



Wednesday,  
October 19th  
7pm-8pm  
Park 245



# HOMOTOPICAL MODELS FOR METRIC SPACES AND COMPLETENESS

Presented By: Chloe Shupe '24

A Lawvere metric space is a set equipped with a notion of distance with relaxed conditions on the distance function. We will introduce the basics of category theory, Lawvere metric spaces, and completeness to discuss how homotopy theory can be applied to categories of Lawvere metric spaces. To accomplish this, we will construct model structures on the categories of Lawvere metric spaces and of symmetric Lawvere metric spaces, with a focus on defining homotopy equivalences in extended, Cauchy complete Lawvere, and Cauchy complete extended metric spaces. In particular, two of these model structures are suitably unique while the third bears striking resemblance to an existing model structure on the category of small categories.

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