

# Physics 130 General Relativity Seminar

## Assignment 9    March 24, 2011

### Part 1: Readings

**Cheng:** Chapter 8-Sections 8.3-8.5 Pages 158-175(Black Holes-Part 2)

**Amanda Peet GR Lectures** - Appropriate pages.

**Other sources** among references on website or books in my office.

### Part 2: Review Questions from Text

1. Cheng: 8-6, 8-8

### Part 3: Everyone Problems

1. Cheng: 8-7 No counter-rotating light is possible in the ergosphere
2. Cheng: 8-8 Circulating light at the horizon
3. Cheng: 8-9 Binding energy of a particle in the ISCO of a rotating black hole

### Part 4: Extra Problems

1. EP #48 - Geodesic Effect \_\_\_\_\_
2. EP #52 - A Charged Black Hole \_\_\_\_\_
3. EP #68 - The Horizon inside a Collapsing Shell \_\_\_\_\_
4. EP #75 - Worm-Hole Metric \_\_\_\_\_
5. EP #76 - Alcubierre Warp-Drive Spacetime \_\_\_\_\_  
See me about horrible calculations.
6. EP #77 - General Relativistic Twins \_\_\_\_\_
7. EP #87 - Meter Stick Near Black Hole \_\_\_\_\_
8. EP #90 - Geometry in a Curved Space \_\_\_\_\_
9. EP #92 - Negative Mass \_\_\_\_\_