

**CALIFORNIA STATE UNIVERSITY, FULLERTON**

**PROGRAM REVIEW**

**Department of Physics**

**EXTERNAL REVIEW COMMITTEE MEMBERS**

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## EXECUTIVE SUMMARY

The Department of Physics has by multiple measures improved over the last five years. Over that period, 1) the number of full time equivalent students served has increased dramatically to 424 requiring 70 introductory laboratories taught (as compared to ~40 historically), 2) extramural funding and research activity has grown, 3) the number of physics majors has doubled to over 100 undergraduates and 20 masters candidates and 4) the number of faculty has grown to a current total of 13 (4 female). The committee noted an extremely strong interaction between students and faculty, facilitated in part by well-designed use of limited space. The current chair has provided excellent leadership through this period of growth, particularly impressive with only a 9-month appointment.

The department has a diverse research expertise, including individual efforts in condensed matter theory, fiber- and quantum-optical science, general relativity, and observational astronomy. In addition, the department has developed strong team efforts in the areas of atomic/molecular physics, gravitational-wave astronomy, and physics education research. The recent hires following a clear strategic plan have greatly strengthened existing research areas and show excellent promise for high quality research activity for long term. The committee finds that the department is well balanced with a reasonable composition of research and teaching expertise to fulfill its current mission within the University, considering the additional possibility of growth by ~3 faculty and the addition of an astronomy major. The committee also recognizes the Department's vital role in the workforce pipeline of a growing STEM economy.

## CONCERNS

The committee is aware of the resource challenges faced by University administration, particularly in the areas of space, service personnel, startup funding and tenure-track positions. Within that context, we find the following concerns should be addressed:

- There are currently two technical staff in the Department, whose roles can be defined broadly as 1) an undergraduate laboratory coordinator and 2) a service course demonstration coordinator. However, they perform substantially more functions including computer technical support for the Department, purchasing for research groups, and maintaining/developing teaching experiments for the undergraduate majors laboratories.
- The Department Chair currently holds a 9-month appointment only. It is the committee's understanding that Physics has the only chair in the College without a 12-month appointment, which is clearly warranted in light of recent growth and success.
- Physical space for offices/laboratories for new faculty is inadequate. Similarly, space is missing for students teaching assistants and performing thesis work. Even though the Department is flourishing and growing, the space in which it is housed hasn't grown commensurately. If the department undergoes further expansion (by ~3 faculty) to incorporate an astronomy major, the space situation will become untenable.
- The committee understands that the operational expenses (OEE) has not grown to accommodate the increased activity and productivity of the Department, with baseline OEE remaining fixed for ~6 years.

- Experimental physics (for both teaching and research) requires the capacity to build instrumentation in house, yet the Department's machine shop access is severely limited, causing a *critical* bottleneck in productivity.
- Some faculty indicated limited access to research journals. Considering the high research activity level in the Department, this should be addressed.

### **RECOMMENDATIONS**

With the above concerns in mind, the committee makes the following recommendations:

- Hire 1 additional technical staff to support the instructional and research needs of the Department.
- Convert the existing Department Chair appointment to a 12-month position.
- Provide additional space for instruction and research that is commensurate with the current and future scope of the Department.
- Fully support the operational budget (OEE) of the Department so that non-fixed resources such as indirect cost recovery and gift funds (e.g. Dan Black) can be appropriately reinvested into further developing the missions of teaching and research, particularly demonstration/instructional equipment and faculty research startups.
- Immediately solve the problem of machine shop access through a meeting with the Deans of both Colleges involved, appropriate faculty, and machine shop personnel.
- Consider further growth in the Department with the addition of an astronomy major. The increased number of student majors can be well absorbed by a growth in the tenure and tenure track faculty, particularly because of overlap with existing courses.