Physics Funding Priorities Document
(Updated on 5/2/2017)

The Department of Physics would like to seek philanthropic funding for the following causes that have been deemed as priorities by a majority of the faculty.

- **Sponsorship of Student Research ($15,000 per student per academic year)**

  We invite donors to support our student research directly through Physics Student Research Sponsorships. Donors can support one or more students at the undergraduate or graduate level. Current student research opportunities include: Biomedical physics, Condensed Matter physics, Experimental High Energy Particle physics, Observational Astronomy, and Theoretical physics. Sponsorship will enable students to receive monetary compensation for their time spent on research tasks, allowing them to work towards their degree and professional goals instead of working part time off campus for financial support. In addition, the sponsorship of student research will greatly enhance the ability to recruit and attract the best students to our programs. The donors will be recognized in scientific peer-reviewed publications and presentations for their support.

  Undergraduate Student Research Sponsorship
  $15k to sponsor an **Undergraduate** Research Assistantship for one academic year.
  Goal: up to 10 students funded per year.
  Graduate Student Research Sponsorship
  $15k to sponsor a **Graduate** Research Assistantship for one academic year.
  Goal: up to 5 students funded per year.

- **Graduate Student Tuition and Living Expenses Scholarship - $300,000**

  Graduate Students are financially challenged without a tuition waiver at Fresno State to go through the rigor of the program with outside employment. We would like to create an attractive package to aid the students in their tuition and living expenses. This will be for our top five graduate students and we would like to support the graduate program for at least five years.

- **Outreach to Community ($80,000)**

  Our renowned Outreach program to Fresno and surrounding community covering hundreds of K-12 schools as well as nursing homes and the community at large during parades, television programs such as *Great Day, KSEE 24 Sunrise, and Central Valley Today etc.* with students demonstrating the physical principles requires continuing operational costs such as the outreach van, demos, trailers, booth at events, student conferences, media equipment, etc. This program directly impacts lives and excites students about physics and STEM in general. The Physics Outreach team, on average, visits over 100 schools per year teaching science in a fun "hands-on", interactive way where all students and teachers participate in the demonstrations. It currently serves the valley, including the counties of Fresno, Madera, Merced, Mariposa, Stanislaus, Kings, and Tulare.

- **Sierra Remote Observatories and the Downing Planetarium ($300,000)**

  Sierra Remote Observatories are at a superb dark site for astronomical observatories, at 4610' altitude near Shaver Lake. The telescope at this site is operated at Fresno State, 47 miles away, by remote control over the internet. This donation would cover the $14,000/year membership fees for Fresno State's station at Sierra Remote Observatories.

- **Research Equipment Fund for Condensed Matter Physics Program ($1 – 2 million)**

  Research in Condensed Matter Physics focuses on the superconducting, magnetic, and nano materials. These materials can applied to energy conservation to reduce the rate of depletion of natural resources, to decrease the production of carbon dioxide, and to cut down the usage of environmentally hazardous hydro fluorocarbons, which can preserve the *earth's* ecology. The Department would like to allocate a fund for purchase of state-of-the-art equipment such as X-ray Crystallography system, SEM/TEM (electron scanning/transmission microscopes), SQUID magnetometer, etc., which would allow faculty and students to perform sensitive experiments.

- **ATLAS program at Large Hadron Collider of CERN and CSU Nuclear and Particle Physics Consortium (NUPAC) (from $500 to $300,000)**

  The physics department has a research program on the ATLAS (A Toroidal LHC ApparatuS) experiment of the Large Hadron Collider (LHC) at the European Organization for Nuclear Research (CERN) in Geneva, Switzerland. Fresno State has been the center of CSU NUPAC which consists of 17 campuses. This unique program in the CSU system could greatly benefit from funding for the following items: ATLAS Grid Computing Cluster for CSU ($300,000), collaboration with Ph.D. institutions in the US, China, and other countries ($25,000 per Ph.D. student per year), fund to sponsor female US ATLAS physicists stationed at CERN who are mentors of CSU students to give recruiting talks at CSU campuses ($3000 per speaker), fund to sponsor Fresno State female ATLAS students to give recruiting talks at CSU campuses and local high/middle school (~$500 per visit), and fund to expand and strengthen CSU NUPAC and turn it into an official CSU-wide affinity group with CSU ATLAS and NUPAC as its core ($5000 per year).

- **Endowed Professorship for Enhancement of Programs in the Department ($1-2 million)**

  There are several exciting programs within the department that would really benefit both in terms of course offerings and department profile as well as research opportunities for our students with the hiring of another faculty member. Although a small department, several varied specialties and research programs have a vibrant home in the department, usually under one or two faculty members. Current programs include Biomedical physics, Condensed Matter physics, Experimental High Energy Particle physics (ATLAS), Observational Astronomy, and Theoretical physics.

- **Remodeling of McLane Hall ($10 million)**

  The Department has been physically separated in different buildings for many years now. In addition, our labs that serve many students in the College of Sciences and Mathematics as well as College of Engineering are beginning to show their age. It would be great if the department could emerge as a powerful, cohesive, modern, and attractive place to study 21st century physics under the roof of a single re-modeled or new building. This building will include a large teacher resource room that would have equipment to check out for teachers in the community as well as physics lessons for all ages and levels of competencies, a large biomedical research lab, a large computational lab, additional conference rooms to teach small classes, a media room where classes could be filmed, a dedicated radioactive storage room, two advanced labs, and an electronics room.