

PHYSICAL MATH SEMINAR

Weak turbulence of 2D internal gravity waves



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ABSTRACT:

Our work addresses a **long-standing** problem: describing internal wave turbulence in the ocean from the governing equations.

A **promising** avenue lies in the kinetic approach. But the stratified Euler equations form an anisotropic, non-canonical Hamiltonian system, making the classical wave-turbulence approach inapplicable.

We take a new route: studying the singular limit of vanishing rotation, where rotation acts as a regulator near the curve of zero-frequency slow modes. This regime is both mathematically tractable and oceanographically relevant. In this limit, we derive the turbulent spectrum of 2D weakly interacting internal gravity waves, which matches the celebrated **Garrett–Munk** spectrum known from observations, for the first time from first principles.

TUESDAY, OCTOBER 21, 2025

2:30 PM – 3:30 PM

Building 2, Room 449