Area Seminar

Title	Computational and Numerical Algebraic Geometry and Their Applications in Theoretical Physics
Date and Time	06/01/2011 16:00:00
Speaker	Dhagash Mehta Syracuse University
Area	Theoretical Physics
Venue	Room No. 469
Abstract	Nonlinear equations arise in theoretical physics naturally and frequently. In general, it is always difficult to solve (i.e., get ALL solutions, either exactly or numerically) them. However, if the non-linearity of the equations is polynomial-like, then one can use the computational and numerical algebraic geometry methods developed recently to solve the equations exactly or numerically, respectively. I will take an example of the XY model Hamiltonian, a well-known spin glass system, to illustrate how the methods can be used to get all stationary points. I will then briefly mention the other applications of these methods to many problems in theoretical physics (e.g., minimizing a classical hamiltonian) and non-linear dynamics (e.g., solving steady state equations of the neural models and models exhibiting synchronization).