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Title: Topological phases of matter and operator algebras

Abstract: We present operator algebraic studies of tensor categories arising from topological phases of matter. Anyon condensation can be understood with alpha-induction which was introduced in the operator algebraic approach to chiral conformal field theory. We disprove a conjecture of famous physicists, give mathematical understanding of gapped domain walls, and present a relative version of the boundary-bulk duality through the relative Verlinde formula.