

IGPG policy on graduate comprehensive exams

Physics students advised by the core gravity faculty must demonstrate a mastery of general relativity and of their particular subfield (quantum gravity, etc.) before taking the departmental comprehensive exam.

The comprehensive exam (see Section 3.2.9 of the Physics graduate handbook) is a 30-minute seminar on the student's research plus 30 minutes of questions on the student's research and is conducted by the thesis committee. Research is the sole subject of the exam.

Before scheduling the comprehensive exam with the thesis committee, the student must pass an oral exam which tests broader knowledge of gravity and the student's whole subfield, not just the specific research topic. This gravity exam is conducted by the student's advisor and one or two other core gravity faculty, one of whom must specialize in another subfield. All examiners must be satisfied with the student's broader knowledge, based on questions drawn from the following core reading list:

- All students: Chapters 1–6 of the textbook *General Relativity* by R. M. Wald or all but Chapter 9 of the textbook *Spacetime and Geometry: An Introduction to General Relativity* by Sean M. Carroll
- Quantum gravity: Chapters 1–8 of the textbook *An Introduction to Quantum Field Theory* by M. E. Peskin and D. V. Schroeder
- Numerical relativity: The article “Numerical Relativity and Compact Binaries” by T. Baumgarte and S. L. Shapiro, *Physics Reports* vol. 376, p. 41 (2003)
- Gravitational waves: Sections 9.1–9.4 of the chapter “Gravitational Radiation” by K. S. Thorne in the book *300 Years of Gravitation*, edited by S. W. Hawking and W. Israel, and the article “An Overview of Gravitational-wave Sources” by C. Cutler and K. S. Thorne, gr-qc/0204090

The graduate school requires three weeks notice to schedule a comprehensive exam (and in practice most faculty require even more notice). Since the student cannot schedule the comprehensive exam with the full committee until the gravity exam has been passed, the student should schedule the gravity exam as early in the semester as possible. The semester will normally be the one following completion of PHYS 510.