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Who:

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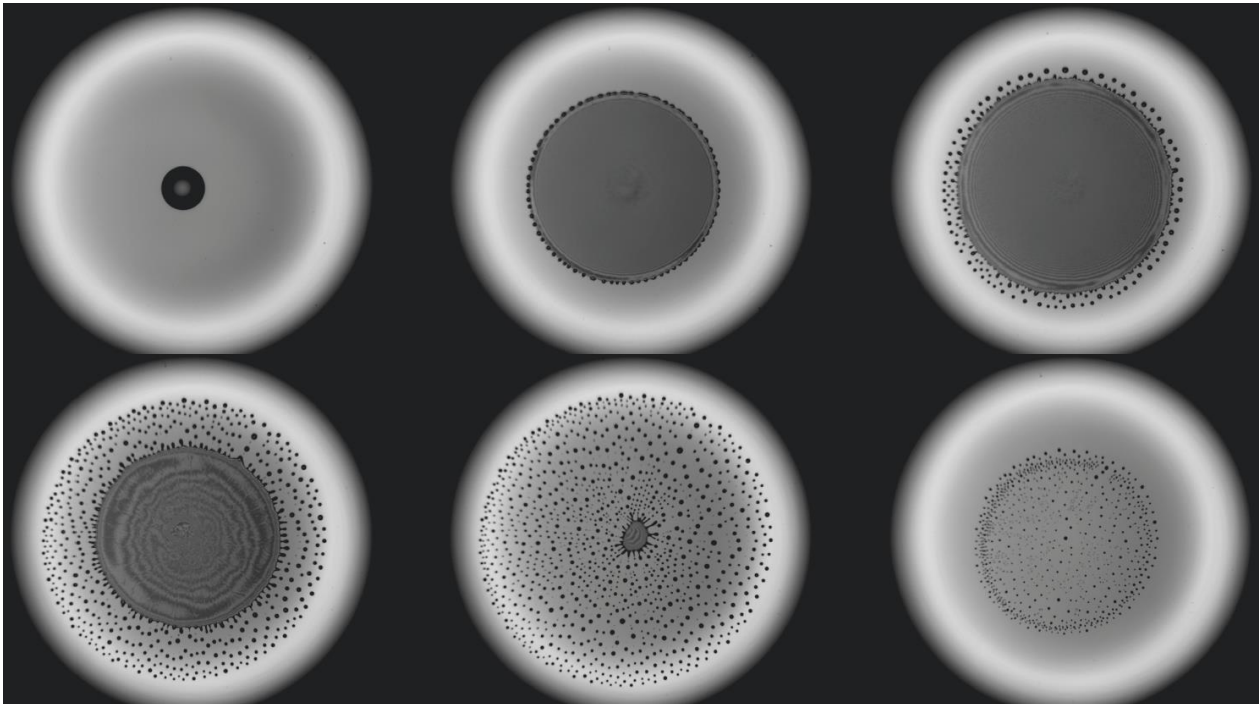
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DROP DYNAMICS ON A LIQUID SUBSTRATE

A rivulet of water flowing on a window leaves a series of droplets behind. This phenomenon involves wetting properties and the growth of instabilities. When a liquid film is deposited on a non-wetted, horizontal substrate, holes may appear, allowing the film to recede. This is the *dewetting* phenomenon, detrimental to various applications such as coating, painting, adhesives and photographic films. Dewetting experiments on solid substrates are numerous, but the substrate roughness or its heterogeneity make their interpretation difficult. We have built experiments on a *liquid* substrate which, under some conditions, yield regular arrays of droplets (see image sequence below).



Top view: the liquid puddle first spreads, then its rim destabilizes, and droplets are emitted during retraction. They later gather in an annulus.

During the internship, the student will measure the spreading dynamics (radius, thickness, rim, velocity field...). The instability during retraction will be characterized. We will also study the regime without instability, which has surprisingly not yet been studied experimentally, although a model appeared recently [1]. The student will have the opportunity to use various techniques of measurement, acquisition and image processing (tensiometry, fast camera, light absorption, interferometry...).

[1] H. Gelderblom, H.A. Stone, and J.H. Snoeijer. Stokes flow in a drop evaporating from a liquid subphase. *Phys. Fluids* **25**, 102102 (2013)

PhD opportunity: The internship can lead to a PhD on similar topics in the group “Liquids and interfaces”.

Type of funding: Ecole doctorale