

Liquid bridge fragmentation

Internship position | MSc 2 or equivalent

Host organisation: SIMaP UMR 5266

Supervisor: Romain VALLON (MCF)

Context

From the formation of spray, sneezing or agricultural irrigation, the fragmentation of liquids is at the heart of many natural and industrial processes. Knowing the size of the resulting droplets is essential for understanding and controlling those processes, for example, to anticipate the spread of airborne diseases or to optimise water use.

Project

The focus is on studying the fragmentation of liquid bridges by performing direct numerical simulations (DNS) using the open-source software Basilisk. The DNS will be computed on the regional HPC cluster Gricad. The objective is to implement a death manifold algorithm so to control the liquid pinch-off and ensure grid converge of the results. Once the grid convergence is ensured, the focus will be given on tracking liquid bridges across the simulation, so to provide the evolution of the velocity profiles in the bridge and the size distribution of the droplets generated by the fragmentation on the bridge.

Requirements

2nd-year MSc or final-year engineering student. A strong knowledge of Fluid Mechanics and solid programming skills (Python-like) are expected. Knowledge of C++ is a plus. Technical English is required. The candidate must have a degree of autonomy.

Starting date, duration and allowance

The internship will start in February 2026 and last up to 26 weeks. Internship allowance will be provided (~660€/mois).

Application

Please send your CV (1 page max.), a motivation letter (1 page max.) and the transcripts of the last two academic years to romain.vallon@grenoble-inp.fr.