

## S. N. Biswas (1926–2005)

Samarendra Nath Biswas, endearingly called 'Dada' by his colleagues, students and associates in the world of physics in India, breathed his last in the early hours of 4 January 2005. He was amongst the eminent physics personalities in India after independence and one amongst the handful of theoretical physicists in the country from the early 1950s to do research in the field the particle physics and related areas with a high degree of international recognition.

Biswas was born on 1 May 1926 in the then undivided Bengal, now part of Bangladesh and had his education there till the graduate level, graduating from Pabna Edward college. He moved thereafter to Kolkata, obtaining his Master's degree in pure mathematics with distinction from the University of Calcutta.

His interests then shifted towards theoretical physics and he joined the Indian Association for the Cultivation of Science in Jadavpur, Kolkata for research under the supervision of D. Basu in the area of quantum field theory. He obtained his D Phil degree from the University of Calcutta. He also started his teaching career in Calcutta by joining the West Bengal educational service and taught in several government colleges. However, he soon got a fellowship to go to Australia and work with the renowned theoretical physicist H. S. Green at the University of Adelaide. He did remarkably well there and was awarded the Ph D degree by the University in 1958.

On his return to India, Biswas was invited by H. J. Bhabha to join the theory group at the Tata Institute of Fundamental Research which he did and continued there till 1964. Working at the Tata Institute, he soon became an important name in the emerging field of theoretical elementary particle physics. He lectured as well at the training school of the Atomic Energy Establishment and attracted a large number of students to work in the exciting field of theoretical particle physics.

In 1964, Biswas moved to the physics department of the University of Delhi as a professor in the Centre for Advanced Study in Theoretical Physics which had been established in the department two years earlier. In Delhi, Biswas got to do something that was closest to his heart which was teaching. He was a very careful and strenuous teacher, teaching advanced courses in most branches of theoretical physics and a whole generation of students here were initiated into physics through his very inspiring presentation of modern branches of physics. Some of us who as

younger colleagues had the opportunity of teaching some courses along with him learnt a great deal through that association. His careful lecture notes were later presented as two textbooks in the fields of classical mechanics and of quantum mechanics.

Biswas started his research work by an elegant analysis, done in collaboration with H. S. Green, of the Bethe Salpeter equation which leads to a solution of the same. Subsequently his interests and activities in theoretical physics became much wider resulting in many investigations in



particle physics phenomenology, two-dimensional quantum electrodynamics, some very elegant contributions to the analysis of anharmonic oscillator in quantum mechanics, scattering theory, geometrical phases in quantum mechanics, quantum optics, equation of state of neutron stars, atomic physics, astroparticle physics and many others. Students and younger colleagues could always approach him for help in their work, especially in mathematical analysis. For me personally, as with many who were fortunate to work and collaborate with him, whether it was a solution to a difference equation or some doubts regarding hypergeometric equations, or a question on projective representation or some other question in physics or mathematics, a discussion with him was invariably of great benefit. He supervised doctoral work of a large number of students, a good many of them now occupying senior academic positions in universities in India and abroad.

In the later stages of his remarkable spectrum of research interests, Biswas also moved into fields of mathematical biology and ecology and as before initiated a sizable number of students in these fields as well.

Biswas moved to Visva Bharati University in West Bengal in 1973 to start a theo-

retical physics group there. Subsequently in 1975, he joined as Dean of newly started School of Environmental Sciences at the Jawaharlal Nehru University in New Delhi. Eventually, however, he returned to the University of Delhi in 1976 from where he finally retired in 1991.

Biswas was a Fellow of the Indian National Science Academy, Indian Academy of Sciences and of the National Academy of Sciences. He was also honoured with the UGC National Lecturership for the year 1975. He was a senior Associate at the International Centre for Theoretical Physics in Trieste, Italy. He had held visiting positions at the Institute of Physics at the Technical University in Goteborg, Sweden, at the State University of New York in Stony Brook, NY, at UCLA in Los Angeles, California and at several other institutions. In the early 1970s he was invited to visit Brown University in Providence as a Research Investigator on a long-term basis but he preferred to stay on and work with his colleagues in India. In this respect, he shared with many of his generation, who grew to maturity in the years before 1947, a strong attachment to the nation to whose birth they were witness. Equally, his faith in his abilities as a physicist and teacher was such as to nurture the belief – amply justified by experience – that his presence here, as of others like him, made a difference to the possibilities which had opened up in the nascent scientific and academic world of the country.

Biswas was a complete physicist with a dedication to work and teaching in a most remarkable sense. To students, colleagues and associates who were fortunate to interact with him, he came out as a most lively and warm person. His activity in physics continued well after his retirement but for the last phase of his life, eyesight problems became a major hindrance which more or less restricted his movements outdoors. But even then, in verbal discussions, with his daughter who teaches physics at a college of the University of Delhi, he would discuss physics and physics teaching. And so it came about that in the early hours of 4 January 2005, he asked his wife for some water, drank it, told his wife that he seemed to be forgetting classical mechanics and within minutes it was all over.

Biswas will be widely missed by all those who knew him.

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