LENS/CMP Seminar
January 18, 2013

Speaker: Lorenza Viola, Dartmouth College

Title: “Dissipative entanglement engineering with quasi-local resources”

Abstract: Harnessing dissipation is a goal of increasing significance for quantum control. In this context, characterizing Markovian evolutions which admit a desired pure state as their unique asymptotically stable state is both relevant for a system-theoretic understanding of open-system stability properties and potentially useful for dissipative quantum state preparation. In this talk, I will focus on addressing under which conditions a multipartite qubit system can be driven to a desired pure entangled state by a Lindblad dynamics that obeys suitably defined "quasi-locality" constraints. I will first present a necessary and sufficient linear-algebraic criterion for the simplest scenario where the target system is driftless and quasi-local stabilization is possible for arbitrary initial states solely based on dissipative control resources. If the required conditions are not met, I will further address whether the control objective may be achieved conditional upon initialization in a proper subspace and/or by additionally exploiting Hamiltonian control. Applications to engineering entangled states of physical interest and, time permitting, explicit schemes for synthesizing the required controls will be discussed.