Syllabus
AOS 718
Fall 2006

(I) Governing Equations for Deep Convection (4)
   a. Moist thermodynamics
   b. Nonhydrostatic flow, scale analysis

(II) Linear Theory of Unbalanced Flow (6)
   a. Stable flow, vertical structure equation
   b. Effect of latent heating
   c. Forced Unbalanced/Balanced flow (Wave CISK)
   d. Advective and propagating solution modes
   e. Geostrophic Adjustment

(III) Scale Interaction (2)
   a. Reynolds averaging, apparent heat source, sink (Yanai, Esbensen and Chu)
   b. Cumulus parameterization
      i. Kuo
      ii. Arakawa-Schubert
      iii. Betts
      iv. Kain-Fristch

(IV) Outflow Scale Interactions (2)
   a. C-S1 (1) (Emanuel, Seaman, Wolf)
   b. IAKE, anvil interaction
   c. Convection sorting

(V) Potential Vorticity of Deep Convection (2)
   a. Generation of PV
   b. Organization of PV
   c. PV sorting
   d. Interaction of Convection with upper level PV anomaly (1-2)

(VI) MCS dynamics (6)
   a. Unbalanced MCSs
      i. Resonant GWs
      ii. Density Current forcing
      iii. Houze models
   b. Hybrid MCSs
      i. Momentum forcing
      ii. Thermal Forcing
         1. Synoptically forced
         2. Orographic circulations
         3. Land/sea breeze circulations

(VII) Tropical cyclone dynamics (10)
   a. Steady state dynamics of mature system (Carnot Engine) (2)
   b. Role of convection versus Carnot energy sources (.5)
   c. Genesis of TC dynamics (8)
      i. Geostrophic adjustment
      ii. Outflow feedback
      iii. Microphysics
      iv. Hot towers
      v. PV sorting
      vi. Wind shear
      vii. Sea Spray
      viii. Rain Bands
ix. Eye wall maintenance
x. Eye wall replacement