METR 5123 ADVANCED ATMOSPHERIC DYNAMICS II
Spring 2009
TR 11:30 - 12:45
National Weather Center, room 5930

Instructor:

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Office hours:

TR 1:00 - 2:30 pm. Extra hours available upon request -- or just drop by and see if I'm free. I'm usually not here much in the mourning, er morning.

Required texts: none

Recommended texts:

Chandrasekhar, S. 1962: *Hydrodynamic and Hydromagnetic Stability*. Dover.
Gill, A. E., 1982: *Atmosphere-Ocean Dynamics*. Academic Press.
Kundu, and Cohen, 2008: *Fluid Mechanics*. Academic Press.
A more extensive list of suggested reading/references will be distributed in class.

Prerequisites:

- METR 5113 (Advanced Atmospheric Dynamics I) or equivalent.
- Working knowledge of advanced calculus, differential equations (odes and pdes)

Grading:

- Mid-term exam @ 30 %
- Class presentation/lecture on baroclinic instability @ 35 %
  OR
  Critical literature review on a topic in dynamics (your choice) @ 35 %
- Final exam @ 35 %

Topics (tentative):

Shallow water theory, Poincare and Kelvin waves, nonlinear steepening, Stokes drift, linear and nonlinear lee waves, WKB approximation, method of stationary phase, solitons, hydraulic jumps and bores, katabatic flows, low-level jets, thermal instability, centrifugal instability, Kelvin-Helmholtz instability, Orr-Sommerfeld equation, Theorems of Squire, Rayleigh and Fjortoft, baroclinic instability.

Note: Any student who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me as soon as possible so that accomodations necessary to ensure full participation and educational opportunity can be made.