FY2023 FELLOWSHIP EXECUTIVE SUMMARIES

Institution Name	Award Amount	Title of Grant Award
North Carolina State University	$ 400,000.00	North Carolina State University's Graduate Fellowship in Nuclear Engineering (NCSU–GFINE)
Rensselaer Polytechnic Institute	$ 400,000.00	Fostering Next Generation Nuclear Force at Rensselaer
University of Michigan	$ 400,000.00	Nuclear Engineering Fellowship Program at the University of Michigan
Virginia Commonwealth University	$ 400,000.00	VCU Nuclear Engineering Graduate Fellowship Program 2024-2028 (VCUNEF)
Florida International University	$ 400,000.00	FIU Nuclear Fellowship Program - Supporting the Growth of Radiochemistry Ph.D. Track
Colorado School of Mines	$ 400,000.00	Colorado School of Mines Nuclear Science and Engineering Fellowship Program

FY2023 FELLOWSHIP EXECUTIVE SUMMARIES

North Carolina State University

North Carolina State University's Graduate Fellowship in Nuclear Engineering (NCSU–GFINE)

Executive Summary:
We propose to administer a financial aid mechanism for graduate students in nuclear engineering named the 'North Carolina State University's Graduate Fellowship In Nuclear Engineering' (NCSU–GFINE). The primary objective of NCSU–GFINE is to enhance the ability of NCSU's Department of Nuclear Engineering to recruit and retain outstanding individuals and to provide incentive to the sponsored graduate students to maintain high academic performance and provide financial assistance that will contribute to our institution's mission to increase accessibility to graduate study in nuclear engineering to young scientists and engineers who aspire to careers in the nuclear field.

Ultimately, the collective effort by US educational institutions to raise the admission standards and to diversify their graduate student populations, as proposed here for NCSU, will translate into a highly competent and diverse cadre of leaders for the nuclear engineering endeavor at large. The benefit to the nation from NCSU–GFINE is that it will contribute to the production of a highly competitive group of advanced-degree nuclear engineers capable of assuming leadership positions in their area of specialization within the field of nuclear engineering. The diverse profile of NCSU–GFINE fellows will be reflective of the US's population and supportive of the nation's goals of lowering the barriers to higher education and providing opportunities to enter the nation's high-technology sector with minimal financial barrier to entry. The so-developed workforce will be best positioned to lead the nation's charge to reinvigorate its nuclear industry, and will shepherd the design, construction, operation, and regulation of new and innovative nuclear facilities, while maintaining the safety and security of processes for the handling of requisite nuclear materials. This proposal if awarded will support two graduate students per year over a four-year period through combined NRC support and NCSU cost share.

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Rensselaer Polytechnic Institute

Fostering Next Generation Nuclear Force at Rensselaer

Executive Summary:
The primary objective of the proposed Rensselaer Fellowship Program is to attract, retain, and nurture talented graduate students in the field of nuclear science and engineering. Our aim is to cultivate and sustain a robust nuclear workforce essential for various sectors in the United States, including industry, government, and research institutes. Through this program, we will provide comprehensive fellowship support to graduate students, enabling them to pursue education and careers within the nuclear science and engineering domain. Recipients of the fellowship will benefit from a full tuition waiver along with a competitive graduate student stipend per calendar year. The core mission of the fellowship program is to recruit, mentor, and empower fellowship students, equipping them with the necessary skills to serve as a sustainable pipeline for the advancement of nuclear science and engineering. We plan to award up to two fellowships annually, spanning a four-year duration. Ultimately, this initiative will prove highly advantageous for the U.S. nuclear energy sector, furthering two vital objectives. Firstly, by providing support to both new and existing graduate students, the fellowship will promote advanced training and experience, benefiting those entering the nuclear field or currently pursuing graduate studies. Secondly, these fellowship opportunities will stimulate interest in graduate studies related to nuclear science and engineering, ultimately resulting in a more extensive and diverse pool of individuals trained in nuclear energy and technology.

Principal Investigator:
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FY2023 FELLOWSHIP EXECUTIVE SUMMARIES

University of Michigan

Nuclear Engineering Fellowship Program at the University of Michigan

Executive Summary:
The objective of this program is to provide support to starting graduate students at the MS and PhD level for up to three terms of financial support for MS students and up to 2 years of support for PhD students. The program will primarily support newly starting graduate students and, thus, is a strong recruiting tool to bring excellent students into graduate programs. In limited specific occasions, the funds might be used to help an outstanding student finish a degree. All program students would be mentored by faculty members whose work is in technical areas noted as critical to the Nuclear Regulatory Agency program objectives.

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Virginia Commonwealth University

VCU Nuclear Engineering Graduate Fellowship Program 2024-2028 (VCUNEF)

Executive Summary:
The VCU Nuclear Engineering Graduate Fellowship Program 202402028 (VCUNEF) aims to recruit and broadly train diverse and highly qualified nuclear engineering Ph.D. students. The Mechanical and Nuclear Engineering (MNE) Ph.D. at Virginia Commonwealth University (VCU) offers a unique graduate education that combines two major engineering fields: Nuclear and Mechanical Engineering. Graduates of the program earn an M.S. and Ph.D. in Mechanical and Nuclear Engineering, benefit from a broad interdisciplinary education, and perform intensive research projects in areas at the intersection of the two primary disciplines. The research areas include fundamental neutron transport, thermal hydraulics, molten salt chemistry & fuel cycle, and nuclear safeguards for Gen IV reactors. The faculty supports the development of accident-tolerant fuels for advanced light water reactors, plasma physics research for space exploration, and fusion energy system heat removal systems. In addition, the faculty performs interdisciplinary research in nano-radioisotopes for medical applications.

Graduates of the program will benefit by being prepared for research and teaching careers in industry, national laboratories, and research centers. Our partnership with Idaho National Labs and the American Nuclear Society has provided practical work opportunities for participating in this Fellowship. Moreover, a set of required training modules conducted by the VCU Office of Responsible Conduct of Research and a retention and mentoring program will be implemented and weaved into their curriculum. These programs consist of several activities to keep students engaged not only academically but also in the area of personal growth. Activities include coffee with the faculty, creating videos of student life, participation in outreach activities for K-12 students, mentoring, seminars from experts in the field, and more. Student performance will be assessed using specific metrics such as the Oral Qualifier Exam, Ph.D. Proposal Defense, Publication requirements, Final Defense, and job placement with the help of Alumni and the Director of the Nuclear Program.

Previous NRC funding, in conjunction with other sources, has helped support ten students; eight have graduated with a Ph.D. in Mechanical and Nuclear Engineering, with two more in the pipeline, and at least four of the students obtained an M.S. All students are employed at National Labs or the Federal Government. This group of students has published over 65 peer-reviewed journal articles and conference papers and secured two patents.

The new VCU MNE Fellowships would fund two PhD students annually for four years. In addition, the College will help support an additional student and provide tuition assistance for students sponsored by the fellowship. For travel support, the Department Chair has committed to help travel to the ANS conferences.

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Florida International University

FIU Nuclear Fellowship Program - Supporting the Growth of Radiochemistry Ph.D. Track

Executive Summary:
Objective: Expand our developing FIU Nuclear Fellowship (FNF) Program by supporting 3 PhD students for our PhD Radiochemistry Track each year. A total of 12 annual fellowships (for Fall and Spring Semesters) will be funded on this grant over 4 years. These radiochemistry Ph.D. graduates will support the nuclear industry, DOE National Labs and academia. This grant will complement FIU's current NRC grants for Fellowships, and for Distinguished Faculty.

Benefits: FIU's nuclear program and Ph.D. Radiochemistry Track (25 current Ph.D students and 9 graduated Ph.D students) have been expanding with support from NRC, US-DOE, and industry. FIU's Nuclear Scholars and Fellows programs have increased student interest in nuclear & radiochemistry careers. A new collaboration with James Madison University (JMU) (see letter) will ensure a pipeline of strongly qualified applicants for our program. Efforts to provide career opportunities for Ph.D students will expand beyond NRC and DOE to include nuclear companies (see Niowave and SRNL letters). Nuclear Fellows will receive support at an annual rate of $29,000 ($21,750/y for the Fall and Spring semesters) each year for 3 years plus a tuition waiver (cost-shared by FIU). During the summers the students will be paid by our departmental budget in order to fulfill their teaching requirement required for graduation. Students will be recruited internally and nationwide, with emphasis to targeted institutions with strong bachelor programs. The 50+ faculty/staff members associated with FIU's Interdisciplinary Nuclear Research Program will support the NRC nuclear fellows with resources to help ensure their success and rapid progress towards graduation. With >54,000 students, >85% student minority population (>65% Hispanic, >13% African-American), and >$250M in research expenditures, FIU is a public Hispanic-serving Institution classified as an *R1 Research University/Highest Research Activity*, which has been recently designated as an emerging preeminent state research university by the state of Florida board of governors. A national leader in the education of Hispanic Latino students, FIU is ranked 1st in the US in 2018-19 in awarding bachelor's and master's degrees to Hispanic Latino students. FIU has been climbing steadily in national as well as global rankings. Of particular note, U.S. News & World Report ranked FIU as a Top 100 Public National University (#72 in latest rankings) and Wall Street Journal ranked FIU as the No. 29 university in the nation and the 4th ranked public university, in its America's Best Colleges 2024 rankings (published Sep. 6, 2023).

Specific research areas of NRC interest: Our current Nuclear Fellows' research focusses mainly on i) characterization, handling, and disposal of waste streams from nuclear power plants (including the various advanced reactor designs that are currently under development). We aim in further expansion to other areas of NRC interest, such as: ii) Advanced materials and manufacturing for nuclear applications. iii) Aging/degradation of nuclear plant systems, structures, and components.

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FY2023 FELLOWSHIP EXECUTIVE SUMMARIES

Colorado School of Mines

Colorado School of Mines Nuclear Science and Engineering Fellowship Program

Executive Summary:
Starting in the 2015/2016 academic year, the Colorado School of Mines (CSM) established a Nuclear Science and Engineering graduate fellowship program to increase graduate enrollment in our graduate nuclear engineering degree programs. The funding requested will add support for two additional graduate Fellows per year with the intention to attract top students to the Nuclear Science and Engineering (NSE) Program. Potential Fellows will be selected from the pool of NSE Program applicants and NSE faculty will mentor and advise the Fellows throughout the Fellows' time at CSM. Particular emphasis will be placed on encouraging and tracking the Fellows' academic and research progress. While predominantly aimed at Ph.D. candidates, the program will also consider outstanding M.S. students.

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