Department of Mathematics
University of Notre Dame

Michael Ching - Amherst College

TOPOLOGY SEMINAR

Guest Speaker: Michael Ching
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Date: Tuesday, April 20, 2021
Time: 2:30 PM
Location: Zoom
Zoom Link: notredame.zoom.us/j/97262637721

Lecture Title:
Dual tangent structures for ∞-topos

Abstract

Rosický, and then Cockett and Cruttwell, introduced a notion of tangent structure on a category in order to axiomatize some of the properties of the tangent bundle functor on the category of smooth manifolds and smooth maps. Kristine Bauer, Matthew Burke and I have extended that notion to tangent ∞-categories, and constructed an example, the Goodwillie tangent structure, in which the category of manifolds is replaced by a suitable ∞-category of ∞-categories. That structure encodes the information in the Taylor towers of Goodwillie's calculus of functors. In this talk, I will describe two additional tangent structures: one on the ∞-category of ∞-toposes and geometric morphisms, and one on the opposite ∞-category. The latter is simply the restriction of the Goodwillie tangent structure to ∞-toposes. The former is more mysterious and seems hard to calculate (at least for me). However, we can also view it as an extension of the Goodwillie structure if the right perspective is taken. Both examples mimic tangent structures on the ordinary category of commutative rings, and its opposite, the category of affine schemes, which I will use to motivate the constructions.