KOÇ UNIVERSITY

Science – Math Seminar

Speaker: M. Ozgur Oktel
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Date: Thursday, Mar. 31, 2005
Time: 16:45 (Tea and cookies will be served at 16:30)
Place: Science Building, Room Z42

Title: Bose-Einstein Condensates: Optical Properties and Many-Body Physics

Abstract:

After the initial experiments on Bose-Einstein Condensation(BEC), the study of ultra-cold atoms have entered a new phase. While the first experiments have concentrated on verifying already known facts about superfluidity, such as collective oscillations and vortices, new experiments are probing regimes where novel ideas and theories are needed. I will describe our recent work about three new directions in ultra-cold atom physics. First I will talk about how BEC together with quantum coherent schemes can be used to create novel optical effects such as left-handed materials at optical frequencies, or photonic band gaps in a vortex lattice. Second topic will be about the oscillations and melting of a one dimensional vortex lattice. And finally I will briefly discuss how to create a Hofstadter Butterfly in an optical lattice and how Mott transition is affected by an external magnetic field.
