

PHYSICAL MATHEMATICS SEMINAR

Spinning Top-ology

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ABSTRACT:

Geometry, topology and broken symmetry play a powerful role in determining the physics of materials. In this colloquium I will talk of activated materials and fluids built out of mechanically spinning components and show how the subtle interplay of structure, time-reversal and parity leads to ‘odd’ solid and fluid mechanics. In particular, I will discuss a simple kind of active meta-material – coupled gyroscopes – that naturally encodes non-trivial topology in its vibrational spectrum. In particular, I will show how topology can emerge not only in ordered gyro materials but also their amorphous counterparts. We will then foray into activated colloidal gyro fluids and see how breaking symmetry under parity leads to chiral surface states and odd instabilities driven by viscous forces. We will use these chiral waves as a tool to observe the presence of odd (or Hall) viscosity in our chiral fluid.

TUESDAY, NOVEMBER 27, 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/>