

Physics 130 General Relativity Seminar

Assignment 7 March 3, 2011

Part 1: Readings

Cheng: Chapter 15 (Linearized Theory - Gravitational Waves)

Amanda Peet GR Lectures - Appropriate pages.

Other sources among references on website or books 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. Cheng: 15-3, 15-5, 15-6, 15-9, 15-10

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: 15-4 $\Gamma_{\nu\lambda}^{\mu}$ and $R_{\mu\lambda}^{(2)}$ in the TT gauge
2. Cheng: 15-5 Trace calculation of \tilde{I}_{ij}^{TT}
3. Cheng: 15-6 Derive the relation [15.59]

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 15-1 Gauge Transformations _____
2. Cheng 15-2 The Schwarzschild Solution _____
3. Cheng 15-3 Wave effect via the deviation equation _____
4. EP #55 Gravitational Wave Stuff _____
5. EP #56 Waves from Masses on a Spring _____
6. EP #57 Waves from Accelerating Particle _____
7. EP #58 Waves from Colliding Battleships _____
8. EP #59 Waves from a Cannon _____
9. EP #60 Plane Wave Properties _____