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Enstrophy from symmetry and holography

Wednesday 28 July 2021 13:30 (45 minutes)

Enstrophy is an approximately conserved quantity in 2+1 dimensional fluid flows that has dramatic consequences for the phenomenology of turbulence: it implies an inverse energy cascade in 2+1 dimensions.
In this talk, I will illustrate an algorithm to construct an enstrophy current for fluid flows with various degrees of symmetry, including, but not limited to, the well-known case of non-relativistic (Galilean) fluid flows.
Moreover, I will identify the accidental symmetry associated with enstrophy conservation in a recently realized effective action for hydrodynamics.
Finally, I will show how horizon symmetries of 3+1 dimensional black holes with Anti-de Sitter asymptotics also lead to enstrophy conservation.

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