Mihir Chowdhury (1937–2017)

Professor Mihir Chowdhury, one of the pioneers in modern physical chemistry in India, passed away on 28 March 2017. He is widely respected for introducing lasers and many state-of-the-art techniques in physical chemistry research in India. He along with M. V. George, J. P. Mittal, V. Krishnan, late P. Natarajan and V. Ramamurthy ushered in modern photochemistry in India.

Born in Dhaka (Bangladesh) on 15 July 1937, he was the youngest child of Jogendra Kumar Chowdhury and Indira. He had three sisters and one brother. His elder brother, Subir Chowdhury is a pioneer in operations research in India and his eldest sister Amita Datta was a professor of economics at the Presidency College, Kolkata. His father was a Head of the Department of Chemistry and Dean of Science at the Dhaka University. Chowdhury's early childhood at the Dhaka University campus with renowned professors like J. C. Ghosh (chemistry), S. N. Bose (physics) and others had a deep influence on him. In his early life, he often thought of joining J. C. Ghosh's group for a Ph D. However, by the time he finished his M Sc, J. C. Ghosh was too busy with administration.

After independence and the partition of Bengal, Chowdhury came to Kolkata with his family and studied at the Scottish Church Collegiate School (Matriculation 1951), Presidency College (I Sc 1953 and B Sc 1955) and Science College (M Sc 1957). Throughout his life, he was a brilliant student (8th in I Sc). In 1957, he joined Sadhan Basu's laboratory at Calcutta University and obtained his Ph D in 1960. In Basu's laboratory, he worked with professors Animesh Chakravorty, late A. K. Chandra and others.

Around that time, Basu was revolutionizing physical chemistry in India. He introduced teaching and research of quantum chemistry and spectroscopy and made forays into DNA, enzyme and polymers. The topic of Chowdhury's Ph D thesis was charge-transfer (CT) spectroscopy, which was started by R. S. Mulliken (Nobel Laureate) only a few years ago. His early publications are still considered as landmark papers in CT spectroscopy (e.g. polarization of CT band). He carried out postdoctoral work at Pennsylvania State University (with L. Goodman, 1961–62) and at Chicago (with D. S. McClure, 1962–64), USA. There he developed a strong interest in high-resolution spectroscopy.

After returning to India in 1964, Chowdhury joined the Department of Magnetism (now Department of Solid State Physics), Indian Association for the Cultivation of Science (IACS), Kolkata as a CSIR pool-officer. The then Head of the Department, late A. K. Bose, provided grants to set up a world-class laboratory for high-resolution crystal spectroscopic studies on organic and inorganic molecules at liquid hydrogen temperature. Perhaps, Chowdhury's most famous work in this period was excited state geometry change (photo-isomerization) of benzil. This work attracted wide attention because of the contemporary work on photo-isomerization of stilbene and its implication in vision (retinyl polyenes). He established a pulsed high magnetic field set-up for studying the Zeeman effect and magneto-optical rotatory dispersion. Using optical absorption and circular dichroism, he made significant contributions to forbidden transitions in lanthanides.

In 1966, Chowdhury moved to Presidency College as a full professor (later Head) in the Department of Chemistry and continued to carry out his research at IACS. He was a legendary teacher, at both undergraduate and postgraduate levels. He inspired several generations of students through his teaching. I first saw him as a thermodynamics teacher at Presidency College in 1971 (during the turbulent Naxalite period). Many of us still recall his courses on thermodynamics, quantum chemistry, group theory and NMR spectroscopy. His classes used to be long (2 h instead of the scheduled 1 h) and still the students thronged in large numbers. He always encouraged excellence. I remember in a college examination, he deducted 10 marks because I picked up an easy question.

In 1976, Chowdhury moved back to IACS as the Professor and Head of the Department of Physical Chemistry. Within a decade, he transformed it as one of the leading centres of physical chemistry in India with five fellows of the Indian Academy of Sciences and four Shanti Swarup Bhatnagar award winners. Chowdhury himself became a fellow of Indian Academy of Sciences (IASc), Bengaluru in 1977 and of the Indian National Science Academy (INSA), New Delhi in 1980, and received the Bhatnagar Award in 1977.

Since 1976, he started working in three different areas. First, he started working with a hand-made toy nitrogen laser on chemical dynamics (excited state geometry change, proton transfer, nonradiative transitions in lanthanides) and two-photon spectroscopy of double-molecules and lanthanide crystal. Second, since 1980, he started working on the effect of small magnetic field on exciplex emission. Third, in the late eighties, he set up a supersonic jet facility for high-resolution laser spectroscopy in gas phase.

Unfortunately, he suffered a haemorrhage in the eye in 1997 and later developed Parkinson's disease. After official retirement in 2002, he continued as a senior scientist of INSA till 2006. Because of failing health, he stopped coming to the laboratory after 2006.

Chowdhury will be remembered for his deep and scholarly approach to research and teaching, and for enthusing a large number of students. He detested quick and dirty works which may be fashionable and may help to get a large number of publications. Sometimes, his meticulousness delayed his publications. Many of us tried to combine the scholarship of Chowdhury with the adventurous spirit of Basu.

Among Chowdhury's nearly 30 Ph D students, seven are fellows of IASc – three are theoreticians and four are experimentalists. This illustrates the vastness of his research interest. Three of his students received the Bhatnagar Award and four are fellows of INSA. Many of his students and grand-students are now professors at premier institutions in India (IITs, major Universities, IISERs, etc.). Many famous researchers in India were his undergraduate and/or postgraduate students.

Chowdhury received numerous awards and accolades. These include Gold Medal of the Chemical Research Society of India (2006), Eminent Teacher Award of Calcutta University (2006), Mizushima–Raman Lecture of India–Japan Council (2003), *honoris causa* degrees of the Vidyasagar University (2007) and Presidency University (2013), K. Rangadhama Rao Memorial Lecture of INSA (1989), Sadhan Basu Memorial Lecture of INSA (2002), J. C. Ghosh Memorial Lecture of Indian Chemical Society (1997), Morris Travers Memorial Lecture of IISc Bangalore (1998), Baba Kartar Singh Memorial Lecture of Panjab University (1999), UGC National Lecturer (1980), Lifetime Achievement Award of ISRAPS and R. P. Mitra Memorial Lecture of Delhi University (1988). As a member of many important committees, he played a seminal role in nurturing younger scientists in India through research grants and awards.

The hallmark of Chowdhury's character was politeness and kindness. He never lost temper or control of words though he had a strong view on many issues and was most often, quite uncompromising. Even when he disagreed, there was no loss of dignity on either side. He never liked hollow praise. The highest appreciation one could extract from him was 'not bad'. If one could crack his apparent unemotional shield, it was pleasing to find his love for literature, movies and theatre and his wry sense of humour.

He was a good badminton player and would easily defeat students, half his age. In the laboratory, he used to work much harder than the students. He hardly ate anything during long office hours. Because of his presence in the laboratory, we often had to work long hours without any food or tea break. The prize of this torture (!) used to be snacks and coffee, at his expense, at the nearby Jadavpur Coffee House, afterwards.

Mihir Chowdhury is survived by his wife, one son, and one daughter.

KANKAN BHATTACHARYYA

Department of Chemistry,
Indian Institute of Science Education and Research,
Bhopal 462 066, India
e-mail: kankan@iiserb.ac.in

Durga Prasad Roy (1941–2017)

It was a terrible shock with which friends, collaborators and colleagues received the news of the sad demise of Durga Prasad Roy recently. DP, as he was popularly known, passed away on 17 March 2017 in Cuttack, Odisha after a brief illness. Roy was active in every sense of the word till he breathed his last, having posted a review on the arXiv in August 2016, participated in conferences actively even in 2017 and being physically fit to climb hills during the recent INSA meeting. Indeed, he had given a series of lectures on the standard model of particle physics at the University of Hyderabad just a few days before he fell ill.

Roy completed his B Sc (Hons) in 1960 from Ravenshaw College, Cuttack and M Sc in 1962 from Delhi University. He obtained his Ph D degree in 1966 from the Tata Institute of Fundamental Research (TIFR), Mumbai, in particle physics. He was a postdoctoral Fellow at the University of California, Riverside, USA (1966–68); CERN, Geneva (1968–69), and University of Toronto, Canada (1969–70). He then worked at the Rutherford Laboratory, UK (1970–74), and as Reader at Visva-Bharati University, Santiniketan, West Bengal (1974–76). He then joined TIFR as Reader in 1976 and retired as Senior Professor in 2006. He worked at the Homi Bhabha Centre of Science Education (HBCSE), TIFR, as a DAE Raja Ramanna Fellow (until 2011), and then continued working at HBCSE as an INSA Senior Scientist.

Roy made pioneering contributions in the wide area of particle and astroparticle physics. His early research work was in the area of 'Regge phenomenology and duality', which addressed the issue of cross-sections for processes involving low transverse momenta, i.e. the dominant part. Regge theory predicted these to grow as a sum of power law terms of the colliding energy, whereas duality relates resonance contributions in the scattering to these terms. Roy predicted and presented evidences for exotic mesons, called baryonium those days, but now termed tetra-quark, as well as exotic baryons, now called the penta-quark states. These robust predictions continue to attract the attention of experimentalists as well as lattice quantum chromodynamics (QCD) experts. Along with his collaborators, Roy suggested to look for a hard isolated lepton and jets as a signature of the (heavy) top quark. It has been widely used in the top quark search at the CERN and Tevatron proton–antiproton colliders, leading to discovery of the latter in 1995. He worked extensively on many popular theories of physics beyond the standard model, such as supersymmetry. Most popular minimal supersymmetric model requires more than just one recently discovered additional Higgs bosons, including a charged one. He suggested a promising signature for the charged Higgs boson search in its tau lepton decay channel, using the distinctive polarization prediction for tau. This is currently being used in the ongoing search for charged Higgs boson at the Large Hadron Collider at CERN. Like-