Block-Gorman, *A Hierarchy of Expressive Power for Büchi Automata Over the Reals*

There are compelling and long-established connections between automata theory and tame geometry, including Büchi automata and the additive group of real numbers. 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. We say an expansion of the real additive group is k-regular if all of its definable sets are k-regular. In this talk we will discuss the hierarchy of Büchi automata in terms of their expressive power–how many different geometries can a k-regular expansion of the real additive group have? We will unpack the connection between this question and tools from both metric geometry and topological dynamics.