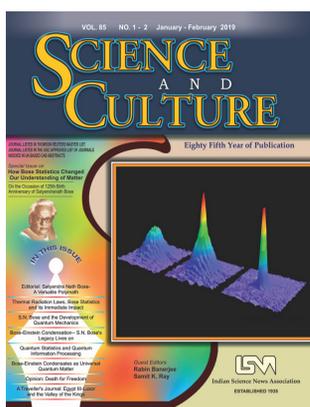


## SATYENDRANATH BOSE- A VERSATILE POLYMATH



Born on first January, 1894, SatyendraNath Bose, a product of the Bengal renaissance, made a highly significant and profound contribution to quantum mechanics that shaped its subsequent development, eventually culminating in quantum field theory. He was one of the pioneers of the modern revival of Indian

science that began in early 20th century. His place in the future history of science is secured forever by coinages like Bose statistics, Bose-Einstein condensation and bosons, that constitute half the particles of the Universe. In this special issue dedicated to commemorate the 125th birth anniversary of this great physicist, we have a bunch of articles that explore these topics.

In 1924, S.N. Bose, then a faculty at the newly formed physics department of Dacca University, wrote a couple of papers on the interaction of radiation with matter. He had noticed certain irregularities in the derivation of the blackbody radiation law by Planck. He cleared up the mess in a very original manner by introducing a new counting method that now bears his name, Bose statistics. It was based on the notion of indistinguishability of the light quanta (photons), which subsequently played a key role in the development of quantum mechanics. He sent the papers to Einstein for his opinion, and possible publication. Einstein translated the papers and got them published in *Zeitschrift für Physik*, the leading German journal. He also wrote at the end of the first paper, “In my opinion Bose’s derivation signifies an important advance. The method used here gives the quantum theory of an ideal gas as I will

work out elsewhere”. Overnight, Bose became famous. Indeed, as Abraham Pais, the noted scientist and the author of arguably the most authentic scientific biography of Einstein, “Subtle is the Lord”, wrote “Bose’s work is the last among the four revolutionary papers of the old quantum theory, the other three being by Planck, Einstein and Bohr”.

Bose was a key figure in the development of a scientific climate in the country. Together with stalwarts like Jagadish Chandra Bose, Prafulla Chandra Ray, Debendra Mohan Bose, Meghnad Saha, Chandrasekhar Venkat Raman, Prasanta Chandra Mahalonobis, Srinivasa Ramanujan and others, he ushered in the modern scientific age in India. As a scientist his interests were varied. Besides physics, he was interested in mathematics, statistics, chemistry, biology, mineralogy, arts, literature, music and even chess. He was an accomplished player of the Esraj and also composed a Raga. In addition to Bengali and English, he was fluent in Sanskrit, French and German, as well.

Although basically a theoretical physicist, he was deeply absorbed in experiments all his life. He was among the first to initiate researches in X-ray spectroscopy and crystallography in our country. He also designed and fabricated instruments for this purpose. Bose was a strong crusader of the idea that science should be taught in the mother tongue, else it would never have a mass appeal. He was convinced that a foreign language prevents the expression of original ideas and acts as a barrier to creativity. With the objective of promoting and popularising science through the vernacular, he founded the ‘*Bangiya Bijnan Parishad*’. Its mouthpiece, ‘*Gyan-o-Bignan*’ is perhaps the first science magazine to be published in India in a vernacular language. Fittingly, Rabindranath Tagore dedicated his only book on science, *Visva-Parichay*, to S.N.

Bose. Bose was also appointed the Upacharya (Vice-Chancellor) of Visva-Bharati in 1956.

The S.N. Bose National Centre for Basic Sciences was established in 1986 under the Department of Science and Technology, Government of India, to honour the life and works of this legendary physicist. The Centre undertook several academic programmes at all levels to commemorate the 125th birth anniversary of Bose. Many conferences, workshops, summer and winter schools were held. Professor Wolfgang Ketterle, a co-recipient of the Nobel prize in physics for providing an experimental demonstration of Bose-Einstein condensation, visited the Centre and delivered technical talks as well as a popular lecture. This lecture was one of a kind and would be long remembered. Several outreach programmes were held. A documentary film "Iconic Genius" on life and works of Bose was produced by the

Centre and the Dept. of posts released a special cover on his 125<sup>th</sup> birth anniversary. In collaboration with different organizations including *Bangiya Bijan Parishad*, the Centre arranged more than 125 science outreach lectures for school, college and university students across the nation. This was a successful venture and triggered the interest of students in science. As yet another venture, a national science quiz competition was held among school students across the country. After an initial screening the students were invited to the Centre for the final round.

All in all it was a fitting tribute to S.N.

Bose, a great scientist but an even greater human being, who would continue to inspire future generations. □

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