Date: April 26, 2001

To: Graduate students and faculty, Department of Physics and Astronomy

From: Nancy Morrison, Chair, Graduate Committee

Re: Ph.D. Qualifying Exam: The New System

Preamble: On Monday, April 2, 2001, the department faculty approved the following revision to the structure of the Ph. D. qualifying examination.

The intentions of the new structure, as compared to the old system, are to: allow well-prepared students to move through the program more quickly; better identify under-prepared students needing study at the 5000 level; identify terminal M. S. students within three semesters, perhaps allowing graduation after two years of study; and allow more time for under-prepared students to attain a high standard of preparation before they are examined on Ph. D.-level physics.

Definitions: The new qualifying exam will consist of two parts as follows. Part I will be a written exam covering all of undergraduate physics at the 3000 and beginning 4000 level. It will be required of all students on entering the program and will serve as a placement exam as well as a qualifier. Part II, given after one year of study, will be at the advanced undergraduate level (4000/5000), cover mechanics, quantum mechanics, and E&M, and have written and oral components.

The purpose of Part II is to decide whether students have the grasp of basic physics that is needed for successful completion of a Ph. D. thesis. It is not intended to be a comprehensive physics exam. Although the specific content will be determined by the exam committee, a typical content will consist of: problems in Lagrangian mechanics; boundary-value problems in E&M; problems in 3-dimensional quantum mechanics; and angular momentum problems in quantum mechanics. The point here is not this specific content, but rather that there will be a well-defined content covering only the core physics that all students will be taking during their first year.

Procedure: Both parts of the written exam will be offered each fall on the weekend before classes start. Part I will be given one day, the written component of part II the next day, and the oral component of Part II the following week. Students will be allowed two attempts to pass each part.

In length and faculty effort involved, the exams will be comparable to the current qualifier; however, at any time, Parts I and II will not necessarily be taken by the same students. Students taking Part I will be entering students and those who failed it the previous year, while most students taking Part II in the fall will be students who have been in the program for one year.
A repeat offering of Part II will be made at the beginning of the spring semester if needed. Students who do not pass Part II in the fall may be allowed to repeat it, but no later than the next semester’s repeat offering. Students will be invited to make a “free” attempt of Part II at entry that will not be counted as one of the two allowed attempts. The free attempt will give students experience with the level of questions (both written and oral) that they must answer. Furthermore, advanced students should pass both parts at this time and thereby be able to begin research immediately. They would be required to take the Comprehensive not more than two years later.

Students whose highest goal is the M. S. will be asked to take Part I for placement purposes but will not have to take Part II. For students who enter in January, the exams will be delayed by one semester relative to their arrival. In other words, they will be examined along with students who enter the following August and will thereby obtain an equal opportunity to take two-semester course sequences. Other unusual circumstances will be treated on a case-by-case basis.

**Transition plan:** Students who have already passed the qualifying exam are unaffected by this change, while students who will enter the program in August 2001 will proceed on the new system. Students who entered in January 2001 will also be asked to proceed on the new system. Students who are in transition, and who will all be treated the same way except for the question of repeating the exam, include students who:

(a) obtained a ‘B’ pass in January 2001 or  
(b) petitioned out of the exam in January 2001 or  
(c) entered the program in August 2000

According to the usual principles of fairness, such students ought to be offered the option of continuing under the rules that were in effect when they entered the program. Therefore, they are offered the following options.

1. Take the old-style qualifying exam in January 2002 with one retake (if applicable) in January 2003, or

2. Take both parts of the new-style exam in August 2001 with a retake of both parts, if applicable, in January 2002. Next year will be the only year in which a retake of Part I will be offered in January. Otherwise, it will be offered only in late August. The reason for the accelerated schedule is that these students will already have been in the program for a year or more when they begin the new system. They will have the corresponding additional preparation, and we want to avoid having them stay in limbo for a long time.

Retakes will not be available to students in category (a) above. Retakes will or will not be available to students in category (b) according to the terms on which their petitions were accepted.