

Physics 130 General Relativity Seminar

Assignment 3 February 03, 2011

Part 1: Readings

Cheng: Chapters 4(Principle of Equivalence), 5(Metric Description of Curved Space)

Amanda Peet GR Lectures - Appropriate pages.

Other sources among references on website or book in my office.

Part 2: Review Questions from Text

You must do the readings BEFORE attempting the problems in order to get a good grasp of the overall content of the week's material to be understood. A problem should then make you look more carefully at specific parts of the readings that are necessary for the solution of that particular problem!

Suggested answers in textbook.

Will be discussed first in seminar.

Participation in discussion = 10% Seminar grade.

Any other questions about readings.

1. Review Questions Cheng: 4-3, 4-4, 4-5, 4-6, 4-7
2. Review Questions Cheng: 5-4, 5-5, 5-7, 5-11, 5-12

Part 3: Everyone Problems

Everyone must understand these solutions.

Most solved in back of textbook.

Only look at solutions if completely stumped!

Will be discussed second in seminar.

Random choice of presenter.

Quality/correctness of presentation = 40% Seminar grade.

1. Cheng: 4-1, 4-2, 4-4
2. Cheng: 5-4, 5-5, 5-9
3. EP #81 What is going on?

Part 4: Extra Problems

One seminar member has overall responsibility for each problem.
Solve as many as you can.

Attempting zero beyond your responsibility is NOT an option!

You will not understand solutions without attempting a problem.

Volunteer presenters OK. Never volunteering is NOT an option!

1. Cheng: 4-3 GPS _____
2. Cheng: 5-11 Local Euclidean Coordinates _____
3. Cheng: 12-13 $T^{\mu\nu}$ for a swarm of dust _____
4. Cheng: 12-14 $T^{\mu\nu}$ for the EM field _____
5. Cheng: 12-15 $T^{\mu\nu}$ for EM fields and charges _____
6. Cheng: 12-16 Radiation pressure and energy density _____
7. EP #10 Oblate Spheroidal Coordinates _____
8. EP #11 Uniformly Accelerating Observer _____
9. EP #78 Hollow Ball in a Bucket _____
10. EP #79 Einsteins Birthday Present _____
11. EP #80 Accelerating Pendulum _____