1089-08-136 **Walter Taylor*** (`walter.taylor@colorado.edu`), 1452 North St, Boulder, CO 80304.
Topological algebras on finite simplicial complexes. Preliminary report.

It would be nice to characterize the collection I of those equational theories Σ that have a topological model $\mathbf{A}$ based on some finite simplicial complex A. This I defines a downward-closed proper subset of the interpretability lattice. I is the union of classes $I(A)$, one for each finite simplicial complex A, where $I(A)$ is the collection of theories that can be modeled on A.

In this survey talk we review some of the known higher (under interpretability) members of I, and mention one or two simple theories that are known not to lie in I.

Many questions can be asked about I and the individual classes $I(A)$. If $\Sigma \in I(A)$, is there a model $\mathbf{A}$ whose operations are all piecewise multilinear? Does A model some $\Sigma' \geq \Sigma$, where all operations of Σ' are ternary? Binary? Does the ideal $I(A)$ have a generator that is a finite theory? Is there an easily described family of theories that generate I as a downward-closed set?

For Σ ranging over finite theories and A ranging over finite simplicial complexes, is the relation $\Sigma \in I(A)$ recursive in Σ and A (either jointly or in each variable separately)? (Received February 10, 2013)