

FELIX KLEIN SEMINAR

Speaker: Pierre Perruchaud
University of Notre Dame



Date: Thursday, September 19, 2019

Time: 2:00 PM

Location: 258 Hurley Hall

Lecture Title:

Rough paths: what are they, and what can they do for me?

Abstract

Introduced by T. Lyons in the 90's, the theory of rough paths is an algebraic framework developed to manipulate highly twisted curves in Euclidean spaces. Intuitively, in the same way one can lift a path from \mathbb{Z}^n to the free group F_n to study its non-commutative properties, there is a known procedure to associate to smooth paths in \mathbb{R}^n an object in the Lie group $GL_k(\mathbb{R}^n)$ that keeps track of its loops. The applications of this relatively recent theory are numerous, and in particular I will discuss its connection to the Cartan development in Riemannian manifolds. If time permits, I will hint at the construction of Brownian motion and other diffusions on manifolds, and say a few words about stochastic fluid dynamics.