A Multi-Dimensional Nuclear Engineering Partnership

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In 2002, the Texas Partnership was awarded a grant as part of the DOE Office of Nuclear Energy, Science and Technology Nuclear Engineering University Partnership program. The Texas Partnership is unique in its breadth and scope. The three participating institutions are Texas A&M University (TAMU), Texas A&M University Kingsville (TAMUK), a Hispanic Serving Institution, and Prairie View A&M University (PVAMU), a Historically Black University. The Department of Nuclear Engineering at TAMU, with nearly 300 students, is the largest such academic unit in the country. TAMU offers undergraduate and graduate degrees in nuclear engineering, radiological health engineering, and health physics. At TAMUK, the Department of Physics is leading the activity, while at PVAMU, the key components are the Department of Chemical Engineering and the NASA funded Center for Applied Radiation Research (CARR). With a common administrative framework and the ease of travel between institutions we have been able to greatly enhance the opportunities for student interaction and participation in a wide range of activities.

Simultaneously we are providing course offerings in nuclear/radiological health engineering via the Trans-Texas Videoconference Network to both African American and Hispanic students. This has led to a greater interest in the field by both science and engineering students. The program is expanding to additional satellite campuses. The first course in atomic and nuclear physics was provided in the spring of 2004. In the fall of 2004, we added courses in reactor theory and environmental measurements of radioactivity. Additional nuclear engineering courses will be offered on a regular basis.

Meanwhile the Physics/Geophysics Department at TAMUK has developed a laboratory-based course in nuclear physics. This is the first upper division laboratory course offered at TAMUK in over a decade. The faculty members in the Department of Nuclear Engineering at TAMU are assisting TAMUK to ensure that the lab equipment is tailored to enhance the success of the students in their preparation for graduate studies. The courses provided at TAMUK and via the TTVN network allow the students entering the graduate program at TAMU to follow the same plan of study as students from TAMU or comparable nuclear/health physics programs.

Research experiences have proven to be the key in attracting students to graduate school. Students in the Partnership have participated in projects at the TAMU Microbeam Laboratory through the Summer Undergraduate Research Program of the Texas Engineering Experiment Station during summer sessions of 2003 and 2004. In addition, other students at PVAMU were involved in projects at the Center for Applied Radiation Research during each of the past two years. The NASA funded Center for Applied Radiation Research (CARR) at PVAMU provides students in the program research opportunities in areas related to space radiation effects and radiation dosimetry. CARR students and researchers participate in all aspects of CARR research. This includes learning about radiation (particularly as it relates to space exploration) and measurement techniques and data acquisition techniques for electronics and dosimetry instrumentation. In addition, some students working at CARR perform experiments at DOE facilities at the Los Alamos Neutron Science Center at Los Alamos National Laboratories and at the NASA Space Radiation Laboratories at Brookhaven National Laboratories. Activities at these facilities give students hands-on experience performing radiation experiments, and provide the students with an understanding of radiation safety and the operation of a large, complex scientific facility. All undergraduate students working for CARR are encouraged to consider graduate studies in general and consider the nuclear engineering program in particular. To date, two CARR student researchers have participated in the DOE nuclear engineering program. With the addition of Sukesh Aghara as a CARR investigator, this number is expected to grow substantially.

Also collaborative recruiting efforts are underway. Over the past six years, the Department of Nuclear Engineering at TAMU has engaged in a vigorous revitalization activity that has led to an increase in undergraduate enrollment from 55 to 204 students. The materials and strategies for enrollment growth are being provided to TAMUK and PVAMU in order to help in attracting students to the program.

The success of the Texas Partnership will lead to greater diversity among nuclear engineering and health physics graduates, and help to assure a continuing supply of well-prepared professionals entering the workforce.

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