Weekly CEAFM Seminar: Spring 2016

JOHNS HOPKINS
Center for Environmental
& Applied Fluid Mechanics

Date: **Friday, April 1, 2016**

Time: 11:00 AM

Location: Gilman Hall # 50

Speaker: **Prof. Luca Biferale** (University of Roma, Tor Vergata)

Title: ***"Lagrangian and Eulerian Statistic in Rotating Turbulence"***

Abstract

State-of-the-art direct numerical simulations of rotating turbulence at changing Reynolds and Rossby numbers are presented. We present results concerning the importance of columnar structures on the statistical fluctuations of the velocity field at small scales. Lagrangian properties are studied by seeding the flow with millions of particles, with and without inertia, light and heavy. We study two regimes, at high and low rotation. Heavy and light particles are injected along different axis of rotations, allowing to study the combined effects of Coriolis and Centripetal forces on preferential sampling.

Bio

Luca Biferale's research is focused on complex flows and complex fluids, from micro- to macro-scale using both theoretical and numerical approach. He is currently Full professor of Theoretical Physics at the University of Rome 'Tor Vergata' and PI of one ERC Advanced Grant 'NewTURB' on New eddy-simulation concepts and methodologies for frontier problems in TURBulence. He received his PhD from University of Rome 'Sapienza' in 1993. He has been visiting professor at Johns Hopkins University (2006), University of Chicago (2008), Technische University of Eindhoven (2011) and Observatory of Nice (2011 and 2012). The main focus of his recent work is on a new method to investigate the physics of small-scale fluctuations in turbulent flows using ad-hoc decimations of the degrees of freedom involved in the non-linear evolution of the Navier-Stokes equations, including helical decimation and mode-reduction on a Fractal set in Fourier space. He is also involved on numerical investigations of Eulerian and Lagrangian rotating turbulence, turbulence under strong shear and helical turbulence.