Let $G$ be a finite group. A $N_\infty$ $G$-operad is an equivariant generalization of an $E_\infty$ operad. Such operads govern the natural algebraic structure on spectra over incomplete universes and on localizations of genuine commutative ring $G$-spectra. Since Blumberg and Hill’s pioneering work, it has been known that the homotopy theory of $N_\infty$ operads is essentially algebraic. They proved that the homotopy type of a $N_\infty$ operad is completely determined by a single combinatorial invariant, and subsequent work has revealed that the homotopy theory of $N_\infty$ operads may be modeled entirely with discrete operads in the category of $G$-sets. On the other hand, there are natural classes of geometrically defined $N_\infty$ operads, which generalize the classical linear isometries and infinite little discs operads. Such operads encode real representation-theoretic properties of $G$, in addition to purely algebraic data. In this talk, I will explain how to reduce the homotopy theory of $N_\infty$ operads to combinatorics, and then I will discuss how the peculiarities of equivariant linear isometries and infinite little discs operads are encoded in algebra.

There will be a pretalk at 3pm.

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