

U.S. DEPARTMENT OF HOMELAND SECURITY

DOMESTIC NUCLEAR DETECTION OFFICE

U.S. DEPARTMENT OF DEFENSE

DEFENSE THREAT REDUCTION AGENCY

Nuclear Forensics Graduate Fellowship Program



Student Application Deadline
February 1, 2013

Awards Announced April 2013

ACADEMIC YEAR: 2013-2014

Administered by the South Carolina Universities Research and Education Foundation

This program description was prepared under Grant Number 2012-DN-130-NF0001 between The United States Department of Homeland Security and the South Carolina Universities Research and Education Foundation and Grant Number DE-NE0000393 between The United States Department of Defense and the South Carolina Universities Research and Education Foundation.

TABLE OF CONTENTS

<u>Program Description</u>	2
<u>Application Procedures</u>	3
<u>Fellowship Obligations</u>	4
<u>Fellowship Benefits</u>	5
<u>Evaluation of Applications</u>	6
<u>Participating Universities</u>	7
<u>Participating Laboratories</u>	9
<u>Application</u>	11

AN INTRODUCTION TO THE NUCLEAR FORENSICS GRADUATE FELLOWSHIP PROGRAM

PROGRAM DESCRIPTION

Jointly sponsored by the United States Departments of Homeland Security and Defense (DHS/DoD), the Nuclear Forensics Graduate Fellowship Program (NFGFP) provides support to graduate students pursuing doctoral degrees in nuclear, geochemical, and other disciplines directly relevant to nuclear forensics. This program aims to develop the next generation of highly qualified scientists to meet U.S. Government needs for nuclear forensics expertise and to build a viable student career path in nuclear forensics.

Nuclear forensics is a top U.S. national security priority. Congress recognized the critical need for first-rate nuclear forensics experts to support this mission in the *Nuclear Forensics and Attribution Act* (P.L. 111-140), which the President signed on February 16, 2010. In addition, world leaders highlighted the importance of international nuclear forensics cooperation during both the 2010 and 2012 Nuclear Security Summits. Restoring and sustaining an enduring expertise pipeline is one of the most significant challenges facing the U.S. nuclear forensics capability today. The U.S. nuclear stockpile and weapons complex has been shrinking since the end of the Cold War, and nuclear scientists have left the field for other pursuits. The majority of those remaining are retired or nearing retirement. Moreover, the number of students graduating with radiochemistry and related degrees, as well as the number of university programs offered, has declined significantly in the past several decades.

The NFGFP, which is a key component of the broader National Nuclear Forensics Expertise Development Program, aims to confront this challenge head-on. Broadly, the fellowship program provides incentives for universities to invest in and further develop radiochemistry and other nuclear forensics-related academic programs. Specifically, the goal is to encourage talented students to seek advanced education in technical areas related to nuclear forensics. Fellows gain unique, hands-on experience through laboratory practicums and close interaction with technical and policy experts throughout the nuclear forensics community. Ultimately, the NFGFP gives highly motivated students an exceptional opportunity to apply their knowledge to enhance U.S. national security.

RELATED TECHNICAL AREAS

The purpose of the NFGFP is to meet U.S. Government (USG) needs for highly trained scientists and engineers in technical areas in which there are ongoing federal research and development programs. Some of these areas include:

1. Technical Mission Area 1 (TMA 1): In general, the NTNF community is interested in advancements in the analysis and characterization of nuclear and other radioactive materials. Of particular importance are innovations in the speed, accuracy, and precision of determining the physical, chemical, isotopic, micro-structural, and/or morphological properties of materials. Specifically in FY2013, the USG is primarily seeking significant developments in the quantification of micro-structural and morphological measurements of bulk uranium and plutonium materials in both oxide and metal forms.
2. Technical Mission Area 2 (TMA 2): Following the detonation of a nuclear device, solid debris samples to be analyzed are expected to contain trace-level quantities of nuclear materials combined with material from the immediate environment around the detonation site, which may have been activated and is assumed to have been vaporized and recondensed. As such, debris for dissolution is expected to have formed at high temperatures and contain silicates and other hard-to-dissolve materials. Solid fallout debris is typically in a glassy matrix containing parts per million (ppm) quantities of plutonium or uranium with radioactive fission products. Improvements are sought in the characterization and analysis of nuclear and non-nuclear constituents within these nuclear and post-detonation debris materials, including those present in trace quantities.

3. **Technical Mission Area 3 (TMA 3):** General studies that improve our understanding of how relevant stages of the nuclear fuel cycle create, persist, or modify discriminating material characteristics in the metal or oxide forms of uranium or plutonium. FY2013 activities should focus on identifying discriminating characteristics that help assess the process history and provenance of bulk uranium and plutonium materials produced in the enrichment, conversion to oxides, and conversion to metal stages of the fuel cycle, and developing simulations that predict material characteristics from parameterized processes.

APPLICATION PROCEDURES

ELIGIBILITY

Students with undergraduate degrees in the physical sciences, life sciences, or engineering are eligible to apply for the Nuclear Forensics Graduate Fellowship. Graduate students in these technical disciplines who will have at least two full years of graduate work remaining at the beginning of September 2013 are also eligible. Applicants must be pursuing or planning to pursue doctoral study in specialties directly relevant to technical nuclear forensics. These specialties include but are not limited to radiochemistry, geochemistry, nuclear physics, nuclear engineering, materials science, and analytical chemistry.

Applicants must be U.S. citizens. It is the policy of the South Carolina Universities Research and Education Foundation (SCUREF) and its contractor, the Medical University of South Carolina (MUSC), to recruit and nominate participants without regard to race, age, gender, religion, color, national origin, physical or mental disability, or special disabled or veteran status.

APPLICATION DEADLINE

The current competition cycle for this program is from November 2012 - February 1, 2013. **The MUSC Office of Special Programs must receive all parts of the application by February 1, 2013.** GRE scores are required for a complete application. Scores earned before November 2003 will not be accepted. MUSC 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
- GRE scores (ETS code 5949)
- Proof of U.S. Citizenship (copy of birth certificate or U.S. passport)

Application materials should be submitted electronically through the SCUREF website (www.scuref.org). If you are unable to submit the application electronically, completed application materials can be mailed to the address below.

Medical University of South Carolina
Office of Special Programs, NFGFP
19 Hagood Avenue, HOT 304-H4
MSC 851
Charleston, SC 29425-8510

For additional information or assistance, please contact the MUSC Office of Special Programs at (843) 792-0832 or nhuchet@scuref.org.

FELLOWSHIP OBLIGATIONS

ENROLLMENT AND PERIOD OF APPOINTMENT

The initial fellowship appointment is for a 12-month period and is renewable for up to a total of 60 months or five years. Each appointment is prorated based on the amount of graduate work completed prior to the fellowship appointment date. Throughout the fellowship appointment, graduate students must be enrolled full time at an approved university and perform research within the objectives of the fellowship program. During the summer months, fellows are to continue working toward achieving a doctoral degree. Students may choose to conduct research relevant to their specialization, enroll in summer classes, complete a practicum assignment at a national laboratory, or do a combination of the three.

PROGRAMS AT PARTICIPATING UNIVERSITIES

A fellowship appointment is contingent upon acceptance into an education program at a DHS/DoD-approved university. Universities selected to participate in the program will have demonstrated a commitment to advancing nuclear forensics education and creating a sustainable academic program. The list of participating universities and university fellowship coordinators is provided on page seven of this booklet. Interested applicants may contact any fellowship coordinator directly for detailed information related to the university's nuclear forensics program.

PRACTICUM

Each fellow is required to complete two 10-week practicums at a Department of Energy (DOE) national laboratory, a DoD laboratory, or a federal agency conducting research related to technical nuclear forensics. Fellows typically complete their practicums during the summer and any practicum may be used to support the Fellow's thesis research. Designated practicum locations and coordinators can be found on page nine of this booklet.

Upon acceptance of a practicum appointment at a DOE/DoD laboratory or a federal agency, fellows may be required to obtain a security clearance.

TERMS OF APPOINTMENT INCLUDING REQUIRED POST-GRADUATE EMPLOYMENT

NFGFP appointments are part of the National Nuclear Forensics Expertise Development Program, which is codified in the *Nuclear Forensics and Attribution Act* (P.L. 111-140). Fellows must agree to specific terms of appointment in accordance with this law. Recipients of the fellowship must complete their academic programs with a consistently high level of academic standing, and upon graduation must serve for two years in a post-doctoral or other staff position at a DOE national laboratory, a DoD laboratory, or a federal agency in a technical nuclear forensics-related specialty. The program sponsors will work closely with MUSC, DOE/DoD laboratory staff, federal agency personnel, and the fellows throughout their appointments to foster strong professional connections. These connections will be further strengthened during the fellows' two summer practicums at DOE/DoD laboratory facilities. It is also important to note that DHS funds post-doctoral laboratory fellowships for which graduating NFGFP participants are eligible to apply. The program sponsors work with the host organizations to ensure that salaries extended to post-graduates are commensurate with salaries offered in similar positions at that organization. Should an NFGFP participant choose not to comply with these terms of appointment, the total amount of the fellowship must be repaid to the U.S. Government, including interest at the prevailing rate current for graduate student loans at the time the fellowship was awarded (this rate is set at 6.8 percent through 2013). Applicants may request the full terms and conditions of this agreement by contacting the MUSC Office of Special Programs at (843) 792-0832 or nhuchet@scuref.org. These terms will be included for review and signature in successful applicants' official letters of appointment.

ANNUAL FELLOWSHIP RENEWAL

It is the responsibility of the award recipient to submit a completed application of renewal to the MUSC Office of Special Programs by February 1st of each year. For renewal consideration, participants should demonstrate superior academic performance and the continuation of an academic program of study and research consistent with the objectives of the fellowship program, as identified in the NFGFP Description. Fellows who have finished the program are required to complete annual questionnaires for MUSC to enable the federal sponsors to continually assess and evaluate the program.

All awards and renewals are subject to the continuing availability of funding.

FELLOWSHIP BENEFITS

TUITION AND FEES

During the appointment, MUSC is responsible for the payment of tuition and fees directly to the participating university. Optional, refundable, and penalty fees (such as late registration and duplication fees) are not payable by MUSC. MUSC pays health insurance fees only if they are required for all graduate students. Tuition and enrollment fees for the graduate program must be consistent with those made to regular graduate students. In August of each year, MUSC sends a notification letter to the university's bursar describing the procedures for invoicing tuition and fees on behalf of the fellow.

STIPENDS

In addition to tuition, fellows receive a monthly stipend of \$2,400 throughout the duration of their appointment. The monthly stipend increases by \$500 (prorated) while the fellow is on a practicum assignment. MUSC will either deposit stipends directly into the fellow's bank account or mail monthly stipends to the fellow.

While participating in the NFGFP, the fellow may accept other awards, prizes, and similar payments (including veteran's benefits) that do not require a product or service. If a fellow accepts another award, such as a research assistantship or other responsibilities in which funds are provided and the fellow is required to spend time on the project, MUSC must be informed in advance and funds may be deducted from the fellow's stipend. In addition, MUSC reserves the right to withdraw the fellowship if the fellow receives compensation without notifying MUSC as to the nature and extent of this payment.

TRAVEL

Travel expenses are approved by MUSC and DHS/DoD prior to actual travel and are based on U.S. General Services Administration (GSA) accepted rates. In general, travel reimbursements are considered for seminars, conferences, and workshops associated with this program or any meeting for which the DHS Program Office requests attendance. Travel in excess of 50 miles to and from the approved practicum location will be reimbursed, in addition to the Dislocation Allowance provided during the practicum assignment. In addition, travel expenses are allowable on occasions requiring the fellow to consult with the university graduate committee and/or deliver a presentation of thesis/dissertation research.

THESIS RESEARCH AT PARTICIPATING DHS/DoD DESIGNATED FACILITIES

A fellow may request to work full or part-time on thesis/dissertation research at one of the participating DHS/DoD-approved facilities (see page nine of this booklet). Off-campus research requires that the fellow complete a request form (available from MUSC) and have it endorsed by the faculty advisor, university coordinator, and facility coordinator. Throughout the research assignment, the faculty advisor must agree to supervise the fellow's progress, coordinate activities with facility personnel, and make one trip to the facility to review the fellow's research. In addition, a research advisor assigned by the facility will mentor the fellow and serve on the fellow's graduate thesis research committee, if approved by the university. Travel expenses are reimbursable in accordance with MUSC's Travel Policy.

EVALUATION OF APPLICATIONS

As the Program Administrator, MUSC ensures that each application package provides the requested information and materials. It is the applicant's responsibility to ensure that his or her application is complete. After the application deadline, MUSC will distribute the 2013-2014 NFGFP applications to an independent panel for review. Panel members are technical experts from national laboratories who are intimately involved in DHS/DoD nuclear forensics programs.

Applications are evaluated based on academic performance, relevant coursework, GRE scores, career and goals statements, and references. Other factors, including geographical criteria and professional personnel needs of the DHS/DoD nuclear forensics research program, are also considered. The number of fellowships awarded annually is contingent on the number of fellows graduating from the program and the availability of funds.

The panel of experts reviews each application and provides award recommendations to the Program Administrator. MUSC submits the panel's recommendations to the program sponsors for consideration. DHS and DoD conduct a final review of the applications and the panel's recommendations and select the official NFGFP award recipients. MUSC will announce award recipients and notify all applicants in April 2013. Applicants not selected may receive "Honorable Mention" status in recognition of their achievements. Should additional funding become available, those receiving an Honorable Mention may qualify as award recipients.

MUSC is responsible for the daily administration of the NFGFP on behalf of the program sponsors; as such, MUSC assists fellows and universities with questions regarding stipends, payment of tuition and fees, practicum assignments, travel, and other related issues.

**NATIONAL NUCLEAR FORENSICS EXPERTISE DEVELOPMENT PROGRAM
NUCLEAR FORENSICS GRADUATE FELLOWSHIP PROGRAM (NFGF)
PARTICIPATING UNIVERSITIES**

<p>Clemson University Tim DeVol, Ph.D. Environmental Engineering and Science Clemson University Advanced Materials Center 342 Computer Court Anderson, SC 29625 864-656-5569 Tim.Devol@ces.clemson.edu</p>	<p>Colorado State University Thomas Johnson, Ph.D. Department of Environmental and Radiological Health Sciences 1681 Campus Delivery Fort Collins, Co 80523 970-491-0563 Tj@colostate.edu</p>
<p>Georgia Institute of Technology Bernd Kahn, Ph.D. Environmental Radiation Center, EOSL, MNG Baker Building 925 Dalney Street, Room 113 Atlanta, GA 30332-0841 404-407-6776 Bernd.kahn@gtri.gatech.edu</p>	<p>Missouri University of Science and Technology Carlos H. Castano, Ph.D. Nuclear Engineering Program 1870 Miner Circle Rolla, MO 65409 573-341-6766 castanoc@mst.edu</p>
<p>North Carolina State University Robin Gardner, Ph.D. Nuclear Engineering Department PO Box 7909 Raleigh, NC 27695-7909 919-515-3378 gardner@ncsu.edu</p>	<p>Ohio State University Richard S. Denning, Ph.D. Nuclear Engineering Graduate Studies Program Scott Laboratory 201 West 19th Avenue Columbus, OH 43210-1142 614-292-2544 Denning.8@osu.edu</p>
<p>Oregon State University Alena Paulenova, Ph.D. Nuclear Engineering & Radiation Health Physics 3451 SW Jefferson Way Corvallis, OR 97331 541-737-7070 alena.paulenova@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 Lefteri Tsoukalas, Ph.D. School of Nuclear Engineering 400 Central Drive West Lafayette, IN 47907-2017 765-496-9696 tsoukala@purdue.edu</p>	<p>Texas A&M University William S. Charlton, Ph.D. Nuclear Engineering Department 3473 TAMU College Station, TX 77843-3473 979-845-7092 wcharlton@tamu.edu</p>
<p>Washington State University Sue Clark, Ph.D. Department of Chemistry Fulmer 202B Pullman, WA 99164 509-335-1411 s_clark@wsu.edu</p>	<p>University of California, Berkeley Eric Norman, Ph.D. Department of Nuclear Engineering 4109 Etcheverry Hall, MC 1730 Berkeley, CA 94720-1730 510-643-9984 ebnorman@lbl.gov</p>

<p>University of Cincinnati Henry B. Spitz, Ph.D. Nuclear and Radiological Engineering Program College of Engineering and Applied Sciences 598 Rhodes Hall Cincinnati, OH 45221-0072 513-556-2003 Henry.spitz@uc.edu</p>	<p>University of Michigan Sara Pozzi, Ph.D. Dept of Nuclear Engineering & Radiological Sciences 2355 Bonisteel Boulevard 2937 Cooley Building Ann Arbor, MI 48109-2104 734-615-4970 pozzisa@umich.edu</p>
<p>University of Missouri, Columbia J. David Robertson, Ph.D. Department of Chemistry 125 Chemistry Building Columbia, MO 65211 573-882-2240 RobertsonJo@missouri.edu</p>	<p>University of Nevada, Las Vegas Ken Czerwinski, Ph.D. Department of Chemistry 4505 Maryland Parkway Box 454003 Las Vegas, Nevada 89154-4003 702-895-0501 Czerwin2@unlv.nevada.edu</p>
<p>University of South Carolina Travis W. Knight, Ph.D. Nuclear Engineering Program 300 Main Street Columbia, SC 29208 803-777-1465 twknight@sc.edu</p>	<p>University of Tennessee Howard Hall, Ph.D. Department of Nuclear Engineering 215 Pasqua Engineering Building Knoxville, TN 37996-2366 865-974-2525 Howard.hall@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 512-232-2467 s.landsberger@mail.utexas.edu</p>	<p>University of Utah Tatjana Jevremovic, Ph.D. Nuclear Engineering Program 2298 MEB 50 South Central Campus Drive Salt Lake City, UT 84112 801-587-9696 Tatjana.jevremovic@utah.edu</p>

PARTICIPATING PRACTICUM CENTERS AND CENTER COORDINATORS

<p>ARGONNE NATIONAL LABORATORY David Chamberlain Argonne National Laboratory 9700 S. Cass Avenue, Building 205 Argonne, IL 60439 630-252-7699 david.chamberlain@anl.gov www.anl.gov</p>	<p>IDAHO NATIONAL LABORATORY Martha R. Finck Idaho National Laboratory Nuclear Nonproliferation Division National and Homeland Security Directorate P.O. Box 1625 Idaho Falls, ID 83415-3740 208-526-4689 Martha.finck@inl.gov www.inl.gov</p>
<p>LAWRENCE LIVERMORE NATIONAL LABORATORY Annie B. Kersting Lawrence Livermore National Laboratory Glenn T. Seaborg Institute PO Box 808, L-231 Livermore, CA 94550 925-423-3338 Kersting1@llnl.gov https://seaborg.llnl.gov</p>	<p>LOS ALAMOS NATIONAL LABORATORY Julianna Fessenden Los Alamos National Laboratory PO Box 1663/MS C936 Los Alamos, NM 87545 505-667-5468 julianna@lanl.gov www.lanl.gov</p>
<p>NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY Kenneth G. W. Inn National Institute of Standards and Technology 100 Bureau Drive, Mail Stop 8462 Gaithersburg, MD 20899-8462 301-975-5541 kenneth.inn@nist.gov www.nist.gov</p>	<p>OAK RIDGE NATIONAL LABORATORY Brad Patton Oak Ridge National Laboratory PO Box 2008 MS6152 Oak Ridge, TN 37831-6152 865-574-6800 pattonbd@ornl.gov www.ornl.gov</p>
<p>PACIFIC NORTHWEST NATIONAL LABORATORY Jon Schwantes Pacific Northwest National Laboratory 902 Battelle Boulevard PO Box 999, MSIN J4-65 Richland, WA 99352 509-375-7378 Jon.schwantes@pnl.gov http://www.pnnl.gov</p>	<p>SANDIA NATIONAL LABORATORIES Jeffrey B. Martin Sandia National Laboratories Department 5734 P.O. Box 5800, MS 5734 Albuquerque, NM 87185-0406 505-844-0028 jbmart@sandia.gov www.sandia.gov</p>
<p>SAVANNAH RIVER NATIONAL LABORATORY Ron Jeffcoat Savannah River National Laboratory Building 735A Aiken SC 29808 803-725-4135 ron.jeffcoat@srnl.doe.gov www.srnl.doe.gov</p>	<p>Y-12 NATIONAL SECURITY COMPLEX James G. Placke, Jr. Y-12 National Security Complex P.O. Box 2009 Oak Ridge, TN 37830-8112 865-574-1446 plackej@y12.doe.gov www.y12.doe.gov</p>

**U.S. DEPARTMENT OF HOMELAND SECURITY
DOMESTIC NUCLEAR DETECTION OFFICE
U.S. DEPARTMENT OF DEFENSE
DEFENSE THREAT REDUCTION AGENCY
NUCLEAR FORENSICS GRADUATE FELLOWSHIP PROGRAM
2013-2014**

A complete application includes:

1. Application Form (Hand written applications will **not** be accepted)
2. Current Official Transcript of Grades (all undergraduate and graduate transcripts required and should be sent directly to the Office of Special Programs from the Registrar)
3. Three (3) Reference Forms (enclosed)
4. GRE Scores (Must be sent directly from ETS. Our institution code is 5949)
5. Proof of U.S. Citizenship (copy of birth certificate or U.S. passport)

Please ensure you have completed all parts of the application and obtained the proper signatures for each section. Please include the fellowship program name on all correspondence. Keep a copy of this application and supporting materials for your files.

All applicants must submit the required information to the MUSC Office by February 1, 2013. It is the applicant's responsibility to ensure the application is complete. MUSC will not process late and/or incomplete applications.

Application materials should be submitted electronically through the SCUREF website (www.scuref.org). If you are unable to submit the application electronically, completed application materials can be mailed to the address below.

Medical University of South Carolina
Office of Special Programs, NFGFP
19 Hagood Avenue, HOT 304-H4
MSC 851
Charleston, SC 29425-8510

For additional information or assistance, please contact the MUSC Office of Special Programs at (843) 792-0832 or nhuchet@scuref.org.

BACKGROUND INFORMATION

9. Address: () Home () School (check one)

Street or Box Number: _____

City: _____ State: _____ Zip: _____

Phone Number: _____ E-Mail: _____

10. Are you a U.S. Citizen? Yes () No ()

11. Extracurricular Activities

List all technical societies and service organizations. Include offices held.

12. Practical Experience

List significant work experience gained from time in a laboratory setting or federal agency.

13. Academic Awards and Honors

List significant pre-college, undergraduate, and/or graduate honors and awards and give a brief description of each.

14. Employment Record

Please attach resume.

15. References

You must include references from three persons familiar with your academic preparation and technical capabilities. At least two references should be from faculty members who are familiar with your current academic work. Please have these individuals send official reference forms directly to MUSC. These forms can be found on www.scuref.org.

COURSEWORK**16. Previous Courses**

List all science, engineering, and mathematics courses that you have completed at all undergraduate and graduate institutions listed in this application. Provide course title and number, hours attempted, and letter grade.* An example is provided. Use additional sheets, if necessary.

<u>Course Title and Number</u>	<u>Hours</u>	<u>Grade</u>
<i>Example: Nuc 400: Advanced Nuclear and Radiochemistry</i>	<i>4</i>	<i>A</i>

*(If grades listed above are numeric, please indicate on which scale they are based, e.g., 4 pt. or 5 pt.)

17. Current Courses

List all courses in which you are currently enrolled. Give title of course and number of hours.

<u>Course Title and Number</u>	<u>Hours</u>
<i>Example: Nuc 400: Advanced Nuclear and Radiochemistry</i>	<i>4</i>

18. Planned Courses

List all courses you plan to take prior to September 2013.

<u>Course Title and Number</u>	<u>Hours</u>
<i>Example: Nuc 400: Advanced Nuclear and Radiochemistry</i>	<i>4</i>

STATEMENT ON CAREER GOALS AND OBJECTIVES

In no more than 500 words, please define Technical Nuclear Forensics and how your career goals will contribute to, or align with, this national security mission. References available to assist you in structuring your answer are listed below. Please relate your statement to one or more of the Technical Mission Areas listed in the Program Introduction on page two of this packet.

References:

- a. *Nuclear Forensics: A Capability at Risk*. National Academy of Science. 2010.
- b. *Nuclear Forensics: Role, State of the Art and Program Needs*. AAAS/APS, 2008.
- c. P. Grant, I. Hutcheon, K. Moody. *Nuclear Forensic Analysis*. CRC, Boca Raton, FL, 2005.

SIGNATURE: _____

DATE: _____

(In providing this signature, the applicant recognizes that SCUREF, MUSC and the program sponsors, the U.S. Department of Homeland Security and U.S. Department of Defense, have the right to verify all information contained in this application. Any false or misleading statements made by the applicant may result in either the removal of the application or termination of a fellowship appointment.)

**U.S. DEPARTMENT OF HOMELAND SECURITY
 DOMESTIC NUCLEAR DETECTION OFFICE
 U.S. DEPARTMENT OF DEFENSE
 DEFENSE THREAT REDUCTION AGENCY
 NUCLEAR FORENSICS GRADUATE FELLOWSHIP PROGRAM
 2013-2014**

REFERENCE FORM

Applicant's First Name _____ Middle Name _____ Last Name _____

How long and in what association have you known the applicant?

PERSONAL CHARACTERISTICS	Highest 10 %	Highest 20%	Mid Level	Lowest 20%	Lowest 10%	Inadequate Observation
Imagination and Originality of Thought						
Ability to Work with Others						
Leadership Potential						
Independence and Self-reliance						
Growth During Total Period Observed						
Motivation Toward a Productive Career						
Technical Expertise						
Ability to Communicate (Written/Oral)						

Add any descriptive comments that will assist in providing a complete picture of the applicant's character, attitude, abilities, and potential for success to perform on a high level at a college or university. Please comment on the applicant's weak and strong points. *Do not write on the back of this form; use additional sheets if necessary. No staples. Please type or use blue or black ink.*

Comments:	
Signature:	Date:
Typed/Printed Name:	Title:
Address:	

Application materials should be submitted electronically through the SCUREF website (www.scuref.org). If you are unable to submit the application electronically, completed application materials can be mailed to the address below.

*Medical University of South Carolina
 Office of Special Programs, NFGFP
 19 Hagood Avenue, HOT 304-H4
 MSC 851
 Charleston, SC 29425-8510*

For additional information or assistance, please contact the MUSC Office of Special Programs at (843) 792-0832 or nhuchet@scuref.org.

Three reference forms are required for a complete application.

U.S. DEPARTMENT OF HOMELAND SECURITY
DOMESTIC NUCLEAR DETECTION OFFICE
U.S. DEPARTMENT OF DEFENSE
DEFENSE THREAT REDUCTION AGENCY
NUCLEAR FORENSICS GRADUATE FELLOWSHIP PROGRAM
2013-2014

REFERENCE FORM

Applicant's First Name	Middle Name	Last Name
------------------------	-------------	-----------

How long and in what association have you known the applicant?

PERSONAL CHARACTERISTICS	Highest 10 %	Highest 20%	Mid Level	Lowest 20%	Lowest 10%	Inadequate Observation
Imagination and Originality of Thought						
Ability to Work with Others						
Leadership Potential						
Independence and Self-reliance						
Growth During Total Period Observed						
Motivation Toward a Productive Career						
Technical Expertise						
Ability to Communicate (Written/Oral)						

Add any descriptive comments that will assist in providing a complete picture of the applicant's character, attitude, abilities, and potential for success to perform on a high level at a college or university. Please comment on the applicant's weak and strong points. *Do not write on the back of this form; use additional sheets if necessary. No staples. Please type or use blue or black ink.*

Comments:	
Signature:	Date:
Typed/Printed Name:	Title:
Address:	

Application materials should be submitted electronically through the SCUREF website (www.scuref.org). If you are unable to submit the application electronically, completed application materials can be mailed to the address below.

*Medical University of South Carolina
Office of Special Programs, NFGFP
19 Hagood Avenue, HOT 304-H4
MSC 851
Charleston, SC 29425-8510*

For additional information or assistance, please contact the MUSC Office of Special Programs at (843) 792-0832 or nhuchet@scuref.org.

Three reference forms are required for a complete application.

**U.S. DEPARTMENT OF HOMELAND SECURITY
DOMESTIC NUCLEAR DETECTION OFFICE
U.S. DEPARTMENT OF DEFENSE
DEFENSE THREAT REDUCTION AGENCY
NUCLEAR FORENSICS GRADUATE FELLOWSHIP PROGRAM
2013-2014**

REFERENCE FORM

Applicant's First Name

Middle Name

Last Name

How long and in what association have you known the applicant?

PERSONAL CHARACTERISTICS	Highest 10 %	Highest 20%	Mid Level	Lowest 20%	Lowest 10%	Inadequate Observation
Imagination and Originality of Thought						
Ability to Work with Others						
Leadership Potential						
Independence and Self-reliance						
Growth During Total Period Observed						
Motivation Toward a Productive Career						
Technical Expertise						
Ability to Communicate (Written/Oral)						

Add any descriptive comments that will assist in providing a complete picture of the applicant's character, attitude, abilities, and potential for success to perform on a high level at a college or university. Please comment on the applicant's weak and strong points. *Do not write on the back of this form; use additional sheets if necessary. No staples. Please type or use blue or black ink.*

Comments:	
Signature:	Date:
Typed/Printed Name:	Title:
Address:	

Application materials should be submitted electronically through the SCUREF website (www.scuref.org). If you are unable to submit the application electronically, completed application materials can be mailed to the address below.

*Medical University of South Carolina
Office of Special Programs, NFGFP
19 Hagood Avenue, HOT 304-H4
MSC 851
Charleston, SC 29425-8510*

For additional information or assistance, please contact the MUSC Office of Special Programs at (843) 792-0832 or nhuchet@scuref.org.

Three reference forms are required for a complete application.