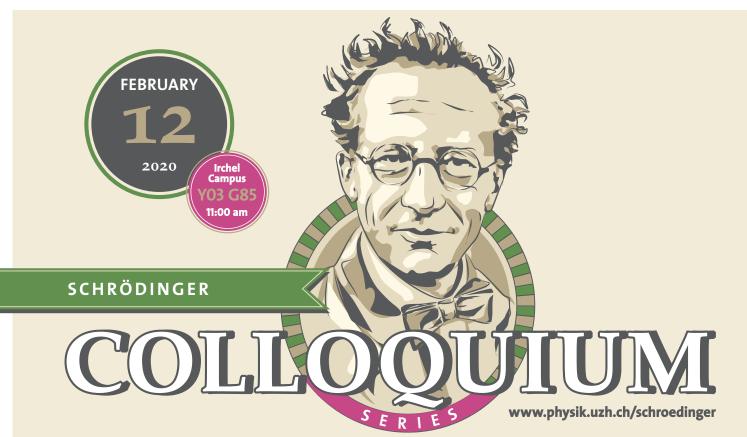


**Faculty of Science** 



## PROF. JOHN BUSH MIT Cambridge Hydrodynamic quantum analogs: droplets walking on the impossible pilot wave

In 2005, Yves Couder and Emmanuel Fort discovered that droplets walking on a vibrating fluid bath exhibit several features previously thought to be exclusive to the microscopic, quantum realm. These walking droplets propel themselves by virtue of a resonant interaction with their own wave field, and so represent the first macroscopic realization of a pilot-wave system of the form proposed for microscopic quantum dynamics by Louis de Broglie in the 1920s. New experimental and theoretical results allow us to rationalize the emergence of quantum-like behavior in this hydrodynamic pilotwave system in a number of settings, and explore its potential and limitations as a quantum analog. A new, trajectory-based description of quantum particles, informed by the hydrodynamic system, is proposed and explored.



A series of special physics colloquia in honor of Erwin Schrödinger, who was a professor at UZH from 1921 – 1927. Lectures are intended for a broad audience from the Faculty of Science, aiming at experts and non-experts.