FLUID MECHANICS TOUR OF THE ALPS

An itinerant seminar series at the heart of Europe

Monday **October 10th 2022**
École normale supérieure, Lyon, France

Tuesday **October 11th 2022**
Laboratoire des Écoulements Géophysiques et Industriels (LEGI), Grenoble, France

Thursday **October 13th 2022**
EPFL Lausanne, Switzerland

Friday **October 14th 2022**
ETH Zürich, Switzerland

Dispersed multiphase Taylor-Couette turbulence: From bubbly drag reduction to catastrophic phase inversion

Taylor-Couette flow has been used for more than a century to test various concepts in physics of fluid dynamics, from linear stability theory to pattern formation to turbulence. In Twente, we built the Twente Turbulent Taylor-Couette facility (T^3C) and demonstrated the transition to the ultimate turbulence regime, with enhanced transport properties. With it, we can achieve Reynolds numbers way beyond 10^6.
In this talk I will show how we employed this facility to elucidate the physics of turbulent bubbly drag reduction and the catastrophic phase inversion from oil droplet immersed in water to water droplets immersed in water. I will also show some corresponding numerical simulations, though for much lower Reynolds numbers.

Prof. **Detlef Lohse**

Physics of Fluids Group, University of Twente, The Netherlands

Chair of Physics of Fluids group, the University of Twente
Member of (American) National Academy of Engineering
Member of the Dutch Academy of Sciences
Member of the German Academy of Sciences

Detlef Lohse studied physics at the Universities of Kiel and Bonn (Germany), and got his PhD at the University of Marburg (1992). He then joined the University of Chicago as postdoc. After his habilitation (Marburg, 1997), he became Chair at University of Twente (Netherlands) in 1998 and built up the Physics of Fluids group. Since 2015 he is Member of the Max Planck Society and of the Max Planck Institute in Göttingen. Lohse's present research interests include turbulence and multiphase flow and micro- and nanofluidics. He does both fundamental and more applied science and combines experimental, theoretical, and numerical methods.