ICTS Postdoc/Graduate Student Seminar Series

Title : Gauge theories and four-dimensional geometry

Speaker : Varun Dilip Thakre, ICTS-TIFR, Bangalore

Date : Friday, February 17, 2017

Time : 11:15 AM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : Manifolds are geometric objects which locally resemble Euclidean space, but may have a complicated structure globally. A central question in differential geometry and topology is *"Can we classify manifolds of various dimensions?"* The classification is known for dimensions lower and higher than 4. Dimension 4 is a boundary case and exhibits uncountably many possibilities. Physically, 4-dimensional manifolds are quite special, in that they are central to theoretical physics, especially in General Relativity, as models for the Universe. In the last three decades, gauge theory has been instrumental in the development of 4-dimensional geometry and topology. Investigation of invariants from gauge theory has revealed many interesting geometric and topological properties of these manifolds. For instance, Yang-Mills theory was used to show that there are simply connected smooth four-manifolds which are homotopically equivalent, but not diffeomorphic. In this talk, I will give a sketch of this vast theory.

Note: This will be an ongoing biweekly seminar series (Fridays, 11:15 am) by the ICTS postdocs and graduate students