DAY 5 (27 June): 13:30 – 14:10

Topological discrete algebra in topological orders

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Algebraic structures in topological orders are discussed. Topological order in two dimensional systems is studied by combining the braid group with a gauge invariant analysis. We show that flux insertions pertinent to the toroidal topology induce automorphisms of the braid group, giving rise to a unified algebraic structure that characterizes the ground-state subspace and fractionalization in topological order. The analysis can be generalized to systems in a higher dimensions or those with non-Abelian gauge symmetries. In latter systems, topological order is found to be closely related to quark (de)confinement phenomena in QCD.