Area Seminar

Title	Bose Einstein Condensation: A Quantum many-body approach
Date and Time	23/09/2010 16:00:00
Speaker	Dr. Barnali Chakrabarti Professor Lady Brabourne College, Kolkata
Area	Theoretical Physics
Venue	Room No. 469
Abstract	The discovery of Bose-Einstein condensation in cold alakali atomic vapors and subsequent experiments including the strong interaction regimes is one of the most successful and interesting research area since last decade. A lot of theoretical works are going on in different directions to explain experimental results and predict new ones. The widely used approach is the mean field Gross-Pitavskii equation. Although it is a very convenient approach to predict gross property of the condensate, still the uncorrelated mean field equation using just contact delta interaction (with a singularity in the origin in 3D) is questionable and deserves full quantum many body calculation using interatomic correlations and realistic interaction. Very recently, we have applied a very convenient ab-initio many body approach with certain approximation, which include two body correlations and realistic van del Walls interaction. We correctly describe ground state properties, collective excitations and also thermodynamic properties of dilute BEC in JILA trap and it can handle quite large number (approx. 15000) of bosons. Our approach has also been spectacularly successful in reproducing the controlled collapse experiment of attractive BEC in JILA trap and calculated stability factor which is in nice agreement with experiment.