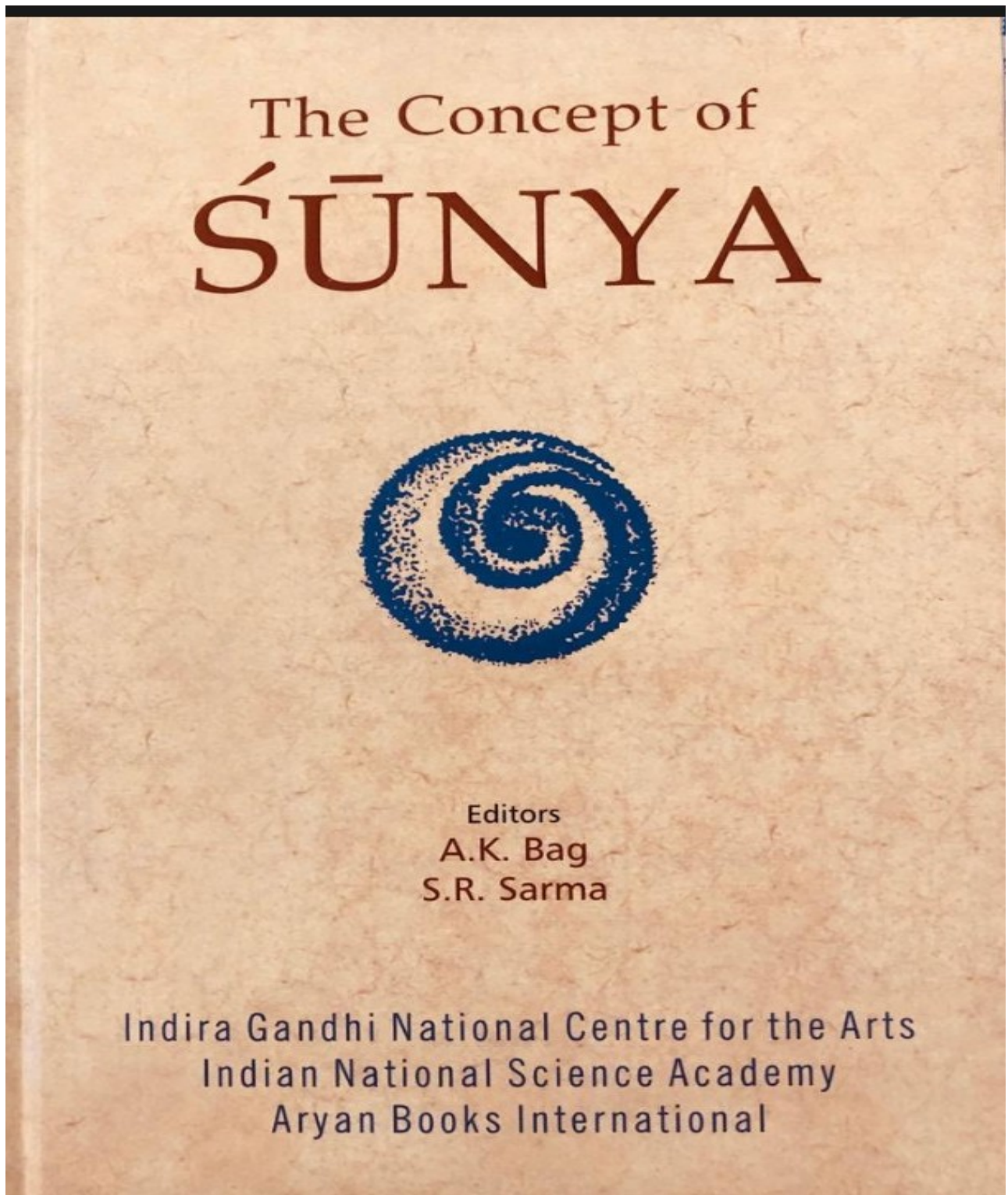


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The Concept of
ŚŪNYA



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Indira Gandhi National Centre for the Arts
Indian National Science Academy
Aryan Books International

The concept of *śūnya* in India has a long history and varied manifestations in different dimensions, in mathematics, in philosophy and in mysticism. In mathematical literature it is used in the sense of 'zero' having no substantial numeral value of its own but playing the key role in the system of decimal notation, to express all numbers with nine digits, one to nine and the *śūnya* as the tenth. The application of *śūnya* in this system of notation was discovered in India some time in the pre-Christian era. Its concretization in the form of a dot or a small circle and its use in decimal place value system was first transmitted to the Middle-East and thence to Europe to supplant the Greek and Roman systems, and the whole world slowly recognized it as the most scientific system of numeration.

The present volume is the outcome of a joint seminar organized by Indian National Science Academy and Indira Gandhi National Centre for the Arts and aims at a documented account of various facets of *śūnya* in mathematics and astronomy and its various ramifications in philosophy and arts.

About the Logo

Zero is the embodiment of *pūrṇa* (full), *lopa* (absence), *ākāśa* (universe), *bindu* (dot), *śūnya* (circle), in Indian literary and cultural traditions. The *logo* has been formulated keeping all these points in mind by the artist, Shri P.T. Deshpande of the Indira Gandhi National Centre for the Arts, New Delhi.

Dr. A.K. Bag (b.1937), an M.Sc. in Pure Mathematics and Ph.D. in History of Mathematics, both from the University of Calcutta, served for seven years (1971-77) as lecturer of mathematics in the Surendranath College, Kolkata, and twenty-three years (1977-2000) as Co-ordinator and Head of History of Science Programme in the Indian National Science Academy, New Delhi. He is the author/editor of a large number of books and research articles. Some of his books are: *Bibliography of Sanskrit Works in Astronomy and Mathematics* (with S.N. Sen and S.R. Sarma), *Mathematics in Ancient and Medieval India, Science and Civilisation in India* (Harappan Period), *Śulbasūtras* (ed. & tr. with S.N. Sen), *History of Oriental Astronomy* (ed. with G. Swarup and K.S. Shukla), *Indian and Central Asian Science and Technology* (two volumes ed.), *History of Technology in India* (Vol. I, ed.).

Dr. S.R. Sarma (b. 1937) studied at Sir C.R. Reddy College, Eluru; Visva Bharati, Santiniketan; and Philipps University, Marburg, Germany. Joined the faculty of Aligarh Muslim University in 1969 and retired from there as Professor and Chairman of the Department of Sanskrit in 1997. Fellow of the German Academic Exchange Service, twice at the Philipps University, Marburg, (1962-66; 1972) and once at Johann Wolfgang Goethe University, Frankfurt, (1995-96); Visiting Associate Professor of History of Mathematics at Brown University, Providence (1992-93); and Visiting Professor at the Université de Paris III (1994). His publications include critical editions with translation of *Ṭhakkura Pherū's Rayanaparikkhā* on gemmology, and *Yantraprakāra of Sawai Jai Singh* on astronomical instruments.