

Nuclear Security Education: The Intersection of Policy, Science, and Technology

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Radiation detection and measurements; Gamma and neutron detectors for portal monitors for land-crossing border.

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Since joining PNNL in 2003, Ms. Berkman has managed communications, developed strategic plans, and co-authored technical proposals. As the Deputy Program Manager for the Nonproliferation Graduate Fellowship Program, Ms. Berkman functions in several capacities, including oversight of marketing and recruitment. Before joining PNNL, Ms. Berkman was production manager for Pacific Metrics in Monterey, California, where she developed the Louisiana PASS online assessment tool. Formerly, she was a science content developer for CTB/McGraw-Hill, a leading education assessment company. Ms. Berkman received her B.S. in molecular, cellular, and developmental biology from University of California at Santa Cruz.

**Nuclear Security Education:
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Mr. Blair has thirty-five years experience in conducting science and engineering workforce studies funded by DOE and other federal agencies with a special focus on the nuclear-related workforce.

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Mr. Boettcher teaches courses on US foreign and security policy, and engages in research on US wartime public opinion and US foreign and security policy decision making.

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Brian Boyer has been in the field of nuclear nonproliferation and safeguards specializing in training and education in nuclear safeguards, the evaluation of design and analysis of nuclear safeguards concepts, and in creating safeguards approaches for various nuclear facilities including gas centrifuge enrichment plants, light water reactors, uranium conversion plants, and plutonium reprocessing facilities. He has also worked as a nonproliferation and safeguards specialist helping to create a safeguards approach with the International Atomic Energy Agency (IAEA) for the Chernobyl Shelter and building a course for the IAEA at Brookhaven to train IAEA inspectors and as a Nuclear Safeguards Inspector.

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David Brulé is an assistant professor of Political Science at the University of Tennessee. Before joining the faculty at the University of Tennessee, David taught at the University of North Texas for one year. His research interests lie at the intersection of domestic politics and international relations. Specifically, he examines the effects of public opinion, economic conditions, and political institutions on national leaders' conflict decisions.

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Ms. Byrd is a Program Manager with the Office of International Operations, and also manages the Office of Defense Nuclear Nonproliferation's Graduate Fellowship Program. Her federal work experience has been in the areas of management and administration, human resources, organizational change, diversity, project management, policy development, quality management, decennial census operations, and training. She provides expert consultation to senior managers on workforce issues, and organizational improvement initiatives, and is a certified facilitator.

Ms. Byrd holds a Master of Public Administration degree from American University, Washington, DC, and a B.S. in Management at Potomac College, Washington, D.C.

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Joseph Caddell (Ph.D. Duke University) is a Lecturer in History at the University of North Carolina at Chapel Hill and an Adjunct at North Carolina State University. A retired Lieutenant Colonel of the U.S. Air Force Reserve, Dr. Caddell also taught at a number of professional schools within the Defense Department. He currently teaches a wide variety of courses relating to national and international security and military history.

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Dr. Charlton serves as the Director of the Nuclear Security Science and Policy Institute and as an Associate Professor in the Nuclear Engineering Department at TAMU. He has also been an Assistant Professor at the University of Texas at Austin and served on the technical staff in the Nonproliferation and International Security Division at Los Alamos National Laboratory. He teaches courses which study the technical aspects of nuclear nonproliferation, safeguards, and nuclear security and fundamentals of nuclear engineering. Dr. Charlton is recognized as one of the leaders in the technical area of nuclear nonproliferation.

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Dr. Christensen's research emphasis has been in all forms of energy production, distribution, and utilization. Research emphasis also includes areas of nuclear fission and fusion, nuclear science and technology, nuclear nonproliferation, and all dimensions of fossil energy extraction, production, and use, including technologies for the abatement of greenhouse gas emissions. Finally, the intersection of water technology with the energy sector is an area of research.

Dr. Christensen has thirty years of management experience in material science, nuclear and fossil energy, and renewable energy, nuclear materials management and scientific research in support of DOE and other Government agencies and industries.

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Mr. Conner currently supports international safeguards cooperation projects at DOE/NNSA conducted under the Department's Next Generation Safeguards Initiative.

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Ambassador DeThomas brings 30 years of global security and diplomatic experience to CRDF; having previously served as U.S. Ambassador to Estonia and as Principal Deputy Assistant Secretary of State in the Bureau of Nonproliferation. He also held a number of posts abroad, including Deputy Chief of Mission in Vienna and Addis Ababa.

An Easton, Pennsylvania native, Ambassador DeThomas has earned both Bachelor's and Master's degrees from Pennsylvania State University and a Master's degree in Public Administration from Harvard University. He is a distinguished graduate of the National War College. His languages include German, Spanish, Farsi and Estonian.

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Shaheen Azim Dewji is a Ph.D. student with a research focus on radiation detection for homeland security and safeguards applications. She received her B.Sc. in physics from the University of British Columbia and has participated in the Education Abroad Program at UC-Berkeley. She has completed research for the Centers for Disease Control and Prevention regarding assaying internal contamination using handheld radiation detectors in the event of a radiological dispersal device. She is currently interning at Oak Ridge National Laboratory through NESLS/NGSI, collaborating on enhancing measurement techniques and numerical simulation to estimate burn-up using XRF and isotopic ratios in spent fuel, in conjunction with inverse code. Dewji has a strong interest in nuclear security policy.

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Deborah Dickman is responsible for developing customer engagement and business development strategies for PNNL in the area of nonproliferation and international security, and overseeing delivery of high-quality technology and services. Mrs. Dickman is internationally recognized for her contributions in the areas of safeguards and security, training, performance assessment and nonproliferation. She has provided technical contributions and program leadership to a variety of programs, including safeguards and security inspections and performance assessment methodology, training, policy development, vulnerability assessments, risk management, nuclear materials control and accounting, and control system analysis. Deborah is a Fellow of the International Institute of Nuclear Materials Management (INMM), a past President, and a recipient of the INMM's Meritorious Service Award.

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Dr. H. L. (Lee) Dodds is IBM Professor of Engineering and Head of the Nuclear Engineering Department at the University of Tennessee. Dr. Dodds earned B.S., M.S., and Ph.D. degrees in nuclear engineering from the University of Tennessee. He has served as a consultant for the U.S. Department of Energy and several American, Canadian, and Dutch nuclear research institutes and companies. He currently serves on the nuclear engineering external review boards for several universities.

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Nick Gallucci is a postgraduate fellow at Savannah River National Laboratory. In May, he received his MA in International Policy from the Monterey Institute of International Studies, as well as a Certificate in Nonproliferation from the James Martin Center for Nonproliferation Studies (CNS). Nick received his BA from Georgetown University in 2005 with majors in English and Government.

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Bethany Goldblum

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Dr. Bethany Lyles Goldblum will join the Department of Nuclear Engineering at the University of Tennessee in August 2010. She received her Ph.D. in Nuclear Engineering from the University of California, Berkeley, in 2007. Dr. Goldblum's research interests are in the area of applied nuclear physics, with current emphasis on nuclear data needs for homeland security and Generation IV nuclear energy systems as well as active interrogation methods for nuclear materials control and accountability.

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Dr. Howard Hall joined the Department of Nuclear Engineering at the University of Tennessee in May, 2009. He is appointed as the UT and Oak Ridge National Laboratory Governor's Chair in Nuclear Security.

Professor Hall is also a Senior Fellow in Global Security Policy at the Howard H. Baker Jr. Center for Public Policy at the University of Tennessee (Knoxville) and serves as Director of the Baker Center's Global Security Policy Program.

Professor Hall received his Ph.D. in Nuclear and Radiochemistry from the University of California in 1989, where he worked with Professor Darleane C. Hoffman and Professor Emeritus Glenn T. Seaborg. His BS in Chemistry was granted by the College of Charleston in 1985.

Prior to joining UT, Dr. Hall spent 20 years at Lawrence Livermore National Laboratory in Northern California, where he led major scientific and operational missions in nuclear and homeland security. During his tenure at LLNL, Dr. Hall led efforts supporting US Government programs in aviation safety and security, nuclear threat detection and nuclear emergency response, security of maritime commerce, and specialized technology support to operational entities (such as the United States Secret Service). In 2005, Dr. Hall was part of the team awarded the Department of Homeland Security/Science and Technology Directorate Undersecretary's Award for Science.

His research interests include nuclear security applications, including proliferation detection, counter-proliferation, detection of and response to radiological or nuclear threats, radiochemistry, nuclear forensics, and applications of nuclear-based methods to other security needs (such as explosives detection). His work with the Baker Center focuses on the intersection of science, security, and public policy.

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Mr. Hanks currently supports the Department of Energy/National Nuclear Security Administration Office of Nuclear Nonproliferation and International Security and Department of Homeland Security.

Mr. Hanks was previously assigned a United Nations post as an international nuclear safeguards inspector for the International Atomic Energy Agency (IAEA), in Vienna, Austria—performing many inspections at various nuclear sites throughout Europe. Mr. Hanks worked for Entergy Operations, Inc. as a licensed senior reactor operator and shift manager at Grand Gulf Nuclear Power Station in Port Gibson, Mississippi after his military service in the U.S. Navy, aboard the USS Nimitz (CVN-68), as a reactor operator.

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Mr. Hayward's research focus is detector science & development for gamma ray and neutron imaging, as well as techniques for improved, quantitative analysis of the associated data. Currently, nearly all of his research is applied to the nuclear security area.

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Dr. Hertel performs research that integrates computational radiation transport with radiation measurements. He has made contributions in computational dosimetry, radiation detection, neutron spectroscopy, radiation dosimetry, radiological assessment, radiation shielding and radiation instrument modeling. Currently he is assessing the potential use of handheld radiation instruments, both spectrometers and counting instruments, to assess potential internal contamination of individuals who might be involved in a radiological dispersion device event.

Dr. Hertel is also currently involved in research to measure the radioactive inventory of the mercury used in the target at the Spallation Neutron Source and compare the resultant activities to those predicted by the codes used to design high-energy facilities.

Michael Hynes

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Dr. Michael Hynes is a Principal Engineering Fellow at Raytheon. Dr. Hynes has been a senior-level nuclear weapons physicist at LANL and a policy analyst at RAND on the dynamics of global nuclear terrorism and its implications for international as well as homeland security. His responsibilities at Raytheon include turning his counterterrorism policy recommendations into practice. He is Program Manager for the SORDS program sponsored by DHS-DNDO, Program Manager for the ISIS program sponsored by DTRA, and Technical Lead on the Stand-off Explosives Detection and the Nanotron Programs which are internally funded.

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Dr. Icenhour has more than 24 years of experience with the nuclear fuel cycle, ranging from reactor operations to radiochemical research. His research has focused on the conversion of ^{233}U to a stable form for long-term storage, studies of the effects of radiation on materials, ^{238}Pu production, and the development of advanced nuclear fuels. He completed a 20-month special assignment in Washington, D.C. as a Technical Advisor to the Proliferation Detection Program within the Office of Nonproliferation Research and Development (NA-22) of the National Nuclear Security Administration. Before joining ORNL, Alan served as a commissioned officer in the U.S. Navy on a nuclear powered submarine. He is still an active reservist in the U.S. Navy, and has the rank of Captain (O-6). He received his B.S. degree in Nuclear Engineering from North Carolina State University, and his M.S. and Ph.D. degrees in Nuclear Engineering from The University of Tennessee.

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Mr. Jay has experience in a variety of Safeguards and Security positions with assignments in nuclear nonproliferation, facility operations support, human performance, quality assurance, emergency services, training and protective force services, as well as direct technical S&S support to the Department of Energy-Savannah River Operations Office. He also serves as SRNL Program Manager, Global Security, working on related NGS initiatives. With over 24 years of active/reserve command and staff experience in the United States Air Force, he has a B.A. in Political Science and an M.A. in Management & Human Relations.

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Christopher Jones is an Associate Professor at the Henry M. Jackson School of International Studies at UW and Co-Director of UW's Institute for Global and Regional Security Studies. He has held fellowships at the Woodrow Wilson International Center for Scholars, the US Naval Academy, the US Army War College and a Ford Foundation Fellowship in Dual Expertise. He holds a Ph.D. in Government from Harvard University and a BA in History from Princeton University.

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Ms. Kirk manages the Nuclear Engineering Science Laboratory Synthesis (NESLS) internships at Oak Ridge National Laboratory and university outreach for the Nuclear Science and Technology Division (NSTD). She is also a participant in the DOE/NNSA Next Generation Safeguards Initiative.

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Mr. Knight's research interests include advanced nuclear fuels, modeling and simulation, and nuclear safeguards. He is the current Secretary of the Education Training and Workforce Development Division of the American Nuclear Society.

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Dr. Kulcinski is the Grainger Professor of Nuclear Engineering and the Director of the Fusion Technology Institute. He was elected to the National Academy of Engineering in 1993 and was awarded the NASA Public Service Medal in 1993. He served on the NASA Advisory Council from 2005 to 2009 and in 2008 he was appointed to the Advisory Committee for the Department of Commerce on Emerging Technology and Research. He has been a Fellow in the American Nuclear Society since 1978.

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Dr. David Kulp is a Research Engineer at the Georgia Institute of Technology in Atlanta, Georgia. A Trident Scholar and graduate with distinction from the United States Naval Academy (1991), David earned his M.S. in physics from Emory University (1997) and Ph. D. from Georgia Tech (2001). His research is focused on gamma-ray and particle signatures for isotope identification, replacement of radioisotopes in industrial uses, and accelerator applications. Related research on the internal degrees of freedom realized in the atomic nucleus is carried out at international laboratories such as the ISAC facility at TRIUMF in Canada, at U.S. national laboratories, and at university accelerator facilities worldwide.

David is currently a member of the Subatomic Experimental Evaluation Committee, and has served as Chair of the User Executive Committee at TRIUMF, Canada's Laboratory for Particle and Nuclear Physics. As a past Fellow in the Sam Nunn Security Program at Georgia Tech, David's research was focused on detection of special nuclear materials, cargo scanning, nuclear forensics, radiological dispersion devices, and low-yield or improvised nuclear weapons.

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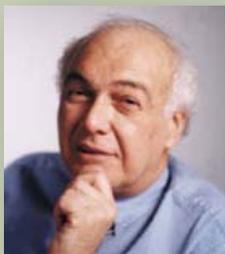
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Mr. Lanza has been active in technical aspects of nuclear security and has organized courses at MIT on non-proliferation and technology.

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Dr. Leibert has developed an interest in the history and policy of nonproliferation and has taught several short presentations on nonproliferation to Nuclear Engineering students. During the coming academic year she will create and teach a three-credit course in Nonproliferation of Nuclear Weapons, offered jointly by the Departments of History and Nuclear Engineering.

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Dunbar Lockwood has responsibility for managing three program elements of the Next Generation Safeguards Initiative (NGSI): Policy; Concepts and Approaches; and Human Capital Development. He also worked for nine years at the U.S. Department of State and the Arms Control and Disarmament Agency (ACDA) on nuclear arms control and nonproliferation issues, including the CTBT, FMCT, and START III talks. Prior to starting in the federal government in 1995, he was the Assistant Director for Research at the Arms Control Association (ACA). He received his Master's Degree in Security Policy Studies from George Washington University's Elliot School in 1985.

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Carrie Mathews will join the International Atomic Energy Agency in the Division of Safeguards Concepts and Planning in August of 2010. Her current interests include the nonproliferation issues associated with a nuclear energy renaissance, enhancing international safeguards and increasing the global pool of safeguards experts, and providing technical support to the newly implemented "Next Generation Safeguards Initiative." She has been with the National Nuclear Security Administration coordinating projects in the areas of bilateral safeguards cooperation, information analysis, IAEA safeguards implementation in the U.S., and Russian nuclear nonproliferation infrastructure.

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Mark T. Nance is an assistant professor of political science in the School of Public and International Affairs at North Carolina State University, where he teaches courses on International Political Economy and European Politics. His main research interests lie at the intersection of IPE, international organizations, and global governance. Currently his primary research focuses on the illicit political economy, specifically on international cooperation regarding money laundering, counter-terrorism financing, and illicit proliferation. He received his Ph.D. in 2009 from the University of Wisconsin-Madison.

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John Neal's research at ORNL has focused on nonproliferation technologies (specifically, neutron interrogation and fast time-correlation studies) and the development of new materials for radiation detection. He is also interested in the intersection of technology and energy/nuclear security policy.

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Professor Pierce is the W. Allen Separk Distinguished Professor of Law at the University of Tennessee. Professor Pierce's primary academic interests relate to corporate law and the regulation of the legal profession. He also serves as chairperson of the Tennessee Valley Authority Board of Contract Appeals and as the Reporter for the Tennessee Bar Association's Standing Committee for Ethics and Professional Responsibility. He has been the Interim Director of the Baker Center since June of 2009.

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Professor Prins is the Director of Graduate Studies and Faculty Associate with the Howard J. Baker Jr. Center for Public Policy. Areas of expertise include international conflict, U.S. foreign policy, and political methodology.

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Carolyn Pumphrey (Ph.D., University of York, UK) has served for thirteen years with the Triangle Institute for Security Studies (TISS) first as a post-doctoral fellow, later as coordinator. She organizes programs, runs outreach, edits books, and develops grant proposals on behalf of TISS, a consortium of Duke University, North Carolina State University, and UNC-Chapel Hill. She is currently working with colleagues at North Carolina State University to develop a program in nuclear security.

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**Nuclear Security Education:
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