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(b. T-k-kāiyūr [Kūapura], Kerala, ca14 June 1444; d after 1501) *astronomy*.

Nilakāḥa, a Nampūtiri Brahman, was born in the house (*illam*) called Keḷallūr (Keralasadgrāma), which is said to be identical with the present Etamana *illam* in T-k-kāiyūr, a village near Tirur, Kerala. His father was named Jātavedas, and the family belonged to the Ġrgyagotra and followed the Aśvalāyanasūtra of the *Rgveda*; Nilakāḥa was a Somasutvān (performer of the Soma sacrifice). He studied Vedānta and some astronomy under Ravi, but his principal instructor in *jyotiṣtra* was Dmodara (fl. 1417), the son of the famous Parameśvara (ca. 1380-1460), whom he also met at the Dāmodara house in Ālattūr (Aśvatthagrāma), Kerala. His younger brother, Śākara, studied astronomy under his tutelage and in turn professed that science. It is possible, but not certain, that Rāma who wrote a *Laghurāmāyana* in Malayālam.

Nilakantha was a follower of Parameśvara's *dragganita* system (see essay in Supplement), although he gives various parameters in his several works (see D. Pingree, in *Journal of the Oriental Institute, Baroda* 21 [1971–1972], 146–148). These works include the following:

1. The *Golasāra*, in fifty-six verses, gives the parameters of his planetary system, a description of the celestial spheres, and a description of the principles of computation used in Indian mathematical astronomy. It was edited by K. V. Sarma (Hoshiarpur, 1970).
2. The *Siddhāntadarpana*, in thirty-two verses, gives another set of parameters and a description of (impossible) planetary models. It also was edited by K. B. Sarma (Madras, 1955). Nilakāḥa's commentary (*vyākhyā*) on the *Siddhāntadarpana* has not been published.
3. The *Candracchāyāganita* describes, in thirty-one verses, the computation of the moon's zenith distance. Neither it nor Nilakāḥa's commentary (*vyākhyā*) has been published.
4. The *Tantrasāgraha* is an elaborate treatise on *dragganita* astronomy, composed in 1501. It consists of eight chapters:
  - a. On the mean motions of the planets.
  - b. On the true longitudes of the planets.
  - c. On the three questions relating to the diurnal rotation of the sun.
  - d. On lunar and solar eclipses.
  - e. Particulars of solar eclipses.
  - f. On the *pātas* of the sun and moon.
  - g. On the first visibilities of the moon and planets.
  - h. On the horns of the moon.

The *Tantrasāgraha* was edited with the commentary, *Laghuvrtti*, of Śaṅkara Vāriyar (fl. 1556) by S.K. Pillai (Trivandrum, 1958).

5. The *Āryabhaṭīyabhāṣya* is an extensive and important commentary on the *Āryabhaṭīya* composed by Āryabhata I in 499. Nilakāḥa's parton for this work was the religious head of the Nampūtiri Brahmans, Netranārāyaṇa. In his commentary on Kālakriyā 12–15 he states that he observed a total eclipse of the sun on 6 March 1467 (Oppolzer no. 6358) and an annular eclipse at Anantaksetra on 28 July 1501 (not in Oppolzer). The *Āryabhaṭīyabhāṣya* was published in three volumes by K. S. Sastri (volumes I and II) and S. K. Pillai (volume III), (Trivandrum 1930–1957).

6 and 7. In the *Āryabhaṭīyabhāṣya* Nīlakaṇṭha refers to his *Grahanirnaya* on eclipses and to his *Sundarājapraśnottara* in which he answers questions posed by Sundararāja, the author of a commentary on the *Vākyakarāṇa*. Neither of these works is extant.

8. An untitled prose work on eclipses by Nīlakaṇṭha included in a manuscript of the *Siddhāntadarpaṇavyākhyā*; it refers to the *Āryabhaṭīyabhāṣya* and thus is his last known work.

## BIBLIOGRAPHY

Nilakantha's method of computing  $\pi$  is discussed by K. M. Marar and C. T. Rajagopal, "On the Hindu Quadrature of the Circle," in *Journal of the Bombay Branch of the Royal Asiatic Society*, n.s. **20** (1944), 65–82. A general survey of his life and works (now superseded by the introductions to Sarma's latest eds.) is given by K. V. Sarma, "Gargya-Kerala Nilakantha Somayajin: The Bhasyakara of the Aryabhatiya (1443–1545)," in *Journal of Oriental Research* (Madras) **26** (1956–1957), **24–39**; and by K. K. Raja, "Astronomy and Mathematics in Kerala," in *Brahmavidya*, **27** (1963), 118–167, esp. 143–152.

David Pingree