Pieter Naaijkens* (pieter.naaijkens@itp.uni-hannover.de), Institute for Theoretical Physics, Leibniz University Hannover, 30167 Hannover, Germany. Operator algebras and topological quantum phases.

One of the striking features of topologically ordered phases of matter is that they have quasi-particle excitations with peculiar properties: they do not behave like bosons or fermions, but rather as anyons. That is, if one exchanges two of such quasi-particles, one can get something more interesting operation on the state of the system than just a sign change. Mathematically such anyons can be realized as equivalence classes of representations of a $C^*$-algebra of observables. In this talk I will explain how one can use operator algebraic methods to further study these anyons. In particular, I will explain how we can look at the inclusion of certain (von Neumann) algebras of observables to learn something about the quantum dimension of the system. (Received September 11, 2014)