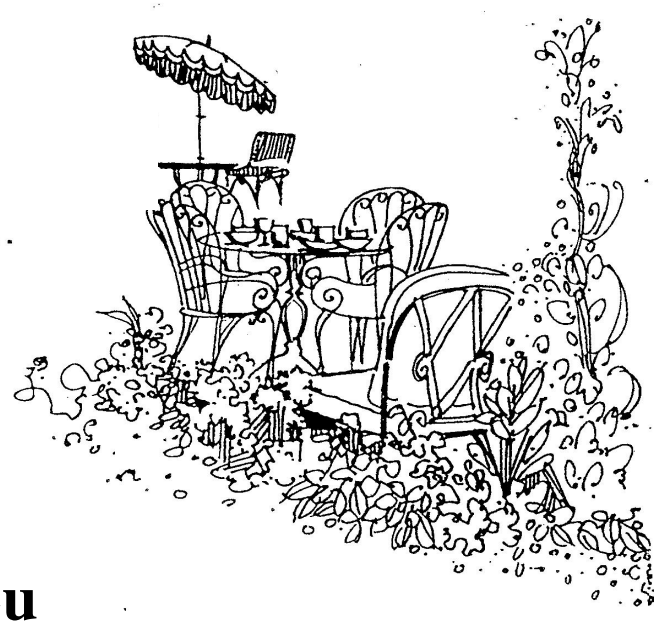
Chez Pierre

Presents ...

Monday, April 13, 2015
12:00pm
MIT Room 4-331



Ling Lu

Massachusetts Institute of Technology

"Topological photonic crystals"

Due to the recent discovery of topological insulators, it has been recognized that topology is indispensable in distinguishing phases of matter. Similarly, new optical material systems are being discovered with non-trivial topologies of their wave-functions in the momentum space, whose interfaces support novel states of light with unprecedented properties such as the robustness to disorder and fabrication imperfections.

In this talk, I will show the photonic (Bosonic) analogues of 2D quantum anomalous Hall effects, 3D topological Weyl and Dirac semimetals and topological crystalline insulators. Specifically, I will present our recent experiments on large Chern numbers (up to four), first observation of Weyl points in gyroids and the first photonic single-Dirac-cone surface state with a Z_2 index. These new degrees of freedom in band topologies promise wide exciting opportunities in both fundamental physics and technological outcomes.