**Progress Report on the Action Recommendations for the Physics Program 9-3-10**

The physics program conducted a program review in 2008. The action recommendations were reprioritized in August 2009 at the request of the Arts and Sciences Dean. The following summarizes our progress on the action items for the 2009-2010 academic year.

**High Priority Actions:**

**Recommendation 1. Obtain a stockroom/laboratory manager position.** Limited or No Progress. Physics (as far as I know) remains the only equipment-intensive program in the College of Arts and Sciences that does not have a staff equipment manager position. This position is essential to maintaining the equipment used in upper- and lower-division laboratory classes, supporting faculty in the setup of demonstration and laboratory activities, and managing inventories, purchasing, repair, etc. A graduating student was hired for two months at the end of the 2009-1010 academic year in a part-time capacity, but funds available to our program are not sufficient to renew her position this year. We are currently investigating the possibility of obtaining some additional funds for a 6-month 20-hour-per-week position through a recent Fletcher Jones Foundation grant for our Complex Dynamical Systems Lab. But, a more permanent solution is desperately needed. Completion of this goal requires a staff position (> 20 hours per week).

**Recommendation 2. Establish an experimental laboratory for nanophysics research.** In Progress. Through the assistance of the Natural Science Division Chair and the College of Arts and Sciences Dean, the Physics Program successfully acquired a room in Founders Hall to support the establishment of a research-grade experimental laboratory. This space will be shared by the Nanophysics Lab and the Complex Dynamical Systems Lab (see below). With funds from a recent Fletcher Jones Foundation grant (see item 4 below) and additional support from the University, renovation of a classroom into a laboratory space will hopefully take place in January 2011. We will be submitting documentation to the Dean's office and to the Space Committee within the next few weeks to request matching funds from the University. Dr. Preisler has been acquiring equipment through division and departmental funds to support this effort. The first phase of the lab is scheduled to become functional in early 2011. Completion of this goal will be supported by funds from the Fletcher Jones Foundation grant, but additional funds from the University are also required.

**University-Level Actions:**

**Recommendation 3. Explore the possibility of establishing a 3-2 program with a local engineering program.** Exploratory Phase. Dr. Preisler has taken the lead on contacting local universities and community colleges to survey how prevalent these programs are, what impact they have had on the participating institutions, and how such a program might be implemented at La Verne. Our preliminary findings suggest that a 3-2 program could serve as a useful method of attracting more physics students. We plan on drafting a plan this year that will outline how a 3-2 program could be implemented at La Verne.

**Recommendation 4. Establish an interdisciplinary center for computational research in Physics, Mathematics, Computer Science and Chemistry.** In Progress. Faculty in the Physics and Math programs (Chappell, Frantz, & Daneshbod) obtained a $250,000 Fletcher Jones Foundation grant to establish a Complex Dynamical Systems Laboratory. The grant will fund major equipment purchases, renovations to create a research-grade experimental lab, student and faculty stipends, and invited speakers in interdisciplinary physics-based fields. Funds from the two-year grant will become available in December 2010. Two physics majors are currently working on senior projects related to this initiative, and one math major is in the initial stages of developing a thesis project. We also obtained $70,000 worth of equipment including a high-speed digital video camera from the Natural Science Division's STEM Title V grant to support this initiative. As in Recommendation 2, completion of this goal will be supported by funds from the Fletcher Jones Foundation grant, but additional funds from the University are also required.

**Recommendation 5. Secure compensation or release time for the physics program chair.** Goal Not Met. The physics program chair continues to receive no compensation for his additional duties. The chair will continue to shamelessly advocate on his own behalf.

**Changes to the Major:**

**Recommendation 6. Implement the proposed changes to the major:**
**6a) Add Differential Equations as a supportive requirement.** Goal Met.
**6b) Replacing Science Seminar with a Physics Seminar course.** Goal Not Met. MATH 315 Differential Equations is now a required supportive requirement for the B.S. degree in physics. The Physics Seminar course has not yet been developed.

**Recommendation 7. Implement the proposed requirements for a physics minor.** Goal Met. A physics minor was formally introduced in April, 2010. The first student to receive a physics minor will be graduating in May, 2011.

**Recommendation 8. Introduce an Advanced Laboratory course and purchase the needed equipment.** In Progress. Rather than adding an Advanced Lab course, the physics program decided to first add a laboratory component to the existing PHYS 360 Modern Physics course. This choice seemed natural since many of our existing upper-division labs were geared to modern physics. The addition of an Advanced Lab course is still viewed as a desirable goal at some point in the future. The department is slowly acquiring equipment to support the lab. This year we purchased a diffusion cloud chamber, a precision gyroscope, materials to demonstrate and quantitatively study superconductivity, and demonstration equipment for Rutherford scattering and magnetic domain visualization.

**Recommendation 9. Introduce a Thermodynamics/Statistical Mechanics course.** Goal Partially Met. Dr. Preisler developed and taught a special topics course on statistical mechanics. The course still needs to go through the university channels to receive a unique course designation.

**Recommendation 10. Introduce a Solid State Physics course.** Goal Partially Met. Dr. Preisler developed and taught a special topics course on solid state physics. The course still needs to go through the university channels to receive a unique course designation.

**Recommendation 10B. Introduce an Astrophysics course.** Goal Met. This goal was accidentally omitted from the original Action Recommendations on the last program review, but it has been goal of the program for a number of years. Dr. Chappell has taught the astrophysics course as a special topics course for a number of years. It now has the designation PHYS 365 Astrophysics.

**Recommendation 11. Institute a dedicated lab section for the Engineering Physics course.** Goal Not Met. This goal requires developing a new set of laboratory experiments with an accompanying lab manual. It also introduces the logistical problem of how to coordinate the equipment needs of two labs within the same laboratory space. It seems unlikely that this goal will be met without the resources of a laboratory manager (see Recommendation 1).

**Recommendation 12. Continue to modernize the General Physics laboratory.** In Progress. We continue to acquire equipment to support the lab. The computers used for data acquisition and data processing are badly out of date (5 – 6 years). We hope to replace them within the next year. A long-term goal is to either renovate the existing lab space or obtain a new lab space so that labs can accommodate more than ten students.

**Student-Related Actions:**

**Recommendation 13. Improve our advising of students particularly with regards to career opportunities.** In Progress. Part of the Fletcher Jones grant provides for a series of workshops to educate junior and senior students about graduate programs, application procedures, etc. We also plan on holding more information sessions during the "group meeting" sessions of the Natural Science Division's Science Seminar.

**Recommendation 14. Continue to explore new opportunities for student internships.** In Progress. The University of La Verne continues to participate in JPL's Student Independent Research Intern Program (SIRI), although no students have yet taken advantage of it. The Fletcher Jones Foundation grant will provide six paid student research positions related to the new Complex Dynamical Systems Laboratory. These positions will become available in the Fall 2010 semester.

**Recommendation 15. Improve the program's website to include information about student career opportunities, student internships, faculty research, course information etc.** In Progress. Small additions were made to the website, including information about majors and minors and the establishment of a Physics News section. More work remains.

**Recommendation 16. Recruit new physics majors so that upper division courses have larger enrollments.** In Progress. The introduction of the physics minor may help in populating the upper-division courses. This year we predict that at least one extra student will be enrolled in our upper-division courses because of the newly introduced physics minor. Recruitment remains an important goal of our program. We are pursuing multiple

possibilities. A 3-2 program with an engineering school looks promising. The Fletcher Jones Foundation grant will provide for student stipends, increase our research capabilities, and enhance the presence of the physics program within the university.

**Recommendation 17. Work with students to establish a local chapter of the Society of Physics Students.** In Progress. Students have expressed interest in a physics club, but do not yet seem to have the required critical mass to make it sustainable.