

Wave self-organization and build-up of macroscopic eigenstates.

Matthieu Labousse

Gulliver, CNRS, ESPCI & PSL University

Waves and particles are distinct objects at a macroscopic scale. The existence of *walkers*, drops bouncing on a vertically vibrated fluid bath is a surprising case of dual objects at our scale. The drop is self-propelled, piloted by the standing surface waves generated by its previous rebounds. These objects exhibit a rich dynamic relying on the concept of *path memory*.

In this talk, I will give a theoretical understanding of the temporal non local structure of *walkers*. We will explore the dynamics of walkers in a confined situation. I will review some of the most striking that have been experimentally observed so far and rationalize theoretically with classical arguments. Finally, we will discuss potential connections with existing pilot-wave theories.