1125-35-772 **Michele Coti Zelati*** (micotize@umd.edu). *Deterministic and stochastic aspects of fluid mixing.*

The process of mixing of a scalar quantity into a homogenous fluid is a familiar physical phenomenon that we experience daily. In applied mathematics, it is also relevant to the theory of hydrodynamic stability at high Reynolds numbers - a theory that dates back to the 1830's and yet only recently developed in a rigorous mathematical setting. In this context, mixing acts to enhance, in certain senses, the dissipative forces. Moreover, there is also a transfer of information from large length-scales to small length-scales vaguely analogous to, but much simpler than, that which occurs in turbulence. In this talk, we focus on the study of the implications of these fundamental processes in linear settings, with particular emphasis on the long-time dynamics of deterministic systems (in terms of sharp decay estimates) and their stochastic perturbations (in terms of invariant measures). (Received September 11, 2016)