The Trivial Notions Seminar
Proudly Announces

Brauer Lifting

A talk by

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Abstract

Let G be a finite group. The modular representation theory of G (particularly in positive characteristic dividing the order of G) is a major topic first pioneered by Brauer in the 1930s. Putting extension problems aside for now, we can try to understand $R_k(G)$, the ring of virtual representations of G over the finite field k. It turns out that there is a "Brauer lift" map br: $R_k(G) \to R_{W_k}(G)$ that lifts representations over k to virtual free modules over the ring of Witt vectors of k. In this way, we can lift representations in characteristic p to characteristic 0: in the case of a one-dimensional representation, this lift is the Teichmuller lift map $GL_1(k) \to GL_1(W_k)$. I will give an explicit construction of the classical Brauer lift (by Lusztig in his 1974 paper "The Discrete Series of GL_n over a Finite Field") which constructs and then analyzes some important representations of $GL_n(k)$ as the top homology groups of certain posets. If there is time (which there likely won't be), I will briefly mention some generalizations, as well as some applications the Brauer lift has had to K-theory and homotopy theory in the years since.

Wednesday April 1st, at 1:00 pm
Science Center 112