

FY 2016 Faculty Development Grant Program

Institution	Amount	Title
University of Massachusetts Lowell	\$450,000	Faculty Development in Radiological Science – Health Physics at UML
Louisiana State University and A&M College	\$450,000	Louisiana State University and A&M College Faculty Development Program in Health Physics
Brigham Young University	\$448,430	Faculty Development Program for a Nuclear Specialty in the Brigham Young University Chemical Engineering Department
Texas A&M University Engineering Experiment Station	\$375,000	Texas A&M Nuclear Engineering Faculty Development Project
University of Michigan	\$450,000	University of Michigan Department of Nuclear Engineering and Radiological Sciences
University of Wisconsin Madison	\$450,000	University of Wisconsin-Madison Faculty Development Program in Nuclear Engineering
Pennsylvania State University	\$450,000	Pennsylvania State University's Faculty Development Grant for Nuclear Security
University of Texas Austin	\$450,000	The University of Texas at Austin Nuclear and Radiation Engineering Program
Utah State University	\$312,145	Utah State University's Faculty Development Program to Integrate New Faculty in Nuclear Engineering Research at Utah State University
Virginia Commonwealth University	\$450,000	Virginia Commonwealth University Faculty Development Program in Nuclear Engineering
University of Illinois	\$450,000	University of Illinois Nuclear Engineering Faculty Development Program
Columbia University	\$289,709	Faculty Development Program in Probabilistic Low-Dose Radiation Risk Estimation, at the Columbia University Center for Radiological Research

Faculty Development in Radiological Science – Health Physics at UML

Executive Summary:

The University of Massachusetts Lowell (UML), with an ongoing Nuclear Science and Engineering Initiative focused on Radiological Science (Health Physics) and Nuclear Engineering, anticipates adding a new tenure-track faculty position to its Radiological Science/Health Physics Program in 2016, supported entirely from UML funds. This proposal requests start-up funds to launch the career of the new faculty. Our objective is to build sustainable and cohesive Nuclear Science and Engineering (NSE) academic and research programs, substantially improve and unify the current NSE curricula to reflect the changed needs and new initiatives in the industry and at UML, and leverage existing strengths in our NSE programs. A new senior faculty member was hired in 2010 and a tenure-track faculty was added in 2012 in Radiological Sciences while three faculty were hired in 2013/14 in Nuclear Engineering as part of the UML initiative. This brought stability to our programs. At this time, in order to maintain our present quality and momentum we request support for start-up funds for a new faculty member in Radiological Science who will replace a retiring faculty. This will enable us to sustain our growth and competitiveness both in our educational and research components. The funds will be used to attract and retain a highly qualified faculty, who will play an integral role in maintaining and advancing the UML Nuclear Science and Engineering Initiative, and will collaborate with existing faculty in the in the College of Science and in the College of Engineering. In addition, we are engaging industry representatives and academic peers to aid the selection of the new hires and assess the progress of the new faculty as well as that of the Program.

Principal Investigator: Erno Sajo, Erno_Sajo@uml.edu

Louisiana State University and A&M College Faculty Development Program in Health Physics

Executive Summary:

The long term objective of this project is to increase the number of well-trained radiation professionals in the national and regional workforces. The objective of this project is to attract and retain highly-qualified tenure-track faculty in academic careers in Health Physics at LSU. The benefits of this project to the NRC include the education of future Health Physicists who are capable of supporting design, construction, operation, and regulation, of nuclear facilities and the safe handling of nuclear materials. Another benefit is that the project will increase educational activities in a state of relevance to the NRC and its mission. The project plan includes searching nationally for two outstanding junior faculty with concerted efforts to increase representation of women and minorities in the nuclear education workforce. The project will provide the junior faculty with research startup funds, mentoring, and other resources necessary for the junior faculty to achieve excellence in research and teaching, *e.g.*, as evidenced by the award of tenure. The faculty will teach in a variety of undergraduate- and graduate-level nuclear science courses. LSU has in place the scientific, instructional, and administrative staff and structures to successfully complete this project.

Principal Investigator: Wayne D. Newhauser, newhauser@lsu.edu

Faculty Development Program for a Nuclear Specialty in the Brigham Young University Chemical Engineering Department

Executive Summary:

The Brigham Young University (BYU) Chemical Engineering is applying for a 3-year faculty development program in support of hiring of a nuclear engineering faculty specifically to develop a nuclear engineering specialty within the chemical engineering department at BYU. The requested funds will be used to support the new faculty hire in developing a world class research program and a specialty in nuclear engineering within the chemical engineering department at BYU. This is in response to large student interest in developing nuclear engineering opportunities in preparation for both graduate school and job placement. This chemical engineering nuclear engineering specialty will be enhanced by the development of a course-sharing network called the Utah Nuclear Education Consortium (UNEC) currently being developed. This UNEC is being formed with Utah State University and the University of Utah via the University of Utah Nuclear Engineering Program UNEP, in which students from either university can take courses from both universities. The requested funding will support both research program development and course development efforts by the new faculty hire, and will increase the graduates from BYU with sufficient experience in nuclear engineering to enter and contribute to the nuclear engineering industry.

Principal Investigator: Randy Lewis, randy.lewis@byu.edu

Texas A&M Nuclear Engineering Faculty Development Project

Executive Summary:

Texas A&M Nuclear Engineering Faculty Development Project will promote the career development of a probationary faculty member in the Department of Nuclear Engineering at Texas A&M University. The funds will enable a faculty member to jump-start a research career in a new strategic direction that aligns with exciting scholarship opportunities in nuclear science and technology, including radiochemistry. With significant institutional support the Department is now comprised of 21 faculty members, 15 of these tenured/tenure-track. A significant number of junior faculty (4) have indicated interest in benefitting from this program. The TAMU Nuclear Engineering Faculty Development Project would fund at least one of these four, selected by a competitive internal process that will be based on presentation of a research proposal, as well as a vision for integrating the teaching and research aspects of the proposed work. The Department will tap into the Center for Teaching Excellence at the University and will integrate teaching enhancement elements with the research work proposed under this grant. By enriching the research portfolio of junior faculty, this grant will also enable the Department to attract top quality graduate students from in and out of state. This will support the envisioned workforce demands in the nuclear sector, particularly those linked more closely to the research experience nurtured in the “next generation” of nuclear professionals.

Principal Investigator: Yassin A. Hassan, y-hassan@tamu.edu

University of Michigan Department of Nuclear Engineering and Radiological Sciences

Executive Summary:

The objective of this program is to provide up to three years of financial support to two new junior faculty members, helping them to succeed as faculty members in their academic career at the University of Michigan.

This program will benefit the junior faculty members by providing them critical financial support early in their academic careers, including: (1) summer support to prepare teaching materials and research grants, (2) support for graduate students early in the faculty members' academic careers, (3) support for supplies and research equipment critical for the faculty members' research, and (4) funds to travel to conferences to present papers and interact with colleagues. All of these items will contribute towards the success of the faculty members to obtain tenure in Nuclear Engineering and Radiological Sciences at the University of Michigan.

Principal Investigator: Ronald M. Gilgenbach, rongilg@umich.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.

The 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 the University of Wisconsin-Madison (UW-Madison) also augments faculty support with operation of common research equipment and/or access to key UW-Madison user facilities, such as the UW Nuclear Reactor Lab, the Extreme Environments Lab and the Materials Science Center. In our program, the mentor committee consisting of the Department Chair and key nuclear engineering faculty will work together with the assistant professor to assist them in their growth as a valuable member of the Engineering Physics faculty and UW-Madison academic community. The faculty mentoring committee provides formative feedback to the assistant professor on their strengths and weaknesses in teaching, research and service and will suggest strategies and techniques for improvement if needed. It will also assist them in discovering opportunities and developing strategies for their growing research program. Finally, the faculty mentoring committee will serve as an advocate for the assistant professor to promote visibility nationally and internationally on their work as a nuclear engineering researcher and scholar.

Principal Investigator: Douglass Henderson, dlhender@wisc.edu

Pennsylvania State University's Faculty Development Grant for Nuclear Security

Executive Summary:

The possibility that nuclear materials (fissile or radioactive materials) could be used in a terrorist attack is one of the most pressing security questions of the present times. Attention is also increasingly being given to the protection of existing nuclear facilities from external threats. These threats fall under the umbrella of nuclear security, and significant resources are being directed to enable the U.S. to cope with these concerns. In this scenario, the role of the university nuclear engineering research and education programs is both to perform the research that will enable the development of technologies that can protect the country from such threats and to educate the scientists and engineers that will work in the field.

Nuclear energy continues to be a clean, safe, reliable and cost effective source of electricity, which will be increasingly relied upon to fulfill the country's energy needs, while reducing greenhouse emissions. Housed within the Department of Mechanical and Nuclear Engineering, the Nuclear Engineering Program at Penn State is an academic program offering the full range of degrees including Bachelors of Science, Masters of Science, Masters of Engineering, and Doctor of Philosophy. The Pennsylvania State University is committed to having a prominent Nuclear Engineering Program with a strong nuclear power component, through strong support from the Department, the College of Engineering and the Provost Office. This proposal seeks start-up funds for a new, junior level, tenure-track faculty member in the Department of Mechanical and Nuclear Engineering (MNE) who has expertise in fields relevant to nuclear security, including radiation detection, remote monitoring and development of portable monitoring sources. The proposal is timely to fulfill the country's current research needs and well suited to the existing capabilities at Penn State which will help and complement the new faculty member's research and professional development. The new faculty member will benefit from a unique educational and research program in Nuclear Security developed at the Radiation Science and Engineering Center at Penn State and multiple collaboration opportunities as detailed below. The support from the United States Nuclear Regulatory Commission (NRC), partially matched by Penn State, will provide the funds to assist the new faculty member in having a productive career at Penn State.

Principal Investigator: Karen A. Thole, kthole@psu.edu

The University of Texas at Austin Nuclear and Radiation Engineering Program

Executive Summary:

The Nuclear and Radiation Engineering Program at The University of Texas at Austin is concluding a search for a tenure-track Assistant Professor. Our position announcement placed an emphasis on nuclear analytical methods, but left open the area(s) in which the successful candidate would apply these methods. Our three finalists apply their skills to diverse areas within nuclear engineering – nuclear fuel cycles, advanced radiation-hard materials, and nuclear forensics, respectively – so the proposed junior faculty development program will focus on providing resources and mentorship that will serve any of the three equally well. The startup package provided by UT-Austin will provide the specialized equipment our new faculty member will request in order to excel in his/her areas. These faculty members succeed in reaching their full research productivity and teaching effectiveness in just 1-2 years. Key recommendations incorporated into the proposed program include:

- pedagogical resources to help the faculty member incorporate their research into their lectures, conveying excitement about the field to students,
- support for a copy editor to facilitate article and proposal writing,
- explicit research and teaching mentorship as well as networking assistance roles for senior faculty,
- uniquely close involvement of a mentor in the mentee's first or second course,
- joint supervision of a student with a mentor (but structured so that the mentee receives credit for leading the supervision).

Principal Investigator: Erich Schneider, eschneider@mail.utexas.edu

Utah State University's 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 one junior tenure-track faculty member to strengthen and expand USU's nuclear research and future workforce development. The faculty member has expertise in developing novel *in vitro* cell and tissue models that can be applied to radiation biology. Her participation in nuclear health physics research will expand nuclear expertise within the college and university. Moreover, her research will be integrated into the state-sanctioned nuclear energy research center at USU, Thermohydraulics and Materials Properties (TMP) Research Center. Specifically, the proposed program:

- 1) Initiate and expand USU's nuclear research and education capacity by cultivating research and teaching opportunities for a highly qualified faculty member with expertise in healthy physics and *in vitro* tissue modeling,
- 2) Establishes the new professor's research programs as integral elements of the nuclear engineering research center to further enable collaboration within the nuclear research community and sustained research success.

As previous USU Faculty Development Programs 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

Virginia Commonwealth University Faculty Development Program in Nuclear Engineering

Executive Summary:

The primary objective of VCU's Nuclear Engineering Faculty Development Program is to attract, retain and successfully mentor a new highly-qualified tenure track Nuclear Engineering Faculty member and to facilitate their continued success in research, teaching and service at VCU. The program seeks to continuously enhance the qualifications and the expertise of our recently hired tenure-track faculty so that they can pursue innovative and multidisciplinary research and develop new course offerings in related areas of nuclear science and technology currently unavailable in VCU's curriculum. VCU offers an ABET accredited BS in Mechanical Engineering with a separately ABET accredited Major Concentration in Nuclear Engineering, and MS and PhD degrees in Mechanical and Nuclear Engineering. VCU is currently the only university in Virginia offering a full suite of undergraduate and graduate degrees in nuclear engineering.

Principal Investigator: Sama Bilbao y León, sbilbao@vcu.edu

University of Illinois Nuclear Engineering Faculty Development Program

Executive Summary:

The objective of this program is to provide resources and support to enhance the teaching and research productivity of two recently hired junior faculty members. These two new faculty members have been hired this year; and they will join the department in August 2106 and in January 2017. Support for our new faculty members is critical to meet our commitment to our students, research sponsors and the nuclear community, and to ensure the high quality of our degree programs and build for the future. The support through the faculty development program will directly influence the abilities of these junior faculty members to develop successful careers, and will also have a very positive impact on our undergraduate and graduate students and their educational opportunities.

Principal Investigator: James F. Stubbins, jstubbin@illinois.edu

Faculty Development Program in Probabilistic Low-Dose Radiation Risk Estimation, at the Columbia University Center for Radiological Research

Executive Summary:

The Fukushima accident in 2011 emphasized major gaps in our understanding of the potential health effects associated with low doses of ionizing radiation. These gaps seriously impact our ability to make optimal science-driven decisions in response to a major nuclear event in the United States, accidental or otherwise. While large-scale radiological events are obvious issues of concern, other issues such as the need for science-based policies regarding the potential expansion of nuclear power, cleanup of radioactively contaminated sites and the potential for radiological terrorism, require a level of research and scientific expertise that the US is rapidly losing. In particular there is concern about a critical decrease in the number of low dose risk estimation experts who will be available to assist in high-level policy and decision making. Our goal is to recruit a tenure-track Assistant Professor to expand and complement the ongoing low-dose radiation risk assessment program at the Center for Radiological Research (CRR) at Columbia University Medical Center (CUMC). The focus will be on Level 3 Probabilistic Risk Analysis relating to potential human health consequences after low-dose radiation exposure. We propose a new Faculty Development Program with five central components: *Training, Mentoring, Evaluation, Management and Sustainability*. It will build on:

- 1) The existing experience and expertise at the Center for Radiological Research - which is in its centenary year - in low-dose radiation risk estimation;
- 2) Already in-place Junior Faculty Development and Mentorship Programs at CUMC and CRR;
- 3) A new Masters program at CUMC/CRR in Radiological Sciences, commencing in 2016;
- 4) Matching funds for the new Program, provided by the Dean of the Columbia Medical School.

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