

Abstract

Although it has been a well-known fact, for more than two decades, that the category theory is needed for the study of topological orders, it is still a non-trivial challenge for students and working physicists to master the abstract language of category theory. In this series talks, for those who have no background in category theory, we explain in great details how the structure of a (braided) fusion category naturally emerges from lattice models and physical intuitions. Moreover, we show that nearly all mathematical notions and constructions in fusion categories and its representation theory, such as (monoidal) functors, Drinfeld center, module categories and Morita equivalence, can all be derived from lattice models and physical intuitions. In this process, we also introduce basic notions and state important facts of topological orders, and clarify subtle issues or misunderstandings that are common in literature.