of a day). The meaning of *ayana* in the context of ritualism, astronomy and astrology changed in history. At the time of *Jyotiṣavedāṅga* the word *ayana* only meant ‘a half year’, a year being divided into two, *uttara-ayana* (‘sun’s northern course’) and *dakṣiṇa-ayana* (‘sun’s southern course’). With time, however, the change of the position of the solstices became known to Indian astronomers, and *ayanāṃśa* (degrees of motion of solstices) became an important topic. In the *nirayaṇa* (sidereal) system, planetary longitudes are counted from the fixed ecliptic point *meṣādi* (the beginning of Meṣa) while according to the *sāyana* (tropical) system, the starting point of reference is the true vernal equinox. When one wants to compute the astronomical elements called *vyatīpāta* and *vaidhṛta* which are defined by the true declination of the sun and the moon, one must use the *sāyana* coordinates, while the *yoga*, as one of the five astrological elements, is computed by the *nirayaṇa* system. The majority of traditional Indian calendars (*pañcāṅga*) give the planetary position in the *nirayaṇa* system. Whether Indian calendars should continue to use the *nirayaṇa* system or switch to the *sāyana* system is a big issue among the traditional calendar makers and ritualists.