

# Colloquium Thermo- and Fluid Dynamics

## Using Lagrangian stationarisation to connect inhomogeneous turbulence in a free shear jet to idealised homogeneous isotropic turbulence

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The presentation will explore the non-stationary Lagrangian dynamics of particle-laden free-shear jets and their turbulent particle transport properties. Using high resolution Lagrangian Particle Tracking, 3D trajectories of particles in the jet are reconstructed, giving access to their position, velocity, and acceleration over a large area. We use this dataset to test Batchelor's 1957 extension of Taylor's turbulent diffusion theory to inhomogeneous flows, which we further extend to develop a new approach to efficiently model inhomogeneous jet turbulence by adapting concepts from homogeneous and isotropic turbulence.



*Mickaël Bourgoïn obtained his PhD in magnetohydrodynamics in Lyon (France, 2003). After a stay at Cornell University (USA, 2003-2004) where he studied fluid turbulence, he was appointed CNRS researcher at the Laboratoire des Écoulements Géophysiques et Industriels in Grenoble (France, 2004) to study turbulent particle transport. He is currently CNRS Research Director at the Physics Laboratory of the Ecole Normale Supérieure in Lyon, where he conducts research into single- and two-phase turbulence, aerodynamics and granular media. He teaches advanced fluid mechanics at the Ecole Normale Supérieure de Lyon and the Ecole Centrale de Lille, and heads the CNRS Research Group (GDR) "Navier-Stokes 2.00".*

Date: Wednesday, 16 October 2024

Time: 16:15 - 17:15 h

Place: ETH Zurich, ML F 36

Host: Prof. Filippo Coletti