PHYSICAL MATH SEMINAR

Droplets, Waves, and Active Matter



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ABSTRACT:

Pilot-wave hydrodynamics provides a unique experimental platform for exploring active particles coupled through a self-generated wave field. In this talk, I will describe our efforts to gain greater control over these systems. I will first discuss how capillarity and ligament breakup enable reproducible generation of millimetric droplets before turning to their dynamics on a vibrating bath. I will then introduce a method for controlling droplet motion by superimposing a small periodic rocking motion onto the conventional vertical forcing. By tuning the amplitude, phase, and direction of this rocking, we can exert controlled lateral forces and propel droplets along prescribed trajectories. I will conclude by discussing how these tools may enable controlled studies of many interacting walkers and wave-mediated active matter.

Tuesday, November 9, 2026

2:30 PM - 3:30 PM

Building 2, Room 449

https://math.mit.edu/pms/