EPFL

INSTITUTE OF PHYSICS IPHYS

High Energy Theoretical Physics Seminar

Friday October 4th, 2019 at 14:00

Room BSP 727, (Cubotron) EPFL

Prof. Yaron Oz

(Tel Aviv University)

"Gravity and Geometrization of Turbulence"

Fully developed incompressible fluid turbulence is largely considered as the most important unsolved problem of classical physics.

Most fluid motions in nature at all scales are turbulent, yet despite centuries of research, we still lack an analytical description and understanding of fluid flows in the non-linear regime. Experimental and numerical data suggest that turbulence at the inertial range of scales reaches a steady state that exhibits statistical homogeneity and isotropy and is characterized by universal scaling exponents. We will propose a conceptually new viewpoint inspired by black hole dynamics and construct a field theory geometrization of turbulence. Within this framework we will derive an exact analytical formula for the inertial range longitudinal anomalous scalings in agreement with the available numerical and experimental data. We will present new predictions of the formula.