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Kempner Colloquium

Locally moving groups, reconstruction and undecidability

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A locally moving (LM) group for a regular topological space X, is a group G of homeomorphisms of X which has the following property: For every nonempty open set U, there is $g \in G$ such that: (1) g is not the identity function, and (2) for every $x \in X \setminus U$, $g(x) = x$.
A group H is a locally moving (LM) group, if it is isomorphic to a group G as above. Many groups of automorphisms of topological spaces, linear orderings, trees, Boolean algebras, measure algebras and some other types of structures are LM.
Examples: (1) The group of all auto-homeomorphisms of a Euclidean space is LM. (2) The group of all C^∞ homeomorphisms of a Euclidean space is LM. (3) The group of all automorphisms of the binary tree is LM.
Using a certain theorem about LM groups, one can prove theorems of the following type: If X and Y are topological spaces such that $H(X)$ (= the group of all auto-homeomorphisms of X) is isomorphic to $H(Y)$, then X is homeomorphic to Y. Similar theorems for linear orderings, trees, Boolean algebras, measure algebras and some other types of structures are also true.
A recent theorem states that: The first order theory of every locally moving group is undecidable. (This solves in much more generality a question of Mark Sapir about the R. Thompson groups). I shall state and explain that "certain theorem" mentioned above. Then I'll speak about consequences of that theorem including the undecidability theorem.
If time allows, I shall mention some open problems.

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