Topology Seminar

Sune Precht Reeh

of MIT will be speaking on

Dimension functions, homotopy sphere actions, and fusion systems

on February 13 at 4:30 in
MIT Room 2-131

Given a representation V of a finite group G we can associate a dimension function that to each subgroup H of G assigns the dimension of the fixed point space V^H. The dimension functions are "super class functions" that are constant on the conjugacy classes of subgroups in G. For a p-group the list of Borel-Smith conditions characterizes the super class functions that come from real representations.

In a joint paper with Ergün Yalcin we show that though we cannot lift Borel-Smith functions to real representations for a general group G, we can lift a multiple of any Borel-smith function to an action of G on a finite homotopy sphere (which would be the unit sphere if we had a representation).

To solve the problem we localize at each prime p, and solve it in general for saturated fusion systems. That is, we give a list of Borel-Smith conditions for a fusion system that characterize the dimension functions of the fusion stable real representations. The proof for fusion systems involves biset functors and characteristic bisets for saturated fusion systems.