

”You don’t see what you’re seeing until you see it, but when you do see it, it lets you see many other things.”

— William Thurston

The Trivial Notions Seminar  
Proudly Announces

Tinker Toys

A talk by  
Karl Winsor

**Abstract**

Suppose you are in your office, playing around with a “tinker toy” set. You have a collection of rigid rods of various lengths, hinges which you can use to attach two rods at their endpoints, and bolts which you can use to attach an endpoint of a rod to the wall. Once you have built a tinker toy out of these materials, how can you move it around (without breaking any rods, hinges, bolts, or walls)? For instance, a single rod bolted to the wall at one endpoint can rotate freely, so the possible configurations form a circle. By attaching additional rods end-to-end with hinges, you get tinker toys whose configuration spaces are higher-dimensional tori. In this talk, I will explain a theorem of Thurston and Kapovich–Millson, that any smooth compact manifold arises as a connected component of the configuration space of a tinker toy. Along the way, I will also explain how to draw a straight line.

Friday, October 5<sup>th</sup>, at 1:00 pm  
Science Center 530