

JOINT TUFTS/MIT COSMOLOGY SEMINAR

Vortexes in Black Holes

Michael Zantedeschi
Max Planck Institute

In this talk I will argue that black holes admit vortex structure. This is based both on a graviton-condensate description of a black hole as well as on a correspondence between black holes and generic objects with maximal entropy compatible with unitarity, so-called saturons. Due to vorticity, a Q-ball-type saturon of a calculable renormalisable theory obeys the same extremality bound on the spin as the black hole. Correspondingly, a black hole with extremal spin emerges as a graviton condensate with vorticity. Next, I will show that in the presence of mobile charges, the global vortex traps a magnetic flux of the gauge field. This can have macroscopically-observable consequences. For instance, the most powerful jets observed in active galactic nuclei can potentially be accounted for. As a signature, such emissions can occur even without a magnetized accretion disk surrounding the black hole. The flux entrapment can provide an observational window to various hidden sectors, such as millicharged dark matter.

Tuesday, February 1, 2022, 2:30 pm

Zoom link will be distributed to joint cosmology seminar mailing list. See <https://cosmos.phy.tufts.edu/mailman/listinfo/cosmology-seminar> to join.

Tufts University