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**Title:** Presheaf models for infinity modular operads

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**Session:** Category Theory, Algebraic Topology, K-Theory

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Getzler and Kapronov introduced the notion of a modular operad to encode the grafting of the stable algebraic curves along boundary components. These objects have played a key role in the description of BV-algebra structures in noncommutativity geometry and physics. Minor generalizations of this theory have lead to the notion of compact symmetric multicategories which play a role in categorical versions of quantum theory.

We wish to study a version of these objects where composition and contraction are only defined up to (coherent) homotopy. To this end, we introduce an appropriate category of undirected graphs  $\mathfrak{M}$ , and identify subcategories of  $\mathfrak{M}$ -presheaves which model the indicated behavior. For set-valued presheaves, these are objects satisfying an inner horn filling condition. For space-valued presheaves these are objects satisfying a Segal-type condition, which are also the fibrant objects in a certain Quillen model structure.