NATS 1111-From the Cosmos to Earth Lab
Fall 2007

The NATS 1111 lab is to be taken concurrently with NATS 1311 – From the Cosmos to the Earth. It consists of seven laboratory experiments and one project to be performed throughout the semester off campus. These experiments are fun, thought provoking, and demonstrate many important concepts from physics and astronomy. We will have labs every other week with a project to be performed at home. There will also be three opportunities to make up missed labs. Labs will not be accepted late without prior arrangements.

The students will learn about the experimental process including measurement techniques, how to make observations and test hypotheses, and deductive reasoning. Some of the experiments involve the use of tools similar to those used by astronomers providing the students with hands-on familiarity with these tools.

INSTRUCTOR:

- **Dr. Phillip C. Anderson 972-883-2875 — Rooms FO2.708D**
  email: phillip.anderson1@utdallas.edu

TEACHING ASSISTANT:

- **Adam Peterson 972-883-2867 — Room FO1.418**
  email: adpete01@hotmail.com

OFFICE HOURS:

- **Dr. Anderson: Tuesday/Thursday 10:00 – 11:00 AM and by appointment**

Grading

Grading will be based on attendance and lab reports. Each lab report will be worth 100 points – missing one will be the equivalent of an entire letter grade.

NATS 1111 - From the Cosmos to Earth Lab
Syllabus - FALL 2006

Experiment

1. Cubes – Learn about deductive reasoning.

2. Measurement and Prediction - Explore the necessity for accurate and reliable data from measurements in order to make predictions. Measure the density of several objects.

3. Conservation of Energy/Momentum - Study laws of conservation of momentum and energy. Determine speed of a ball by 2 different methods. Find percentage difference between the two values of speed.

4. Spectral Lines - Observe and record spectra from several light sources. Become familiar with Kirchhoff's Laws

5. Lenses/Telescope - Study the characteristics of lenses and mirrors. Combine lenses to make a telescope.

6. Pressure of the Atmosphere - Determine the relationship, i.e., the formula, between the pressure and volume of a confined sample of air.

7. Star charts – Learn how to use constellation charts.

Project (choose one):

8a. Sunrise/sunset – Plot the location and time of the sun at sunrise or sunset (once per week).

8b. Moon location/phases - Plot the location and phase of moon over complete synodic month, i. e., from new moon to new moon (every other day).

NATS 1111 - From the Cosmos to Earth Lab
FALL 2007

Schedule

Date	Experiment	Report Due
Aug 21 - 22	1. Cubes	Sept 4 - 5
Sept. 4 - 5	2. Measurement and Prediction	Sept 18 - 19
Sept 18 - 19	3. Conservation of Energy/Momentum	Oct 2 - 3
Sept 25 - 26	Makeup lab	Oct 2 - 3
Oct 2 - 3	4. Spectral Lines	Oct 16 – 17
Oct 16 - 17	5. Lenses/Telescope	Oct 30 – Oct 31
Oct 23 - 24	Makeup lab	Oct 30 – Oct 31
Oct 30 – Oct 31	6. Pressure of Atmosphere	Nov 13 - 14
Nov 13 - 14	7. Star Charts	Nov 27
Project		
Aug 16	8a. Plot of sunrise/sunset	Nov 27
	or	
Aug 16	8b. Plot of Moon phases	Nov 27