

Droplet Dynamics under Extreme Boundary Conditions: The Collaborative Research Center SFB-TRR 75

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Abstract

Processes involving droplets play a central role in both nature and in engineering applications. While some of these examples and applications can be extremely complex, they can often be well understood in terms of very basic drop dynamic processes, which is also the first step to improvements and/or optimization. The Collaborative Research Center (CRC) SFB-TRR 75 was established in January 2010 to focus on research about such basic drop processes, but in particular on those processes involving extreme boundary conditions, for example, near thermodynamic critical conditions, very low temperatures, under strong electric fields or in situations involving extremely large gradients of boundary conditions.

Researchers from the University of Stuttgart, the Technische Universität Darmstadt and the DLR at Lampoldshausen participate in this CRC, coming from various departments, including Mathematics, Chemistry, Electrical Engineering, Mechanical Engineering and Computer Sciences. The goal is to gain a better physical understanding of the essential processes as a basis for new analytical and numerical descriptions, thereby leading to an improved prediction of large systems in nature or in technical applications. This contribution gives an overview of the projects being pursued at the SFB-TRR 75 and highlights scientific results from the first two years of operation. The main purpose of the paper is to familiarize colleagues with this extensive and dedicated research effort in the area of drop dynamics and to motivate and initiate future collaboration with others in the field.
