**John W. McClory**

Associate Professor of Nuclear Engineering

Air Force Institute of Technology

**CONTACT INFORMATION** Updated: 1 July 2017

Air Force Institute of Technology

Department of Engineering Physics

Wright Patterson Air Force Base, Ohio 45433

Email: john.mcclory@afit.edu Phone: (937) 255-3636 ext 7308

**PROFESSIONAL HISTORY**

2008 - Date Associate Professor of Nuclear Engineering

Director, Nuclear Weapons Effects, Proliferation, and Policy Graduate Certificate Program

Air Force Institute of Technology, Wright Patterson Air Force Base, Ohio

2005 - 2006 Chief of Training, Multi-National Corps-Iraq

Camp Victory, Baghdad, Iraq

2003 - 2008 Graduate Student

Air Force Institute of Technology, Wright-Patterson AFB, OH

2002 - 2003 DTRA Liaison Officer to Central Command

McDill AFB, FL and Al Udeid AFB, Qatar

2000 - 2003 Instrumentation and Simulations Branch Chief, Test Division

Defense Threat Reduction Agency (DTRA), Kirtland AFB, NM

1998 - 2000 Operations Officer and Deputy Commander, 235th Base Support Battalion

US Army Europe, Ansbach, Germany

1997 - 1999 Adjunct Assistant Professor, Embry-Riddle Aeronautical University

Heidelberg, Germany

1996 - 1998 Ground Liaison Officer, 52d Fighter Wing and Operations Officer

US Army Europe, Spangdahlem AFB, Germany

1993 - 1996 Assistant Professor of Physics, United States Military Academy

West Point, NY

1988 - 1991 Troop Commander and Squadron Adjutant, 11th Armored Cavalry Regiment

Bad Hersfeld, Germany

1984 - 1988 Platoon Leader and Executive Officer, 3rd Armored Cavalry Regiment

Ft. Bliss, TX

**EDUCATION**

PhD 2008 Air Force Institute of Technology, Nuclear Engineering

MS 1993 Texas A&M University, Physics

BS 1984 Rensselaer Polytechnic Institute, Physics

**AWARDS AND HONORS**

Military

* Legion Of Merit (2012)
* Bronze Star Medal (2006)
* Joint Meritorious Unit Award (2006)
* Joint Meritorious Service Medal (2003)
* Meritorious Service Medal (1996, 1998, 2000)
* Joint Commendation Medal (2003)
* Air Force Commendation Medal (1998)
* Army Commendation Medal (1987, 1991)
* Army Achievement Medal (1985, 1986, 1989)

Academic

* AETC Nuclear Deterrence Operations Professional Team of the Year Award (2013)
* *Ohio Magazine* Excellence in Education Honoree (2013)
* AFIT Civilian CAT III of the Quarter, 4th Quarter 2012 (2012)
* AFIT Dr Leslie M. Thornton Teaching Excellence Award (2011)
* Team Faculty Advisor Finalist in the National Security Innovation Competition (2011)
* AFIT Outstanding Military Professor Award (2010)
* AFIT Instructor of the Quarter – Summer Quarter (2009)
* SOCHE Faculty Excellence in Teaching Award (2009)
* DTRA Director’s Annual Large Team Award (2009)

**RESEARCH INTERESTS**

My primary research interests are in radiation effects on electronic devices, radiation detector development, and nuclear weapon effects. This research includes the interaction of radiation with matter, particularly focused on the characterization and improvement of nuclear radiation detectors and the effect radiation has on the electrical, optical, and mechanical characteristics of materials and devices. I have focused in three areas: the development neutron detectors for security applications, radiation effects on advanced electronic materials, and the effects of nuclear weapon outputs.

This research is multidisciplinary, involving nuclear physics, solid state physics, electrical and nuclear engineering, and other disciplines. The investigation of these materials had led to the use of many spectroscopic and characterization techniques to better understand the response of materials to radiation. It has also led to the development of many strong collaborations with universities including the University of Nebraska, Ohio State University, and the University of Michigan, as well as collaborations with government laboratories including Lawrence Livermore National Laboratory, the Air Force Research Laboratory, the Army Research Laboratory, and Berkeley National Laboratory.

**SCHOLARLY ACTIVITIES**

**Graduate Student Supervision:** Successfully chaired 8 PhD and 30 MS student’s committees. I currently chair 6 PhD students and 3 Master’s students committees.

PhD’s Chaired/Completed

2016 Major David Matters, Applied Physics, *Nuclear Structure of 186Re*

2015 Major Michael Dexter, Nuclear Engineering, Investigation and Development of Atmospheric Nuclear Detonation Optical Forensics Techniques

2015 Captain Maurio Holston, Nuclear Engineering, *Characterization of Point Defects in Lithium Aluminate (Li2AlO2) Single Crystals*

2015 Captain Robert Slaughter, Applied Physics, *Multidimensional Analysis of Nuclear Detonations*

2014 Major Matthew Morello, Nuclear Engineering, *Estimating Disruption Fires from a Nuclear Weapon Detonation Using Fire Following Earthquake Methodology*

2012 Major Douglas Buchanan, Applied Physics, *EPR and ENDOR Studies of Point Defects in Lithium Tetraborate Crystals*

2011 Lieutenant Colonel Stephen McHale, Nuclear Engineering, *Development of a Novel Solid State Neutron Detector Using Gadolinium*

2010 Lieutenant Colonel David Wooten, Applied Physics, *Electronic Structure of Lithium Tetraborate*

PhD’s Chaired/In Progress (Start year listed)

2016 Major Melanie Mace, Nuclear Engineering

2016 Major Matthew Recker, Nuclear Engineering

2015 Major Trevor Warren, Nuclear Engineering

2015 Mr. William Erwin, Nuclear Engineering

2014 Major Brant Kananen, Nuclear Engineering

2014 Ms. Brittany Campbell, Nuclear Engineering

PhD’s Committee Member/Completed

2016 Lieutenant Colonel Daniel Schmitt, Computer Science (Chair: Dr. Gilbert Peterson)

2016 Lieutenant Colonel Christopher Young, Nuclear Engineering (Chair: Dr. James Petrosky)

2014 Major Eric Golden, Applied Physics (Chair: Dr. Nancy Giles)

2014 Major Briana Singleton, Applied Physics (Chair: Dr. James Petrosky)

2013 Mr. Tony Kelly, Nuclear Engineering (Chair: Dr. James Petrosky)

2012 Lieutenant Colonel Eugene Sheely, Nuclear Engineering (Chair: Dr. Larry Burggraf)

2011 Mr. Matthew Lange, Applied Physics (Chair: Dr. Glenn Perram)

2011 Lieutenant Colonel Bradley Christiansen, Electrical Engineering (Chair: Dr. Ron Coutu)

PhD’s On Committee/In Progress (Start Year Listed)

2015 Major Christina Dugan, Nuclear Engineering (Chair: Dr. James Petrosky)

2015 Captain Elizabeth Scherrer, Applied Physics (Chair: Dr. Nancy Giles)

2015 Captain Michael Ford, Nuclear Engineering (Chair: LTC Buckley O’Day)

MS Committee Chaired/Completed (M.S. Nuclear Engineering unless otherwise noted)

2017 Major Clinton Shelby, *Tumbler-Snapper Atmospheric Nuclear Test Series Streak Film Analysis*

2017 First Lieutenant Derek Haws, *Using Principal Component Analysis to Improve Fallout Characterization*

2016 Second Lieutenant Sarah Castro, *Nuclear Forensics Applications of Principal Component Analysis on Micro X-Ray Fluorescence Images*

2016 Major Aaron Ferguson, *Analysis of Neutron Effects for Asteroid Disruption*

2016 Second Lieutenant Molly Wakeling, *Differential (p, p′) and (p, d) Cross Sections of 89Yand 92Zr*

2015 First Lieutenant Ashley Green, *Comparison of Varying Mass-to-Yield Ratio Nuclear Detonations Using DIRSIG*

2015 Second Lieutenant Peter Jackson, *Determination of Dimensions and Yield of Nuclear Fireballs from Test Films*

2015 Major Tamara Vanhoose, *X-ray Shielding Effectiveness of Multifunctional Composite Materials*

2015 Major David Matters, *Analysis of the Nuclear Structure of 186Re Using Neutron-Induced Reactions*

2014 Mr. Josiah Dierken, Material Science, *Analysis of Fallout Particles Using Image Registration of Autoradiography and Scanning Electron Microscopy*

2014 Mr. Evan Kemp, Materials Science, *Proton Damage Effects on Carbon Nanotube Field-Effect Transistors*

2014 Captain Tyrone Ospino, *Modeling Detector Response to Scattered Gamma Rays*

2014 Captain Matthew Recker, *Copper Doping of ZnO by Nuclear Transmutation*

2014 First Lieutenant Timothy Genda, *Optimization of Prompt Neutron Detector Placement for Standoff Photon Interrogation of Special Nuclear Materials*

2013 Major Anthony Marchand, *Neutron Shielding Effectiveness of Multifunctional Composite Materials*

2013 Major James Shinn, *Changes to Tensile Strength and Electromagnetic Shielding Effectiveness in Neutron Irradiated Carbon Nanocomposites*

2013 Captain Jeremy Best, *Electron Damage Effects on Carbon Nanotube Thin Films*

2013 First Lieutenant Nathan Loyd, *Passive, Low Cost Neutron Detectors for Neutron Diagnostics at the National Ignition Facility*

2013 First Lieutenant Mischa Monroe, *Elemental Identification for Forensics Analysis of Nuclear Fallout Debris Samples Utilizing Micro-XRF, SEM, and Autoradiography Mapping*

2012 Captain Melanie Mace, *Neutron Diagnostics for Magnetic Target Fusion*

2012 Major Quan Hai Lu, *Durability of MWCNT Composites under Electron and Neutron Irradiation*

2012 Major Thomas McQuary, *Neutron Detection Using Amorphous Boron Carbide Hetero-Junction Diodes*

2011 Major Brant Kananen, *Characterization of Neutron-Induced Defects in Isotopically Enriched Lithium Tetraborate*

2011 Major Benjamin Thomas, *Neutron Detection Using Gadolinium-Oxide Based Diodes*

2011 Captain Nickolas Duncan, *Changes to Electrical Conductivity in Irradiated Carbon Nanocomposites*

2011 Captain Jesse Foster, *Radiation Effects on the Electrical Properties of Hafnium Oxide Based MOS Capacitors*

2011 Second Lieutenant James Bevins, *Characterization of a Boron Carbide Heterojunction Neutron Detector*

2010 Captain Janusz Mikina, *In-Situ Gate Bias Dependent Study of Neutron Irradiation Effects on AlGaN/GaN HFETs*

2010 Major Christopher Young, *Solid State Neutron Detection with a Heterojunction Made from Gadolinium Oxide and p-type Silicon*

2009 Major Jeffrey Moran, *The Effects of Temperature and Electron Radiation on the Electrical Properties of AlGaN/GaN Heterostructure Field Effect Transistors*

MS Committee Chaired/In Progress (Start Year Listed)

2016 Captain Christopher Earp-Pitkins, Applied Physics

2016 Second Lieutenant Anita Dunsmore, Nuclear Engineering

2016 Captain Jason Stickney, Nuclear Engineering

**Research Grants and Funding by Calendar Year:** Obtained support grants for various agencies for research, education, and equipment totaling over $1,800,000 since 2009.

**2016**

1. AFIT/ENP Research In Support Of Defense Threat Reduction Agency Nuclear Technologies, DTRA Nuclear Technologies, FY16: $100,000, PI, 50% responsibility.

2. Applying Principal Component Analysis to Fallout Characterization: The Link between Actinides and Composition, DTRA Nuclear Forensics, FY16: $55,000, PI, 100% responsibility.

3. Advanced Dielectric Materials Characterization for Space Based Electronics, AS&T, FY16: $60,000, Co-PI, 25% responsibility, PI – LtCol Michael Hogsed.

4. Rapid Location of Radiation Sources Using Polarimetric HSI and Radiation Sensors, DTRA Basic Research in CWMD Service Call, FY16: $322,000, PI, 40% responsibility, 3 Co-PIs.

5. Thermal Studies of Optical Materials Employed in Flash-blindness Protection Equipment, AFRL-RX, FY16: $20,000, PI, 40% responsibility, 2 Co-PIs.

6. Modification of Boron Carbide for Direct Neutron Detection Applications, AFRL-RX, FY16: $10,000, PI, 100% responsibility.

7. Support for the US Nuclear Detonation Detection System, NNSA NA-22, FY16: $50,000, PI, 50%, responsibility, Co-PI – LtCol Briana Singleton.

**2015**

1. AFIT/ENP Research In Support Of Defense Threat Reduction Agency Nuclear Technologies, DTRA Nuclear Technologies, FY15: $65,000, PI, 100% responsibility.

2. Rapid Location Of Radiation Sources In Complex Environments Using Optical And Radiation Sensors, DTRA Basic Research in CWMD Service Call, FY15: $322,000, PI, 60% responsibility, Co-PI – Dr. Kevin Gross.

3. Physics Based NUDET Modeling, NNSA NA-22, FY15: $55,000, PI, 100%, responsibility.

4. Polarimetric HSI for Improved Radioactive Source Detection Sensitivity and Localization Accuracy, DTRA Basic Research in CWMD Service Call, FY15: $327,000, Co-PI, 45% responsibility, PI – Dr. Kevin Gross.

**2014**

1. Rapid Debris Analysis, DTRA Nuclear Forensics, FY14: $22,000, PI, 100% responsibility.

2. Irradiation of Thin Film Systems, AFRL/RYH, FY14: $22,000, PI, 100% responsibility.

3. AFIT/ENP Research In Support Of Defense Threat Reduction Agency Nuclear Technologies, DTRA Nuclear Technologies, FY14: $50,000, PI, 100% responsibility.

4. Support for Nuclear Weapon Survivability, AFNWC, FY14: $185,292, Co-PI, 25% responsibility, PI – Dr. James Petrosky.

5. Polarimetric HSI for Improved Radioactive Source Detection Sensitivity and Localization Accuracy, DTRA Basic Research in CWMD Service Call, FY14: $347,000, Co-PI, 45% responsibility, PI – Dr. Kevin Gross.

**2013**

1. Rapid Debris Analysis, DTRA Nuclear Forensics, FY13: $35,000, PI, 100% responsibility.

2. AFIT/ENP Research In Support Of Defense Threat Reduction Agency Nuclear Technologies, DTRA Nuclear Technologies, FY13: $31,000, PI, 100% responsibility.

3. Nanocomposites as Lightweight Electronic Enclosures for Satellite Applications, AS&T, FY13: $87,674, Co-PI, 25% responsibility, PI – Dr. James Petrosky.

4. Support for Nuclear Weapon Survivability, AFNWC, FY13: $140,000, Co-PI, 35% responsibility, PI – Dr. James Petrosky.

5. Polarimetric HSI for Improved Radioactive Source Detection Sensitivity and Localization Accuracy, DTRA Basic Research in CWMD Service Call, FY13: $348,581, Co-PI, 10% responsibility, PI – Dr. Kevin Gross.

**2012**

1. Polarimetric HSI for Improved Radioactive Source Detection Sensitivity and Localization Accuracy, DTRA Basic Research in CWMD Service Call, FY12: $354,933, Co-PI, 10% responsibility, PI – Dr. Kevin Gross.

2. Nanocomposites as Lightweight Electronic Enclosures for Satellite Applications, AS&T, FY12: $87,674, Co-PI, 25% responsibility PI – Dr. James Petrosky.

3. Support for Nuclear Weapon Survivability, AFNWC, FY12: $236,000, Co-PI, 35% responsibility PI – Dr. James Petrosky.

**2011**

1. DTRA/AFIT Nuclear Partnership, DTRA, FY11: $100,000, PI, 100% responsibility.

2. Support for Nuclear Weapon Survivability/EMP, NNSA, FY11: $36,000, Co-PI, 25% responsibility, PI – Dr. James Petrosky.

**2010**

1. DTRA/AFIT Nuclear Partnership, DTRA, FY10: $100,000, PI, 100% responsibility.

2. Radiation Effects on Rare Earth Oxide High-k Dielectrics, AFIT/AFOSR Faculty Research Council, FY10: $27,000, FY10-11, PI, 100% responsibility.

3. Technical Research on Detection of Weapons of Mass Destruction, DTRA/CXC, FY10: $56,000, Co-PI, 25% responsibility PI – Dr. James Petrosky.

**2009**

1. DTRA/AFIT Nuclear Partnership, DTRA, FY09: $100,000, PI, 100% responsibility.

2. Rare Earth Doped Heterostructures for Neutron Detection, AFIT/AFOSR Faculty Research Council, FY09: $31,000, PI, 100% responsibility.

# Publications: 73 refereed publications: 50 in archived journals and 23 in limited distribution journals. 8 refereed publications in process.

Archived Journal Articles, in Print (“\*” denotes student)

**2017**

1. A.W. Decker, S.R. McHale, J.A. Clinton, **J.W. McClory**, and M. Millett, “Verification and Validation of MCNP6.1 Neutron Protection Factor Estimates Using the WSMR Fast Burst Reactor,” *Journal of Radiation Effects, Research and Engineering*, vol. 35, no. 1, pp. 43-48, April 2017.

2. \*M.L. Gettings, **J.W. McClory**, S.R. McHale, and B.R. Kowash, “Estimating Apparent Surface Temperature of Wasp Prime Using Digitized Nuclear Fireball Films,” *Journal of Radiation Effects, Research and Engineering*, vol. 35, no. 1, pp. 76-86, April 2017.

3. \*B.G. Frandsen, B.E. O’Day, **J.W. McClory**, and T.D. Kelly, “Gamma Radiation Shielding Properties of Composites,” *Journal of Radiation Effects, Research and Engineering*, vol. 35, no. 1, pp. 57-65, April 2017.

4. K. S. Holliday, \*J. M. Dierken, \*M. L. Monroe, M. A. Fitzgerald, N. E. Marks, R. C. Gostic, K. B. Knight, K. R. Czerwinski, I. D. Hutcheon and **J. W. McClory**, “Plutonium segregation in glassy aerodynamic fallout from a nuclear weapon test,” *Dalton Transactions*, vol. 46, no. 6, pp. 1770-1778, February 2017. [http://dx.doi.org/ 10.1039/c6dt04184a](http://dx.doi.org/%2010.1039/c6dt04184a)

**2016**

1. \*B.E. Kananen, E.M. Golden, S.A. Basun, D.R. Evans, A.A. Grabar, I.M. Stoika, **J.W. McClory**, N.C. Giles, and L.E. Halliburton, “Dual role of Sb ions as electron traps and hole traps in photorefractive Sn2P2S6 crystals,” *Optics Materials Express*, vol. 6, no. 12, pp. 3992-3999, December 2016. <http://dx.doi.org/10.1364/OME.6.003992>

2. \*M.L. Gettings, **J.W. McClory**, S.R. McHale, and B.R. Kowash, “Yield Estimate of Wasp Prime Using Digitized Nuclear Fireball Films,” *Journal of Radiation Effects, Research and Engineering*, vol. 34, no. 1, pp. 84-94, December 2016.

3. \*M.L. Dexter, **J.W. McClory**, and B.R. Kowash, “Investigation and Development of Forensic Techniques for Estimating the Mass-To-Yield Ratio of a Nuclear Detonation with Remote Optical Sensors,” *Journal of Radiation Effects, Research and Engineering*, vol. 34, no. 1, pp. 43-52, December 2016.

4. \*R.C. Slaughter and **J.W. McClory**, “Limb Darkening Coefficients of a Nuclear Detonation,” *Journal of Radiation Effects, Research and Engineering*, vol. 34, no. 1, pp. 204-216, December 2016.

5. \*B.E. Kananen, \*E.S. Maniego, E.M. Golden, N.C. Giles, **J.W. McClory**, V.T. Adamiv, Ya.V. Burak, L.E. Halliburton, “Optically stimulated luminescence (OSL) from Ag-doped Li2B4O7 crystals,” *Journal of Luminescence*, vol. 177, pp. 190-196, September 2016. <http://dx.doi.org/10.1016/j.jlumin.2016.04.032>

6. \*D. A. Matters, \*A. G. Lerch, A. M. Hurst, L. Szentmikl´osi, J. J. Carroll, B. Detwiler, Zs. R´evay, **J. W. McClory**, S. R. McHale, R. B. Firestone, B. W. Sleaford, M. Krtiˇcka, and T. Belgya, “Investigation of 186Re via radiative thermal-neutron capture on 185Re,” *Physical Review C*, vol. 93, issue 5, 054319 (19 pages), May 2016. <http://dx.doi.org/10.1103/PhysRevC.93.0543019>.

7. \*M. S. Holston, E. M. Golden, \*B. E. Kananen, **J. W. McClory**, N. C. Giles and L. E. Halliburton, “Identification of the zinc-oxygen divacancy in ZnO crystals,”*Journal of Applied Physics*, vol. 119, 145701 (7 pages), April 2016. <http://dx.doi.org/10.1063/1.4945703>.

8. \*M.S. Holston, \*I.P. Ferguson, N.C. Giles, **J.W. McClory**, D.J.Winarski, Jianfeng Ji, F.A. Selim, L.E. Halliburton, “Green luminescence from Cu-diffused LiGaO2 crystals,” *Journal of Luminescence*, vol. 170, pp. 17-23, February 2016. <http://dx.doi.org/10.1016/j.jlumin.2015.10.010>.

**2015**

1. T. D. Kelly, J. C. Petrosky, **J. W. McClory**, J. M. Mann, J. W. Kolis, “Analysis of oxygen shell splitting in hydrothermally grown single crystal ThO2(200),” *Physica Status Solidi - Rapid Research Letters*, vol. 9, no.11, pp. 668-672, November 2015. <http://dx.doi.org/10.1002/pssr.201510235>

2. \*D. A. Matters, N. Fotiades, J. J. Carroll, C. J. Chiara, **J. W. McClory**, T. Kawano, R. O. Nelson, and M. Devlin, “New transitions and feeding of the Jπ = (8+) isomer in 186Re,” *Physical Review C*, vol. 92, issue 5, 054304, November 2015. <http://dx.doi.org/10.1103/PhysRevC.92.054304>

3. \*M. S. Holston, \*I. P. Ferguson, **J. W. McClory**, N. C. Giles, and L. E. Halliburton, “Oxygen vacancies in LiAlO2 crystals,” *Physical Review B*, vol. 92, issue 14, 144108, October 2015. <http://dx.doi.org/10.1103/PhysRevB.92.144108>

4. A.W. Decker, S.R. McHale, M.P. Shannon, J.A. Clinton, **J.W. McClory**, “Novel Bonner Sphere Spectrometer Response Functions Using MCNP6,” *IEEE Transactions on Nuclear Science*, vol.62, no.4, pp.1689-1694, August 2015. <http://dx.doi.org/10.1109/TNS.2015.2416652>

5. \*M.S. Holston, \*I.P. Ferguson, N.C. Giles, **J.W. McClory**, L.E. Halliburton, “Identification of defects responsible for optically stimulated luminescence (OSL) from copper-diffused LiAlO2 crystals,” *Journal of Luminescence*, vol. 164, pp.105-111, August 2015. <http://dx.doi.org/10.1016/j.jlumin.2015.03.01362>.

6. \*M.S. Holston, **J.W. McClory**, N.C. Giles, L.E. Halliburton, “Radiation-induced defects in LiAlO2 crystals: Holes trapped by lithium vacancies and their role in thermoluminescence,” *Journal of Luminescence*, vol. 160, pp.43-49, April 2015. <http://dx.doi.org/10.1016/j.jlumin.2014.11.018>

7. \*R.C. Slaughter, \*T.R. Peery, **J.W. McClory**, “Two-dimensional temperature analysis of nuclear fireballs using digitized film,” *Journal of Applied Remote Sensing*, vol. 9, 095096 (11 pages), January 2015. <http://dx.doi.org/10.1117/1.JRS.9.095096>

**2014**

1. S. Ashley Francis, James C. Petrosky, **John W. McClory**, and Cory D. Cress, “Effects of Proton and X-ray Irradiation on Graphene Field-Effect Transistors with Thin Gate Dielectrics,” *IEEE Transactions on Nuclear Science*, vol. 61, no. 6, pp. 3010-3017, December 2014. <http://dx.doi.org/10.1109/TNS.2014.2364780>
2. \*D. A. Buchanan, \*M. S. Holston, A. T. Brant, **J. W. McClory**, V. T. Adamiv, Ya. V. Burak, and L. E. Halliburton, “Electron paramagnetic resonance and thermoluminescence study of Ag2+ ions in Li2B4O7 crystals,” *Journal of Physics and Chemistry of Solids*, vol. 75, issue 12, pp. 1347-1353, December 2014. <http://dx.doi.org/10.1016/j.jpcs.2014.07.014>
3. \*T. D. Kelly, E. Echeverria, Sumit Beniwal, V. T. Adamiv, Ya. V. Burak, Axel Enders, J. C. Petrosky, **J. W. McClory**, and P. A. Dowben, “The chromium site in doped glassy lithium tetraborate,” *Materials Chemistry and Physics*, vol. 147, pp. 492-495, August 2014. <http://dx.doi.org/10.1016/j.matchemphys.2014.05.021>
4. \*Jeffrey J. Graham, J. Matthew Mann, Timothy W. C. Zens, **John W. McClory**, “Hydrothermal Phase Stability Study of Li2B4O7,” *Journal of Solid State Chemistry,* vol. 216, pp. 79-84, August 2014. <http://dx.doi.org/10.1016/j.jssc.2014.04.019>
5. \*M. C. Recker, **J. W. McClory**, \*M. S. Holston, E. M. Golden, N. C. Giles, and L. E. Halliburton, “Copper doping of ZnO crystals by transmutation of 64Zn to 65Cu: An EPR and gamma spectroscopy study,” *Journal of Applied Physics*, vol. 115, 243706 (6 pages), June 2014. <http://dx.doi.org/10.1063/1.4885439>
6. \*Tony D. Kelly, James C. Petrosky, **John W. McClory**, Volodymyr T. Adamiv, Yaroslav V. Burak, Bohdan V. Padlyak, Ihor M. Teslyuk, Ning Lu, Lu Wang, Wai-Ning Mei, Peter A. Dowben, “Rare earth dopant (Nd, Gd, Dy, and Er) hybridization in lithium tetraborate,” *Frontiers in Physics*, vol. 2, art. 31 (10 pages), May 2014. <http://dx.doi.org/10.3389/fphy.2014.00031>
7. A. T. Brant, \*D. A. Buchanan, **J. W. McClory**, V. T. Adamiv, Ya. V. Burak, L. E. Halliburton, and N.C. Giles, “Photoluminescence from Ag2+ ions in lithium tetraborate (Li2B4O7) crystals,” *Journal of Luminescence*, vol. 153, pp. 79-84, March 2014. <http://dx.doi.org/10.1016/j.jlumin.2014.03.008>
8. \*T. D. Kelly , J. C. Petrosky, D. Turner, **J. W. McClory**, J. M. Mann, J. W. Kolis, Xin Zhang, P. A. Dowben, “The unoccupied electronic structure characterization of hydrothermally grown ThO2 single crystals,” *Physica Status Solidi - Rapid Research Letters*, vol. 8, no. 3, pp. 283-286, March 2014. <http://dx.doi.org/10.1002/pssr.201308286>

**2013**

1. S. Ashley Francis, Cory D. Cress, **John W. McClory**, Elizabeth A. Moore, James C. Petrosky, “Characterization of Radiation Damage in Carbon Nanotube Field-Effect Transistors”, *IEEE Transactions on Nuclear Science*, vol.60, no.6, pp.4087-4093, Dec. 2013. <http://dx.doi.org/10.1109/TNS.2013.2284542>
2. \*Tony D. Kelly, James C. Petrosky, **John W. McClory**, Timothy Zens, David Turner, J. Matthew Mann, Joseph W. Kolis, Juan A. Colón Santana and Peter A. Dowben, “The Debye Temperature for Hydrothermally Grown ThO2 Single Crystals”, *Materials Research Society Symposium Proceedings*, Vol. 1576-Nuclear Radiation Detection Materials, August 2013. <http://dx.doi.org/10.1557/opl.2013.996>
3. A. T. Brant, \*D. A. Buchanan, **J. W. McClory**, P. A. Dowben, V. T. Adamiv, Ya. V. Burak, and L. E. Halliburton, “EPR identification of defects responsible for thermoluminescence in Cu-doped lithium tetraborate (Li2B4O7) crystals”, *Journal of Luminescence,* vol. 139, pp 125-131, July 2013. <http://dx.doi.org/10.1016/j.jlumin.2013.02.023>
4. \*T. D. Kelly, L. Kong, \*D. A. Buchanan, A. T. Brant, J. C. Petrosky, **J. W. McClory**, V. T. Adamiv, Y. V. Burak, and P. A. Dowben, “EXAFS and EPR analysis of the local structure of Mn-doped Li2B4O7”, *Physica Status Solidi (b)*, vol 250, issue 7, pp 1376-1383, July 2013. <http://dx.doi.org/10.1002/pssb.201349013>
5. Juan A. Colón Santana, \*C. M. Young, S. R. McHale, **J. W. McClory**, J. C. Petrosky, X. Wang, P. Liu, Jinke Tang, V.T. Adamiv, Ya. V. Burak, Keisuke Fukutani, and P.A. Dowben, “Gamma and X-ray sensitivity of Gd2O3 heterojunctions”, *Radiation Measurements*, vol. 51-52, pp 99-102, April 2013. <http://dx.doi.org/10.1016/j.radmeas.2013.02.021>
6. \*Christina Dugan, R. Hengehold, Stephen R. McHale, Juan A. Colón Santana, **John W. McClory**, V.T. Adamiv, Ya.V. Burak, Ya. B. Losovyj and Peter A. Dowben, “Reversible Mn segregation at the polar surface of lithium tetraborate”, *Applied Physics Letters*, vol. 102, 161602 (4 pp), April 2013. <http://dx.doi.org/10.1063/1.4802760>

**2012**

1. \*Lu Wang, Wai-Ning Mei, \*S. R. McHale, **J. W. McClory**, J. C. Petrosky, J. Wu, R. Palai, Ya. B. Losovyj, and P. A. Dowben, “The rare earth 4f hybridization with the GaN valence band”, *Semiconductor Science and Technology*, vol. 27, 115017 (7 pp), October 2012. <http://dx.doi.org/10.1088/0268-1242/27/11/115017>
2. \*J.A. Colón Santana, Pan Liu, Xianjie Wang, J. Tang, \*S. R. McHale, \*D. Wooten, **J. W. McClory**, J. C. Petrosky, J. Wu, R. Palai, Ya. B. Losovjy, and P. A. Dowben, “The local metallicity of gadolinium doped compound semiconductors”, *Journal of Physics: Condensed Matter*, vol. 24, 445801 (6 pp), October 2012. <http://dx.doi.org/10.1088/0953-8984/24/44/445801>
3. \*N. A. Estep, J. C. Petrosky, **J. W. McClory**, Y. Kim, A. J. Terzuoli, “Electromagnetic Interference and Ionizing Radiation Effects on CMOS Devices”*, IEEE Transactions on Plasma Science*, vol.40, no.6, pp.1495-1501, June 2012. <http://dx.doi.org/10.1109/TPS.2012.2193600>

**2011**

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**Conference Presentations (not including publications listed above)**

1. \*William J. Erwin, Edward Cazalas, **John W. McClory**, Justin A. Clinton, James R. Fee, Andrew W. Decker, “Verification and Validation of Monte Carlo N-Particle Code 6 (MCNP6) for Evaluating Shielding Materials against Gamma Radiation,” presented at the *16th International Symposium on Reactor Dosimetry* in Santa Fe, NM on 9 May 2017.
2. A.W. Decker, S.R. McHale, J.A. Clinton, **J.W. McClory**, M. Millett, “Radiation Spectra and Dose Comparisons Utilizing Monte Carlo N-Particle 6 (MCNP6) and Fast Burst Reactor Source Measurements,” presented at the *16th International Symposium on Reactor Dosimetry* in Santa Fe, NM on 8 May 2017.
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25. \*B.E. Kananen, \*E.S. Maniego, **J.W. McClory**, “Characterization of Lithium Tetraborate for Dosimetry Applications”, *ANS Technical Meeting on Nuclear Energy and Cyber Security* in Annapolis, MD on 18 April 2016.
26. \* N.M. Kaminski, M.R. Hogsed, J.C. Petrosky, **J.W. McClory**, “Radiation Effects in Thin Layer Hexagonal Boron Nitride”, *ANS Technical Meeting on Nuclear Energy and Cyber Security* in Annapolis, MD on 18 April 2016.
27. \*A.J. Ferguson, **J.W. McClory**, “Effects of Neutron Energy Deposition for Asteroid Disruption”, *ANS Technical Meeting on Nuclear Energy and Cyber Security* in Annapolis, MD on 19 April 2016.
28. J.L. Mann, M.A. Tyra, J.L. Molloy, J. Buscaglia, K. Pfeuffer, J. Dettman, J. Leggitt, T.D. Kelly, **J.W.**

**McClory**, and S. Jerome, S “Surrogate Post-Detonation Urban Debris Standard Reference Material”, presented at the *Tenth International Conference onMethods and Applications of Radioanalytical Chemistry* in Kona, Hawaii on 13 April 2015.

1. \*A. G. Lerch, A. M. Hurst, R. B. Firestone, Zs. Revay, L. Szentmiklósi, B. Detwile, S. R. McHale, J. W. McClory, and J. J. Carroll, “Transitions, cross sections, and neutron binding energy in 186Re by prompt gamma activation analysis”, presented at the *American Physical Society April Meeting* in Savannah, Georgia on 7 April 2014.
2. Justin A. Clinton, Benjamin Kowash, Stephen McHale, and **John McClory**, “ Neutron Spectrometry and Source Location Using Solid-State Detectors”, presented at the *IEEE Nuclear Science Symposium* in Seoul, South Korea on 29 October 2013.
3. \*Tony D. Kelly, James Petrosky, **John W. McClory**, Timothy Zens, David Turner, James Mann, Joseph Kolis, Juan A. Colón Santana, and Peter A. Dowben, Paper No. WW10.03, “The Debye Temperature for Hydrothermally Grown ThO2 Single Crystals”, *2013 Material Research Society Spring Meeting*, San Francisco CA, 4 April 2013.
4. A. T. Brant, \*D. A. Buchanan, **J. W. McClory**, and L. E. Halliburton, Paper No. TT5.03, “Radiation-Induced Electron and Hole Centers in Cu-Doped Lithium Tetraborate (Li2B4O7) Crystals”,*2012 Material Research Society Fall Meeting*, Boston MA, 27 November 2012.
5. \*M. A. Ford, A. A. Bickley, S. R. McHale, **J. W. McClory**, J. C. Petrosky, Paper No. N1-93, “Application of LiF Coated Diodes to Neutron Spectroscopy for Thermal through Fast Energies”, *IEEE Nuclear Science Symposium 2012*, Anaheim CA, 29 October 2012.
6. \*J. S. Best, **J. W. McClory**, C. D. Cress, S. A. Francis, J. C. Petrosky, Paper No. N33-7, “Electron Radiation Damage Effects on Single-Walled Carbon Nanotube Thin Films”, *IEEE Nuclear Science Symposium 2012*, Anaheim CA, 1 November 2012.
7. \*M. R. Halstead, J. C. Petrosky, **J. W. McClory**, S. Clark, P. E. Sokol, Paper No. N14-6, “Considerations for Neutron Irradiation when Using Constant and Pulsed Sources”, *IEEE Nuclear Science Symposium 2012*, Anaheim CA, 30 October 2012.
8. \*S. B. Fagan-Kelly, C. S. Williams, \*D. A. Buchanan, **J. W. McClory**, A\*. M. Bonavita, \*S. M. Jimenez, L. W. Burggraf, Paper No. N20-8, “Positron Annihilation Momentum Spectroscopy of Nuclear Detection Materials: Coincident Angular Correlation of Annihilation Radiation / Doppler Broadening of Annihilation Radiation (ACAR/DBAR)”, *IEEE Nuclear Science Symposium 2012*, Anaheim CA, 31 October 2012.
9. \*T. D. Kelly, **J. W. McClory**, \*D. A. Buchanan, A. T. Brant, J. C. Petrosky, Ya. B. Losovyj, V. T. Adamiv, Ya. V. Burak, and P. A. Dowben, “Investigation of rare earth doped lithium tetraborate glasses with XAFS and emission and excitation spectroscopy”, *Actinides and Rare Earths Session, American Vacuum Society 59th Annual Symposium and Exhibition,* Tampa FL, 29 October 2012.
10. **J. W. McClory**, S. R. McHale, Lu Wang, Wai-Ning Mei, J. C. Petrosky, J. Wu, R. Palai, Ya. B. Losovyj, and P. A. Dowben, “The rare earth 4f hybridization in gallium nitride”, *Actinides and Rare Earths Session, American Vacuum Society 59th Annual Symposium and Exhibition*, Tampa FL, 29 October 2012.
11. \*D. A. Buchanan, A. T. Brant**, J. W. McClory**, N. C. Giles, P. A. Dowben, and L. E. Halliburton, “Identification of Radiation-Induced Defects in Undoped, Ag-Doped, and Cu-Doped Lithium Tetraborate (Li2B4O7) Crystals: Application to Thermoluminescence Dosimeters and Neutron Detectors”, *Materials Research Society Spring 2012 Meeting*, San Francisco, CA, April 2012.
12. S. R. McHale, **J. W. McClory**, J. C. Petrosky, R. Palai, Ya. B. Losovyj, P. A. Dowben, and I. Ketsman, “Surface segregation in rare earth doped GaN thin films”, *Materials Research Society Spring 2012 Meeting*, San Francisco, CA, April 2012.
13. \*M. E. Mace, **J. W. McClory**, B. R. Kowash, A. A. Bickley, “Calibration of a Pulsed Neutron Source Detector System”, *Hardened Electronics and Radiation Technology Conference*, Monterey, CA, March 2012.
14. J. Petrosky, **J. W. McClory**, S. Mall, George Hansen, M. D. Alexander, “Analysis of Shielding Effectiveness for Novel, Multi-Purpose Composite Radiation Shields (NABS-EMP)”, *Hardened Electronics and Radiation Technology Conference*, Monterey, CA, March 2012.
15. L. Wang, W.-N. Mei, D. Wooten, **J. McClory**, J. Petrosky, V. Adamiv, Ya. Burak, I. Ketsman, Ya. Losovyj, P.A. Dowben, “The Surface States of Lithium Tetraborate”, *American Vacuum Society Symposium 2011*, Nashville, TN, November 2011.
16. \*Helen C. Jackson, Don Dorsey, James Petrosky and **John McClory**, “Impact of Silicon Nitride Passivation Thickness on Electron Irradiated AlGaN\GaN”, *Materials Research Society Spring 2011 Meeting*, 26 Apr 11, San Francisco, CA.
17. \*Helen C. Jackson, Gary C. Farlow, Timothy Cooper, James Petrosky and **John W.** **McClory**, “Mobility Variation in Electron Irradiated Gated and Ungated AlGaN/GaN High Electron Mobility Transistors”, *Materials Research Society Spring 2011 Meeting*, 28 Apr 11, San Francisco, CA.
18. \*E. R. Myers\*, \*Bruce K. McNamara, A. M. Casella, P. A. Dowben, **J. W.** **McClory**, J. C. Petrosky and A. N. Caruso, “Electrical Carrier Transport and Electronic Structure Studies of Amorphous UO2”, *American Physical Society March Meeting 2011*, 15 Mar 11, Dallas TX.
19. \*S. Karki, \*J. E. Bevins, \*Joseph Sandstrom, C. Clayton, M. S. Driver, B. Nordell, **J. W.** **McClory**, J. C. Petrosky , K.I. Pokhodnya and A.N. Caruso, “Fabrication and transport properties of a-B5C:Hx to n-type Si heterojunction diodes”, *American Physical Society March Meeting 2011*, 15 Mar 11, Dallas TX.
20. **J. W. McClory**, \*Brant E. Kananen, \*A. T. Brant, J. C. Petrosky, and L. E. Halliburton, “Point Defects and Their Role in Thermoluminescence in Silver Doped Lithium Tetraborate (Li2B4O7) Crystals Being Developed for Neutron Dosimetry”, *Materials Research Society Fall 2010Meeting*, 1 Dec 10, Boston, MA.
21. \*S. R. McHale, **J. W.** **McClory**, J. C. Petrosky, J. Wu, A. Rivera, A. Martinez, R. Palai, P. A. Dowben, Ya. B. Losovyj, “Photoemission Studies of Au-GdxGa1-xN Schottky Barrier Formation”, *Materials Research Society Fall 2010Meeting*, 3 Dec 10, Boston, MA.
22. \*Christopher M. Young, **John W. McClory**, Benjamin R. Kowash, and James C. Petrosky, “Solid State Neutron Detection with a Gadolinium Oxide and p-type Silicon Heterojunction”, *IEEE Symposium on Radiation Measurement and Applications*, 25-27 May 2010, Ann Arbor, MI.
23. Benjamin Kowash, Randall Rockrohr, Larry Burggraf, James Petrosky, and **John McClory**, “Estimating Source Position in Sealed Shipping Canisters Using Gamma Ray Spectra From a Portable HPGe Detector”, *IEEE Symposium on Radiation Measurement and Applications*, 25-27 May 2010, Ann Arbor, MI.
24. \*C. M. Young, \*J. K. Mikina, **J. W. McClory**, J. C. Petrosky, “Gate Bias Dependent Neutron Radiation Effects on AlGaN/GaN Heterojunction Field Effect Transistors”, *Hardened Electronics and Radiation Technology Conference*, 20-23 April 2010, Tucson, AZ.
25. \*M. W. Swinney, **J. W. McClory**, J. C. Petrosky, Ya. V. Burak, \*Shan Yang, \*A. T. Brant, and L. E. Halliburton, “Identification of electron and hole traps in lithium tetraborate (Li2B4O7) crystals: Oxygen vacancies and lithium vacancies”, *Materials Research Society Fall 2009 Meeting*, 1-4 Dec 2009, Boston, MA.
26. \*S. McHale, Ya. B. Losovyj, \*D. Wooten,**J. McClory**, J. Petrosky, “Au-Al0.27Ga0.73N Shottky Barrier Formation and Charge Carrier Mobility Estimation”, *American Vacuum Society 56th International Symposium and Exhibition,* 8-13 November 2009, San Jose, CA.
27. \*Brian D. Blasy, \*David Schultz, James C. Petrosky, **John W. McClory**, Jinke Tang, Zhenjun Wang, Jennifer I. Brand, and P. A. Dowben, “Neutron Detection Using Gd-doped HfO2/Silicon Heterojunctions”, *IEEE Nuclear Science Symposium*, 25-31 October 2009, Orlando, FL.
28. **John McClory**, James Petrosky, \*Jeffrey Moran, “The Effect of Silicon Nitride Passivation on the Electrical Properties of Neutron and Electron Radiated AlGaN/GaN HFETs”, *IEEE Nuclear Science Symposium,* 25-31 October 2009, Orlando, FL.
29. **John McClory**, Eugene Sheely, “AFIT Graduate Nuclear Engineering and Combating WMD Programs”, *DTRA Detailee Training Conference,* 14-16 Oct 2009, Fort Belvoir, VA.
30. \*E. Lam, \*D. M. Arnold, Y.C. Kim, J. C. Petrosky, **J. W. McClory**, “Evaluation of Retention Characteristics in Dynamic Random Access Memory Using Reconfigurable Computers for Low-cost In-situ Radiation Reliability Testing”, *Hardened Electronics and Radiation Technology Conference,* 1-4 April 2009, Albuquerque, NM.
31. \*David Wooten, I. Ketsman, Jie Xiao, Ya. B. Losovyj, J. Petrosky, **John McClory**, Ya. V. Burak, V.T. Adamiv, and P.A. Dowben, “Differences in the Surface Charging at the (100) and (110) Surfaces of Li2B4O7”, *Materials Research Society Spring Meeting,* 13-17 April 2009, San Francisco, CA.
32. \*David Schultz, James C. Petrosky, **John W. McClory**, Markus Natta, \*Nathan Schemm, S. Balkir, Michael W. Hoffman, Mark Bauer, J.I. Brand, Jinke Tang, Wendong Wang, and Peter A. Dowben, “Single Neutron Pulse Counting with p-type Gd Doped HfO2 Thin Film Heterojunctions with Silicon”, *Materials Research Society Spring Meeting,* 13-17 April 2009, San Francisco, CA.
33. \*D. Wooten, Ya. B. Losovyj, N. Lozova, J. Petrosky, **J. W. McClory**, Juan Colon-Santana, A. Sokolov, Jinke Tang, Wendong Wang, I. Ketsman, and P.A. Dowben, “Comparison of n-type Gd2O3 and Gd-doped HfO2 Electronic Structure”, *Materials Research Society Fall Meeting,* 1-4 December 2008, Boston, MA.

**Patents:**

**Patent Applied 08/18/10**: Apparatus and Method for Directional and Spectral Analysis of Neutrons. Local filing number: UMKC 10-1-1, University of Missouri. 25% each: J. Petrosky (AFIT), J. McClory (AFIT), P. Dowben (UNL), T. Caruso (UMKC)

**Technical Description:** The invention is based on the alternate stacking of contact pixilated direct conversion pn junctions, with hydrogenous moderator and reflector in such a way as to optimize the detection efficiency for incident neutron energies in the thermal (25 meV) to the fast (5 MeV) range. The pn junctions are based on a semiconducting boron-rich solid as the p-type material and single crystal silicon as the n-type material. It is not required that the n-type material be single crystal silicon. Amorphous silicon, silicon carbide, gallium arsenide and other popular semiconductors could work just as well. pn junction devices where both the p- and n-type layers are a boron rich semiconductor are also possible. The important points toward device optimization, in either the spectrometer or detection efficiency use relate to: (1) the type of moderator (including elemental and isotopic makeup and density), it's thickness and relative location; (2) the type of neutron reflector materials, their thickness and relative location; (3) the thickness and isotopic ratio of the semiconducting boron carbide layers as part of the pn junction; (4) the orientation of the pn junctions relative to the incident neutron beam; (5) the thickness and isotope of neutron blocking, absorbing or scattering material; and (6) the overall diameter of the device.

**Teaching:** 14 years of classroom teaching experience at the undergraduate and graduate levels covering a variety of subjects from basic physics, mathematics, nuclear physics, nuclear instrumentation, nuclear weapons effects, and radiation effects on electronics.

**Courses Taught**

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| COURSE | TITLE | TERM (# OF STUDENTS) |
| PHY201 | Physics 1 | FA 93 (56) |
| PHY202 | Physics 2 | SP 94 (60) |
| PHY251 | Honors Physics 1 | FA 94 (58), FA95 (60) |
| PHY252 | Honors Physics 2 | SP 95 (56), SP 96 (61) |
| MA302 | Analytical Geometry and Trigonometry | FA 97 (8), FA 98 (12) |
| MA305 | Calculus 1 | SP 98 (15) |
| MA410 | Introduction to Probability and Statistics | SP 99 (10) |
| MATL 560 | Elec., Mag., and Opt. Prop. of Materials | FA 10 (4) |
| NENG 500 | Nuclear Policy and Strategy | FA 13 (16), FA 14 (24), FA 15 (37),  FA 16 (37), SU 17 (33) |
| NENG 596 | Nuclear Weapons Effects | SU 12 (11), FA 12 (26) |
| NENG 591 | Nuclear Weapons and Proliferation | WI 13 (27) |
| NENG 605 | Physics of Nuclear Explosives | WI 09 (15), WI 10 (24), WI 12 (22), WI 17 (13) |
| NENG 625 | Electromagnetic Pulse Effects | SU 10 (5), SU 11 (5) |
| NENG 635 | Residual Effects of Nuclear Weapons | SU 17 (11) |
| NENG 650 | Nuclear Instrumentation | WI 10 (16), WI 12 (20) |
| NENG 651 | Introduction to Nuclear Physics | FA 08 (15), FA 09 (22) |
| NENG 660 | Radiation Effects on Electronics | SP 11 (9) |
| NENG 664 | Radiation Effects on Electronics Lab | SU 08 (4), SU 09 (8), SU 12 (7),  SU 13 (4) |
| NENG 699 | Independent Study | SU 09 (1) |
| NENG 830 | Advanced Nuclear Weapons Effects | SU 14 (7), SU 15 (4), SU 16 (5) |
| NENG 751 | Nuclear Physics II | FA 15 (6), FA 16 (4) |
| PHYS 570 | Physics of Solid State Devices | FA 10 (7), FA 11 (7) |

**Course and Curriculum Development**

Developed instructional material for the courses NENG 596 (Nuclear Weapons Effects), NENG 625 (Electromagnetic Pulse Effects), NENG 660 (Radiation Effects on Electronics), PHYS 570 (Physics of Solid State Devices), NENG 500 (Nuclear Policy and Strategy), NENG 830 (Advanced Nuclear Weapons Effects), and NENG 751 (Nuclear Physics II).

**SERVICE**

**Institute Activities**

* Director, Nuclear Weapons Effects, Policy, and Proliferation Graduate Certificate Program, Oct 2013 to present
* AFIT Academic Standards Committee, Oct 2017 to present
* AFIT Faculty Research Council, Oct 2016 to present
* AFIT Doctoral Committee, Oct 2015 to present
* AFIT/EN Awards Committee Member, Oct 2014 to present
* Faculty Advisor – AFIT Student Chapter of the American Nuclear Society, Jul 2013 to Oct 2015
* Faculty Council Secretary, Oct 2013 to Oct 2014
* Curriculum Chairman, Combating WMD Program, Mar 2012 to June 2013
* Air Force CBRN Symposium Co-Chairman, 2011 and 2013
* Military Member, AFIT Doctoral Council, Jan 2010 to Oct 2011
* Member, AFIT Library Council, Sep 2009 to Sep 2011
* Chair of JOWOG-36, Nuclear Survivability, Planning Committee, 2009

**Professional Activities**

* Proposal Reviewer for the Defense Threat Reduction Agency Basic Science to Combat Weapons of Mass Destruction Broad Agency Announcement 2015-2017
* Proposal Reviewer for the National Nuclear Security Administration Nuclear Forensics Call for Proposals 2015-2017
* Member Joint National Security Applications Council-Peer Review Panel (JNSAC-PRP) 2014-2017.
* Technical Chair, Materials Session, Hardened Electronics and Radiation Technology Conference
* Invited Speaker, American Vacuum Society International Symposium
* Reviewer of the Journal of Electrochemistry, Journal of Radiation Effects, Journal of Vacuum Science and Technology, Journal of Luminescence and Solid State Letters

Membership in Professional Societies

* American Nuclear Society
* IEEE Nuclear and Plasma Sciences Society
* Materials Research Society

Membership in Honorary Societies

* Tau Beta Pi (Engineering Honor Society)
* Sigma Pi Sigma (Physics Honor Society)