

# Physics 130 General Relativity Seminar

## Assignment 11 April 08, 2013

General topic: **The Einstein Equation**

### Part 1: Readings

**Hartle:** Chap 21 - Section 5 Linearized Gravity

**Hartle:** Chap 22 The Source of Curvature

**Hartle:** Chap 22 Supplement Stress-Energy Tensor for Short-Wavelength, Linearized Gravitational Waves

### Part 2: Problems Hartle Problems

1. Hartle 21.19 Static weak field metric
2. Hartle 21.23 Linearized Riemann curvature
3. Hartle 21.24 Polarized wave
4. Hartle 21.26 Metric perturbation
5. Hartle 22.02 Cube on an inclined plane
6. Hartle 22.03 Law of atmospheres
7. Hartle 22.05 A box of gas at rest
8. Hartle 22.09 Invariance of vacuum energy density
9. Hartle 22.10 Weak energy condition
10. Hartle 22.11 No local gravitational field
11. Hartle 22.12 Symmetry implies conservation
12. Hartle 22.14 Warp drive requires negative energy density
13. Hartle 22.15 Wormholes requires negative energy density