

From Navier-Stokes Equations to Stochastic Navier-Stokes Equations

In this talk we give a brief introduction into fluid dynamics by Euler and incompressible Navier-Stokes equations. Small scale perturbations are present in fluid motion, especially when the viscous forces are small compared to inertial forces. It is reasonable to introduce a random body force to capture this perturbation. From this, we will explain how the stochastic incompressible Navier-Stokes equations can be derived from its deterministic equivalent by using the central limit theorem and the large deviation principle. To conclude, we depict the main issue one can meet when a numerical approximation on these stochastic equations are performed.