

Information for University Reaccreditation
Reponse of the Department of Astronomy
PhD Outcomes Assessment
February 2005

1. What are the primary goals of your program?

The primary goal of our program is to produce professional astronomers, equipped to advance the frontiers of our discipline in a variety of settings ranging from federal or international observatories, research centers, and private observatories to colleges and universities, and able to communicate the results of astronomical research, as well as science in general, to students and to members of the public. We do not subscribe to the currently fashionable notion that training for a PhD in Astronomy should include training in management, accounting, group dynamics, IT services, or other skills in which our faculty are not expert. During the course of PhD research, these and other activities may impinge on student consciousness, and we do not attempt to shield them from real-world issues that they might one day face as professional astronomers. We also do not forbid students from taking courses and/or directing a modest portion of their energies to formal training for such activities. However, our primary goal is to train astronomers; the small fraction of our graduates who ultimately pursue other careers apparently find this training of use in other pursuits.

2. What methods of assessment do you use?

Assessment begins the first week new students arrive; all are given an assessment exercise that, along with an examination of their transcripts and GRE scores, provides us with grounds for advising their course choices in the first two years (e.g., whether or not remediation in physics or mathematics is necessary).

During the first month at Columbia, students are required to select a first-year research project and faculty mentor. The DGS queries each student during the first week of October to assure that this requirement has been met. During the first week of May, *ad hoc* committees of three faculty members meet with each first- (and second-) year student to assess progress on the research project and to hear a plan for completion of the project during the upcoming summer. A brief written report from each Committee to the DGS is digested and passed on to the student. In September, the student must present both a written and an oral presentation of his/her research to the three-member committee. A written assessment of the work, along with advice for the coming year is communicated to each student. The same process is reiterated in the second year. In addition, throughout

the first two years, each student is registered for a research seminar which meets weekly and allows for ongoing assessment of student progress.

All students must take five required core courses, usually during their first two years, although we strongly discourage students from taking more than two courses per semester so that they can devote an appropriate amount of time to research. Assessment in these courses is done through formal exams (in class or take-home).

In May of each year, a Faculty Meeting is held to assess all students' progress toward the degree; problematic cases are discussed at other Faculty Meetings during the year as warranted.

In the third year, students are required to present a written and oral description of their dissertation project to a three-person faculty committee chosen by the student in consultation with the DGS. This committee subsequently meets every six months for an informal discussion with the student about his/her progress; this is followed by a meeting without the student present in which the committee provides recommendations for the advisor and DGS to communicate to the student.

Upon completion of the dissertation, a standard University defense is held in which three Departmental faculty and two outside experts provide written and oral critiques of the dissertation and require (usually minor) revisions before deposit.

All students in the program are required to teach four semesters. Normally the teaching assignment consists of leading a twelve-student section of a laboratory for an introductory course for non-science majors. Student evaluations are required, and are reviewed by the Chair and the students themselves.

3. Application of assessment outcomes

We maintain a public record on our website of program outcomes with both statistical data for the last twelve years on the number of applications, number of students accepted, number of students completing various degrees, time-to-degree, etc., as well as job placement for all students individually for the past fifteen years. While this information is obviously of value to prospective students, it also provides the faculty with hard data as a basis for discussion of changes to the program.