JEAN-BAPTISTE VIENNEY, University of Ottawa

From tangent categories to Weil categories

Abstract: A tangent category is a category $\mathcal{C}$ equipped with an endofunctor T and some natural transformations which make T looks like the tangent bundle functor on the category smooth manifolds.

Two basic examples are the category of smooth manifolds and the category of commutative rings.

Poon Leung has proven that to make a category $\mathcal{C}$ into a tangent category is equivalent to equip it with a nice monoidal functor from a subcategory of Weil algebras generated by $\mathbb{N}[x]/(x^2)$ to the category $\mathrm{End}(\mathcal{C})$ of endofunctors of $\mathcal{C}$.

I'll explain how it could be interesting to define the notion of a Weil category as a category $\mathcal{C}$ with a nice monoidal functor from the category of all the Weil algebras to $\mathrm{End}(\mathcal{C})$.

We'll then see how both the category of smooth manifolds and the category of commutative rings should not only be tangent categories but Weil categories.

This is work in progress. The talk will explain the plan and hopefully suggest some precise definition for the notion of a Weil category.