ESI Erwin Schrödinger International Institute for Mathematical Physics

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Seminar

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Topological K-theory of dg-categories (part 1/2)

Thursday, October 9, 2014

at 15:15 h

ESI, Boltzmann Lecture Hall

Abstract:
In noncommutative algebraic geometry à la Kontsevitch, the role of de Rham cohomology is played by periodic cyclic homology. It is then natural to ask: what is the noncommutative extension of Betti cohomology of complex algebraic varieties? Based on Toën and Bondal's idea, we have defined a topological K-theory of dg-categories defined over the complex numbers, as well as a Chern map into periodic cyclic homology. The definition involves a non trivial topological result, namely a homotopical version of Deligne's proper cohomological descent. This invariant furnishes a candidate for a rational structure on the periodic cyclic homology of a smooth proper dg-algebra, making a step toward the dream of the existence of a noncommutative Hodge structure on the latter. It indeed gives a rational structure in the case of a smooth scheme, and of a finite dimensional associative algebra.

Nils Carqueville

October 10, 2014