

LadHyX Seminar – July 2nd, 10:45

Sofia Angriman
(Institut de Physique de Nice)

Transport in multiphase flows: from heat transfer to turbulent diffusion.

Multiphase and dispersed-phase flows display rich transport phenomena that arise from the coupling between flow structures, interfaces, and immersed objects. In this talk, I will present two numerical studies that explore how such couplings affect transport across scales and flow regimes.

The first part focuses on heat transfer during the melting of neighbouring ice objects in fresh water. I will show how flow-mediated interactions between the melting blocks modify heat transfer and interface evolution. The relative position of the blocks leads to non-trivial variations in melting rates, driven by a competition between natural and forced convection.

In the second part, I will discuss the transport of long, inertialess rods in idealised turbulent conditions, with a focus on long-time dispersion. Here, the geometry and the range of scales spanned by the rods strongly affect their transport properties, reflected in velocity correlations, tumbling dynamics, and effective diffusion.