



Novel patterns of Faraday instability

Key words: fluid mechanics, surface waves, Faraday instability.

A 3 to 6 months internship position is currently open at the Institute of Physics of Rennes (France). The internship can start as early as January 7th, 2019, but the starting date is flexible.

The project is mostly experimental and follows from the grant funded by CNRS Momentum:

"Self-organization of fluid and solid structures at fluid interfaces at the macroscopic scale".

The Institute of Physics of Rennes covers a wide range of topics in modern physics, and includes an internationally recognized team in soft matter.

Project

In 1831, Michael Faraday discovered that a liquid bath undergoing vertical vibration is unstable to surface waves [1]. The Faraday instability has been studied in domains with rigid boundaries (see for instance [2]) and more recently in domains with flexible boundaries [3]. We will explore exotic patterns of the Faraday instability in novel geometrical configurations (see figure). Techniques for the numerical reconstruction of the liquid surface will be developed to characterize those patterns as a function of control parameters. The possibility of wave-controlled self-assembly and self-organization of floating bodies will be sought.

Working language

French, English or Italian

Salary

Net monthly salary will be about 525€ as prescribed by French law.

Required skills

Expertise in experimental physics, and in setting up and control of experiments through hardware and software (Matlab, Arduino...).

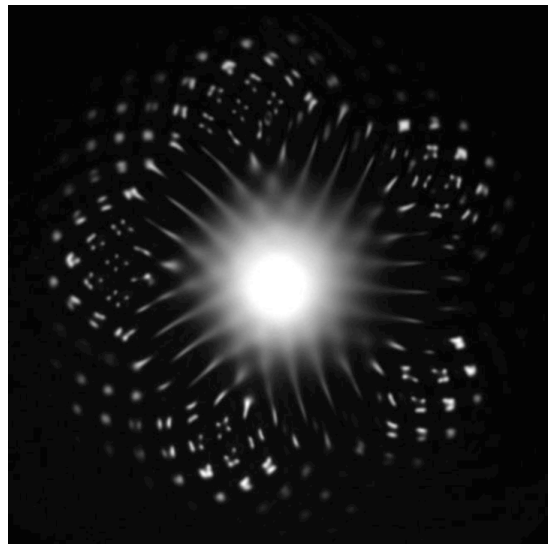


Figure: an exotic pattern of Faraday instability.

Contact: Giuseppe Pucci, giuseppe.pucci@univ-rennes1.fr.

Links: <http://www.gpucci.net>

<http://cnrsinfo.cnrs.fr/intranet/actus/171221-momentum.html>

[1] FARADAY, M. 1831 On the forms and states assumed by fluids in contact with vibrating elastic surfaces. *Phil. Trans. R. Soc. Lond.* 121, 319–340. [2] DOUADY, S. 1990 Experimental study of the Faraday instability. *J. Fluid Mech.* 221, 383–409. [3] PUCCI, G., FORT, E., BEN AMAR, M. & COUDER, Y. 2011 Mutual adaptation of a Faraday instability pattern with its flexible boundaries in floating fluid drops. *Phys. Rev. Lett.* 106, 024503.