Logic Seminar

Expansions by k-regular sets of reals: toward a characterization of V_k definability Alexi Block-Gorman (McMaster University)

Abstract: Büchi automata are the natural extension of finite automata to a model of computation that accepts infinitelength inputs. We say a subset X of the reals is k-regular if there is a Büchi automaton that accepts (one of) the base-k representations of every element of X, and rejects the base-k representations of each element in its complement. These sets often exhibit fractal-like behavior–e.g., the Cantor set is 3-regular. Let V_k be a ternary predicate such that V_k(x,u,d) holds if and only if u is an integer power of k and d is the coefficient of the term u in some base-k expansion of x. For a fixed k and for each natural number n, all of the k-regular subsets of Euclidean space definable in the expansion of the ordered additive group of reals by the predicate V_k. In this talk, we will discuss the significance of the ordered additive group of reals by V_k (and its reducts) from the perspectives of tame geometry and neostability. We will also discuss current and ongoing progress toward a characterization of the reducts of this structure in terms of definability, neostability, and fractal dimensions.

Tuesday, April 25 at 4:00 PM in 636 SEO