Contribution ID: **4** Type: **not specified**

Holography for extended theories of gravity

Thursday 8 December 2022 15:00 (20 minutes)

The nonextremal Kerr black holes have been considered to be holographically dual to two- dimensional (2D) conformal field theories (CFTs). In this talk, we present the holography for the asymptotically anti-de Sitter (AdS) rotating charged black holes in extended theories of gravity. We find that the scalar wave radial equation at the near-horizon region implies the existence of the 2D conformal symmetries. We note that the 2π identification of the azimuthal angle φ in the black hole line element, corresponds to a spontaneous breaking of the conformal symmetry by left and right temperatures TL and TR, respectively. We show that choosing proper central charges for the dual CFT, we produce exactly the macroscopic Bekenstein-Hawking entropy from the microscopic Cardy entropy for the dual CFT. These observations suggest that the rotating charged black holes in extended theories of gravity, are dual to a 2D CFT at finite temperatures.

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Session Classification: Gravity - Dark Energy

Track Classification: Gravity and gravitational waves