

Speaker: **Gabriel Conant**
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Tuesday, September 29, 2015
11:00 am
Room: 125 Hayes-Healy Hall

Title: Extending partial isometries of generalized metric spaces

Abstract:

A class \mathcal{K} of finite structures has the Hrushovski property if, for any A in \mathcal{K} , there is some B in \mathcal{K} such that A is a substructure of B and any partial automorphism of A extends to a total automorphism of B . When \mathcal{K} is a countable Fraïssé class, the Hrushovski property can often be used to prove that the Fraïssé limit has “ample generic automorphisms”, which has strong consequences for the topological structure of its automorphism group. In 2005, Solecki used a deep theorem of Herwig and Lascar, to prove that the class of finite metric spaces has the Hrushovski property and, as a consequence, the isometry group of the rational Urysohn space has ample generics. Due to a more recent exposition by Rosendal, this result can also be seen as an application of the Ribes-Zalesskii theorem on the profinite topology on free groups. In this talk, we consider metric spaces taking distances in an arbitrary positively ordered commutative monoid, and prove the Hrushovski property in cases when the archimedean classes of the monoid are “well-behaved”. This unifies previous work of Hrushovski, Malicki, and Solecki, and also includes some new examples. We then modify our method to obtain a proof of ample generics for the automorphism group of the universal existentially closed graph omitting cycles of uniformly bounded odd length.