ALGEBRA AND GEOMETRY SEMINAR

The Hong Kong University of Science and Technology
Department of Mathematics

Multi-fusion categories from 2-Segal spaces

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In the study of 3-dimensional Topological Quantum Field Theories (short TQFTs), certain monoidal categories called multi-fusion categories are of fundamental importance. Well-known examples of these arise from finite groups through a linearization construction. However, it is less well-known that the same construction can produce more interesting examples of monoidal structures from any 2-Segal space. These include so-called Hall monoidal structures, which are anticipated to have interesting connections to quantum topology and TQFTs.

In this talk, I will classify those 2-Segal spaces that induce multi-fusion categories. For this, I will introduce a 2-categorical characterization of multi-fusion categories to translate questions about these monoidal structures to questions about homotopy coherent algebra in span categories. Afterwards, I will discuss extensions of this to the context of derived categories and derived TQFTs.

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