

PHYSICAL COLLOQUIUM
INVITATION

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speaks

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about

Turbulence - a challenge for statistical mechanics and applications

The Earth's atmosphere and oceans may serve as two examples in which turbulence plays a key role. On an astrophysical scale, the Sun's convective core as well as the ejected solar wind both are turbulent. Turbulence is also present in our everyday life; when stirring milk in coffee, we benefit from its properties, whereas we may suffer its consequences during a turbulent flight.

Despite its ubiquity in nature and technology, turbulence remains a paradigmatic challenge for non-equilibrium statistical mechanics. This challenge is closely related to the nonlinear, non-local and dissipative character of the underlying equations of motion which withstand most concepts that modern physics has developed so far. The rapid evolution of computational power and experimental techniques, however, has brought significant progress over the past decades by allowing unprecedented insights into the structure and dynamics of turbulence.

This presentation will cover recent results on the multi-scale nature of turbulent flows that illustrate the interplay of theory, numerical simulation and experiments. Furthermore, it will be discussed how such fundamental research can contribute to applied topics such as wind energy conversion.

All interested persons are cordially invited.

Sgd. Prof. Joachim Peinke