

published more than 150 research publications, and had one patent.

Aparna was elected fellow of all the three Science Academies of India, viz. Indian National Science Academy India, Indian Academy of Sciences, and the National Academy of Sciences, besides the Telangana Academy of Sciences. She served on various committees in all these Academies. She also contributed immensely by serving as an expert for CSIR-UGC, UPSC, and KVPY examinations. She was invited for several visiting assignments abroad: USA (1984, 1991), Germany (1999, 2000–2003, 2008), Czech Republic (2000) and Japan (2012). She was actively involved in Scientific Societies: General Secretary/Vice-President/President – Indian Society for Comparative Endocrinology; Joint Secretary – Society for Reproductive Biology and Comparative Endocrinology, and Vice President – Indian Society of Cell Biology. She was an editorial board member of *Entomon*, *Archives of Insect Biochemistry and Physiology*, *Current Science* and Guest Editor, Special Volume, *Fish Physiology and Biochemistry* (Springer, Holland). She was a member of Scientific Advisory Committees of UGC, CSIR, DBT, DST, SERB, INSA-DST-INSPIRE and DBT-TWAS. She was also a member of Academic Advisory Bodies of Zoology/Biological Sciences Departments in Visva Bharati (Santiniketan), Delhi University (Delhi), IISER (Kolkata), and MRDG-IISc (Bengaluru).

Aparna helped in the teaching/training activities of other schools and colleges in and around Hyderabad. She made it a

practice to go around various schools and colleges in Hyderabad and outside to deliver lectures to inspire younger minds. She was always enthusiastic about training young minds and was a resource person and co-coordinator of 12 Science Academy sponsored training workshops/lecture courses. She conducted as many as 76 Hands-on Training/Workshops under the umbrella of the UoH-DBT-CREBB Programme.

She was a great philanthropist and had a soft corner for under-privileged kids, especially from Adivasi areas. At a later stage, she adopted thirteen kids from Sajina Gram, a remote village near Bolpur, Santiniketan. In every locality where she lived, she used to help the needy and affected people and was fondly known as 'The AMMA' or 'DIDI' in the area. It is incredible that despite having so much commitment to social and academic life, she was an ideal mother and perfect wife. She was a constant inspiration to her son and was very proud of his achievements.

In her last years, she put up a brave fight against a disease for which modern medical science does not have any cure, but has only remission. She bravely accepted the fact with everlasting smile and endurance. She did win the battle since the disease could never affect her mental processes and scientific alertness. She ensured that her students completed their PhD under her guidance, even when she was not all well.

Aparna is survived by her husband (Prof. S. Dutta-Gupta, a physicist), son, Dr Shourya Dutta-Gupta (a faculty member at IIT-Hyderabad and a material

scientist) and daughter-in-law, Amrita Kundu (a freelance journalist). She will be forever missed by the scientific, teaching, and student communities.

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## Dwarka Nath Bose (1938–2020)

Professor Dwarka Nath Bose, a renowned professor of experimental physics, son of Sunil Chandra Bose, first cardiologist of India and nephew of Netaji Subhas Chandra Bose, passed away on 9 August 2020. His demise brings a vacuum among experimental scientists. He was notable for his seminal contributions in the area of semiconductor science and technology as well as fast ion conductors, synthesis of industrially important semiconductors and more emphatically on the preparation of polysilicon from rice-husk.



Bose was born on 25 June 1938 in Calcutta, India. He was the son of Sunil Chandra and Lalita (Dutta) Bose. He obtained Cambridge School Certificate from St Paul's School, Darjeeling, during 1946–52; Bachelor of Science in Physics with Honors from Calcutta University in 1956.

Bose obtained his MSc (Tech) in Radiophysics and Electronics from the University of Calcutta (1959) after which he won an ICI (India) Technical Scholarship and obtained his PhD in Semiconductor Physics from the University of

Reading, UK (1961–65). He then worked as Associate Lecturer at IIT Kharagpur in 1960–61, Lecturer at Jadavpur University, Kolkata in 1966 and Research Associate (1966–1970) at the Materials Research Laboratory, Penn State University working on Radiation Dosimetry and Ferroelectrics.

Bose joined the ECE Department at the Indian Institute of Science, Bangalore as Associate Professor in 1970 and worked on amorphous semiconductors and yttrium iron garnet (YIG) microwave devices. In 1977 Bose moved as Professor of the Materials Science Centre at IIT Kharagpur (1977–1998) where he was Dean, Faculty and Planning (1989–91). He established a modern experimental laboratory for semiconductors and fast ion conductor research. He was Principal Investigator of 10 major research projects including the national project on ‘Semiconductor Lasers’. He was also Coordinator of the Photonics Mission at IIT Kharagpur (1989–96). He was also a Visiting Professor of the Electrical Engineering and Materials Engineering Departments at Virginia Polytechnic Institute, USA (1985–86), Visiting Scientist at MIT, USA (2003) and Visiting Professor at University of Puerto Rico (2009, 2013). After retirement he taught ‘Medical Instrumentation’ at USIC Calcutta University (2003–2012) and then was Honorary Visiting Professor in the Department of Physics at St Xavier’s College, Calcutta since 2013 until 2020.

Bose published more than 200 research papers and several short notes in peer-reviewed journals. His findings include invention of amorphous semiconductor microwave switch (Amorphous Semiconductor Microwave Switch IISc Patent 1977); observation of resistivity maximum in lithium fast ion conductors at high-pressures<sup>1</sup>; providing evidence for Amphoteric nature of Ru on CdTe surfaces<sup>2</sup>; first observation of doping dependence of insulator-metal transitions at high pressures<sup>3</sup> and low cost preparation of polysilicon from rice husk and Purulia quartzite<sup>4</sup>. Bose authored several well-cited popular books<sup>5–11</sup>.

Bose has been recognized with many academic Honours: Won Majumdar Science Prize and Ashutosh English Lite-

ature Prize at St. Paul’s School Darjeeling (1952), the ICI (India) Technical Scholarship in UK (1961–65) at J. J. Thomson Physical Laboratory, Reading University; Ram Lal Wadhwa Gold Medal from IETE (1982) for significant contributions in electronic materials and devices; Silver Jubilee Research Award of IIT, Kharagpur for 1986. He was elected Fellow of the West Bengal Academy of Sciences and Technology, member of the Institute of Electrical and Electronics Engineers (senior), Member of the American Physical Society. He was also elected fellow of the Indian Academy of Sciences (1989).

Bose was an excellent and positive-minded human being and a good sports person. He played cricket for St. Paul’s School Darjeeling, Postgraduates Calcutta University 1957, Reading Cricket Club 1962–63 in England and captained the Penn State cricket team 1969; he represented Reading University at Table-Tennis and Badminton 1961–62. He was contributed articles on popular science. He wrote many articles for a Bengali newspaper. Besides cricket, he was also interested in tennis, English literature, films, western classical music, world travel, history and photography.

He had an enormous patience in doing experiments through sitting along with young researchers and noting down the experimental data with his own hand written notes in the experimental logbook. During experiments he used to narrate his own experiences at various institutes. He was quite fond of his students; he often mentioned the names of P. A. Govindacharyulu, D. Mazaumdar, S. Seishu and K. C. Mandal. On one such occasion I learnt that ‘Satyendra Nath Bose did NOT work with Albert Einstein. This is a very common mistake. S. N. Bose wrote the first paper on quantum statistics on his own at The University of Dacca (now Dhaka) and sent it to Albert Einstein who translated it into German and got it published in The Zeitschrift fur Physik with his endorsement. Thus there is no joint paper with S. N. Bose and Einstein as joint authors.’

Bose was very much excited with the announcement of our present Prime Minister about the need for India to develop a domestic solar manufacturing

industry and also on the planning to make Ladakh carbon-neutral, as he loved our nation and providing clean energy. I was fortunate to have worked with Bose during my student time and he used to send greetings and messages to me regularly till 13 July 2020. His colleagues and students will certainly remember him as a helpful, affectionate colleague, and a positive minded person with special concern for the colleagues. We deeply mourn the loss of this great experimentalist from a Royal family.

Bose is survived by his daughter Nandana Bose who is a faculty at the Department of Film Studies, University of North Carolina Wilmington, Wilmington, USA.

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