On Ramsey-like theorems on the rationals and Rado graph

Abstract
Ramsey theorem implies for every 2-coloring of pairs of naturals there is an infinite set H of naturals where all the pairs formed from H have the same color. We will explore how to extend this to the rationals, the Rado graph and some other relational homogenous countable structures. One of the main tools used in these extensions is Milliken's tree theorem and it’s recent modifications. Our goal is to try to understand the arithmetic complexity of the resulting “homogenous” set or structure. I.e. if the colorings are computable is there a “homogenous” structure within the arithmetical hierarchy and if so where.