B. Buffoni – B. Dacorogna – J. Krieger - H.M Nguyên – Mathematics Section

SEMINAIRE D'ANALYSE

➢ *VENDREDI 27 AVRIL 2018 à 14:15 - SALLE MA A1 12*

Dr Michele **Coti Zelati**

*(*Imperial College London - UK)

donnera un séminaire sur le thème :

« *DIFFUSION AND MIXING IN INCOMPRESSIBLE FLOWS*»**

Abstract:

We study diffusion and mixing in different fluid dynamics models, mainly related to incompressible flows. In this setting, mixing is a purely advective effect, which causes a transfer of energy to high frequency. In turn, mixing acts to enhance the dissipative forces, giving rise to what we refer to as enhanced dissipation: this can be understood by the identification of a time-scale faster than the purely diffusive one. We will give a general quantitative criterion that links mixing rates (in terms of decay of negative Sobolev norms) to enhanced dissipation time-scales. Applications include passive scalar evolution in both planar and radial settings, fractional diffusion, linearized two-dimensional Navier-Stokes equations, and even simple examples in kinetic theory.