Fusion categories and Monster Moonshine

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Abstract:

In recent years, the symmetry principle has been generalized in theoretical physics, motivated by developments in high energy and condensed matter physics. In particular, symmetries of a quantum system need not form a group. Rather, in 1+1d, they form a fusion category. We demonstrate that the generalized global symmetry of the Monster CFT includes not only the Monster group, but also the Ising fusion category. We define a new McKay-Thomspon series based on this fusion category, and find that it is invariant under a genus-zero congruence subgroup. Time permitting, we will discuss other categorical generalizations found recently by Fosbinder-Elkins and Jeffrey Harvey. This talk is based on 1911.00042.