



Physical Research Laboratory, Ahmedabad

COLLOQUIUM 13 - 30

Speaker: Prof. K. Asahi
Senior Professor, Department of Physics, Tokyo Institute of Technology (TIT),
Tokyo, Japan.

Title: Spin masing, and looking for an atomic EDM of nuclear origin

Abstract

A permanent electric dipole moment (EDM) is an electric polarization vector that spontaneously occurs in a particle with nondegenerate internal state, due to violation of CP. The CP violation embodied in this flavor-diagonal quantity EDM, however, should be different from the "normal" CP violation already included in the Standard Model (the Kobayashi-Maskawa CP violation) and, if observed to be finite, definitely evidences presence of physics beyond the Standard Model. We, at Tokyo Tech, have been preparing for an experiment to search for a ^{129}Xe (Xenon) atomic EDM, with an external feedback nuclear spin maser which enables spin precession to last for an unlimitedly long period. We are now in a stage to incorporate a ^3He comagnetometer, and will be conducting an EDM search run in coming spring. Finally discussion will be given on a future extension of the ^{129}Xe EDM experiment incorporating ^{131}Xe spins as a co-magnetometer.

The Speaker

Prof. K. Asahi is a Senior Professor at Department of Physics, Tokyo Institute of Technology (TIT), Tokyo, Japan since 1998. He did his PhD at the Department of Physics, the University of Tokyo in 1980. He then joined as an Assistant Professor in the institute of Solid-state Physics, the University of Tokyo. Subsequently he moved to Osaka University and was associated with the Radiation Laboratory, RIKEN during 1984-1989 as a scientist followed by TIT during 1990-1998 as an Associate Professor and Applied Nuclear Physics Laboratory, RIKEN during 1999-2007 as the Chief Scientist. His research covers a wide range of Nuclear and Atomic Physics topics spanning over particle, nuclear and Astroparticle physics. Some of his pioneering research works include development of nuclear spin maser techniques for the future measurement of the permanent electric dipole moment of ^{129}Xe atom, structure studies of neutron-rich nuclei, discovery of large spin polarization, establishing two-stage adiabatic nuclear demagnetization, experimental search for superconductivity in Au and gamma ray spectroscopic study in Bi isotopes. He has been a co-author in more than 140 papers in many peer reviewed international journals including an article recently published in Nature Physics and published more than 20 articles in the reviewed proceedings. Prof. Asahi has been members of the Physical Society of Japan and the Japanese Society of Neutron Science. He has been awarded Inoue Science Prize in 2001 and Siro Fujino prize in 2003.

Wednesday: 04 December, 2013, 16:00 hrs

K.R. Ramanathan Auditorium, PRL

Tea at 15:30 hrs

ALL ARE WELCOME