ICFO Colloquium KLAUS SENGSTOCK 'Magnetism without Magnetism: New Trends in the Physics of ultracold Quantum Gases'

KLAUS SENGSTOCK

February 04, 2013

Monday, February 4, 2013, 12:00. ICFO?s Auditorium

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Ultracold quantum gases in optical lattices allow for the realization of condensed matter like systems as well as for fully new many-body quantum systems. Recent examples were studies on the superfluid to Mott-insulator transition, the BEC-BCS crossover and quantum information applications. Compared to electrons neutral atoms have no

charge and typically a small magnetic dipole moment such that 'conventional' magnetic effects do not exist. In contrast it would be very stimulating to study model systems for high magnetic field physics like the famous Hofstadter butterfly physics.

In this presentation I will address different regimes of 'magnetism without magnetism' in quantum gases, ranging from spin dependent interactions to the emulation of external virtual magnetic fields acting on the atoms which allow us to study fundamental magnetic model systems.

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Hosted by Prof. Maciej Lewenstein