



TOR VERGATA
UNIVERSITÀ DEGLI STUDI DI ROMA

Dipartimento di Fisica



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Seminar

Friday, 23 September 2022 - h. 15:00

Fisica della Materia room (Department of Physics)

Prof. Luca MORICONI

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“Turbulent Circulation Statistics: Recent Advances and Perspectives”

Abstract

Improvements of high-performance computing platforms have paved the way for the very recent implementation of numerical simulations of homogeneous and isotropic turbulence at unprecedented high Reynolds numbers.

They have brought to light completely new aspects of turbulence, mainly related to the statistical description of velocity circulation fluctuations. Motivated by these advances, we discuss a fruitful phenomenological model of circulation intermittency which combines structural ingredients of turbulence (the existence of vortex tubes) and its multiplicative cascade nature (related to the transfer of kinetic energy across a broad range of length scales). Besides a number of predictions which accurately agree with numerical findings on the statistical features of circulation, the vortex gas model is able to address the short-distance physics of interacting vortex structures.

We furthermore outline open modeling issues which have interesting connections to field-theoretical approaches and minimal surface theory.

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(P.I. Prof. Luca Biferale)

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