

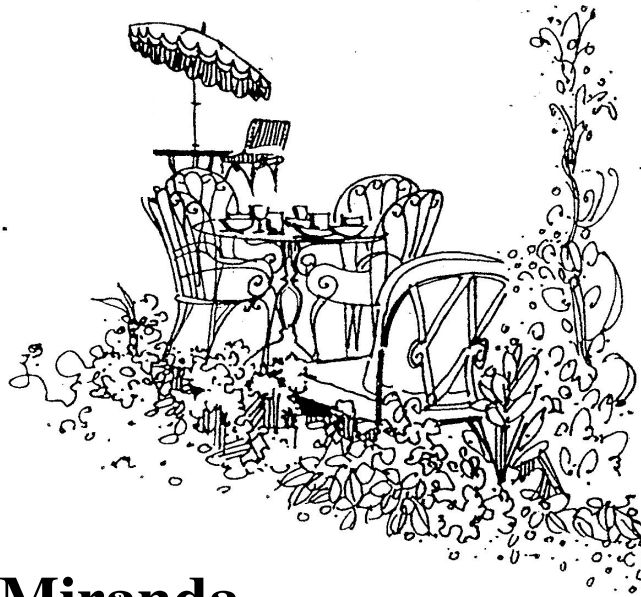
Chez Pierre

Presents ...

Monday, March 16, 2015

12:00pm

MIT Room 4-331



Luz Martinez-Miranda

University of Maryland, College Park

“Liquid Crystal Nanocomposites: The Interaction among the Different Interfaces and their Role in Electron Transfer”

We investigate how liquid crystals order in the presence of diverse nanoparticles. We have found that the liquid crystal in the immediate vicinity of the nanoparticles is fairly disordered, and the disorder depends on the functionalization of the nanoparticle, or lack of it. This disordering is observed as short range order X-ray peaks, where the coherence length of the peaks is close to the molecular spacing of the liquid crystal and persists into the nematic phase as a function of temperature. This disordered structure is still in the smectic phase, and seems to reflect the faceting of the nanoparticle, or the self-assembly of the nanoparticle into a faceted structure. Understanding the structure the liquid crystal assumes in the vicinity of the nanoparticles, and how it compares to the bulk structure of the liquid crystals gives us an idea of how electrons, or light are transmitted from the liquid crystal to the nanoparticle and vice versa, and how strong this transmission is. This transmission can be understood by a simple electronic model consisting of two diodes and resistors. We will present how these ideas can be extended to a polymeric liquid crystal nanocomposite.