Physical Research Laboratory, Ahmedabad

COLLOQUIUM – 14 – 09

Speaker: **Dr. Ketan Patel**
Istituto Nazionale di Fisica Nucleare, Theoretical Physics Group, Padova, Italy.

Title: **"The Flavour Puzzle and Grand Unification"**

Time: **Wednesday, 06 August, 2014, 16.00 hrs.**
Venue: **Seminar Hall, Above NANOSIMS Laboratory, PRL.**

Abstract

From the electron mass (0.5 MeV) to the top-quark mass (173 GeV), the masses of electrically charged fundamental fermions span over six orders of magnitude. Neutrino masses (< eV) expand this range by another at least six orders of magnitude. Further, it is a puzzling fact that there exist several similarities and differences between the masses and mixing patterns of different fermion flavours. While the standard model of particle physics can successfully account for the observed fermion masses, it does not shed any light on this puzzle. Some of its extensions, originally proposed for the unification of fundamental interactions, provide a more appropriate platform to address this puzzle by unifying also the fundamental fermions. In this talk, I will review some of the grand unified theory based attempts to understand and resolve the flavour puzzle. Examples of approaches based on new symmetries will be discussed. Alternative proposals from the grand unified theories in higher space-time dimensions will also be discussed.

The Speaker

Dr. Ketan Patel obtained B.Sc. (2005) from the Gujarat University and M.Sc. (2007) from the Sardar Patel University. He then joined PRL and received Ph.D. in theoretical high energy physics in 2012. Dr. Ketan was then post doctoral visiting scientist at TIFR for a year and have joined the National Institute for Nuclear Physics (INFN), Padua in Italy as an INFN postdoctoral fellow since October, 2013.

Tea at 15:30 hrs.

ALL ARE WELCOME