

Relation to Longer-term Goals of Institutions, PIs and Qualifications

Houston Community College has embarked on a five year (2003-2008) project that will enable the institution to address state mandates to “Close the Gaps” in college participation and increase achievement for the expanding Hispanic population. The Higher Education Coordinating Board of Texas (the governing board for Texas public higher education) announced a critical goal was to close gaps in science education. HCC has already implemented a project funded by the U.S. Department of Education Title V Program to increase the numbers of minority students participating in the fields of math and the sciences, and a model program for astronomy will be developed to provide teachers with a robust program. The Title V project efforts for faculty development and advising will transfer to astronomy seamlessly. This Title V program is directed by Dr. J. C. Reina. HCC is presently developing initiatives to strengthen its relationship with the school districts within its service area, particularly the Houston School Independent District, whose students are 91% underrepresented groups and 80.3% economically disadvantaged. Initiatives include an Honors College, a dual enrollment for credit program, Early College, to obtain an associates degree and high school diploma simultaneously, and professional development programs for teachers in math, science and English through Summer Institutes. TORRE will enhance these activities by making astronomical observation time and data accessible to high school students who may enroll directly in dual credit or early college. Teachers will be provided with workshops and seminars through the Summer Institute.

Rice will be able to utilize the remote observatory on an on-going basis, augmenting current on-campus observatory labs with observational opportunities in an optimal area more conducive to astronomical observations by virtue of its dark site and the routine maintenance and support to be provided by McDonald Observatory personnel. The remote telescope will offer extensive new opportunities for student instruction and research that are currently unavailable to present students at the Rice campus. Dr. Johns-Krull will supervise the undergraduate and graduate student activities. Both institutions will pursue funding opportunities and partnerships with NASA, the Space Alliance, and other NSF-funded programs, as well as seek additional outside support for the project to maintain the observatory after the initial funding period ends.

Broader Impact

TORRE will advance discovery and understanding and promote teaching, training and learning by integrating research at the non-science major, community college, undergraduate and graduate school levels, including them as participants in research. Staff will develop a program

of master courses for personal and synchronous and asynchronous delivery through the internet to educate local teachers about the instruction of astronomy to students in grades 9 – 12. Dr. J. C. Reina has developed a television program, "Astronomy Spoken Here," which is broadcast on the HCC TV cable channel through the Time Warner Cable Corporation, with the potential of reaching over 300,000 households in the area. TORRE initiatives will become integrated in this TV program. TORRE will broaden participation of underrepresented groups, reaching them at home or school, at their computers and television sets. Infrastructure for research and education will be enhanced by a remote system, utilizing television and internet-based modern technologies and providing courses on the web, allowing multi-users and large numbers of students access to the observatory.

Intellectual Merit

Students, graduate students, faculty and professional astronomers will serve as researchers, educators, and students, infusing education with discovery and enriching research through the diversity of learning perspectives. Graduate students will utilize the observatory for their thesis work and one graduate student will serve as the Rice Coordinator. Professional and amateur astronomers will utilize approximately 100 nights annually. The PI and Co-PIs, Ph.D.s in physics and astronomy, have worked on over 75 NSF grants. The program will focus on variable stars, asteroid research, and spectroscopic monitoring program of the spectra of symbiotic stars, with results disseminated in professional astronomical journals such as The Astrophysical Journal, The Astronomical Journal, and the Publications of the Astronomical Society of the Pacific.