Seminar

Dr. Alessandro Valentino

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Topological Quantum Field Theory via Higher Category Theory
(Simons Lecture Course on Mathematical Physics)

October 20 - 24, 2014

at 14:15 h

ESI, Boltzmann Lecture Hall

Abstract: In this series of lectures I will give an introduction to Topological Quantum Field Theories (TQFTs) as first formalized by Atiyah and Segal, namely as functors from a geometric category of cobordism to some suitable symmetric monoidal categories. More specifically, I will introduce elements of ∞-category theory which will allow to discuss in unified way extended theories, and in particular fully extended TQFTs. The cobordism hypothesis, which allows to completely classify fully extended theories, will be discussed as well. I will also discuss TQFTs with boundary conditions, and the relevance of the theory of module categories for 2-tier extended TQFTs on maifolds with boundaries. Finally, I will present some applications to Chern-Simons theories and Dijkgraaf-Witten theory.

This short course is aimed at advanced master students, PhD students and Postdocs in mathematics and physics.

Nils Carqueville

October 13, 2014