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Finite 2-groups, their representations and characters

I will give an informal introduction to the character theory arising from categorified representations. I will explain how 2-characters of finite groups naturally yield class functions on pairs of commuting elements. (This was independently discovered by Bartlett–Willerton.) Interestingly, the Mackey functor structure is governed by the same formulas as for the homotopy-theoretic characters discovered by Hopkins, Kuhn and Ravenel, adding evidence to the *redshift conjecture* in chromatic homotopy theory.

In recent work, joint with Usher, we are able to generalize these results to representations of 2-groups, finding that the characters of Frenkel and Zhu's *gerbal representations* naturally form a module over the twisted Drinfel'd double.

I will then discuss some examples of 2-groups, including the Weyl 2-groups, the conjectural Monster 2-group, and the *Platonic 2-groups* (finite sub-2-groups of the string extensions of $\mathbb{S}U(2)$), which were classified in joint work with Epa.

This is joint work with N. Epa, M. Kapranov and R. Usher.