Physics Seminar: Thomas Waddleton
Wednesday, September 18 · 2:00 – 3:00pm

Location: 313

Title: The Fate of Topological Operators in Gravity

Abstract: Recent years have taught us many things about global symmetries in QFTs, stemming from an understanding of them through topological operators embedded into the theory's spacetime. When coupled to gravity, in greater than three spacetime dimensions, it is well-established lore that no global symmetries can survive and must be absent in the resulting theory. It is then natural to wonder as to the fates of these topological operators when embedded into a gravitational theory. In this talk I will propose a new way to construct symmetry operators in a given theory and analyze their behavior in the presence of small metric fluctuations, ultimately finding an obstruction to making them topological. I will motivate the construction through three examples before giving a more general argument using physical motivations that we expect to see in any quantum theory of gravity. Finally, I will conclude with some justifications for the constructions from both bottom-up and top-down points of view, as well as some possible future directions.