



Seminar

“IRTG: Soft Matter Science “

Wetting-assisted structure formation and nanofabrication: Beyond Deegan and the coffee-ring stains

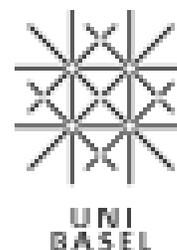
Hamidou Haidara

Institut de Science des Matériaux de Mulhouse- Mulhouse
hamidou.haidara@uha.fr

Wednesday, December 8th, 14h15

“Hörsaal Makromolekulare Chemie”,
Stefan-Meier-Str. 31, Freiburg

You are welcome to meet Hamidou Haidara after the seminar. Do not hesitate to contact Christelle Vergnat (softmattergraduate@physik.uni-freiburg.de) to organize a meeting.

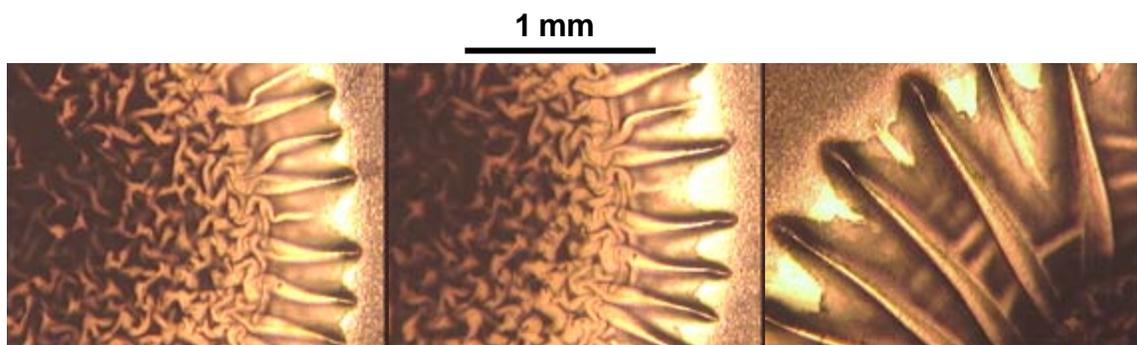


**Wetting-assisted structure formation and nanofabrication:
Beyond Deegan and the coffee-ring stains**

Wetting and capillarity basically cover almost all interface phenomena and have produced, since Young and Laplace the *fundamental tools* to capture their essential features (cell adhesion, lubrication of cornea, capillary transport of fluid in plant, crystallisation, technological coating). This field has also emerged recently as a potential tool for the formation of functional surface structures/patterns, microfabrication and actuation, pushed in that by seek of spontaneous assembly methods and capillary actuation processes for micro-/nano-devices. Although definitely turned toward the emerging nanotechnological applications, both issues (spontaneous assembly and structuration assisted by wetting, capillary-driven motion) require an important fundamental work for understanding the mechanisms, and for the precise control of the processes.

This talk is a contribution to this task. Rather than a professorial course where everything would appear smooth, it is a presentation and discussion based on original works of our group (vs. literature), highlighting some of the mechanisms, and the crucial parameters needed in any theoretical modeling, simulation and phenomenological analysis of these dynamic processes.

A focus on the drying and structure formation of multicomponent fluids (nanofluids, polysaccharide and vesicular solutions) will show how the already known bulk behaviors (various transitions) of these fluids couple to the surface features of the underlying substrate to create patterns of unique richness and aesthetic. Reactive wetting and capillary-driven nanofabrication of millimeter to nanosize objects (ring/nanomembranes) issued from current works in the group will be presented, and the mechanisms discussed.



Wetting-induced wrinkles and fingering gel formed in the drying spot of an ink drop on a formulated-complex-sodium alginate coating, [Langmuir 23, 2007, 9447-9454](#)