

Speaker: Russell Miller

Title: Genericity, Infinitary Interpretations, and Automorphism Groups of Structures

Abstract: It has long been recognized that the existence of an interpretation of one countable structure B in another one A yields a homomorphism from the automorphism group $\text{Aut}(A)$ into $\text{Aut}(B)$. Indeed, it yields a functor from the category $\text{Iso}(A)$ of all isomorphic copies of A (under isomorphisms) into the category $\text{Iso}(B)$. In traditional model theory, the converse is false. However, when we extend the concept of interpretation to allow interpretations by $L_{\omega_1\omega}$ formulas, we find that now the converse essentially holds: every Borel functor arises from an infinitary interpretation of B in A , and likewise every Borel-measurable homomorphism from $\text{Aut}(A)$ into $\text{Aut}(B)$ arises from such an interpretation. Moreover, the complexity of an interpretation matches the complexities of the corresponding functor and homomorphism. We will discuss the concepts and the forcing necessary to prove these results and other corollaries.

This is joint work with Matthew Harrison-Trainor and Antonio Montalban.