



TECHNISCHE
UNIVERSITÄT
DARMSTADT

Dynamics of Fibre-laden Drops

Experiments where solid and fluid mechanics meet (Theses)



Who hasn't noticed strands of hair clumping together after a shower? The cause is a phenomenon called elastocapillarity. Surface tension from water drops exerts forces that deform flexible materials like fibers. Thus, hydrophilic fibers can get coiled inside droplets, a behavior also seen in nature. For example, spiders use micro-drops to enhance the elasticity of their webs. This principle may offer interesting applications in biomimetics, and microelectronics. Furthermore, this effect can be used in industry to produce micro-electronics. In our research, we investigate the fundamental dynamics of fiber-laden droplets.

Currently, there are these topics available:

- **Experimental drop mandalas:** Fiber morphology in hanging drops (*Bachelor/Master*)
- **Bouncing or exploding?** Fiber-laden Leidenfrost drops (*Master*)
- **The wedding experiment** - Does a ring divorce the drop halves? (*Bachelor*)

What we offer you:

- **Hands-on experience** with state-of-the-art equipment and evaluation techniques, including **image processing in Python**
- Interdisciplinary research: **structural and fluid mechanics, and thermodynamics**
- **Shape your own work** on your interests (more experimental or theoretical) with **personalized mentoring**



**Nano- and
Microfluidics**

*Feel free to write me a
mail:*

bauer@nmf.tu-darmstadt.de

*I am looking forward
to hearing from you!*

Lisa

