Physics Department Action Plan

The Faculty and Staff of the Department of Physics appreciate very much the recommendations made by the review panel. Following these recommendations, we plan to take the following actions:

- Rename the department to **Department of Physics and Astronomy** as soon as possible. A formal request has been made to the administration recently. The main reasons for this name change are the following: a) The name “**Department of Physics and Astronomy**” can better reflect the identity and functions of the department. Besides teaching astronomy and astrophysics courses, more than half of the department faculty members, postdocs and graduate students are doing research in areas closely related to astronomy and astrophysics. b) We will offer a minor very soon and hopefully a major in a few years in astronomy. c) Nationally, on most university campuses it is a common practice to have a joint Department of Physics and Astronomy as the two fields have become inter-dependent. The name Department of Physics and Astronomy will also help us advertise and recruit more undergraduate and graduate students to the department. It may also help us in applying both educational and research grants from NASA and other external funding agencies. A proposal to NASA was recently submitted. Another one is under preparation. We are also in the process of preparing a REU/NSF proposal on Astronomy and Astrophysics to host about 10 students each summer at TAMUC.

- Start offering a minor in Astronomy as soon as possible
  The minor in astronomy is especially suitable for students majoring in arts, humanities and social sciences to get a natural science minor that does not require as much deep and extensive math skills as most of other natural science minors. It will allow the department to take the full advantage of the state-of-the-art planetarium, its excellent staff members and the newly built astronomy observatory in south Commerce by highway 50. The two astronomy classes (Astronomy 101 and 102) have grown from about 50 in 2005 to totally 126 in Spring 2009. Some of these students have requested more astronomy and/or astrophysics courses and expressed interests in getting a minor in Astronomy if available. The department has already submitted the degree plan for a minor in Astronomy. We have submitted new course proposals on
    1) Archaeoastronomy, 2) Observational Astronomy and 3) Introduction to Astrophysics. In particular, the Archaeoastronomy will be part of a University Study cluster to be taught together with history, archaeology, science fiction, and possibly other social
science and/or literature. This is a new effort in combining some social and natural science courses to make our courses more interesting to a broader student population.

- While strengthening our BS and MS Physics programs are our first priority, we will also use our strength to better serve other strong programs on campus more efficiently. We identified Science Education, Music and Videogame Design as the most important areas where the Department can make a stronger impact and more contributions. At present, the department offers Integrated Science 351, 352 and 451 to pre-service and in-service science teachers. In Spring 2009, totally 322 students are enrolled in these courses. Besides better serving the College of Education, we shall try to get some of these students into our science education reach activities. The department is currently in the process of hiring a tenure-track assistant professor in science education. We will collaborate with the faculty in the College of Education to apply more aggressively external research grants in science education, such as NSF’s GK-12 program, Department of Education’s McNair program, and the recently announced American Recovery and Reinvest programs. TAMUC has an outstanding music program. We can help make the program better known nationally by offering the course: Acoustics for Musicians. It is a course currently not offered at TAMU-Commerce. We were also requested by the Department of Music to offer this course. A proposal to teach this course has been submitted recently. We will also strengthen our longstanding productive collaborations with the Department of Computer Science and Industrial Engineering. Besides the existing cross-listed courses, we will continue testing and improving the Video Game Design course. It was first offered in Summer, 2008. We plan to offer it in regular Spring/Fall semesters soon.

- We shall recruit graduate and undergraduate students more aggressively both locally and internationally. We shall also be more pro-active in recruiting minorities in to the department. For graduate students, we shall try to get more undergraduate students involved in research with faculty members. Our experience and findings at other schools indicate that involving undergraduate students in research is the most effective way of getting undergraduate students to continue as graduate students locally. While presently the primary role of faculty at TAMU-Commerce is to produce quality graduates, it is the research that attracts students and helps better prepare them for careers in industry and for further study. The research experience has becoming a critical factor to open the doors for students to get into good Ph.D programs and/or find jobs in industry. The number of undergraduate physics majors has been relatively small (about 30). While the university enrollment is approximately 9000 students, the number of undergraduate students on campus is well below the number implied by that figure and the department must be more proactive in increasing the number of physics majors. While the historical number of graduating majors is respectable and comparable with our peer institutions, we need to do better. Besides more frequent visits to area high schools and community colleges by faculty
and staff, we shall more aggressively recruit physics majors from undecided students in introductory physics classes.

- Given the limited resources from the University, further growth of our graduate program depends strongly on our ability to obtain more external research grants including money to support graduate students. Most of the physics faculty members have been seeking in real earnest external grants. Compared to similar institutions, our extremely heavy teaching load and lack of national reputation for reach in many fields make our proposals often less competitive. But we will keep trying.

- Enhance our reputation and visibility in the physics community especially in the state. Besides continuing exchanging faculty visits, inviting outstanding physicists from other physics departments in the state as colloquium speakers, we shall bid for hosting the Texas Sectional Meeting of the American Physical Society (TSAPS) in Commerce in the near future. A faculty member has volunteered to serve as the chair of the local organizing committee and has already started working with the executive committee of the TSAPS on the matter. In collaboration with the Physics Department and the Cyclotron Institute at Texas A&M-College Station, we will bid for co-hosting the 11th International Conference on Nucleus-Nucleus Collisions in 2012 in San Antonio.

**Challenges and Department Needs**

The Physics Department has many challenges that must be overcome to reach its full potential, implement its action plan and reach its ambitious goals.

- The department is understaffed in faculty members
  Two additional tenure track positions would bring the faculty numbers to a level which is more indicative of departments across the country at comparable institutions with similar institutional roles.

- The faculty teaching load is too heavy with very little time to concentrate on research, advising student research and engage in recruiting activities. Without additional faculty members, it is not absolutely impossible but very hard to offer any new courses that are very critical for the development of the department. Mainly because of the shortage of faculty members, required courses for both undergraduate and graduate programs are not always available when needed by students. The selection of courses is thus very limited for both undergraduate and graduate students. Given the size of the department, graduate students have very few choices in selecting a research area and/or a faculty advisor.
The salary for our graduate students is too low compared to near-by institutions (our pay is about 1/3 of that paid by the Physics department at College Station) ($4000/semester total pay, $2129 for tuition at TAMU-Commerce). Nationally, Physics has become a field where all graduate students are normally expected to be paid. Our current pay to graduate students is actually below the local living costs determined by the US State Department to issue a student visa to international students. It is thus very difficult for us to recruit international students. We simply cannot compete with other schools with the currently level of financial support from the University.

Because of the increased enrollments in Astronomy 101 and 102 (currently 126 students), Integrated Science 151 and 152 (currently 197 students), Integrated Science 351 and 352 (currently 322 students) the Department of Physics is in urgent need for at least 2 additional GA positions to support teaching. Currently, the Department has 6 GA positions. We need more GA positions and pay our graduate students better for the physics graduate program to survive longer and possibly become stronger. Within the Texas A&M University System we are the only MS program outside College Station. This helps distinguish TAMU-Commerce from other schools in the system. We are optimistic that with the strong support of the administration, our MS program in Physics will become much stronger than it is today.