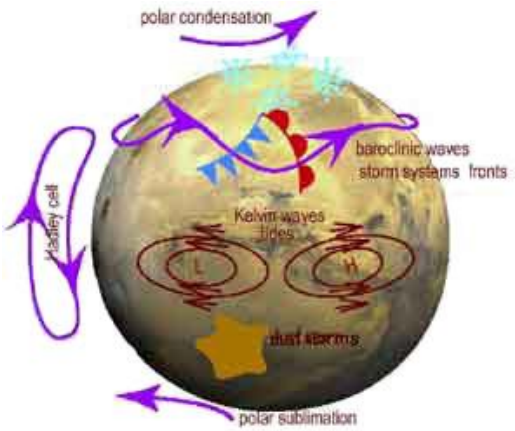
PLANETARY ATMOSPHERES

Objectives: Introduction of observations of planetary atmospheres and dynamics of global atmospheric circulations



Meetings:
Tuesday and Thursday 11:40-12:55, Space Sciences 105

Instructors:
Peter Gierasch, 318 Space Sciences,
pjg10@cornell.edu, 255-8544
Gang Chen, 1115 Bradfield Hall,
gchen@cornell.edu, 255-1503

Schedule

Week 1 (Aug 26)	Observations: compositions, temperatures, circulations
Week 2 (Sep 2)	Vertical structure: homosphere, heterosphere
Week 3 (Sep 9)	Equations of motion
Week 4 (Sep 16)	Hydrostatics, geostrophy, thermal wind
Week 5 (Sep 23)	Planetary examples
Week 6 (Sep 30)	Rossby waves, wave propagation and pseudomomentum
Week 7 (Oct 7)	Quasigeostrophic formalism, topographic forced stationary waves
	Fall break (Oct 11-Oct 14)
Week 8 (Oct 16)	Barotropic and baroclinic instability I: Mars, Earth
Week 9 (Oct 21)	Barotropic and baroclinic instability II: Mars, Earth
	Energetics and Lorenz energy cycle
Week 10 (Oct 28)	Two dimensional flow and inverse cascades: Jupiter and Saturn I
Week 11 (Nov 4)	Two dimensional flow and inverse cascades: Jupiter and Saturn II
Week 12 (Nov 11)	Numerical general circulation modeling I: numerical method
Week 13 (Nov 18)	Numerical general circulation modeling II: computer lab
Week 14 (Oct 25)	Internal gravity waves I: Mars, Venus, Titan
	Thanksgiving (Nov 26-Nov 30)
Week 15 (Dec 2)	Internal gravity waves II: Mars, Venus, Titan

References:
Andrews, An Introduction to Atmospheric Physics, Cambridge U. Press
Holton, An Introduction to Dynamic Meteorology, Academic Press
Ingersoll, Planetary Climates, Princeton U. Press
Lodders and Fegley, The Planetary Scientist's Companion, Oxford U. Press
Vallis, Atmospheric and Oceanic Fluid Dynamics, Cambridge U. Press

Grading:
Problem sets every two weeks or so, mid-term and final examinations.
Grades: 1/3 problem sets, 1/6 mid-term, 1/2 final.