

# Black Holes from Supercharge Cohomology

*Monday 3 June 2024 12:30 (30 minutes)*

In this talk, I will introduce supercharge cohomology, which is semi-protected by supersymmetry and reveals much richer information beyond state counting. I will classify supercharge cohomologies in holographic conformal field theories into two categories: monotone (graviton) and fortuitous (black hole). Focusing on  $N=4$  super-Yang-Mills theory, I will present explicit constructions of monotone and fortuitous cohomology classes and discuss their conjectural bulk duals as smooth horizonless geometries and black holes. Finally, I will examine the spectrum of near-BPS operators and near-BPS black holes.

**Presenter:** CHANG, Chi-Ming