

Mathematics and CS Seminar

Defining and classifying TQFTs via surgery

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We give a presentation of the n-dimensional oriented cobordism category Cob_n with generators corresponding to diffeomorphisms and surgeries along framed spheres, and a complete set of relations. Hence, given a functor F from the category of smooth oriented manifolds and diffeomorphisms to an arbitrary category C, and morphisms induced by surgeries along framed spheres, we obtain a necessary and sufficient set of relations these have to satisfy to extend to a functor from Cob_n to C.If C is symmetric and monoidal, then we also characterize when the extension is a TQFT.This framework is well-suited to defining natural cobordism maps in Heegaard Floer homology. Finally, we use it to classify (2+1)-dimensional TQFTs in terms of J-algebras, a new algebraic structure that consists of a split graded involutive nearly Frobenius algebra endowed with a certain mapping class group representation.

Thursday, November 2, 2017 01:00pm - 03:00pm
Big Seminar room Ground floor / Office Bldg West (I21.EG.101)

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