Physical Research Laboratory, Ahmedabad

COLLOQUIUM - 13 – 10

Speaker: **Prof. Deepak Mathur**
Distinguished Professor, Tata Institute of Fundamental Research, Mumbai, India.

Title: **Ultrafast science:** ***Adventures on the interface of physics, chemistry and biology***

Abstract

Access to ultra short laser pulses that last long enough to accommodate only a few optical cycles, is beginning to allow time-dependent nuclear and electron dynamics to be probed within atoms and molecules, thereby enhancing our ability to gain proper insights into how quantum systems react to strong external fields and how they might be subjected to optical control. In this talk I shall present an overview of how we have utilized intense laser pulses of duration as short as ~4 fs to explore dynamical effects of relevance to diverse areas of the physical and engineering sciences, including applications pertaining to DNA damage, laser-induced materials modification and green photonics.

The Speaker

Prof. Deepak Mathur obtained a Bachelors degree in electronics (1973) from the University of London and PhD (1976) in physics from Birkbeck College, London, where he discovered very-low-energy resonances in electron scattering from polyatomic molecules. He subsequently did post-doctoral research at the University College, London and carried out the earliest electron-ion collision experiments within an ion trap. In 1981, he returned to India and joined the Tata Institute of Fundamental Research (TIFR) where he is a distinguished professor at present. On joining TIFR, Mathur initiated experimental atomic and molecular physics research, initially setting up novel electron scattering experiments that discovered inner-shell resonances involving high angular momentum states in molecules. He was the Director of the University of Mumbai, DAE Centre for Excellence in Basic Sciences (2007-2010); Member of IUPAP commission C-15 on atomic, molecular and optical physics; Co-chair of Asian Intense Laser Network; Member of the International Committee for Intense Laser Science; Former Secretary of the International Committee for Ultra Intense Lasers; Executive Committee Member of the International Conference on Photonics, Electronic & Atomic collisions; Member of the Council of the Raja Ramanna Centre for Advanced Technology and Executive Committee of Nehru Science Centre (Indian Council of Science Museums). He was Editor of *Rapid Communications in Mass Spectrometry*, and a co-editor of *Europhysics Letters (EPL);* at present he is a Member of the International Advisory Board of the *Journal of Physics B: Atomic, Molecular and Optical Physics*. Prof. Mathur is a recipient of the Bhatnagar Prize, J.C. Bose National Fellowship of DST and Eminent Mass Spectrometrist Prize. He has been a Royal Society Guest Fellow at Oxford University and was awarded the Fulton Fellowship by the Association of Commonwealth Universities. He was also the European Union's Erasmus Mundus Scholar in optical science and technology. He is a Fellow of the Indian Academy of Sciences, Bangalore and Indian National Science Academy, New Delhi.

Wednesday: 06 March, 2013, 16:00 hrs.

K.R. Ramanathan Auditorium, PRL

Tea at 15:30 hrs

ALL ARE WELCOME

Let us pledge, to make this year,
A YEAR OF NEW SCIENCE, NEW DISCOVERIES and DEEPER SOCIETAL COMMITMENT