

# Sameer Murthy

Tuesday, November 1·1:15 – 2:15pm

Location: SCGP 102

Speaker: Sameer Murthy

Title: Quantum black holes: a macroscopic window into quantum gravity

Abstract: The pioneering work of Bekenstein and Hawking in the 1970s showed that black holes have thermodynamic properties like temperature and entropy. This discovery gave rise to deep questions about the quantum structure of spacetime, in particular, (1) What is the nature of the microscopic states underlying a black hole? (2) How does one describe the collective behavior (phases) of these microstates? In this colloquium, I will discuss recent developments on these themes in the context of supersymmetric black holes in string theory. After a broad introduction I will discuss two prototype models in which we can study the above two questions in detail. In the first model we see how the integer number of microstates of the black hole are encoded in the continuum gravitational variables. In the second model we uncover a rich phase diagram that generalizes the Hawking-Page transition in the gravitational theory and the deconfinement transition in the dual gauge theory.