



Modelling and simulation of multiphase flows with Immersed Boundary and Volume-of-Fluid methods

Friday, Oct 3, 3:00PM

Abstract: Multiphase flows problems occur in a huge number of technical applications. The modelling and numerical simulation causes different problems. Besides the nature of the flow – dispersed or separated – one has to struggle with different temporal and spatial scales which have to be handled in reasonable simulation times in technical applications. Furthermore, different physical phenomena can be present which finally lead to a coupled multi-physics problem of multiphase flows. Although a lot of work has already been done, there are still some fundamental questions which have to be answered.

• In this talk, two examples of multiphase flows will be discussed:

- The behaviour of droplets due to flow and mechanical vibration in channel flows is described in detail including the interaction of gas and liquid phase. Experimental and numerical results will be presented including volume-of-fluid methods capable of handling contact angle hysteresis
- Immersed boundary methods for the modelling of dispersed multiphase flows including additional potential forces, e.g. adhesion to model filtration, separation processes as well as the impingement of liquid-filled particles on substrates.



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