

FY2022 MINORITY SERVING INSTITUTIONS GRANTS AWARDS

Institution	Amount	Title
University of Central Florida	\$397,943.00	Fellowships in Support of the Radiochemistry Program at the University of Central Florida
University of North Texas	\$400,000.00	Nuclear Safety Testing and Analysis Research (NSTAR) Fellowship Program at The University of North Texas
University of Nevada – Las Vegas	\$100,000.00	Training a Diverse Nuclear Workforce: UNLV Scholarship Program
Virginia Commonwealth University	\$100,000.00	VCU Nuclear Engineering Undergraduate Scholarship Program

Title: Fellowships in Support of the Radiochemistry Program at the University of Central Florida

Principal Investigator: Dr. Vasileios Anagnostopoulos, Vasileios.Anagnos@ucf.edu

Executive Summary:

The objective of this proposal is to provide financial support through fellowships to graduate students in order to study and perform research in the field of Radiochemistry at the Department of Chemistry at the University of Central Florida. Specifically, the students will have the opportunity to perform research in the fields of radionuclide migration and dispersion due to waste stream disposal leakage and groundwater contamination minimization, as well as waste forms stability. The research topics align with NRC's Program Objectives, as well as nation's mission and they are integral part of the university's strategic plan through "Energy and Sustainability" Focus Area. The fellowships aim to address the country's current shortage of expertise and workforce in the field of radiochemistry, due to a massive retirement of previous generations' scientists and engineers on the field. Furthermore, they will assist underrepresented groups to be a part of the evolution of nuclear science and technology in the US, since UCF is the largest institution in enrollment and a Hispanic Serving Institution.

UCF Department of Chemistry has already developed a vigorous Radiochemistry research program spearheaded by Dr. Vasileios Anagnostopoulos and has attracted undergraduate students and Ph.D. candidates in his research group, who upon graduation, will support the nuclear industry, national labs, government, and academia. This program has been very successful and has produced numerous publications and presentations, whereas its students have received awards on a national level and have secured prestigious internships. This proposal requests \$397,943 for the training of four NRC Fellows on the field of Radiochemistry and specifically waste forms, radionuclide sensitive detection for security and radionuclide migration. The program consists of courses and research training that will allow NRC Fellows to obtain a strong foundation in radiochemistry, along with analytical chemistry, spectroscopy and thermodynamics. This skillset will allow them to be competitive candidates for a wide array of positions in the nuclear field upon graduation. The program has a comprehensive management and evaluation plan in order to ensure the success of the program and the NRC Fellows. Furthermore, there is a detailed mechanism to ensure the employment of NRC Fellows post-graduation in the nuclear field via fellowships in DOE National Labs during their studies and post-graduation employment tracking.

These performance metrics, combined with UCF's capacity and role as a research-intensive minority serving institution, as well as support on department and institutional level, make it an ideal candidate for NRC Fellowships in the field of radiochemistry.

Title of proposed project: Nuclear Safety Testing and Analysis Research (NSTAR) Fellowship Program at The University of North Texas

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Executive Summary:

The proposed NSTAR fellowship program at UNT aims to reinforce the workforce in the nuclear energy safety community by engaging the selected fellowship students (fellows) with interdisciplinary education and research. The overarching theme and research focus of the proposed NSTAR program is acoustics-based non-destructive testing and analysis and nanoparticle processing for thermal management applications. An interdisciplinary research team will investigate these research areas with backgrounds in mechanical engineering, material science, and/or physics.

The North Texas Institutes that will recruit fellows include UNT, Texas Woman's University (TWU), and Austin College (AC). Qualified fellows will be from underrepresented groups of students (i.e., Women, Hispanics, and African Americans). The program will fully support two fellows over four years. The NSTAR program will provide full tuition, stipends, travel funds, and other financial aid expenses for books, health insurance, and engineering fees. Upon completion of the NSTAR program, fellows will be given the following benefits: (1) experience in novel research in nuclear engineering and science, (2) exposure to hands-on lab training, (3) networking opportunities with nationally recognized researchers, (4) full financial aids with competitive stipends and benefits until graduation with M.S. or Ph.D. degrees, and (5) successful employment in STEM-related industries, academia, or national labs after graduation.

Title: Training a Diverse Nuclear Workforce: UNLV Scholarship Program

Principal Investigator: Professor Emma Regentova, emma.regentova@unlv.edu

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Co-Principal Investigator: Professor Yi-Tung Chen, yitung.chen@unlv.edu

Executive Summary:

The University of Nevada, Las Vegas (UNLV's) Department of Mechanical Engineering and Department of Computer and Electrical Engineering train students to be fully prepared with the knowledge and skills necessary to join the nuclear workforce. Both undergraduate programs are ABET accredited. Department faculty have a strong background, research and teaching record in these disciplines related to preparing students for nuclear-related jobs.

In this proposal, two Departments propose creation of the Training a Diverse Nuclear Workforce: UNLV Scholarship Program in the Howard R. Hughes College of Engineering at UNLV, a Carnegie Research 1 (R1) and a Minority Serving Institution (MSI). The project's objective is to provide Scholarships to 10 undergraduate students in Mechanical Engineering and Electrical Engineering majors who will be the next generation workforce capable of supporting design, construction, operation, and regulation of nuclear facilities and safe handling of nuclear materials. The Scholarship Program will recruit talented and motivated undergraduate students who possess the required prerequisites. The team of investigators will focus on recruiting students from underrepresented groups, particularly those of low socioeconomic status who satisfy the Program conditions. During the Program's lifetime, the team will seek internships and jobs for the students in the nuclear industry and labs. In addition, the team will strive to provide students with research experiences to enhance their knowledge and prepare them for entry into UNLV's Nuclear Engineering master's and doctoral programs, or admission to Nuclear Engineering graduate programs at other schools across the nation. Overall, the Program will pipeline students' training and retraining into employment for the benefit of the nuclear sector, while enhancing the education of the U.S. 21st century workforce. Benefits of the Program include contributions 1) to the Net-Zero initiative to accelerate global energy system decarbonization, 2) to UNLV and the State of Nevada in achieving its strategic goals of enhanced STEM education, 3) to the growth of employment opportunities, and 4) to expediting establishment of the Minor in Nuclear Engineering (currently under development).

Title: VCU Nuclear Engineering Undergraduate Scholarship Program

Principal Investigator: Dr. John E. Speich, jespeich@vcu.edu

Executive Summary:

The primary objectives of VCU's Nuclear Engineering Undergraduate Scholarship Program are to 1) attract and retain a diverse group of talented students into VCU's unique ABET accredited Nuclear Engineering Major Concentration Option in the Mechanical Engineering BS program, and 2) to facilitate the future success of these students in a career in the nuclear industry. Between fall 2015 and spring 2022, this scholarship program awarded \$534,400 to 41 students. The proposed program continuation will provide \$100,000 for five \$10,000 scholarships each year for the next two academic years.

In particular, the scholarships will provide additional incentive for students to choose and remain in the Nuclear Engineering Option and allow them to spend more time on coursework instead of part-time jobs. Thirty-two out of 35 awardees responding to an assessment survey stated that the scholarship allowed them to spend more time on academics and 24 out of 35 specifically mentioned that the scholarship allowed them to work fewer hours at a job or not at all.

Furthermore 18 out of 35 awardees responding to the survey stated that the scholarship contributed to their decision to stay in the Nuclear Engineering Option. Thus, the scholarship program has clearly provided a valuable impact on student success in the Nuclear Engineering Option. Furthermore, given VCU's student demographics, status as a minority serving institution (MSI) and situation as an urban university, the program is expected to attract a higher than average population of traditionally underrepresented minorities. In fall 2021, the VCU Mechanical & Nuclear Engineering (MNE) enrollment was 40.6% minority students, 27.2% underrepresented minority students & 17.2% female students. Of the 41 NRC scholarship recipients that have graduated from or are currently in the program, 12 are from underrepresented minority groups and 8 are women.

Another benefit of the scholarship program is extensive professional development, including mentorship from NE faculty advisors, a 1-credit professional course and opportunities for both undergraduate research and conference attendance. At least 13/15 (87%) of the most recent cohort of scholarship recipients have chosen to work in a research lab, and 11/15 (73%) have attended an American Nuclear Society (ANS) conference. VCU will provide \$5,000 in cost-shared support to enable each student to attend one conference. The VCU ANS and Institute for Nuclear Materials Management (INMM) student sections are very active with development opportunities.

VCU has a strong tradition of collaboration with nearby nuclear companies, and these stakeholders provide scholars in the program with relevant internships or co-ops, which are required for the BS degree, and permanent employment opportunities in the nuclear industry.

Based on our most recent data from previous scholarship recipients, the program has led to 27 graduates with careers in the nuclear industry. Nine work at Dominion Energy, three work at Huntington Ingalls Industries, five work at the NRC, two work at national labs and eight work in other nuclear-related jobs. In addition, four are currently in graduate school in Nuclear Engineering, and eight are still completing their undergraduate degrees at VCU. We expect the proposed continuation of the VCU Nuclear Engineering Scholarship Program to achieve similar success in leading participants into careers in the nuclear industry.