

About the speaker



Professor Aditi Sen De is a professor in the Quantum Information and Computation group at the Harish-Chandra Research Institute (HRI), Prayagraj. Her current research interest is in the frontier areas of quantum technology. Along with Professors Ujjwal Sen and Arun K Pati, she started the quantum information and computation group (QIC) at HRI in 2009. Currently, the group consists of 3 faculty members, 24 PhD students and 4 post doctoral fellows. After graduating from Bethune College in Kolkata with Honours in Mathematics, Professor Sen De, with her strong passion and proficiency in Higher Mathematics, joined the Applied Mathematics department of the Science College, University of Calcutta for the Master's degree. She pursued her interests in quantum and statistical physics and completed her M Sc. degree in 1997. After a short stint of research work in India, she joined the University of Gdansk, Poland from where, she received her Ph D degree in 2004. Subsequently, she received the Alexander Von Humboldt post doctoral fellowship to work with Prof. Maciej Lewenstein at the Leibniz University in Hannover, Germany. Thereafter, she joined ICFO - The Institute of Photonic Sciences at Barcelona, Spain to continue her research on quantum information theory, condensed matter and statistical physics. She won the prestigious Ramón y Cajal research fellowship during her time in Spain. Upon her return back to India in 2008, she joined the School of Physical Sciences at Jawaharlal Nehru University as an Assistant Professor in Physics. Soon after, she moved to HRI where she is now one of the lead scientists of the group. She is known for her research on quantum information and computation, quantum communication including quantum cryptography, quantum optics and many-body physics. She is the recipient of the Shanti Swarup Bhatnagar Prize for Science and Technology for her contributions to physical sciences in 2018. In 2022, she was elected as member of the IASc and the INSA.

SAHA INSTITUTE OF NUCLEAR PHYSICS ALUMNI ASSOCIATION

cordially invites you to attend the

4th Professor Manoj Kanti Banerjee Memorial Lecture

on

Recent Trends in Quantum Technologies

by

Professor Aditi Sen De

Professor, Harish-Chandra Research Institute, Prayagraj

Venue

Meghnad Saha Auditorium Complex

Saha Institute of Nuclear Physics, Sector I, Block AF, Bidhannagar, Kolkata

at 3-00 pm

NOVEMBER 18, 2024

Organized by

Saha Institute of Nuclear Physics Alumni Association (SINPAA)

SINP, Kolkata



Professor Manoj Kanti Banerjee

Born : 25 May 1930 ;
Died : 18 February, 2006

Manoj Kanti Banerjee (MKB) was a prominent and brilliant theoretical nuclear physicist, a great teacher and an intellectual leader. He had graduated from Patna University and completed his Master's degree in 1951 from Calcutta University with a blazing track record. Soon after in 1952, he was recruited as a lecturer at the newly founded Institute of Nuclear Physics, led by Professor Meghnad Saha. After the untimely death of Professor Saha in 1956, the Institute was named as Saha Institute of Nuclear Physics. Inspired by the trail-blazing research and discoveries in Nuclear Physics in the 1930s carried out mostly in Europe, Professor Saha made an early and all-out effort to initiate research in these frontline areas. No trained nuclear physicist was available in the country that could help in this mission. Under the academic leadership of Professor Saha, handful of young nuclear physicists like MKB started to learn the subject by themselves and to teach the subject to the Ph D aspirants. The first Post M Sc teaching programme in the country was thus started at the institute. MKB not only fulfilled this mandate, but achieved much greater success of doing Ph.D. himself in the subject mostly by his own effort and intellect. With students and colleagues, he created a vibrant research group at SINP on nuclear many-body problem based on Bruckner theory, nuclear reactions and nuclear structure with fundamental contributions. An exceptional young researcher, restless to seek the unknown, MKB went to the United States in 1955 as a research fellow at Princeton University to work with E. P. Wigner. He performed important work with Carl A. Levinson to develop the theory of direct nuclear reactions and to provide the first serious calculations of nuclear reaction cross sections using computers of the late fifties. MKB returned to the Saha Institute in 1957 to accept a position as Reader. He left again in 1959 for a year at Princeton as Research Associate, and returned again to SINP in 1960 as Professor. In 1966, he left India to join University of Maryland as a Professor of Physics. MKB was a teacher and an intellectual leader. He possessed an uncommon intensity and he cared very much about reaching a high level of truth and understanding based on fundamental principles.

In the 1970s, MKB became interested in the fundamental dynamics of mesons and nucleons in order to understand better their roles in the formation of nuclei. In 1984, he and collaborators developed a chiral soliton model of the nucleon and delta resonance that was based on quarks interacting with a pion cloud. This much-cited model and its variants that were developed by other workers have provided valuable insights into the dynamics of mesons and nuclei. Over his career, he supervised the research of 22 Ph.D. students, ten of whom were students at the Saha Institute of Nuclear Physics. He had a very gentle nature with regard to personal interactions.

MKB was a Fellow of the American Physical Society, a Fellow of the Indian Academy of Sciences, and served on the editorial board of Physical Review Letters. In 1996-97, he was a recipient of an Alexander von Humboldt Research Award for Senior U.S. Scientists to work in KFA, Juelich, Germany. He retired from the University of Maryland teaching faculty in 2001, but continued his association as an Emeritus Professor. He had often visited India and was always in touch with Saha Institute, his alma mater. In 1981, MKB was asked to return to the Saha Institute to accept the directorship. Ultimately, he declined the position out of concern that its administrative burdens would make it impossible for him to continue his research. For him, administrative power mattered little. He was a true seeker of knowledge. His friend and colleague Jim Griffin had said of him, "for him, new truth was the ultimate treasure, ... he was deeply and even intrinsically a scholar".

Recent Trends in Quantum Technologies

ABSTRACT

The quantum theory of nature, formalized in the first few decades of the 20th century, contains elements that are fundamentally different from those required in the classical description of nature. Based on the laws of quantum mechanics, in recent years, several discoveries have been reported that can revolutionize how we think about modern technologies. I will talk about such inventions in the field of communication as well as computation and some of our recent results towards building communication networks.

Programme

Welcome Address

Professor Rupayan Bhattacharya

President, SINPAA

Address by Guest of Honour

Professor Bikas Kanti Chakrabarti

Former Director, SINP

4th M K Banerjee Memorial Lecture

Professor Aditi Sen De

Presentation of Memento

President, SINPAA

Vote of Thanks

Professor Satyajit Saha

Secretary, SINPAA