Improving Nuclear Education by Advancing Educational Infrastructure: The Advanced Nuclear Science Educational Laboratory (ANSEL)

Executive Summary

This proposal requests funds to continue a second year of the development project started on 9/1/2007 at the University of Rochester (UR) to complement our science and engineering curriculum with an advanced nuclear science laboratory course (ANSEL), open to undergraduate and graduate students, as well as to professionals working in various academic units and fields. The main objectives of the semester-long ANSEL curriculum are to disseminate and illustrate knowledge about the relevance of modern nuclear science and technology for society and to provide in-depth, hands-on training in nuclear radiation applications and in the design and execution of complex nuclear procedures deploying a large variety of radiation detectors. ANSEL experiments demonstrate the ubiquitous nature of nuclear radiation in the environment, the characteristics of interactions of neutrons, charged particles, and gamma radiation with matter and the utility of irradiation methods to image and transform materials in a non-destructive fashion. ANSEL students will work with, and be mentored by, researchers active in nuclear science and professionals who routinely apply nuclear methods in their work.

Establishment of ANSEL will reverse a decade-long decline of nuclear science education infrastructure at UR, and open new nuclear science/engineering training and career options for UR students and professionals, as well as for the greater Rochester community.

The requested level of funding for 9/1/2008-8/31/2009 will allow us to complete the final stage of the development of ANSEL and develop the two remaining experiments that complete ANSEL and offer it as a stand-alone course in January 2010. Our current funding from the U.S. NRC has allowed us to start the development of the first two experiments of ANSEL, which may be offered already as part of the existing Advanced Laboratory in the Department of Physics and Astronomy in September 2008 or 2009.