

PHYSICAL MATHEMATICS SEMINAR

Knotted dynamics in light and superfluids

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ABSTRACT:

A knot---a closed loop tangled with itself, which cannot be untangled without cutting the loop---preserves its identity when stretched or rotated. Remarkably, knots in the vortex lines of a dissipationless fluid, or in the magnetic field lines of an infinitely conducting plasma, can stretch and rotate as they evolve but can never untangle, persisting forever. Seeking a better understanding of the persistence of knots, we study if knots can persist in a linear theory such as Maxwell's equations. A consequence of the persistence of knots in dissipationless fluids and plasmas, is an additional conserved quantity: helicity, which has far-reaching implications for the dynamics of fluids and plasmas. We seek to understand if an additional conserved quantity analogous to helicity exists in superfluids since they also flow without dissipation.

TUESDAY, APRIL 10, 2018

2:30 PM

Building 2, Room 136

*Reception following in Building 2, Room 290
(Math Dept. Common Room)*

<http://math.mit.edu/seminars/pms/>