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Graduate Center
CUNY, with funds from the Simons Foundation

Where:

CUNY-Graduate Center, 365 5th Ave. Rm. 5209

[and on zoom](#)

When:

10-11:30 on Nov. 10, 16, 17, 30, Dec. 1

with coffee+lunch provided before/after

[please RSVP](#)

Gregory Falkovich
Modern kinetics and turbulence theory

5-lecture mini-course

I. Interacting particles.

1. Quantum kinetic equation and its two limits, Boltzmann and wave kinetics. Liouville equation and derivation of the Boltzmann equation. H-theorem and mutual information.

Stationary solutions (and their entropies).

2. Non-equilibrium solutions and kinetic coefficients: diffusivity and viscosity. Corrections to the Boltzmann equation, resummation of divergences, multi-particle correlations and memory effects.

II Interacting waves

3. Kinetic wave equations and weak turbulence solutions.

4. Validity of kinetic equations for turbulence: corrections, divergences and renormalized kinetic equations.

5. Strong wave turbulence: zero charge (flux-dependent spectra) and confinement (universal spectra).

If time allows: turbulence in incompressible fluids.