

NUCLEAR NONPROLIFERATION INTERNATIONAL SAFEGUARDS GRADUATE FELLOWSHIP PROGRAM

Deadline for Applications for 2022-2023
February 15, 2022

Awards Announced April 2022

Administered by:
South Carolina Universities Research and Education Foundation

Sponsored by:
U.S. Department of Energy, National Nuclear Security Administration, Office of
International Nuclear Safeguards



TABLE OF CONTENTS

INTRODUCTION TO THE NUCLEAR NONPROLIFERATION INTERNATIONAL SAFEGUARDS.....	3
GRADUATE FELLOWSHIP PROGRAM	3
EXPLANATION OF INTERNATIONAL NUCLEAR SAFEGUARDS.....	3
RESEARCH OBJECTIVES	3
PROGRAM BENEFITS	4
TUITION AND FEES.....	4
TRAVEL.....	4
THESIS RESEARCH	4
FELLOWSHIP OBLIGATIONS.....	5
PROGRAMS AT PARTICIPATING UNIVERSITIES	5
ENROLLMENT	5
TERMS OF APPOINTMENT.....	5
ANNUAL RENEWAL.....	5
PRACTICUM.....	5
PUBLICATION ACKNOWLEDGMENT	5
APPLICATION PROCEDURES.....	6
ELIGIBILITY	6
APPLICATION DEADLINE	6
EVALUATION OF APPLICATIONS.....	6
PARTICIPATING UNIVERSITIES.....	8
PARTICIPATING NATIONAL RESEARCH AND PRACTICUM LABORATORIES	11
PARTICIPATING INTERNATIONAL PRACTICUM AND RESEARCH LABORATORIES.....	12

INTRODUCTION TO THE NUCLEAR NONPROLIFERATION INTERNATIONAL SAFEGUARDS GRADUATE FELLOWSHIP PROGRAM

The Department of Energy (DOE) National Nuclear Security Administration's (NNSA) Office of International Nuclear Safeguards (OINS) is a comprehensive, multi-million-dollar program dedicated to developing the policies, concepts, technologies, expertise, infrastructure, and human capital necessary to sustain and enhance international nuclear safeguards. DOE/NNSA is the principal federal sponsor of the Nuclear Nonproliferation International Safeguards (NNIS) Graduate Fellowship Program.

Increasing costs for graduate education and demand for employees with bachelor's degrees in nuclear-related science and engineering has reduced the number of qualified students seeking advanced degrees in those fields. Simultaneously, demand for Ph.Ds. in the radiopharmaceutical, nuclear power, defense, and waste management industries means that fewer scientists and engineers with advanced degrees are available to pursue careers in nuclear nonproliferation and safeguards. This, coupled with the retirement of a broad range of nuclear scientists and engineers who were educated in the 1970s, has exacerbated the issue.

The NNIS Graduate Fellowship Program provides financial support for exceptional students pursuing technical doctoral research relevant to the field of international safeguards. Participating universities foster partnerships between science/engineering programs and programs focused on nuclear nonproliferation and safeguards policy. Armed with both deep technical expertise and policy understanding, NNIS Fellows are primed to take on the exciting and challenging work of international nuclear safeguards.

EXPLANATION OF INTERNATIONAL NUCLEAR SAFEGUARDS

International nuclear safeguards consist of technical measures that the International Atomic Energy Agency (IAEA) uses to verify that countries are in compliance with their legally binding commitments not to pursue nuclear weapons. They comprise a wide variety of tools, methods, and technologies that provide assurances to the international community that a country's nuclear activities are exclusively peaceful. Common safeguards measures include destructive and non-destructive assay of nuclear material, review and analysis of nuclear material accounting data and other facility operator records, facility design information verification, containment (e.g., use of tamper-indicating tags and seals), surveillance, environmental sampling, satellite imagery review and analysis, and open-source searches for safeguards-relevant information, among others.

RESEARCH OBJECTIVES

The objective of the NNIS Graduate Fellowship Program is to identify and educate highly trained scientists and engineers to take on the challenges and opportunities of international nuclear safeguards. NNIS Fellows must demonstrate the safeguards-impact of their funded research and an intent to pursue a career that will positively contribute to the international safeguards regime. To that end, applications shall describe:

- The potential safeguards impact of their research. For example, will research results enhance the IAEA's technical capabilities to detect the diversion of nuclear material, facility misuse, or undeclared nuclear activities in a timely manner? Will the research results lead to greater efficiency in the implementation of safeguards, e.g., by allowing the IAEA to spend less time on in-field verification? Why does this matter? The best applications will link research proposals to priorities identified in the IAEA Long-Term Safeguards R&D plan, or other indications of IAEA and/or United States Government (USG) safeguards interest/concern.
- The specific existing or future technical safeguards challenge that the research addresses. For example, if research intends to improve containment/surveillance (C/S) capabilities, how specifically will that be achieved? By designing a more sensitive monitor? Improving telemetry? Developing a new material for use in tamper-evident seals?
- The dearth of viable fixes to the technical challenges they propose to address.

PROGRAM BENEFITS

The maximum value of any individual award, including stipend and tuition and associated fees is \$65,000/year.

STIPEND

Fellows receive a monthly stipend of no more than \$2,500. Fellows will also receive an additional Dislocation Allowance of \$600 per month (prorated) while on a practicum assignment.

The program sponsor attempts to provide adequate funding for Fellows to meet the costs of graduate school. No other student support that requires work or any other obligation such as teaching, or a research assistantship can be accepted without the direct consent of the South Carolina Universities Research and Education Foundation (SCUREF). Other awards, prizes, and similar type payments (including veteran's benefits) that do not require a service may be accepted. Please contact the SCUREF Charleston Office if you have a question regarding accepting the NNIS Fellowship in conjunction with any other award, prize, or similar type payment. Payment received for such employment may result in an equivalent deduction from the Fellow's stipend. SCUREF reserves the right to revoke the appointment if the Fellow receives compensation without notifying program administrators as to the nature and extent of any payment.

TUITION AND FEES

SCUREF pays tuition and fees (up to \$35,000/year) directly to the participating university upon receipt of invoice. Optional, refundable, and penalty fees (such as late registration and duplication fees) are not payable by SCUREF. Health insurance fees will be paid by only if they are required for all enrolled graduate students at the Fellow's university. All tuition and fee charges must be certified consistent with those made to regular graduate students and necessary for enrollment into the graduate program. In no case will the annual cost of *tuition, fees, and stipend* exceed \$65,000 per Fellow.

In August of each year, SCUREF will notify the bursar's office at each university regarding invoicing procedures for Fellowship students. Students will receive a copy of this correspondence and should retain this copy for use in discussing any billing errors with their university's bursar office.

TRAVEL

Travel expenses must be approved by the SCUREF program administrators and the sponsor prior to actual travel and must be U.S. General Services Administration (GSA) compliant. In general, travel reimbursements are considered for seminars, conferences, and workshops associated with this program or any meeting for which the sponsor requests attendance. Full or partial reimbursements may be authorized depending on the availability of funds. Fellows should submit a Travel Request Form to SCUREF at least 30 days before the anticipated travel dates.

Travel expenses will be reimbursed for the Fellow for travel to/from the practicum site providing that the distance is more than 50 miles one-way from the Fellow's university. It is the Fellow's responsibility to find the least expensive mode of travel. No expenses are paid for food or lodging at the practicum site. All travel must be authorized in advance by SCUREF and the sponsor and must be GSA compliant.

Full or partial travel reimbursement is also considered on occasions requiring the Fellow to consult with the university graduate committee and/or deliver a presentation of thesis/dissertation research.

THESIS RESEARCH

A Fellow may request to spend all or part of the time working on thesis/dissertation research at one of the participating DOE/NNSA-approved facilities listed at the end of this booklet. Off-campus research requires that the Fellow complete a request form and have it endorsed by the faculty advisor, laboratory coordinator, and laboratory advisor. Laboratory advisors must agree to mentor and supervise the Fellow and coordinate activities with the Fellow's university personnel throughout the research assignment. Laboratory advisors should serve on the Fellow's graduate thesis research committee, if approved by the university.

FELLOWSHIP OBLIGATIONS

PROGRAMS AT PARTICIPATING UNIVERSITIES

Fellowship awardees are required to attend a university participating in the NNIS Graduate Fellowship Program. To become a participating university, interested faculty members must submit an application, which can be found at www.scuref.org. Universities selected to participate in the program will have demonstrated a commitment to advancing nuclear nonproliferation international safeguards education and creating a sustainable academic program. The list of participating universities and university Fellowship coordinators is provided at the end of this booklet. Interested Fellowship applicants may contact any Fellowship university coordinator directly for detailed information related to the university's nuclear nonproliferation international safeguards program.

ENROLLMENT

Fellowship appointment is contingent upon acceptance into an approved program at a participating university. The initial Fellowship appointment is for a 12-month period, typically renewable for up to 48 months. Prorated for previously completed graduate work, appointments may be shorter than the maximum allowable number of months. Extensions beyond the initial appointment will be considered on a case-by-case basis.

Throughout their Fellowship period, Fellows must be enrolled full-time at an approved university and working toward the degree described in their application. During the summer months, Fellows will conduct relevant research, enroll in summer classes, complete a practicum assignment, or perform a combination of any of these activities.

TERMS OF APPOINTMENT

Each Fellow must agree to the terms and conditions of appointment delineated in their Appointment Letter and Terms of Appointment documents. This includes agreement to pursue the course of study and research described in their application, participate in at least one summer practicum, and entertain DOE/NNSA contractor employment opportunities. Fellows must inform the SCUREF program administrators of address changes and must complete any evaluation/assessment questionnaires sent by SCUREF for program information and/or evaluation during the Fellowship and for at least five years after the end of their Fellowship.

ANNUAL RENEWAL

Each Fellowship appointment is renewed annually through a renewal application process. Each renewal is based upon the Fellow's maintaining excellent performance and professionalism including, but not limited to, passing examinations in pursuit of a masters or doctoral degree required by their academic department, progressing research toward completion of a degree, and otherwise maintaining eligibility for a degree (for example, maintaining necessary grade point average and good standing with their academic department and university). Renewal forms along with supporting references and current official transcripts must be submitted to SCUREF annually. All awards and renewals are subject to the continuing availability of funding.

PRACTICUM

Fellows are required to participate in at least one practicum for *at least* three months at a designated DOE/NNSA facility to gain applied experience. Fellows typically complete a practicum during the summer term and select a practicum opportunity that can be used to support their thesis research. Fellows are responsible for securing their own practicum appointments by contacting the appropriate laboratory coordinator and completing a practicum request form. In addition to the opportunities at U.S. national laboratories, there are also international practicum and research opportunities at European Union (EU) laboratories listed on the last page of this booklet. Fellows interested in an international assignment should contact SCUREF. Fellows may be required to apply for security clearance upon acceptance of a practicum or research appointment at a DOE/NNSA facility or an affiliated federal agency.

PUBLICATION ACKNOWLEDGMENT

The program sponsor and administrators encourage Fellows to publish reports and articles in scientific and engineering journals and present posters or papers at conferences. Prior to submission, *all* publication and

presentation materials must undergo classification, export control, and technical reviews. The Fellow must submit abstracts, articles, reports, posters, papers, etc. to the SCUREF *at least three weeks* before submission for publication or presentation. These works should show the joint affiliation of the Fellow with the university and, if appropriate, with the laboratory at which the research was conducted, and acknowledge Fellowship support with the following:

“This research was performed under appointment to the Nuclear Nonproliferation International Safeguards Fellowship Program sponsored by the Department of Energy, National Nuclear Security Administration’s Office of International Nuclear Safeguards (NA-241).”

APPLICATION PROCEDURES

ELIGIBILITY

This Fellowship is open to all U.S. Citizens about to enroll in or currently enrolled in a qualified course of study at a participating university with at least one full year of graduate work remaining at the beginning of September 2022. Candidates with dual citizenship must notify SCUREF. It is the policy of DOE and SCUREF to recruit and nominate participants without regard to race, age, gender, sexual orientation, religion, color, national origin, physical or mental disability, or special disabled or veteran status.

APPLICATION DEADLINE

Please go to www.scuref.org and navigate to the NNIS Fellowship page to submit all materials electronically by February 15, 2022. The current competition cycle for this program is from November 2021 – February 2022. SCUREF will not process late and/or incomplete applications. Please include the Fellowship program name on all correspondence.

A complete application includes the following components:

- Application Form
- Three (3) References
- Official Transcripts (all transcripts must be sent directly from the university registrar) *

If you are unable to submit the application materials electronically, please contact Nicole Huchet at (843) 793-1079, nhuchet@scuref.org.

*Transcripts should be sent directly from the university registrar by fax, mail, or email to:

SCUREF, Charleston Office
PO Box 1026
Johns Island, South Carolina 29457
843-614-6421 fax
nhuchet@scuref.org

UPS/Fed Ex/DHL address:
SCUREF
2860 Maybank Highway
#1026 (You must use the pound/hashtag sign)
Johns Island, SC 29455

EVALUATION OF APPLICATIONS

Applicants are responsible to ensure that their applications are complete. After the application deadline, the SCUREF will distribute the fellowship applications to an independent panel for review. The review panel is composed of university, DOE/NNSA, and national laboratory personnel directly responsible for instruction and/or research in the international safeguards and nuclear nonproliferation fields. The DOE/NNSA program sponsor reviews the applications and the panel's recommendations and approves the final selection.

Applications are evaluated based on academic performance, relevant coursework, demonstrated commitment to the field of international nuclear safeguards, research relevance, and references. The number of fellowships awarded annually is contingent on the number of Fellows graduating from the program and the availability of funds.

After the DOE/NNSA approves the award recipients, SCUREF notifies applicants of their award status. Notification usually occurs in mid-April. SCUREF is responsible for the daily administration of the NNIS on behalf of the program sponsors, and assists Fellows, universities, and laboratories with questions regarding stipends, payment of tuition and fees, practicum assignments, travel, and related issues.

PARTICIPATING UNIVERSITIES

<p>CLEMSON UNIVERSITY Timothy DeVol, Ph.D. Environmental Engineering and Earth Sciences 342 Computer Court Anderson, SC 29625-6510 864-656-1014 devol@clemson.edu</p>	<p>UNIVERSITY OF CALIFORNIA, BERKELEY Rachel Slaybaugh, Ph.D. Department of Nuclear Engineering 4173 Etcheverry Hall Berkeley, CA 94720-1731 570-850-3385 slaybaugh@berkeley.edu</p>
<p>COLORADO SCHOOL OF MINES Jeffrey King, Ph.D. Nuclear Science and Engineering Program 1500 Illinois Street, Hill Hall 201 Golden, CO 80401 303-384-2133 kingjc@mines.edu</p>	<p>COLORADO STATE UNIVERSITY Ralf Sudowe, Ph.D. Dept of Environ. and Radiological Health Sciences 1618 Campus Delivery Fort Collins, CO 80523 970-491-0219 ralf.sudowe@colostate.edu</p>
<p>UNIVERSITY OF FLORIDA James Baciak, Ph.D. Department of Materials Science and Engineering 549 Gale Lemerand Drive Gainesville, FL 32611-6400 352-273-2131 jebaciak@mse.ufl.edu</p>	<p>GEORGIA INSTITUTE OF TECHNOLOGY Steven Biegalski, Ph.D. The George W. Woodruff School of Mechanical Engineering, Nuclear and Radiological Engineering, and Medical Sciences Program 770 State Street, Boggs Building, Suite 3-44 Atlanta, GA 30332-0745 404-385-5973 steven.biegalski@me.gatech.edu</p>
<p>UNIVERSITY OF ILLINOIS, CHAMPAIGN Angela Di Fulvio, Ph.D. Department of Nuclear, Plasma, and Radiological Engineering 116 Talbot Laboratory 104 S. Wright St. Urbana, IL 61801 217-300-3739 difulvio@illinois.edu</p>	<p>MASSACHUSETTS INSTITUTE OF TECHNOLOGY Areg Danagoulian, Ph.D. Department of Nuclear Science and Engineering 77 Massachusetts Avenue Building 24-220 Cambridge, MA 02319 617-324-6329 aregjan@mit.edu</p>
<p>UNIVERSITY OF MICHIGAN Igor Jovanovic, Ph.D. Department of Nuclear Eng. and Radiological Sciences 2355 Bonisteel Boulevard 1902 Cooley Building Ann Arbor, MI 48109-2104 734-647-4989 ijov@umich.edu</p>	<p>UNIVERSITY OF MISSOURI, COLUMBIA John Brockman, Ph.D. University of Missouri Research Reactor Center 1513 Research Park Drive Columbia, MO 65211 573-884-8095 brockmanjd@missouri.edu</p> <p><i>Alternate contact: Ms. Gayla Neumeyer 573-882-8366, neumeyerg@missouri.edu</i></p>

<p>UNIVERSITY OF NEVADA, LAS VEGAS Artem Gelis, Ph.D. Department of Radiochemistry 4505 S. Maryland Parkway MS 4009 Las Vegas, Nevada 89154 702-895-2640 artem.gelis@unlv.edu</p>	<p>NORTH CAROLINA STATE UNIVERSITY John Mattingly, Ph.D. Department of Nuclear Engineering 2148 Burlington Nuclear Laboratory 2500 Stinson Drive Raleigh, North Carolina 27695-7909 919-515-0224 john_mattingly@ncsu.edu</p>
<p>OHIO STATE UNIVERSITY Vaibhav Sinha, Ph.D. College of Engineering Department of Mechanical and Aerospace Engineering Scott Lab 428, 201 W. 19th Avenue Columbus, OH 43210-1142 614-292-3571 sinha.181@osu.edu</p>	<p>OREGON STATE UNIVERSITY Camille Palmer, Ph.D. School of Nuclear Science and Engineering 210 Merryfield Hall Corvallis, OR 97331 541-737-7065 camille.palmer@oregonstate.edu</p>
<p>PENNSYLVANIA STATE UNIVERSITY Kenan Unlu, Ph.D. Radiation Science and Engineering Center 101 Breazeale Nuclear Reactor University Park, PA 16802 814-865-6351 k-unlu@psu.edu</p>	<p>PURDUE UNIVERSITY Jason T. Harris, Ph.D. Center for Radiological and Nuclear Security 550 Stadium Mall Drive West Lafayette, IN 47907 765-496-1271 jtharris@purdue.edu</p>
<p>RENSSELAER POLYTECHNIC INSTITUTE Emily Liu, Ph.D. Mechanical, Aerospace, and Nuclear Engineering Department 110 8th JEC 5046 Troy, NY 12180 518-276-8592 liue@rpi.edu</p>	<p>UNIVERSITY OF SOUTH CAROLINA Travis W. Knight, Ph.D. Mechanical and Nuclear Engineering Department 300 Main Street Columbia, SC 29208 803-777-1465 twknight@sc.edu</p>
<p>TEXAS A&M UNIVERSITY Craig Marianno, Ph.D. Nuclear Engineering Department 3473 TAMU College Station, TX 77843-3473 979-845-6093 marianno@tamu.edu</p>	<p>UNIVERSITY OF TENNESSEE Howard Hall, Ph.D. Department of Nuclear Engineering Zeanah Engineering Complex 863 Neyland Drive Knoxville, TN 37996 865-974-2525 hhall6@utk.edu</p>
<p>UNIVERSITY OF TEXAS Sheldon Landsberger, Ph.D. Nuclear and Radiation Engineering Program Nuclear Engineering Teaching Lab Pickle Research Campus, R-9000 Austin, Texas 78712 512-796-0287 s.landsberger@mail.utexas.edu</p>	<p>VIRGINIA COMMONWEALTH UNIVERSITY Supathorn Phongikaroon, Ph.D. Department of Mechanical & Nuclear Engineering 401 West Main Street, Room E3253 PO Box 843015 Richmond, VA 23284-3015 804-827-2278 sphongikaroon@vcu.edu</p>

UNIVERSITY OF WISCONSIN-MADISON
Paul Wilson, Ph.D.
Department of Engineering Physics
1500 Engineering Drive
Madison, WI 53706
608-263-0807
paul.wilson@wisc.edu

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PARTICIPATING NATIONAL PRACTICUM AND RESEARCH LABORATORIES

<p>ARGONNE NATIONAL LABORATORY Claudio Gariazzo, Ph.D. Argonne National Laboratory 9700 S. Cass Ave, Bldg. 315, Rm L122 Argonne, IL 60439 Phone: 630-252-4812 cgariazzo@anl.gov www.anl.gov</p>	<p>BROOKHAVEN NATIONAL LABORATORY Lisa Toler, Ph.D. Brookhaven National Laboratory Bldg. 490C; PO Box 5000 Upton, NY 11973 631-344-2276 toler@bnl.gov www.bnl.gov</p>
<p>IDAHO NATIONAL LABORATORY Amanda Rynes Idaho National Laboratory PO Box 1625 Idaho Falls, ID 83415-3740 208-526-1616 Amanda.rynes@inl.gov www.inl.gov</p>	<p>LOS ALAMOS NATIONAL LABORATORY Chloe McMath Los Alamos National Laboratory PO Box 1663, Mailstop J976 Los Alamos, NM 87545 505-412-7842 cmcmath@lanl.gov www.lanl.gov</p>
<p>LAWRENCE LIVERMORE NATIONAL LABORATORY Yana Feldman Lawrence Livermore National Laboratory P.O. Box 808, L-184 Livermore, California 94551-0808 925-423-0604 feldman13@llnl.gov www.llnl.gov</p>	<p>OAK RIDGE NATIONAL LABORATORY Jessica White-Horton Oak Ridge National Laboratory One Bethel Valley Road Bldg. 5300, MS 6315 Oak Ridge, TN 37830 865-574-1075 whitejl@ornl.gov www.ornl.gov</p>
<p>PACIFIC NORTHWEST NATIONAL LABORATORY Rebecca Jones Pacific Northwest National Laboratory 902 Battelle Boulevard PO Box 999, MSIN K8-50 Richland, WA 99352 509-371-7745 rl.jones@pnnl.gov www.pnnl.gov</p>	<p>SANDIA NATIONAL LABORATORIES Zoe Gastelum Sandia National Laboratories PO Box 5800 Albuquerque, NM 87185-1373 505-401-6959 zgastel@sandia.gov www.sandia.gov</p>
<p>SAVANNAH RIVER NATIONAL LABORATORY Tim Hasty Savannah River National Laboratory Road 1, Building 773-42A Aiken, SC 29808 803-725-8641 timothy.hasty@srnl.doe.gov www.srnl.doe.gov</p>	<p>Y-12 NATIONAL SECURITY COMPLEX Chantell Murphy, Ph.D. Y-12 National Security Complex PO Box 2009, MS 8112 Oak Ridge, TN 37831-8112 865-241-9580 chantell.murphy@cns.doe.gov www.y12.doe.gov</p>

PARTICIPATING INTERNATIONAL PRACTICUM AND RESEARCH LABORATORIES

JOINT RESEARCH CENTER, GERMANY

Klaus Luetzenkirchen, Ph.D.
Head of Nuclear Safeguards and Forensics Unit
European Commission, Joint Research Centre
Directorate of Nuclear Safety and Security
PO Box 2340
76125 Karlsruhe, Germany
Phone: +49-7247-95-1424
Email: klaus-richard.luetzenkirchen@ec.europa.eu
<https://ec.europa.eu/jrc/en>

JOINT RESEARCH CENTER, ITALY

Willem Janssens
Head of Department, Nuclear Security and Safeguards
European Commission, Joint Research Centre Directorate, Nuclear
Safety and Security
Via E. Fermi, 2749
TP 210 – 21027, Ispra (VA), Italy
Phone: +39-0332-78-9939, Mobile: +39-349-761-7411
Email: willem.janssens@ec.europa.eu
<http://npns.jrc.ec.europa.eu>

FORSCHUNGSZENTRUM JUELICH

Dr. Irmgard Niemeyer, Ph.D.
Head of Division, Nuclear Safeguards and Security
Institute of Energy and Climate Research
IEK-6: Nuclear Waste Management and Reactor Safety
Forschungszentrum Juelich GmbH
52425 Juelich, Germany
Tel.: +49-2461-61-1762
Fax: +49-2461-61-2450
Email: i.niemeyer@fz-juelich.de
<http://www.fz-juelich.de/iek/iek-6/safeguards-security>