



Physical Research Laboratory, Ahmedabad

Colloquium 17-16

Speaker: Dr. Nissim Kanekar

Associate Professor, National Centre for Radio Astrophysics, Pune

Title: "Do the Fundamental Constants change with Time?"

Time: Wednesday, 21 June 2017, 15:45 hrs.

Venue: K. R. Ramanathan Auditorium, PRL

Abstract

Temporal evolution in low-energy fundamental constants such as the fine structure constant and the proton-electron mass ratio is a generic prediction of field theories that attempt to unify the Standard Model of particle physics and general relativity. The exciting possibility of low-energy tests of such unification theories has inspired a number of methods to probe fundamental constant evolution on a range of timescales, from years to billions of years. Astrophysical studies of redshifted spectral lines provide a powerful probe of such putative changes in the low-energy fundamental constants across a large fraction of the age of the Universe. After reviewing the current state of the field, I will focus on two techniques, based on radio spectral lines from the hydroxyl and methanol molecules, and will describe new high-sensitivity results from these methods. Finally, I will discuss present limitations of such studies and the improvements that are likely to be possible with the advent of new experimental and observational facilities over the next decade.

The Speaker

Dr. Nissim Kanekar did his B.Sc.(Physics) in 1993 from University of Bombay and M. Sc.(Physics) in 1995 from University of Pune. He did his Ph. D. (Physics) in 2000 from University of Pune. His significant contribution is studies of galaxy evolution and multi-phase structure of the interstellar medium. His main Research area is on Fundamental constant evolution, galaxy formation and evolution, the interstellar medium, high-redshift galaxies & atomic and molecular spectroscopy. He is a recipient of Hari Om Prerit Vikram Sarabhai Award (2015), Physical Research Laboratory. He is also recipient of DST Swarnajayanti Fellowship (2015), National Centre for Radio Astrophysics.

NOTE: Hari Om Ashram Prerit Dr. Vikram Sarabhai Research Award 2015, in the field of Space Science, will be presented to Dr. Nissim Kanekar at 15.45 hrs. before the colloquium/ Award lecture, as Dr. Kanekar could not be present during the award ceremony held at PRL on 11th November, 2016.

Wednesday 21st June 2017, 15.45 hrs.

Tea at 15:15 hrs.

ALL ARE WELCOME

