

Mellon College of Science — Center for Theoretical Science

Guest Lecture: **John Bush, MIT**

Hydrodynamic Quantum Analogs

April 19 at 4:30 p.m.
Wean 7500



Bio: John Bush, professor of applied mathematics and director of the Applied Math Laboratory in the Department of Mathematics at MIT, is a fluid dynamicist and physical mathematician who studies the application of mathematical methods to problems arising in the physical sciences. His research has focused on geophysical and environmental flows and surface tension-driven phenomena and their applications in biology and hydrodynamic quantum analogues.

Abstract: 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 wavefield, 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 pilot-wave system in a number of settings and explore its potential and limitations as a quantum analog.

An informal preparatory talk will be held on
April 18 at 4:30 p.m. in Wean 7500 (with pizza!)