Title: Crystallization of strongly interacting photons in a nonlinear optical fiber
Time: 2/20/2009 (Fri.) 3:40 PM~4:40 PM
Place: RM 112, New Physics Building
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Abstract:

Understanding strongly correlated quantum systems is a central problem in many areas of physics. While such systems typically involve massive particles, optical photons can also interact with each other in a nonlinear medium. In practice, however, such interactions are often very weak. We describe a novel technique that allows the creation of a strongly correlated quantum gas of photons using one-dimensional optical systems with tight field confinement and coherent photon trapping techniques. The confinement enables the generation of large, tunable optical nonlinearities via the interaction of photons with a nearby cold atomic gas. In its extreme, we show that a quantum light field can undergo fermionization in such one-dimensional media, which can be probed via standard photon correlation measurements.