Astronomy

A department in the College of Natural Sciences offering the B.A., B.S., M.S. and Ph.D. in Astronomy.

The Review Process

This was a standard AQAD review. Reviewers were:

Jack Burns, Chair (University of Colorado, Boulder)
Henry Ferguson (Space Telescope Institute, Baltimore)
Jay Gallagher (University of Wisconsin, Madison)
Douglas Richstone (University of Michigan, Ann Arbor)

Main Issues

The visiting team strongly praised the Astronomy department in the areas of teaching and scholarship, and service to the University. The reviewers noted numerous strengths of the faculty, including their combined level of grant funding and publications record, as well as the department's two distinguished research groups (instrumentation and theory). The reviewers also highlighted two "potential" areas of strength: the Large Millimeter Telescope (for bolstering the department's research) and the Five College Astronomy Department (FCAD), a cooperative teaching arrangement with Amherst, Hampshire, Mount Holyoke, and Smith Colleges. The graduate and undergraduate programs, as well as the environment for postdoctoral fellows, were all judged positively by the team. Physical space for the department was also considered to be satisfactory.

The reviewers expressed concerns in several areas. They stated that the LMT's future may be precarious, due to reductions in staff support, an uncertain future for funding, and a weak structure of cooperation with partners in Mexico, the site of the telescope. The reviewers critiqued logistical aspects of the FCAD and undergraduate programs, citing lack of adequate communication about opportunities and course offerings, and a "cumbersome and confusing" registration process. They also voiced concern over the reduction in Five Colleges funding and in faculty numbers. The reviewers reported that graduate students requested a greater degree of guidance in several areas, including their academic progress and development as teachers; this was coupled with the request for more departmental communication generally, including an enhanced orientation. The team also remarked that the recruitment of top graduate students was being hampered by lower than average TA stipends. Affecting both undergraduate and graduate students, inadequate communication and collaboration between Astronomy and the Physics department results in "missed opportunities" within the curriculum in some cases, and needless redundancy in others. Finally, the reviewers observed a lack of adequate office staffing for the department, especially insofar as the staff must provide support both to academic matters and to the telescope construction project.

The reviewers offered a number of specific recommendations:

- The team strongly urged the campus administration to commission an external review of the LMT project to fully assess the feasibility and requirements for successful

implementation. If the review is successful, the University should either commit to provide a portion of the financial support for the project on a continuing basis, or seek additional partners to provide such funding.

- Work with other departments (Chemistry, Mathematics, Physics) to take advantage of the Research Cluster faculty hiring initiative. The reviewers also noted that appointments in planetary science, exoplanets or astrobiology could be appealing for collaborative arrangements with the Commonwealth Honors College.

- Increase funding for departmental colloquia, raising their profile from a regional to national level, which could lead to enhanced recruiting of graduate students and a variety of networking opportunities.

- Hire an additional departmental support staff position to avert a potential "catastrophic problem" in the event of any losses of current staff.

- Hold an FCAD retreat to "re-envision and re-energize the program." The retreat should entail the participation of senior administration of each institution including Five Colleges, Inc. as well as the academic faculties. Participants should discuss strategies for use of grant funds and faculty hires, and ways of improving the academic programs.

- Institute improvements in the graduate program, including increased stipends, more structured orientation and clearer guidelines. Target the recruitment of graduate students who wish to focus on theory, in part through utilizing extant networks (Mexican institutions, the Five Colleges, "feeder" departments, and colloquium speakers).

- Improve communication with the Physics department through formation of a standing committee in charge of maintaining productive relations.

Results of the Review

The Dean reported that the team's recommendations were being taken seriously at both the departmental and College levels. The Dean noted that "the primary research emphasis will continue to be the LMT. The open question is whether we are prepared to operate it." The Dean concurred with the recommendation of the review team that the campus "should take some ownership of the project at an institutional level," and also agreed that "the time has clearly come for the University to commission an external comprehensive review of the project. … Now would be the appropriate time for the University to pull together a comprehensive look at its commitments to the project moving forward."

The Dean reported actions responding to other recommendations of the team:

- Support for a retreat involving FCAD faculty to improve communication among faculty, students and administrators.

- Support for reducing impediments to Five College course registration.

- College leadership to facilitate better coordination between the Astronomy Department and the Physics Department.

- An offer on the part of the College to match any departmental increases in graduate student stipends up to a total of $2000.

■ Outcomes Assessment

The Astronomy department has developed a set of common student learning objectives for its undergraduate program. In 2009, the Department reported that it was developing methods for direct assessment of these objectives, including having the Undergraduate Curriculum Committee score a sample of student work. It was also planning to implement an in-house senior survey to ascertain students' perceptions of the strengths and weaknesses of the program.