# Virtual TEP Seminar

UCLA

Tuesday, February 9th$^{th}$ @ 4:00PM

Via Zoom

## "The statistical mechanics of near-extremal and near-BPS black holes"

Luca Iliesiu (Princeton)

Abstract: An important open question in black hole thermodynamics is about the existence of a "mass gap" between an extremal black hole and the lightest near-extremal state within a sector of fixed charge. In this talk, I will discuss how to reliably compute the partition function of 4d Reissner-Nordstrom near-extremal black holes at temperature scales comparable to the conjectured gap. I will show that the density of states at fixed charge does not exhibit a gap in the simplest gravitational non-supersymmetric theories; rather, at the expected gap energy scale, we see a continuum of states whose meaning we will extensively discuss. Finally, I will present a similar computation for nearly-BPS black holes in 4d N=2 supergravity. As opposed to their non-supersymmetric counterparts, such black holes do in fact exhibit a gap consistent with various string theory predictions.