Topology Seminar

UNIVERSITY OF NOTRE DAME
Department of Mathematics

Speaker: Moritz Groth
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Thursday, April 18, 2013
11:00 AM
258 Hurley Hall

Title: Grothendieck derivators and the additivity of traces, Part I

Abstract:

Peter May proved that in a category which is both triangulated and monoidal in a compatible way, the categorically defined Euler characteristic of dualizable objects is additive with respect to distinguished triangles. However, it is impossible to establish a more general additivity result for traces at the level of triangulated categories, and Peter May instead established such a result for nice model categories. In these talks we want to advertise stable, monoidal derivators as a framework in which to prove and generalize such additivity results.

The theory of derivators (going back to Grothendieck, Heller, and others) provides an axiomatic approach to homotopy theory. It adresses the problem that the rather crude passage from model categories to homotopy categories results in a serious loss of information. In the stable context, the typical defects of triangulated categories (non functoriality of cone construction, lack of homotopy colimits) can be seen as a reminiscent of this fact. The simple but surprisingly powerful idea behind a derivator is that instead one should form homotopy categories of various diagram categories and also keep track of the calculus of homotopy Kan extensions.

In the first talk we cover some basics of derivators culminating in a sketch proof that stable derivators provide an enhancement of triangulated categories. In the second talk we will develop some aspects of the monoidal theory focusing on ideas involved in the proof of the abovementioned additivity result. The aim of these talks is to (hopefully) advertise derivators as a convenient, 'weakly terminal' approach to axiomatic homotopy theory.