Topological Homogeneity

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Abstract: Topological homogeneity is not a well understood notion. In manifold theory, homeomorphism extension theorems play a prominent role in the proofs of various characterization theorems. But if the space under consideration is not close to a manifold, many fundamental problems remain unsolved. Among them, for example: if X is a homogeneous metric continuum, is its group of homeomorphisms of positive dimension? Or, is there an example of an infinite-dimensional homogeneous indecomposable continuum? We discuss the Effros Theorem, several classes of homogeneous spaces, among them the countable dense homogeneous spaces and the uniquely homogeneous spaces. We also state some intriguing open problems, some of which are (very) old and some of which came from recent investigations.