

## 2012 Special Program in Applied Mathematics and Applied Mechanics

*Modeling of turbulent cavitating flow and Lagrangian-based  
investigation of multiphase flows*

2012 - 12 - 19 (Wed.)

15:00 - 17:00

308, Mathematics Research Center Building (ori. New Math. Bldg.)

---

Cavitation typically occurs when the fluid pressure is lower than the vapor pressure at a local thermodynamic state, and the flow is frequently unsteady and turbulent. To assess the state-of-the-art of computational capabilities for unsteady cavitating flows, interactions between cavitation and turbulence model will be highlighted today. Besides, it will be found that the eddy viscosity near the closure region can significantly influence the capture of detached cavity. Furthermore, I would like to show how we utilize Lagrangian coherent structures (LCS) defined by the ridges of the finite-time Lyapunov exponent (FTLE) to elucidate the multiphase interactions in gaseous jets injected into water. The highlighted phenomena of the jet transportation can be observed by the LCS method, including expansion, bulge, necking/breaking, and back-attack.



**CASTS**

Center for Advanced Study in Theoretical Sciences, NTU