

**THE *SIDDHĀNTA ŚĒKHARA* OF ŚRĪPATI (11<sup>TH</sup> CENTURY) - TEXT  
AND ENGLISH TRANSLATION\***

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The objective of the project was to make critical study of the text and English translation of *Siddhānta Sekhara* of Śrīpati as it was not translated before, and to highlight the contribution of Śrīpati to Indian Astronomy. *Siddhānta Śekhara* is one of the greatest astronomical works of ancient India. This magnanimous treatise was composed in 961 *Śālivahana Śaka* (1039 AD). Apart from this he has also composed *Karaṇa* text, *Dhikotida*. It is believed that Śrīpati has composed two more books *Jātakapaddhati* and *Ratnamāla* which are connected to astrology. Śrīpati belonged to *Kaṣyapa Gotra* and his father was Keśava. He was born in Rohinikhanda about 150 miles south of Ujjain. No more personal details of Śrīpati are available.

Makki Bhatta of 1299 *Śaka* (1377 AD) has written a commentary called *Gaṇitabhūṣaṇa* on this text. But the commentary of Makki Bhatta abruptly ends at *śloka* 75 of *Tripraśnādhyāya*. This book was published by University of Calcutta in the year 1932 in two volumes, edited by Mr. Babuaji Mishra (Shri Krishna Mishra) who himself wrote a commentary named *Vivaraṇa* for the remaining parts of the text. Now this book is out of print. Luckily the Investigator could procure xerox copies of the two volumes of the book from learned scholar of Indian astronomy Shri Madhura Krishnamurthy Shastri of Rajamahendrapuram of Andhra Pradesh.

The First chapter *Sādhanaādhyāya* of *Siddāntaśekhara* of Śrīpati consists of 52 verses and deals with the measurements of time in Indian Astronomy. The definitions of various units of time and their relevance are explained as found in other ancient astronomical texts. The author gives the number of sidereal revolutions of the planets, the number of *adhimāsas*, the solar months, the lunar months and the *avamas* in a *Kalpa*.

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In the second chapter called *Madhyamādhyāya*, seven different methods are given to obtain *ahargaṇa* i.e. number of elapsed civil days from the beginning of the *Kalpa* on given day. The different formulae to obtain the mean position of the planets are given. Some of the methods are similar to that of *Brāhmasphuṭasiddhānta* and some are Śrīpati's own.

In the third chapter, named *Spaṣṭādhyāya* the methods of rectifying the mean positions of the planets are given. The method of obtaining H sine without using the table of H sines given in the text is Śrīpati's original contribution to the Indian astronomy which was latter adopted by Gaṇeśadaivajña in his *Gṛahalāghava*. Śrīpati explains different formulae to compute *mandaphala* and *śīghraphala* of the planets.

The fourth chapter named *Tripraśnādhyāya* deals with the determination of *dig-deśa-kāla*. Śrīpati explains the Indian methods of spherical trigonometry and different *akṣakṣetras* and other important topics of astronomy.

The fifth and the sixth chapters *Candragrahaṇādhyāya* and *Sūryagrahaṇādhyāya* deal with the computation of the eclipses of the Moon and of the Sun. Like Lalla, Śrīpati uses *natotkramajyā* while computing *akṣijavalana*. Śrīpati gives different methods to compute *valana* and to draw the *parilekha* of the eclipses.

In the seventh chapter *Parvasambhāvādhyāya*, Śrīpati gives *pākṣika* and *śanmāsika calanas* to investigate the occurrence of the eclipses of the Moon and the Sun.

The eighth chapter *Patādhyāya* deals with the computation of *vyātipata* and *vaidhṛuti*. This chapter closely follows that of *Brāhmasphuṭasiddhānta*.

In the ninth chapter *Udayastādhyāya*, *ayana* and *akṣija dṛkkarma* corrections are explained and heliacal rising and setting of the planets are calculated.

The tenth chapter *Candrādhyāya* deals with the computation of the *śringonnati* i.e. the elevation of the lunar horn. Here too Śrīpati follows the method of Lalla, by using *utkramajyā*.

The eleventh chapter *Grahayuddhādhyāya* deals with the conjunction of the planets. In the first verse of this chapter Śrīpati explains a correction which is similar to *udayantara* and in the next verse he explains different topic. It is presumed that the Bhāskara might have taken the idea from Śrīpati and given *udayantara* correction.

The twelfth chapter named *Bhagrahayogādhyāya* explains the conjunction of the planets with the stars. Polar latitudes and polar longitudes of the stars are given in this chapter.

### Concluding Remarks

While studying the *Siddhāntaśekhara* of Śrīpati, the Project investigator has compared the same with *Brāhmasphuṭasiddhānta* of Brahmagupta. It is realized that Śrīpati closely followed *Brāhmasphuṭasiddhānta* to compose his text. He had great respect for Brahmagupta.

The ancient astronomers of the latter date have also followed Brahmagupta to compose their Siddhānta texts. Though Bhāskara of the 12<sup>th</sup> century closely followed Śrīpati to compose his masterpiece *Siddhānta-śiromaṇi*, yet Brahmagupta was his great inspirer. Whenever Bhāskara found difficulties to solve astronomical problems only the scholarship of Brahmagupta comes to his mind. Bhāskara declares-

*yadā mahatā kālena mahādantaram bhaviṣyati tadā mahāmahimānta  
brahmaguptasamānādharmaṇa eva utpatsyante, te ca adupalabdhyānu  
sārīneem gatimurarikṣitya śāstrāni kariṣyanti,*

“whenever the difference between the computed positions of the planets and the observed positions of the planets arise, the great scholars like Brahmagupta will take birth and make the required corrections to the computed positions of the planets in accordance with the observed ones”.

Śrīpati also places the same confidence on the scholarship of Brahmagupta. After thorough study of *Siddhāntaśekhara*, it is realized that Bhāskara of 12th century closely followed Śrīpati to compose his work.

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