# CASTS TALKS

## Special Program in Applied Mathematics and Applied Mechanics

*Gravity currents produced from a density-stratified buoyancy source*

Prof. Hsi-heng Dai

2018 - 10 - 17 (Wed.)
15:30 - 17:30
103, Mathematics Research Center Building (ori. New Math. Bldg.)

Experiments for the gravity currents produced from a two-layer density-stratified buoyancy source in a lock-exchange setup are presented. We showed that the Froude number in the inertial phase is not a universal constant but depends on the two controlling parameters, namely, the density difference and the buoyancy distribution between the upper and lower layers. For weakly stratified two-layer heavy fluid, mixing between the fluids from the two layers is more immediate. For strongly stratified two-layer heavy fluid, there is less mixing between the layers for flows dominated by the upper layer and for flows dominated by the lower layer. Surprisingly, for the gravity currents produced from a strongly stratified source, mixing of fluids from the two layers can be enhanced when the buoyancy is more evenly distributed between the two layers and such an exceptional observation is successfully explained by the scaling analysis.