

## DY 13: Talk D. Lohse

Time: Monday 15:00–15:30

Location: BH-N 334

**Invited Talk**

DY 13.1 Mon 15:00 BH-N 334

**Diffusive Droplet Dynamics in multicomponent fluid systems**

— •DETLEF LOHSE — Physics of Fluids, University of Twente, The Netherlands

Liquid-liquid extraction - the transfer of a solute from one solvent to another - is one of the core processes in chemical technology and analysis. To be able to control & optimize the extraction processes, it is crucial to quantitatively understand the diffusive droplet dynamics in such multicomponent fluid systems. This is essential not only for modern liquid-liquid extraction processes for diagnostics & microanalysis, for droplet microfluidics, or in the paint & coating industry, but on larger scales also in the remediation industry, in chemical technology, or in food processing.

Taking examples from daily life, in this talk I will report on our efforts to come to a quantitative understanding of diffusive droplet dynamics on multiple scales, in order to bridge the gap from modern fluid dynamics to process-technology and colloidal & interfacial science, from nano/microscopic and purely diffusively governed droplets to macroscopic ones and from single droplets to multiple and multi-component droplets.

One of these examples is the evaporation of droplets of ternary mixtures such as the Greek drink Ouzo (a transparent mixture of water, ethanol, and anise oil). The evaporation process can trigger a phase transition and the nucleation of microdroplets of anise oil. We find and explain four life phases of the evaporating ouzo droplet, illustrating the richness of such phenomena.