Abhijit Mookerjee (1946–2019)

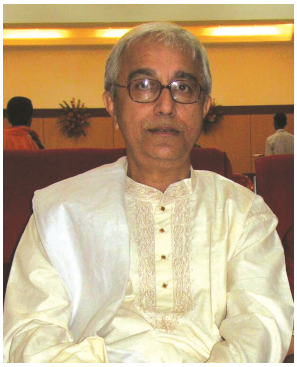
Professor Abhijit Mookerjee (AM), one of the leading condensed matter theorists of India, passed away on 18 July 2019. We had the privilege of doing our Ph D under his supervision, and having close academic as well as personal interactions with AM over the last four decades.

AM was born in an erudite family of Calcutta (now Kolkata) in 1946. He obtained his B Sc (Honours in Mathematics) from Presidency College, Calcutta, in 1966 and proceeded to Imperial College, London, UK for higher studies. In 1968, he earned B Sc (Special) degree from the University of London and joined St John's College, Cambridge, UK. He completed Tripos Part III in 1969 and Ph D in 1973, both from the University of Cambridge. Interestingly, although officially Brian Josephson (a Nobel laureate after whom the 'Josephson effect' is named) was his thesis supervisor, AM actually did most of his works in Volker Heine's research group.

In 1974, AM returned to India and joined S. K. Joshi's group at the University of Roorkee (now IIT Roorkee) as a CSIR Silver Jubilee fellow. In 1975, he joined the Department of Physics at IIT Kanpur as a lecturer, got promoted to the rank of an Assistant Professor in 1978 and to full Professor in 1985. He left IIT Kanpur in 1990 to join (as the first Professor) the newly established S. N. Bose National Centre for Basic Sciences (SNBNCBS), Kolkata, from where he retired in 2011, becoming an Emeritus scientist.

In broad terms, AM's main research interest was in the theoretical calculations of electronic structures of materials. In 1973, he proposed the 'Augmented space formalism', a sophisticated method for the computation of electronic structures of disordered materials. With his collaborators and students, he developed it into a powerful computational tool by combining it with tight-binding linear muffin-tin orbital (TB-LMTO) and recursion methods. Applications of these tools to binary and ternary alloys allowed studies of phase stabilities and phase diagrams of those materials. It was subsequently extended for the calculation of response functions like, for example, generalized susceptibilities.

In the early 1980s, AM got interested in the magnetic phases of disordered alloys like gold–iron (AuFe), copper–manganese (CuMn), etc., the archetype of spin-glasses. The physics of the spin-glass transition was being hotly debated at that time. The simple theories of spin-glasses that he developed included the prediction of a 'mixed phase'. Although AM predicted the mixed phase before others, he did not get due credit, perhaps because he published the results in *Pramana* (1980, **14**, 11), which was not well circulated in the Western world at that time.



The present authors worked with him on various aspects of disordered magnetic alloys that exhibit spin-glass behaviour. Some of his most notable contributions in this area were either directly or indirectly motivated by the experimental results obtained by Alak Kumar Majumdar's (AKM's) group in the low-temperature laboratory at IIT Kanpur. In fact, one of us (S.B.R.) was guided jointly by AM and AKM for his Ph D thesis, while the other (DC) analysed AKM's experimental data on transport properties of AuFe and CuMn in the light of the corresponding theory that AM and DC developed.

AM has always been popular in the student community. His teaching of undergraduate, postgraduate as well as pre-Ph D courses has always been rigorous (perhaps because of his initial training in mathematics) and, yet, accessible even to students who did not have all of the required background. He loved to teach and continued to do so on a voluntary basis at some colleges in Kolkata even after his formal retirement. He was a legend as a mentor for Ph D students. Even for those who came with modest academic training to join as his Ph D student, he had unlimited patience to train them.

AM's students were like his family members – he used to invite them almost every alternate weekend for dinner at his residence. During, and after those dinners we have enjoyed long informal discussions with AM, which not only enriched our knowledge outside our research areas but also aroused our curiosity in the history and culture of nations beyond our borders.

Although educated in some of the most elite academic institutions in the UK, AM was never an 'elitist' himself. He developed an indigenous research group in India and collaborated with many other Indian physicists. At the same time, he maintained a strong link with Europe by visiting leading European research centres, particularly, ICTP, Trieste, Italy and his alma mater Cambridge. AM regarded Phil Anderson (at that time in Cambridge on leave from Bell Labs, USA), Roger Haydock and S. K. Joshi as his gurus, besides Josephson and Heine.

AM was a man of many talents. He used to play the violin. He also directed and acted in more than two dozens of plays in three different languages, namely English, Hindi and Bengali. He had a flair for the critique of pieces of art and sculpture, and liked to go on long-distance road-trips.

During his two decades at SNBNCBS, AM served the institute in various administrative capacities that included Dean (Academic Program), Dean (Faculty) and Director. He served as a catalyst for the growth of SNBNCBS since its inception. AM will be missed by all those who interacted with him and were inspired by his enthusiasm for doing science.

AM is survived by his wife, son and two daughters. His legacy will be carried forward by many of his more than 40 Ph D students.

DEBASHISH CHOWDHURY[1,*]
SINDHUNIL BARMAN ROY[2]

[1]*Physics Department,*
Indian Institute of Technology,
Kanpur 208 016, India
[2]*UGC-DAE,*
University Campus,
Khandwa Road,
Indore 452 012, India
**e-mail: debchg@gmail.com*