

Speaker: Anton KAPUSTIN (Caltech, USA)

Title: Topological invariants of gapped lattice systems and locality

Abstract: The conjectural bulk-boundary correspondence says that certain topological invariants of gapped lattice systems are equal to 't Hooft anomalies of their boundary field theories. Usually, this is argued by assuming that the bulk is described at low energies by a TQFT. The simplest example is a 2d system exhibiting the quantum Hall effect, which is assumed to be described by a Chern-Simons field theory. In this talk I will explain how to formulate the bulk-boundary correspondence as a purely bulk statement and then prove it. The bulk counterpart of 't Hooft anomaly is an obstruction to promoting a global symmetry of a gapped state to a local one. To define what this means, I will introduce the notion of a local Lie algebra which encodes the physical notion of a gauge symmetry and can be useful in other contexts too.