Brief Biography of Professor Kankan Bhattacharyya

Kankan Bhattacharyya is a modern non-linear Laser Spectroscopy scientist. His main interest is in femtosecond dynamics in nano-confined systems which include biological assemblies. His most important discovery is the ultraslow nature of biological water. In recent years, he has applied time resolved confocal microscopy to study live cell. He was the Director & Chair Professor of Indian Association for the Cultivation of Science (IACS), Kolkata, the oldest centre for scientific research in Asia. He is a fellow of all of the national science academies of India and is a senior editor of The Journal of Physical Chemistry. He received many awards from all around the world, most importantly, the Shanti Swarup Bhatnagar Award in Chemical Science from the (CSIR, India) in 1997 and the TWAS Prize in 2007.

BOSE-125 Distinguished Lecture

on

TWENTY EIGHTH AUGUST
2018

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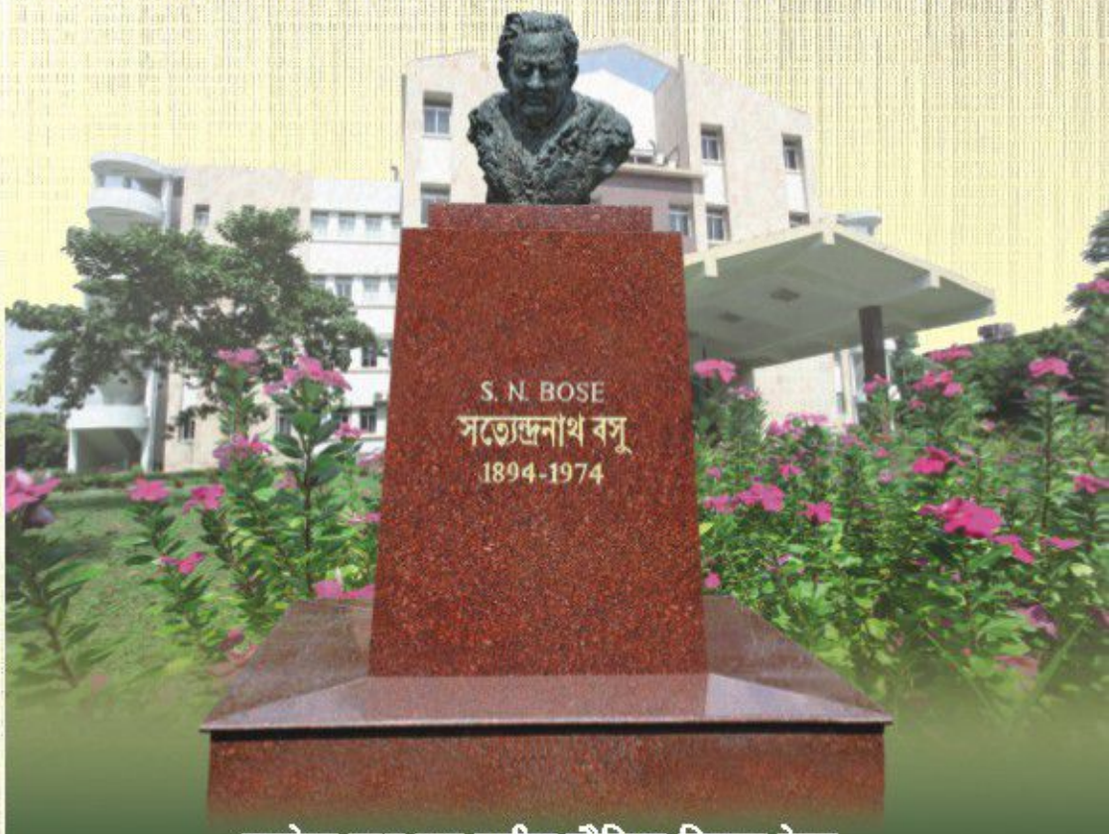

सत्येन्द्र नाथ बसु राष्ट्रीय मौलिक विज्ञान केन्द्र

Satyendra Nath Bose National Centre for Basic Sciences

Live Cell Microscopy: A Physical Chemistry Approach

Kankan Bhattacharyya

ABSTRACT

A live cell is an extremely complex assembly of various organelles. There is a long standing interest to understand the physical chemistry of a live cell, in terms of dynamics and spectra at a selected intracellular location of a cell (organelle). Recently, we have made significant progress in this direction, using time resolved confocal microscopy. The smallest size of the focused spot in a confocal microscope is 200 nm. This is nearly one hundred times smaller than the size of a live cell. Thus, one can selectively study different regions/organelles in a live cell. In this talk, we discuss how one can image different intracellular organelles, record fluorescence spectra and decay, ascertain local polarity and viscosity, and monitor the dynamics of solvation, proton transfer, redox and other phenomena at specified locations inside a cell. We will highlight how this knowledge enriched us in differentiating between cancer and non-cancer cells, 3D tumor spheroids and drug delivery [1-2] and in DNA dynamics [3].

1) S. Nandi, S. Ghosh, K. Bhattacharyya, "Live Cell Microscopy: A Physical Chemistry Approach," Feature article, J Phys Chem B 122 (2018) 3023-3036.
2) M A Amin, S Nandi, P Mondal, T Mahata, S Ghosh, K Bhattacharyya, "Physical Chemistry in a single Live cell: Confocal Microscopy," PCCP 19 (2017) 12620-12627.
3) M. Debnath, S. Ghosh, A. Chauhan, R. Paul, K. Bhattacharyya, J. Dash, "Preferential targeting of I-motifs and G-quadruplexes by small molecules," Chemical Science 8 (2017) 7448-7456.

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BOSE-125 Distinguished Lecture

by

Prof. Kankan Bhattacharyya

Chemistry Department,
Indian Institute of Science Education and Research, Bhopal

on

Tuesday, 28th August, at 4:00 pm

to celebrate

125th Birth Anniversary of Professor Satyendra Nath Bose

Prof. Samit Kumar Ray
Director

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