

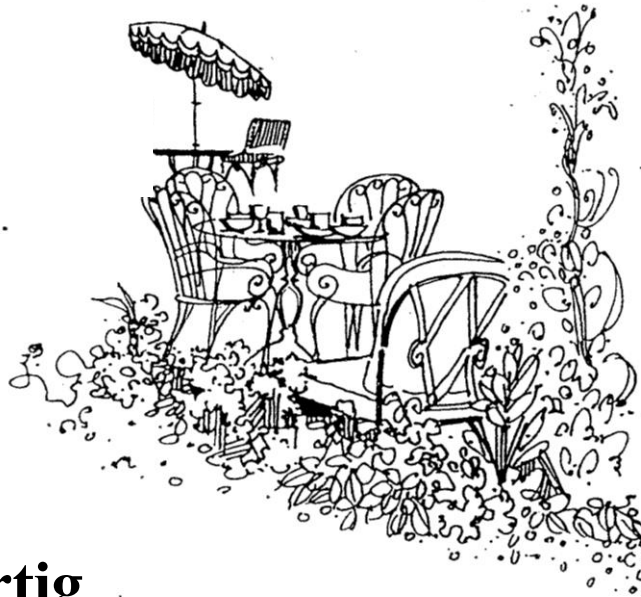
Chez Pierre

Presents ...

Monday, May 6, 2013

12:00pm

MIT Room 4-331



Herb Fertig
Indiana University

“Irradiated Graphene as a Floquet Topological Insulator”

Graphene supports a number of remarkable electronic properties, some of which make it a candidate for certain microelectronic applications. The challenge, however, of opening a gap in its electronic spectrum has limited its use for basic circuit elements such as transistors. In this talk I will review recent work in which an analog of such a gapped spectrum is induced by a time-dependent potential.

The resulting system turns out to have electronic structure with non-trivial topology, and is an example of a "Floquet Topological Insulator." It supports surprising fundamental behaviors -- including a quantized Hall effect with no magnetic field -- but there are fundamental challenges to predicting its electronic behavior in settings where it can be measured. I will present results of numerical calculations in which we meet some of these challenges, and show what should be found in the simplest possible measurement geometry, a two-terminal conductor. I will discuss the features of the results that demonstrate the unusual topology of the electronic structure, as well as surprising properties that are unique to the time-dependent nature of the system.