ICTS Special Colloquium

Title : Can a Quantum Computer Solve Optimization Problems More Efficiently than a Classical Computer

Speaker : Allan Peter Young, University of California, Santa Cruz, USA

Date : Wednesday, January 25, 2017

Time : 4:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : I will discuss ways in which the quantum world is different from the classical world, and how these differences might be used to design quantum computers which are more powerful than classical computers, at least for certain problems. I shall focus on one approach to quantum computing, called the Quantum Adiabatic Algorithm, which is used to solve optimization problems, which are of great importance in science, engineering and industry. An optimization problem is one in which one has to minimize (or maximize) an energy function in which there is competition between different terms. I will discuss results both from computer modelling of the Quantum Adiabatic Algorithm and real experiments on a device which has of order 1,000 superconducting quantum bits. The difficulty of getting a "quantum speedup" from this device due to the great sensitivity of the ground state to changes in parameters (chaos) will be discussed.