

Colloquium Notice

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Hamiltonian structure of 2D fluid dynamics with broken parity

Isotropic fluids in two spatial dimensions can break parity symmetry and sustain transverse stresses which do not lead to dissipation. Corresponding transport coefficients include odd viscosity, odd torque, and odd pressure. In this talk, I will discuss conditions on transport coefficients that correspond to dissipationless and separately to Hamiltonian fluid dynamics. The restriction on the transport coefficients will help identify what kind of hydrodynamics can be obtained by coarse-graining a microscopic Hamiltonian system. Interestingly, not all parity-breaking transport coefficients lead to energy conservation and, generally, the fluid dynamics is energy conserving but not Hamiltonian. I will outline how this dynamics can be realized by imposing a nonholonomic constraint on the Hamiltonian system.

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Monday
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Starts at 12:15 PM
Physics Conference Room, SB B326