

Prof. Deepak Mathur (Tata Institute of Fundamental Research, India)

New insights into molecular dynamics in very strong fields

講演会場：第四講義室 (化学大学院講義棟1階)

日時：3月16日(火) 16:00 ~ 17:00

The physics that describes the interaction of strong optical fields with matter has attracted much attention in the course of the last decade; the subject has witnessed very considerable growth and many new phenomena have been discovered. These phenomena invariably reflect the highly nonlinear nature of strong field-matter interaction, and their description within a proper theoretical framework is difficult to achieve because of the breakdown of conventional perturbative approaches to formulating and solving physical problems. The nonlinearities that are encountered are, as shall be shown in the talk, due to the magnitude of the fields that are involved in the interactions of interest. Very frequently, some of the phenomena to have emerged from experiments have been counterintuitive, providing challenges for both theorists and experimentalists. Moreover, some of the phenomena offer tantalizing possibilities of applications that promise to revolutionize subsets of diverse areas of research, ranging from molecular dynamics and pulsed control of chemical reactions, the formation of giant pulsed magnetic fields and pulsed neutron beams for radiotherapy and materials diagnostics, to the possibility of tabletop synchrotron sources and electron/ion accelerators. It is the combination of both the intrinsic interest in the highly nonlinear physics and the applications that presently drive research in this area. This talk will focus of the behaviour of gas-phase molecules in strong optical fields, and some new insights will be discussed that involve the dynamics that result upon introduction of laser chirp and upon irradiation of molecules by a white light laser.

連絡先：数理化学研究室 河野裕彦 (内7720)