

Antoine Briard (Institut d'Alembert, UPMC)

**Modelling of Transport in Homogeneous Turbulence: Helicity, Stratification, and Shear**

In this presentation, I will expose part of my PhD work, regarding a possible approach to model homogeneous anisotropic turbulent flows at large Reynolds numbers. This is crucial to further understand the complex dynamics of atmospheric turbulence, in which production mechanisms such as shear and stratification make the global flow highly anisotropic. Indeed, direct numerical simulations and experiments cannot reach (yet) regimes of Reynolds numbers representative of atmospheric turbulence, so that alternative approaches are required. Moreover, the use of models has the practical advantage of precisely disentangling the effects coming from different anisotropic production mechanisms, and consequently of identifying the dominant contributions: this could be of great use for more applied cases. In this talk, I will give you the main ideas of our modelling in spectral space, which basically consists into two steps: (i) the use of a well-known method first developed in the 70's to close the non-linear terms in our equations, and then (ii) a modelling of anisotropy through spherically-averaged descriptors. As applications, three cases are proposed, from the "simplest" to the most anisotropic one: helical turbulence, unstable stratification, and shear flows.