1106-03-1646 **Gabriel Conant*** (gconan2@uic.edu). *Urysohn spaces over restricted distance sets.*

Given a countable subset $SsubseteqmathbbR^{geq0}$, which contains 0, there is a characterization of the existence of a countable, homogeneous metric space $mathcalU_S$, which has distances only in S, and is universal for finite metric spaces with distances in S. Working from previous results on the complete Urysohn sphere in continuous logic, we develop a model theoretic context for the study of $mathcalU_S$, resulting in characterizations of quantifier elimination, forking independence, stability, and simplicity. We then use tools from model theory to investigate the combinatorial properties of these spaces. In particular, the finitary strong order property provides a concrete combinatorial rank for measuring the complexity of both the theory of $mathcalU_S$, as well as the algebraic structure inherited by the distance set S. The relationship between this algebraic structure and certain kinds of ordered monoids motivates further conjectures and questions, which are of a similar flavor as several interesting problems in additive and algebraic combinatorics. (Received September 16, 2014)