

“Physics is like sex: sure, it may give some practical results, but that’s not why we do it.” –Richard Feynman

## The Trivial Notions Seminar Proudly Announces

### Feynman Integrals and Three-fold Invariants

A talk by

Si Li

#### **Abstract**

Starting from the physics idea of the Feynman Integral, I will discuss Witten’s insight of constructing invariants of three dimensional manifold from Chern-Simons theory. The first example will be the Ray-Singer Torsion constructed from the spectrum of Laplacian operator. I will explain the reason to believe its topological property. Then by adding Wilson lines, we show how to obtain the linking number of two circles in  $\mathbb{R}^3$  from Chern-Simons point of view. This is the simplest but intuitive example of Witten’s construction of knot invariants.

Thursday, March 12<sup>th</sup> at 2:07 pm  
Science Center 507