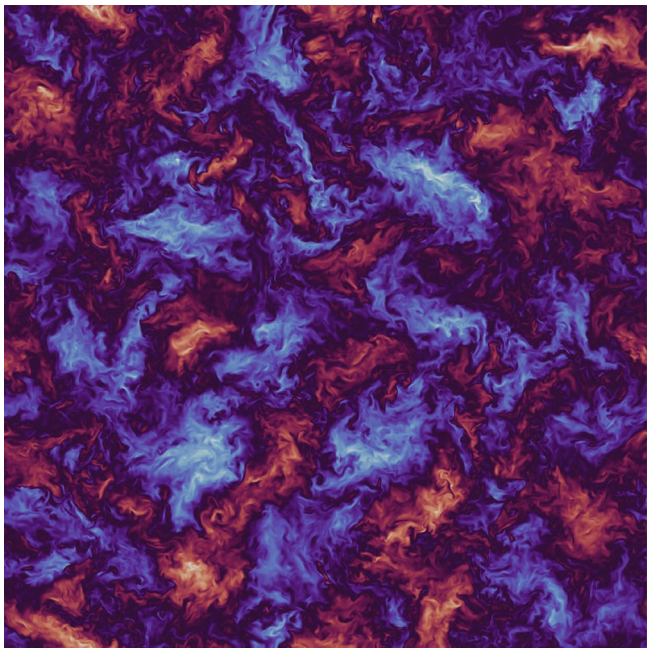
Physikalisches Institut
Fakultät für Mathematik und Physik
Albert-Ludwigs-Universität Freiburg

# PHYSIKALISCHES KOLLOQUIUM

## AM 18. NOVEMBER 2024 UM 17 UHR C.T.
## IM GROßEN HÖRSAAL



# TURBULENCE: THE GREATEST UNSOLVED PROBLEM IN CLASSICAL PHYSICS?

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Turbulence is the chaotic and seemingly unpredictable motion that manifests itself in various scales and systems: swirls in the clouds, currents in the oceans, fluid motions in stars and galaxies, as well as the flows of the air around us are all turbulent. The problem of turbulence begins from its definition: no commonly agreed precise definition apart from qualitative descriptions exist. The extremely complex dynamics of turbulent flows defy mathematical description although the dynamics are governed by the purely classical Navier-Stokes equations. The issues in formulating a universal theory of turbulence have led it to be called the greatest unsolved problem in classical physics.

I will introduce the basic concepts of turbulence and discuss some mundane as well as more exotic settings where turbulence plays a role. I will then proceed to show why turbulence is so difficult to handle theoretically or numerically and why solving the problem of turbulence is not only of academic interest.

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