Logic Seminar

UNIVERSITY OF NOTRE DAME
Department of Mathematics

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11:00 AM
125 Hayes-Healy Hall

Title: Spectra of computable models of strongly minimal theories

Abstract:

The Baldwin-Lachlan theorem states that the countable models of an uncountably categorical but not totally categorical theory T in a countable (for us, computable) language form an elementary chain M_0 < M_1 < ... < M_omega.

If T is decidable then by Harrington/Khisamiev, every countable model M of T is "decidable" (i.e., the theory of M with constants for M is decidable).

If T is undecidable, each model M of T must be undecidable, but some can be "computable" (i.e., the *quantifier-free* theory of M with constants for M is decidable) while others are not, leading to the notion of the spectrum of computable models SCM(T) = { alpha <= omega | M_alpha is computable }.

SCM(T) is currently quite poorly understood: The "most complicated" example is the union of two intervals, but the best-known upper bound is Sigma^0_3(0^omega).

If one restricts the language, one can do better: Andrews and Medvedev recently showed that for most strongly minimal theories in a *finite* language
(namely, disintegrated, modular group or field-like), the only possible spectra are the empty set, omega+1 and {0}.

Andrews and I have been considering infinite languages but restricted ourselves to disintegrated strongly minimal theories over infinite relational languages of bounded arity. In the binary case, we can show that there are exactly seven possible spectra; in the ternary case, the number is between 9 and 18. We are currently working toward sharpening the result for ternary languages, with the ultimate goal of showing that for any fixed arity n, there is a fixed finite bound on the number of possible spectra.