

June 4, 2001

JOHN B. SIMPSON
Campus Provost and Executive Vice Chancellor

RE: Astronomy and Astrophysics External Review Closure Report

Dear John,

The most recent Astronomy and Astrophysics Department external review was conducted on May 31 and June 1, 2000, and the subsequent closure meeting was convened April 23, 2001. Closure meeting participants were Astronomy Chair Stan Woosley, Natural Sciences Dean David Klinger, Vice Provost and Graduate Dean Frank Talamantes, Committee on Educational Policy (CEP) representative Richard Hughey, Graduate Council (GC) representative Martine Schlag, Committee on Planning and Budget representative (CPB) Barry Bowman, Senior Analyst Betsy Moses, and myself. Academic senate reports were available prior to the closure meeting.

The External Review Team (ERT) reports that Astronomy and Astrophysics continues its commendable historical position as one of the top programs in the nation. Faculty collaborations with University of California Lick Observatory scientists are cohesive and strengthen graduate instruction and research productivity. Specific areas of projected faculty growth identified in department preliminary plans were endorsed by the ERT to broaden the department; build on current strengths; and develop at the borders with Physics and Earth Sciences. The range of growth FTE, their pacing, and configuration with UCO appointments will emerge with current campus long-range planning efforts. There was general consensus among the department, division, and CPB that the ERT's strong endorsement for expansion is justified and the campus should sustain support to ensure continued excellence. Future changes in the discipline and the prospect of participating in the California Extremely Large Telescope (CELT) project justify strengthening campus investments in one of its finest programs.

Issues raised by the review team and subsequent department, division and senate responses focused on the graduate program and campus-wide problems related to the regional high housing market and cost of living. The closure meeting discussion was organized into four categories:

- 1) Role of the Department with UC Lick Observatory
- 2) Graduate Program
- 3) Undergraduate Program
- 4) Resources/Administration

Role of the Department with UC Lick Observatory

The Astronomy and Astrophysics Department partnership with the Lick Observatory is as old as the Santa Cruz campus. The Lick Observatory was established in the 1880's and has been part of the University of California since 1888. Lick observatory staff are UC funded through the University of California Observatories (UCO), an organized research unit including UC's component of the Keck Observatory. The two organizations share supervision of doctoral students, department support staff, and instructional workload. Lick Observatory staff teach one course annually; department-based faculty teach three courses. Lick Observatory staff salaries are paid 80% UCO and 20% UCSC. The current division is fourteen Lick Observatory staff and eight department faculty.

The ERT noted that the long-standing shared governance and a collegial style are particularly remarkable and not often present in comparable organizations. This atypical institutional structure works well, as demonstrated through faculty productivity, consistent national rankings, and department attractiveness to outside postdocs. Reviews of the research center are regularly conducted through UCO separate from UCSC's academic program external review.

Graduate Program

The doctoral program was established in 1966, one year after UCSC's founding, and greatly enabled by the already established strength and resources of Lick Observatory. Despite a long history of excellence and generous (compared to other departments) student support packages, only one new graduate student entered the program Fall 2000. Intense competition from top private institutions with generous support packages and extremely high local housing costs strain the program's capacity to recruit the best students. Department strategies to improve competitiveness are limited by regional economic issues and systemwide low salary scales. The ERT recommendation, confirmed by the Graduate Council, of raising GSR pay scales to step 6 and assurance of full-time summer support will be implemented. However, it was recognized that balancing higher GSR support with the lower TA salary scale is problematic and reduces student incentives to serve as Teaching Assistants.

Atypically long time-to-degree was noted by the ERT and was also an issue raised in the 1993 external review. Five to six years is considered the discipline's average; the program average currently exceeds six years. Discussion raised the interesting comment that while limiting time to degree benefits the university, students and their research productivity are sometimes well-served by extended residence. The department intends to follow the ERT recommendation to establish a Thesis Advisory Committee to more closely follow students' progress.

Recent revisions in the graduate curriculum, particularly the implementation of a preliminary exam, need further experience to interpret the outcomes. Department faculty are following up with recommendations made by the ERT.

Undergraduate Program

Astronomy and Astrophysics were commended for providing a number of lower division undergraduate courses targeted to non-science majors. The department currently offers a doctoral program and an astrophysics minor. An Astrophysics B.S. degree was proposed this year by the Physics Department in partnership with Astronomy and Astrophysics. This major was

encouraged by the 1993 external review and developed this year as an interdisciplinary collaboration.

The proposed major includes a new observational laboratory course offered by Astronomy and Astrophysics and requires construction of an on-campus optical observatory telescope. This pending program will further integrate undergraduates with existing large and excellent research activities.

The Astronomy and Astrophysics workload ratio has gradually increased and exceeded the Natural Sciences division average the last two years, a noticeable achievement for a research-focused department without an undergraduate major.

Teaching Assistant support was identified by the department as an underfunded need that affects the quality of undergraduate courses and which overextends instructors. While overall resource issues will be addressed below, the department is encouraged by CEP to consider adding undergraduate tutors as enrollments grow. If TA resources increase, the department must still attract qualified graduate students to the available lower funded TA positions while balancing overall student support.

Resources/Administration

The ERT remarked that "the task of chairing the Astronomy department has become one that no rational person chooses gladly." The chair routinely donates \$7,000 in salary support to supplement the department's budget, a practice unlikely to be followed by subsequent chairs. The department notes that their operational budget has not changed significantly in ten years while undergraduate enrollments have grown and technology costs have increased. The dean agrees that operating resources are problematic and his preliminary analysis indicates that the needs of Astronomy and Astrophysics are justified.

Considerable discussion was devoted to the department's technology needs. The department purchases specialized technical support services from UCO for shared computer access, security, and discipline-specific software. The annual charge consumes most of the department's operational funding although it covers all instructional computer access for faculty, students, and Teaching Assistants. Computing resources are shared with UCO staff. The only difficulty identified with this arrangement is that their cost contributes to the overextension of department support funds. Given campus problems in recruiting and retaining skilled technical staff, contracting with an established University research partner appears reasonable and cost efficient. The department's specialized needs should not preclude it from receiving operational resource allocations sufficient to support faculty and students at a comparable level with other natural sciences units.

UCO Lick contributes resources to the department and division through teaching, opportunity funds, and faculty grant administration. The newly funded NSF Science and Technology Center in Adaptive Optics reports to the UCO Director and promises additional linkages with astronomy.

Summary

The outstanding collegial partnership between UCO and Astronomy and Astrophysics has produced exemplary research and instructional programs. It is important that the collaboration continues; care must be taken to prevent unnecessary division over relatively minor support issues. The department's high ranking can be sustained by careful attention to moderate faculty growth and the broadening of fields. This will also contribute staffing for the CELT project, anticipated as a collaboration with the California Institute of Technology. The proposed undergraduate major promises to generate sufficient enrollments to support Astronomy and Astrophysics ambitions in our current period of rapid campus growth. The very positive external review should position the department well in campus current long-range academic planning.

The Astronomy and Astrophysics final academic plan will be submitted with the Natural Sciences Division comprehensive plan December 2001. Progress on operational issues can be reported in the program's external review twelve to eighteen-month follow-up report. I am asking Dean Kliger to provide responses to the attached questions no later than December 1, 2002.

Sincerely,



George Brown
Vice Provost for Academic Affairs

Attachment

cc: Graduate Council Chair Belanger
Academic Planning Director Dettman ✓
CEP Chair Freeman
VPDUE Goff
Chancellor Greenwood
CPB Chair Hay
Natural Sciences Dean Kliger
UCO/Lick Director Miller
Senior Analyst Moses
VPGD Talamantes
Astronomy Chair Woosley

Astronomy and Astrophysics

Eighteen Month Follow-Up Questions

Please submit no later than December 1, 2002.

Graduate Program

1. What strategies were attempted to increase graduate student support and improve competitiveness?

Were GSR pay scales raised to step 6?

Was the Fall 2001 entering cohort larger than Fall 2000?

Are the entering students of comparable quality to the previous years?

2. Was the ERT recommendation to establish a Thesis Advisory Committee followed?

3. Has the doctoral preliminary exam level of difficulty stabilized?

Do faculty contribute equally in providing appropriate questions?

Undergraduate Program

1. Was the undergraduate Astrophysics major approved?

If so, what are the early indications of student demand?

2. What is the department's Teaching Assistant allocation policy?

Have departmental TA Resources changed since the external review?

3. What is the Natural Sciences Division TA allocation policy?

Resources/Administration

1. Have department staffing resources changed?

How do current staff resources compare per headcount faculty and graduate student to other Natural Sciences departments?

2. What is the result of the division's comprehensive staffing analysis for Astronomy and Astrophysics?

3. Have department operational/technical support resources changed?

How do Astronomy's current operational/technical resources compare to other Natural Sciences departments?