

**SYLLABUS**  
**ASTRONOMY 8700: RELATIVISTIC ASTROPHYSICS**  
**SPRING SEMESTER 2002**

**Instructor:** Prof. Paul J. Wiita

**Timings:** Mondays, Wednesdays (and some Fridays), 1:15 PM – 2:30 PM

**Location:** Room 732, One Park Place

**Office hours:** usually available M 10–noon and Th 11–noon, and by appointment

**Primary Contacts:** 715 1PP      wiita@chara.gsu.edu      (404)651-1367

**Other Contacts:** cell/home in Atlanta (609)638-8334; home in Princeton (609)683-3834

**Prerequisite:** Physics 8100 or equivalent; Astronomy 6000 and/or 8100 are helpful but not necessary.

**Schedule**

Because of Prof. Wiita's travel schedule, this class will meet on a somewhat unorthodox schedule. First, there will be no classes during the first week of the semester because of the American Astronomical Society meeting in Washington, DC which Dr. Wiita and some students will be attending.

Also note that there will be no class on 21 January, Martin Luther King, Jr. Day, that the Spring Break will be the week of 2–10 March, and that the final day of classes will be Monday, 29 April.

In addition, on several weeks we will meet three times, on MWF, and on other weeks we will not meet at all. Please pay careful attention to the exact meeting dates below.

**DATES**

**TOPIC**

Jan. 14, 16	Review of Special Relativity
Jan. 18, 23, 25; Feb. 4	Tensor Formalism for General Relativity
Feb. 6, 8, 11, 13	Einstein Equations
Feb. 18, 20, 22; Mar. 11	Schwarzschild Metric and Classical Tests of GR
Mar. 13, 15	Neutron Stars and Pulsars
Mar. 18	Midterm Exam
Mar. 20, 22	Neutron Stars and Pulsars
Apr. 1, 3, 5, 8	Black Holes and the Kerr Metric
Apr. 10, 12; 22, 24	Gravitational Radiation
Apr. 26, 29;	Introduction to Relativistic Cosmology
May. 1	Final Exam Due by 2:30 PM

*Required text:*

1) Ray D’Inverno, **Introducing Einstein’s Relativity**, (Oxford U.P.) (paperback).

*Recommended text:*

2) Stuart L. Shapiro & Saul A. Teukolsky, **Black Holes, White Dwarfs & Neutron Stars** (Wiley Interscience)

Other books you might wish to look at to get alternative presentations of some of the material include Hans Stephani’s, “General Relativity”, Steven Weinberg’s, “Gravitation and Cosmology”, and Hans Ohanian and Remo Ruffini’s “Gravitation and Spacetime”.

**Grades:** will be based  $\approx 40\%$  on assignments,  $\approx 30\%$  on an in-class mid-term (closed book) and  $\approx 30\%$  on a take-home final. You can expect one assignment to be due every two or three weeks.

All students are expected to understand and abide by the University Policy on Academic Honesty. In particular, no collaboration on any assignment is permissible unless I explicitly say otherwise in a particular case. All questions are to be directed to me.

This syllabus may be revised if necessary.