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Algebra Day on the Hudson

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Locally approximating groups of homeomorphisms.

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Abstract:
I will survey the model theory of locally approximating groups of homeomorphisms of compact manifolds, which are groups of homeomorphisms which are "sufficiently dense" in the full group of homeomorphisms, with the compact-open topology. These groups always interpret first order arithmetic; using arithmetic, one can prove that all finitely generated subgroups of locally approximating groups are definable, with parameters. Under some further conditions, one can prove that these groups are prime models of their theories. I will also discuss action rigidity for these groups: if an arbitrary group G is elementarily equivalent to a locally approximating group of homeomorphisms of a compact manifold M, then for any locally approximating group action of G on a manifold N, we must have that M and N are homotopy equivalent to each other. In low dimensions, we may in fact conclude that M and N are homeomorphic to each other.

This represents joint work with J. De la Nuez Gonzalez.