Geometry, Physics, and Representation Theory
Northeastern University

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Wednesday, April 22, 1:30-4 pm (two talks), Lake Hall 509

Introduction to derived algebraic geometry (baby talk, 1.30-2.30pm)

Abstract. Derived algebraic geometry is a generalization of algebraic geometry that incorporates homotopy theory into the foundations. Such a generalization has numerous important consequences for the study of algebraic varieties, including giving a geometric approach to deformation theory and virtual fundamental classes. Furthermore, many moduli spaces, such as those in Donaldson-Thomas theory and Gromov-Witten theory have natural derived enhancements which are often better behaved and convey important geometric information. This talk will be an introduction to derived algebraic geometry focused on examples and applications.

Higher Differential Operators and Invariants of Varieties (adult talk, 3-4pm, joint with GASC)

Abstract. I will describe a generalization of the algebra of differential operators, which gives a geometric description of quantization of cotangent field theories. This construction is compatible with "integration" thus giving a local-to-global construction of volume forms on derived mapping spaces using a version of non-abelian duality. These volume forms produce interesting invariants of varieties generalizing the Todd genus, such as the Witten genus and the B-model operations on Hochschild homology.