Speaker: Prof. Tudor Dimofte, University of Edinburgh

Title: Spark Algebras, Quantum Groups, and Kazhdan-Lusztig Correspondences

Abstract:

In a 3d topological quantum field theory, topological line operators are expected form a braided tensor category. While it is well known in many examples that braided tensor categories arising this way can be represented as modules for quasi-triangular Hopf algebras, a.k.a. ""quantum groups,"" it is a longstanding difficult problem to see/extract quantum groups directly from 3d QFT. I'll discuss a method for solving this problem in the special case that the QFT in question admits topological boundary conditions, using the eponymous ""spark algebras."" The method was inspired by recent work of N. Aamand; and is related to Koszul-duality constructions of K. Costello, N. Paquette, and others; as well as to current work of T. Johnson-Freyd and D. Reutter. When a 3d QFT also admits holomorphic boundary conditions, supporting vertex algebras, the spark-algebra methods here lead to Kazhdan-Lusztig-like correspondences. I'll (hopefully) finish by outlining some applications of this type. (Joint work with C. Beem, T. Creutzig, & W. Niu.).