SYWG 2 Gentner-Kastler-Preis: Verleihung und Preisträgervortrag

Zeit: Mittwoch 10:00–11:15 Raum: Aula

SYWG 2.1 Mi 10:00 Aula

Preisverleihung Gentner-Kastler-Preis — • —

Hauptvortrag

SYWG 2.2 Mi 10:30 Aula

A particle-wave association on a fluid interface — •Yves Couder — Matières et Systèmes Complexes (Université Paris 7 Denis Diderot) — Laboratoire de Physique Statistique, 24 rue Lhomond, 75231 Paris Cedex 05, France — Träger des Gentner-Kastler-Preises

In many instances in microscopic physics a real particle (e.g. electrons in solids) is "dressed" by waves (e.g. phonons) they generate. Here we introduce a new particle-wave association on a macroscopic scale. We use drops emitting capillary waves as they bounce on an oscillating fluid surface. A drop, can bounce vertically or, by coupling with its own wave, acquire spontaneously a solitary drift motion and become a "walker". Because of their waves interference, these drops have non-local interaction and present various modes of self-organisation. Motionless bouncers form bound-states and crystalline clusters. At larger forcing, the collisions between walkers reveal that their interaction can be either repulsive or attractive, depending on their distance. The attraction leads to the spontaneous formation of orbiting pairs, the possible orbit diameters forming a discrete set. A theoretical model of the non-local interaction resulting from the interferences of the waves will be presented. We will also discuss other experiments demonstrating the dual characteristics of the walkers as mass-like particles or as waves.