

## FY 2015 Faculty Development Grant Awards

Institution	Amount	Title
Oregon State University	\$443,277	Nuclear Engineering Faculty Development Program at Oregon State University
Jackson State University	\$399,070	Radiochemistry Education and Research Program at Jackson State University
Florida International University	\$450,000	Faculty Development for Radiochemistry at FIU
Missouri University S&T	\$450,000	Missouri S&T Nuclear Engineering Faculty Development Program (2015-2018)
Massachusetts Institute of Technology	\$450,000	MIT Nuclear Education Faculty Development Program
University of Wisconsin - Madison	\$442,962	University of Wisconsin-Madison Faculty Development Program in Nuclear Engineering
Rensselaer Polytechnic Institute	\$449,997	Junior Faculty Development: Loading the Fresh Fuel into Our Nuclear Engineering Academic Core
University of Utah	\$449,845	Faculty Development at the University of Utah Nuclear Engineering Program
University of Florida	\$343,277	2015 University of Florida Nuclear Engineering Faculty Development Program
Utah State University	\$329,779	Faculty Development Program to Integrate New Faculty in Nuclear Engineering Research at Utah State University
University of Nevada, Reno	\$450,000	University of Nevada, Reno Faculty Development Program in Nuclear Materials
University of Pittsburgh	\$350,000	Pitt Nuclear Engineering Faculty Growth and Development
University of Puerto Rico, Mayaguez	\$359,707	The University of Puerto Rico at Mayaguez Faculty Development Program: Structural Engineering for Nuclear Facilities – Experimental Research Initiative
Ohio State University	\$450,000	

		Ohio State University Nuclear Engineering Faculty Development Program
University of Idaho	\$434,048	University of Idaho Nuclear Engineering Faculty Development Program
University of Missouri - Columbia	\$450,000	MU Faculty Development Program in Modeling and Simulation of Radiation Damage

## **Nuclear Engineering Faculty Development Program at Oregon State University**

### **Executive Summary:**

The Nuclear Engineering Faculty Development Program (NEFDP) at Oregon State University (OSU) will support a junior faculty member in the Department of Nuclear Engineering and Radiation Health Physics (NERHP). The requested funding includes support for new courses development, developing proposals of research, equipment acquisition, participation in professional society meetings, preparation of technical papers, graduate student support, and other costs associated with faculty development. The faculty development grant will be used to support Dr. Haori Yang, a recently hired tenure-track faculty member, to develop a research program in the field of radiation detection and measurement. This grant will greatly help provide him a strong foundation to excel in research, teaching, and service. The overarching goal of our faculty development program at OSU is to attract highly-qualified faculty members, develop probationary, tenure-track faculty, and to retain them so that NERHP is better equipped to educate the next generation of nuclear engineers and health physicists to meet the nation's need.

**Principal Investigator:** Haori Yang, [haori.yang@oregonstate.edu](mailto:haori.yang@oregonstate.edu)

## **Radiochemistry Education and Research Program at Jackson State University**

### **Executive Summary:**

High demand on clean energy requires potential expansion of nuclear power production. With the recent Japanese nuclear power plant accident and increasing awareness of safe disposal of nuclear wastes, there are great needs in training and educating the next generation radiochemists. On the other hand, there is a great need for the U. S. to protect its territory against nuclear threat by terrorists as a result of the high volatile Mid-East political situation. However, the number of students in nuclear and radiochemistry has decreased significantly over the past few decades. It is urgent for the country to fill the workforce gap in these critical areas by building radiochemistry educational capacity of domestic institutions. Jackson State University (JSU) is a Carnegie classification of “Research University with High Research Activities” and the fourth largest HBCU in the country. JSU, as a leader in STEM education of African American students, is ideally positioned to fill this gap by establishing a BS in Chemistry with a Concentration in Radiochemistry. This has been made possible by the newly established research and education program in radiochemistry at JSU and taking advantage of JSU being one of the top two chemistry programs in producing African American BS, MS, and PhD chemists. We propose to establish new radiochemistry concentrations for BS, MS, and PhD chemistry programs at JSU. In order to do it, it is critical for us to recruit and train a new radiochemistry faculty member, develop new courses and revise existing courses, and establish novel research programs for the radiochemistry concentration. The proposed activity will also strengthen the current chemistry Ph.D. as well as the interdisciplinary Environmental Science Ph. D. programs at JSU.

**Principal Investigator:** Fengxiang Han, [Fengxiang.han@jsums.edu](mailto:Fengxiang.han@jsums.edu)

## Faculty Development for Radiochemistry at FIU

### Executive Summary:

**Objective:** Support the development of an early career PhD professor (ECP) to help lead the Chemistry Ph.D. Radiochemistry Track to be launched in Fall 2015. The ECP will help train, educate and mentor radiochemistry Ph.D. students and develop grant funding. In turn, Ph.D. graduates will support the nuclear industry, national labs, gov., and academia. This grant will complement FIU's current NRC grants for FIU Nuclear Research Fellowships and Scholarships.

**Benefits:** FIU's new Ph.D. Radiochemistry track and its growing nuclear program are critical to supplying needed nuclear professionals to replace an aging workforce. See the attached letter of support from Savannah River National Lab as evidence of the extensive interest shown for this needed program. The expanding FIU Nuclear Research Scholarship and Fellowship programs have created a critical mass of highly motivated, qualified students with interest in nuclear & radiochemistry research and career paths. FIU is at a critical point, ready to advertise nationally for an ECP in radiochemistry, and has already recruited students into the Chemistry Ph.D. Radiochemistry Track. Funding to support this ECP in launching a vigorous externally-funded research program is critical for the growth of this new Ph.D. track. The 40+ faculty/staff members developing the FIU nuclear program will provide an interdisciplinary cohort that will support this ECP with several resources to help ensure success. FIU, a Hispanic-Serving Institution, is a multi-campus public research university with many undergraduate, graduate, and professional programs. Through 12 colleges and schools, FIU offers 193 bachelor, master, and doctoral degree programs. Annual research expenditures exceed \$132 million, classifying FIU as a Research University/High Research Activity. With a student body of approximately 54,000 students, Hispanic students comprise more than 60 percent of FIU's undergraduate enrollment. A national leader in the education of Hispanic students, FIU ranked 1st in the USA in 2014 in awarding bachelor's and master's degrees to Hispanics and 5th in PhDs to Hispanic students.

**Principal Investigator:** David Chatfield, [chatfiel@fiu.edu](mailto:chatfiel@fiu.edu)

## **Missouri S&T Nuclear Engineering Faculty Development Program (2015-2018)**

### **Executive Summary:**

The primary objective of the Missouri S&T Nuclear Engineering Faculty Development Program is to attract, mentor and retain a nuclear engineering tenure-track assistant professor to be hired in Fall 2015. The faculty to be hired is strategic to Missouri S&T's Best-in-Class initiative in Materials for Extreme Environments signature area. The faculty recruitment process is in progress. The NE program will benefit from the hiring of its 8<sup>th</sup> faculty considering the annual growth the program has experienced in recent times. The NE program has seen 43% increase in enrollment since 2010. The increase in graduate students within the same period is 96%. The grant will help in the retention of the new faculty member by providing her/him with resources to build her/his research program, including graduate student support, laboratory equipment, travel to professional meetings, and to publish in refereed journals. The realization of the research development will enhance S&T's mission in the signature area. In addition, it will positively shape the quality, productivity, and performance of the NE program and the University as a whole.

**Principal Investigator:** Hyoung Koo Lee, [leehk@mst.edu](mailto:leehk@mst.edu)

## **MIT Nuclear Education Faculty Development Program**

### **Executive Summary:**

Over the past seven years the MIT Department of Nuclear Science and Engineering has hired eleven new faculty members, of whom two have already achieved tenure, another two are being considered for tenure this year, and only one has left MIT. Our strategic plan calls for continued faculty hiring at a rate of roughly one per year for the next several years. The continuing renewal of our faculty is the single most urgent and important challenge the Department faces. The MIT Nuclear Education Faculty Development Program is designed to support each stage of the faculty development process, including searching, recruiting, startup, mentoring, promotion, and retention. As part of this Program, we are specifically requesting NRC resources to support the career development of the two most recent junior faculty members to have been hired into the Department: Assistant Professor Michael Short, whose work is focused on corrosion and mesoscale materials science in nuclear reactors; and Assistant Professor Areg Danagoulian, whose research is concerned with nuclear detection and nuclear forensics. The NRC support, which will augment resources provided by the Department and other units at MIT, will help these junior faculty members to establish a strong foundation in research, teaching, and service. The NRC funds will be used for summer salary support, new course development, the development of research proposals, travelling and conference attendance, and other startup activities. The budget requested is \$450,000 over a three-year period. Matching funds provided by MIT will also be used for these activities, as well as to support graduate students who will work with the faculty. The Department will also provide a range of other services in support of these young faculty members, including mentoring, performance assessments, administrative support, and general support for their teaching and research activities. The MIT Nuclear Education Faculty Development will thus benefit the junior faculty members themselves, the students in the Department, the Department's ability to continue to recruit and retain outstanding young faculty members, and the country's ability to educate a new generation of nuclear engineering leaders who will shape and implement the future national nuclear agenda.

**Principal Investigator:** Richard K. Lester, [rklester@mit.edu](mailto:rklester@mit.edu)

## **University of Wisconsin-Madison Faculty Development Program in Nuclear Engineering**

### **Executive Summary:**

The proposed faculty development program consists of both research and curriculum development support, paired with a mentoring program for this junior nuclear engineering faculty. Development of a robust faculty research and teaching program requires a number of elements that will be supported by this proposal. These elements include: 1) faculty summer salary support, 2) support for graduate students or post-doctoral fellows, 3) travel support for faculty and students to participate in technical symposia and research program development, and 4) key equipment purchases and materials/supplies for unique laboratory capability. Our nuclear engineering program at UW-Madison also augments faculty support with operation of common research equipment and/or access key UW-Madison user facilities, such as the Heat Transfer Lab, the Extreme Environments Lab and Materials Science Center. In our program, the mentor committee consisting of the Department Chair and key nuclear engineering faculty will work together with this assistant professor to assist in her growth as valuable member of the Engineering Physics (EP) and UW academic community. The faculty mentoring committee will provide formative feedback to the assistant professor on her strengths and weaknesses in teaching, research and service. It will also assist them in discovering opportunities and developing strategies for her growing research program. Finally, the faculty mentoring committee will serve as an advocate for the assistant professor to promote visibility nationally and internationally in her work as a nuclear engineering researcher and scholar.

**Principal Investigator:** Douglass Henderson, [henderson@engr.wisc.edu](mailto:henderson@engr.wisc.edu)



## **Junior Faculty Development: Loading the Fresh Fuel into Our Nuclear Engineering Academic Core**

### **Executive Summary:**

#### Objectives and Benefits:

- Develop new core of Nuclear Engineering faculty – target junior faculty by hiring to strategic research thrust areas that uniquely define Rensselaer in the nuclear engineering community.
- Enable growth and sustainability of the Nuclear Engineering program by supporting new junior faculty.
- Maintain a strong and large undergraduate and graduate Nuclear Engineering programs.

**Principal Investigator:** Yaron Danon, [danony@rpi.edu](mailto:danony@rpi.edu)

## **Faculty Development at the University of Utah Nuclear Engineering Program**

### **Executive Summary:**

This funding will provide a base to pursue innovative, multidisciplinary and effective research and to be able to develop courses in the field of expertise that currently do not exist in the Program. This new UNEP hire will therefore benefit highly from this award with us being able to offer nation-wide competitive start-up and early-career funding to help developing competitive research while setting up advanced laboratory, supporting top graduate students, writing winning proposals and high quality papers, and being able to contribute in developing new courses; portion of these funding will support travels to conferences, workshops and meetings, as national exposure is very important for young faculty to develop collaborations and recruit outstanding graduate students. All UNEP junior faculty are mentored by an interdisciplinary mentoring cadre that is created as soon as a new faculty is hired. The cadre consists of a minimum of three full professors and meets formally up to four times a year, and informally per faculty request. The mentoring cadre meetings are focused at reviewing and advising on all aspects of tenure promotion criteria. Prior to these meetings, faculty is asked to provide self assessment on research (proposals, funding, and journal publications), progress of graduate students and other researchers, class teaching and service to the community. In addition, Program Director meets individually with faculty in reviewing their progress. Other mentoring support is provided from the Vice President for Research Office. Recently established Women Advisory Council serves as a mentoring team to female faculty across the campus. No administrative support for mentoring this new faculty is included in this funding request. This award will importantly benefit UNEP to continue with its successful growth in research revenue, number of students and yearly publications, and by retaining the newer junior faculty in enabling them to enhance their careers as professors and researchers in the Program.

**Principal Investigator:** Tatjana Jevremovic, [Tatjana.Jevremovic@utah.edu](mailto:Tatjana.Jevremovic@utah.edu)

## **2015 University of Florida Nuclear Engineering Faculty Development Program**

### **Executive Summary:**

The objective of the 2015 University of Florida Nuclear Engineering Faculty Development Program is to produce a new high quality faculty member that will produce new research, education, and train new students that will benefit the nuclear industry. The goal of this proposal is to augment the startup package for a new junior faculty member in the Nuclear Engineering Program. The Faculty Development Program will be administered and managed by the Director of the Nuclear Engineering Program. He will coordinate the different functions for the program, including providing mentoring of the new faculty member, assist in management of the research funds, and promote the new faculty member through an aggressive marketing campaign to attract additional research funding for the new faculty member. The PI will monitor the progress of the new faculty member to ensure they are progressing towards tenure and program, and will prepare and submit an annual report and a final report to the NRC Project Manager electronically detailing the progress of the new faculty member.

**Principal Investigator:** James Baciak, [jebaciak@mse.ufl.edu](mailto:jebaciak@mse.ufl.edu)

## **Faculty Development Program to Integrate New Faculty in Nuclear Engineering Research at Utah State University**

### **Executive Summary:**

Utah State University's Faculty Development Program is focused on two newly hired tenure-track assistant professors that will strengthen and expand USU's nuclear research and future workforce contributions. These two new faculty members complement and expand existing expertise within the Mechanical and Aerospace Engineering Department such that a nuclear engineering emphasis option can be included in its ABET accredited mechanical engineering BS degree. Moreover, their research will be integrated into the newly established Thermohydraulics and Materials Properties (TMP) Research Center. Specifically, the proposed program:

- 1) Expands MAE's nuclear research and education capacity by cultivating research and teaching opportunities for two new highly qualified faculty members with expertise in materials development for nuclear energy systems,
- 2) Establishes the new professors' research programs as integral elements of TMP to further enable collaboration within the nuclear research community and sustained research success.

As the previous USU Faculty Development Program provided essential support that enabled nuclear engineering research and education to achieve critical mass and momentum at USU, this new Faculty Development Program will strengthen and expand USU's nuclear research and future workforce contribution to new levels.

**Principal Investigator:** Heng Ban, [heng.ban@usu.edu](mailto:heng.ban@usu.edu)

## **University of Nevada, Reno Faculty Development Program in Nuclear Materials**

### **Executive Summary:**

The need for an alternative to fossil fuels, and the inability of renewables to provide enough base load electricity, has led to the re-emergence of nuclear power. However, the continued success of nuclear power as a safe, efficient and low carbon energy source will depend on our ability to address material issues. Developing a scientific basis for understanding and predicting long-term degradation of materials in nuclear power plants is not only crucial for decisions on plant-life extensions but also required for deployment of advanced nuclear materials in proposed generation IV designs. Also, materials issues regarding used nuclear fuel need to be addressed in near term. University of Nevada Reno (UNR) has been conducting research in these areas and this proposal requests support from U.S. nuclear Regulatory Commission (NRC) to initiate and establish a new Faculty position with focus on nuclear materials. Support requested from NRC is for a personnel, equipment, travel and supplies. The overarching aim is to increase the number of Americans graduating with a strong background in Nuclear Materials.

**Principal Investigator:** Dev Chidambaram, [dcc@unr.edu](mailto:dcc@unr.edu)

## **Pitt Nuclear Engineering Faculty Growth and Development**

### **Executive Summary:**

This project seeks to recruit and hire a junior faculty for a tenure-track position in Nuclear Science and Engineering to further develop our Nuclear Engineering program. This position would be within the Department of Mechanical Engineering and Materials Science, the department that oversees the Nuclear Engineering program. This individual should be able to build an externally funded research program and to contribute to the teaching mission of the Nuclear Engineering program and the department. This award would be used for start-up funds for the new junior faculty and would be used to establish a state of the art laboratory in their area of expertise, recruit and pay for graduate students, and support the new faculty in their transition. We are seeking applicants who have strong interdisciplinary interests, who can collaborate across disciplines of engineering, and a demonstrated ability to contribute to research extending beyond conventional nuclear engineering applications. We are particularly interested in candidates with expertise in the following areas: reactor multi-physics modeling and simulation; transport phenomena; nuclear materials and nuclear fuels; thermal-hydraulics; nuclear detection; nuclear imaging and radiography; and other emerging areas.

This project is emblematic of the Swanson School's commitment to nuclear education and research. While we are happy with our success, we aim to grow our Nuclear Engineering program, and the hiring of a new faculty in the area of Nuclear Science and Engineering is a necessary first step.

**Principal Investigator:** Daniel Cole, [dgcole@pitt.edu](mailto:dgcole@pitt.edu)

## **The University of Puerto Rico at Mayaguez Faculty Development Program: Structural Engineering for Nuclear Facilities – Experimental Research Initiative**

### **Executive Summary:**

The University of Puerto Rico at Mayaguez (UPRM) Faculty Development Program: Structural Engineering for Nuclear Facilities – Experimental Research Initiative will provide funds for developing a structural engineering experimental research program for nuclear facilities. The funds provided will allow summer salary and time for a new faculty member at the Department of Engineering Sciences and Materials to develop this initiative and the research equipment necessary for the first stage of this experimental research program. The 2014 NRC Faculty Development Program have being focused on the acquisition of research equipment to have the ability to conduct robust simulations for the analytical research part of the program. These analytical simulations can only be validated through experimental input thus the addition of the new faculty member, with expertise in experimental research in the areas of seismic and structural engineering, will make a stronger program in Structural Engineering for Nuclear Facilities at the UPRM.

**Principal Investigator:** Dr. Jaime Ramirez-Vick, [jaimee.ramirez@upr.edu](mailto:jaimee.ramirez@upr.edu)

## **Ohio State University Nuclear Engineering Faculty Development Program**

### **Executive Summary:**

The goal of this proposed Ohio State University Nuclear Engineering Faculty Development Program is to provide necessary funding, in addition to the regular start-up funding, to attract, recruit, and retain a highly qualified individual to the Nuclear Engineering Program (NEP) at The Ohio State University (OSU). This Program is particularly important because the demand for such individuals across all sectors of the nuclear industry, including nuclear power utilities, national laboratories, vendors, and academia, is very high and still rising, but the supply of such individuals who can effectively fit into an academic setting is very limited. The continuing increase in student enrollment of nuclear engineering graduate students and minor students, and the plan to establish a nuclear engineering major at OSU make it essential to recruit high quality faculty into the OSU NEP. Consistent with the academic calendar and the anticipated timing of the start of this grant proposal, we have been approved to initiate a new search for a tenure-track junior faculty member in nuclear engineering in the summer of 2015. The focus of the search will be an individual with a specialty area in nuclear reactor design and analysis. It is expected that the new hire will start at OSU in the 2016 Spring or Summer semester. The requested funding from the U.S. Nuclear Regulatory Commission (NRC) will enable the new faculty member to initiate new programs that can contribute significantly to workforce training and first-class research primarily in support of design and construction of advanced reactors and small modular reactors (SMRs), as well as life extension of existing nuclear power reactors. Two of our senior faculty members who are active in these areas are close to retirement age. The new faculty will expand OSU NEP's activities in a compatible manner with the on-going activities in areas of nuclear fuels and materials, advanced instrumentation and control, reactor safety, probabilistic risk assessment, software and human reliability, and reactor thermal hydraulics. If this proposal is selected for award, the funding from the grant program will be fully used to support this new hire and help OSU build a stronger NEP.

**Principal Investigator:** Tunc Aldemir, [aldemir.1@osu.edu](mailto:aldemir.1@osu.edu)



## **University of Idaho Nuclear Engineering Faculty Development Program**

### **Executive Summary:**

The comprehensive Faculty Development Program is aimed at strengthening the University of Idaho's (UI's) Nuclear Engineering (NE) Program through the support of the research and teaching activities of four (three currently existing and one new hire) faculty members associated with the NE program. The Faculty Development Program will enable the faculty to acquire/upgrade experimental capabilities as well as computational resources. The funds from the grant will also provide summer support for the faculty to develop their ideas into relevant research proposals and new courses for the NE program. The UI NE program will enhance its core capabilities in the arenas of Thermal Hydraulics, Passive Safety Systems, Nuclear Materials, Fuel Cycle and Safeguarding, increasing its sustainability. The resulting NE Program will contribute to the nuclear energy field not only in terms of innovative research, but also through improved number and quality of the graduates adding to the nation's technological workforce.

**Principal Investigator:** Vivek Utgikar, [vutgikar@uidaho.edu](mailto:vutgikar@uidaho.edu)

## **MU Faculty Development Program in Modeling and Simulation of Radiation Damage**

### **Executive Summary:**

This proposal requests \$450,000 from the NRC to support the MU Faculty Development Program with establishing research in the area of modeling and simulation of radiation damage. The goal of this project is to provide an effective mentoring environment by tenured faculty in nuclear engineering to support the academic career of a newly hired MU Assistant Professor of Chemical Engineering/Nuclear Engineering in September 2014. This mentoring relationship will help ensure successful progress toward a tenure application to the MU College of Engineering, while filling a gap in MU's nuclear engineering teaching and research offerings. This will be accomplished through providing the academic and research infrastructure for research and teaching activities, including the creation of a state-of-the-art visualization and simulation laboratory for radiation damage, reactor physics, and porous materials investigations. This faculty development enhancement -- which will benefit from the expertise of the MU Research Reactor (MURR) in operational reactor physics and materials degradation analysis -- will provide benefits to the nuclear utility infrastructure by enhancing and retaining a new faculty to contribute to teaching and research based on state-of-the-art computational modeling and analytic methods.

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