

## Nuclear Science and Technology Division

### **Director:**

Anthony Hechanova

### **Group Leaders:**

Denis Beller (Nuclear Engineering)  
Steven Curtis (National Security)  
Kenneth Czerwinski (Radiochemistry)  
Ning Li (Materials for Nuclear Applns)

### **Researchers:**

Gary Cerefice  
Allen Johnson  
Jian Ma  
Longzhou Ma  
Tyler Sullens

### **Technical Support Staff:**

Jeanette Daniels  
Kathleen Lauckner  
Trevor Low (Laboratory Manager)  
Jeremy Maute  
Thomas O'Dou (Radiation Lab. Director)

### **Administrative Staff:**

Sandra Boydston  
Cristalyne Estella  
John Knoten  
Rebecca Paulson  
Leisa Rodriguez (Director of Finance)

### **Part-Time Staff:**

Leslie Jardine

### **Postdoctoral Researchers:**

Cynthia Gong  
Frederic Poineau  
Daniel Rego

### **Graduate Students:**

Timothy Beller  
Megan Bennett  
Craig Bias  
Narek Gharibyan  
Julie Gostic  
Richard Gostic  
Kiel Holliday  
Christopher Klug  
Lawrence Lakeotes  
Ryan LeCounte  
Ed Mausolfe  
Lisa Mullen  
Quinten Newell  
Wendy Pemberton  
Troy Robinson  
Chinthaka Silva  
Nick Smith  
Evgeny Stankovskiy  
Sherry Stock  
Jamie Warburton  
Amber Wright  
Charles Yeamans

### **Undergraduate Students:**

Deborah Callaway

**Mission:** The mission of the Nuclear Science and Technology Division is to conduct research and support academic programs regarding aspects of nuclear science and technology that are of interest to the community and sponsoring organizations.

**Summary:** The NSTD was formed in 2001 and houses a multi-disciplinary team with extensive expertise in radiochemistry, nuclear engineering, radioactive waste management, radiation detection and measurement, geology, environmental chemistry, risk assessment, and public communication. The division has state-of-the-art facilities including radiochemistry, radiation detection, transmission electron microscopy and a host of other analytical laboratories. The division also supports two academic programs: the Ph.D. program in Radiochemistry and the M.S. program in Materials and Nuclear Engineering. This year the division expanded by adding a fourth technical area or "group" on National Security. Steve Curtis, retired DOE program manager, was assigned to develop this program and crosscut resources with the other three technical groups. The research and academic activities of the division are well integrated with the UNLV campus with about a third of the division's funding sub-awarded to academic departments (Chemistry, Physics, Health Physics, Mechanical Engineering, Civil Engineering,

and Electrical and Computer Engineering). Only projects that are directly managed by the NTSD are identified in this report. Further information about projects can be found on the NSTD website at <http://nstg.nevada.edu>.

### **Completed Projects:**

“Dissolution, Reactor, and Environmental Behavior of Z402-mGo Inert Fuel Matrix,” TRP Task 19, DOE Cooperative Agreement DE-FG07-01AL67358. Project start date: March 2006. Project end date: June 2007. Award Amount: \$109,349.00.

“Fundamental Chemistry of U and Pu in the TBP-Dodecane-Nitric Acid System,” TRP Task 26, DOE Cooperative Agreement DE-FG07-01AL67358. Project start date: May 2004. Project end date: June 2007. Award Amount: \$253,300.00.

“On the Crystal Structure and Nano Structure of Oxide-and Nitride Transmutation Fuel - A Student Proposal to Refine Transmutation Fuel Processing,” TRP Task 28, DOE Cooperative Agreement DE-FG07-01AL67358. Project start date: May 2005. Project end date: June 2007. Award Amount: \$119,694.00.

“Investigation of Optical Spectroscopy Techniques for On-Line Materials Accountability in the Solvent Extraction Process,” TRP Task 29, DOE Cooperative Agreement DE-FG07-01AL67358. Project start date: May 2005. Project end date: June 2007. Award Amount: \$151,217.00.

“Radiation Detection,” Idaho National Laboratory Subcontract 00052644. Project start date: March 2006. Project end date: June 2007. Award Amount: \$50,000.00.

“Advanced Accelerator Applications University Participation Program,” Administration, DOE Cooperative Agreement DE-FG07-01AL67358. Project start date: May 2001. Project end date: June 2007. Award Amount: \$10,143,842.00.

“Microbial Transformations of Tru and Mixed Wastes: Actinide Speciation and Waste Volume Reduction,” DOE Cooperative Agreement DE-FG02-04ER63733. Project start date: December 2003. Project end date: June 2007. Award Amount: \$210,000.00.

“Combined Radiation Detection Methods for Assay of Higher Actinides in Separations Processes,” TRP Task 30, DOE Cooperative Agreement DE-FG07-01AL67358. Project start date: May 2005. Project end date: June 2007. Award Amount: \$144,201.00.

“Deep Burn Separation and Repository Behavior,” Deep Burn, DOE Cooperative Agreement DE-FG07-01AL67358. Project start date: May 2005. Project end date: June 2007. Award Amount: \$317,880.00.

“General Atomics-Deep Burn Reactor Physics Analyses,” Deep Burn, DOE Cooperative Agreement DE-FG-07-01AL67358 / SubAward 280207-DB-01. Project start date: May 2005. Project end date: June 2007. Award Amount: \$1,138,120.00.

“Investigation of the Fundamental Surface Reactions Involved in the Sorption and Desorption of Radionuclides-MATCH,” EPSCoR-Match, State of Nevada Cooperative Agreement SFFA NSHE-07-26. Project start date: August 2006. Project end date: July 2007. Award Amount: \$41,272.00.

“Uranium Visualization Chemistry,” NSTec Prime Contract DE-AC52-06NA25946, SubContract Number 30451 - UNLV Task Order Number 46. Project start date: May 2007. Project end date: September 2007. Award Amount: \$44,620.00.

“Radiation Decontamination,” DARPA Contract Number HR0011-06-C-0106. Project start date: June 2006. Project end date: September 2007. Award Amount: \$1,500,000.00.

### **Ongoing Projects:**

“High Temperature Heat Exchanger Project Administration,” UNLV/RF Contract Number RF-05-HTHX-001.05. Project start date: July 2006. Project end date: March 2008. Award Amount: \$1,292,343.00.

“Investigation of the Fundamental Surface Reactions Involved in the Sorption and Desorption of Radionuclides-MATCH,” State of Nevada Contract Number SFFA NSHE-07-26. Project start date: August 2007. Project end date: June 2008. Award Amount: \$21,300.00.

“Dissolution, Reactor, and Environmental Behavior of ZrO<sub>2</sub>-MgO inert Fuel Matrix,” TRP Task 19, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$111,884.00.

“Fundamental Chemistry of U and Pu in the TBP-Dodecane-Nitric Acid System,” TRP Task 26, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$122,040.00.

“Reactor Physics Studies for the AFCI RACE Project (Reactor-Accelerator Coupling Experiments Project),” TRP Task 27, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$115,495.00.

“Crystal & Nano Structure of Oxide and Nitride Transmutation Fuel,” TRP Task 28, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$159,270.00.

“Investigation of Optical Spectroscopy Techniques for On-Line Materials Accountability in the Solvent Extraction Process,” TRP Task 29, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$100,596.00.

“Combined Radiation Methods for Assay of Higher Actinides in Separations,” TRP Task 30, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$313,608.00.

“Improvement of Controlling Algorithm of the TC-1 Loop,” TRP Task 31, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$99,431.00.

“Synthesis & Properties of Metallic Technetium & Technetium Zirconium Alloys,” TRP Task 33, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$389,029.00.

“Solution-Based Synthesis of Nitride Fuels,” TRP Task 34, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$292,604.00.

“Criticality Studies of Dilute Plutonium Mixtures for UREX Processes,” TRP Task 35, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$324,077.00.

“Deep Burn Separation & Repository,” Deep Burn, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$277,465.00.

“General Atomics - Reactor Physics Analysis (Deep Burn sub-award) TRP,” Deep Burn - GA, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$622,535.00.

“Advanced Fuel Cycle Initiative (AFCI) Transmutation Research Program - Administrative Task,” DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: September 2006. Project end date: August 2008. Award Amount: \$3,571,869.00.

“Evaluation of Cs/Sr Waste Form for Long Term Storage and Disposal,” TRP Task 36, DOE Cooperative Agreement DE-FC07-06ID14781. Project start date: April 2007. Project end date: August 2008. Award Amount: \$90,163.00.

“Nuclear Hydrogen Initiative - Admin Support,” DOE Cooperative Agreement DE-FC07-07ID14878. Project start date: September 2007. Project end date: September 2008. Award Amount: \$1,033,315.00.

“Counting Lab Equipment Acquisition,” R.F. Pass Thru Number RF-06-RCL-001. Project start date: October 2005. Project end date: June 2009. Award Amount: \$451,833.00.

“Investigation of the Fundamental Surface Reactions Involved in the Sorption and Desorption of Radionuclides-MATCH,” EPSCoR-Match, State of Nevada Number SFFA NSHE-08-27. Project start date: August 2007. Project end date: June 2009. Award Amount: \$42,341.00.

“Investigation of the Fundamental Surface Reactions Involved in the Sorption and Desorption of Radionuclides,” EPSCoR/DOE Cooperative Agreement Number SFFA NSHE-07-22 / DE-FG02-06ER46295. Project start date: August 2006. Project end date: July 2009. Award Amount: \$467,845.00.

“GNEP Readiness,” DOE Cooperative Agreement DE-FG07-07ID14847. Project start date: September 2007. Project end date: September 2009. Award Amount: \$100,000.00.

“Nevada Risk Assessment Management Program - Phase 2,” NRAMP2, DOE Cooperative Agreement DE-FG52-06NA26399. Project start date: October 2006. Project end date: September 2009. Award Amount: \$2,226,296.00.

### **Publications:**

Gong, C.-M.S, F. Poineau, and K.R. Czerwinski, “Synthesis and characterization of the solid uranium(VI)dioxo-diacetohydroxamate complex,” *Radiochim. Acta*, 95, 1-12, 2007.

- Mullen, L., C. Gong, and K. Czerwinski, "Complexation of Uranium(VI) with the Siderophore Desferrioxamine B," *J. Radioanalytical Nucl. Chem.*, 273(3), 683-688, 2007.
- Subramanian, S., V. Ponyavin, C.R. DeLosier, Y. Chen, and A.E. Hechanova, "Design Considerations for Compact Ceramic Offset Strip-Fin High Temperature Heat Exchangers," *Advances in Compact Heat Exchangers*, Editors: B. Sunden and R.K. Shah, R.T. Edwards, Inc., Philadelphia, PA, 2007.
- Weck, P.F., E. Kim, N. Balakrishnan, F. Poineau, C.B. Yeaman, and K.R. Czerwinski, "First-principles study of single-crystal uranium mono- and dinitride," *Chemical Physics Letters*, 443(1-3), 82-86, 2007.
- DeLosier, C.R., S. Subramanian, V. Ponyavin, Y. Chen, A.E. Hechanova, and P. Peterson, "The Parametric Study of an Innovative Offset Strip-fin Heat Exchanger," *Journal of Heat Transfer*, 2007, in press.
- Hosemann, P., M.E. Hawley, D. Koury, J. Welch, A.L. Johnson, G. Mori, N. Li, and S.A. Maloy, "Nanoscale Characterization of HT-9 Exposed to Lead Bismuth Eutectec at 550°C for 3000h," *J. Nuclear Materials*, in press.
- Ponyavin, V., Y. Chen, T. Mohamed, M. Trabia, A.E. Hechanova, and M. Wilson, "Parametric Study of Sulfuric Acid Decomposer for Hydrogen Production," *Progress in Nuclear Energy*, 2007, in press.
- Sickafus, K.E., M. Ishimaru, Y. Hirotsu, L.O. Usov, J.A. Valdez, P. Hosemann, A.L. Johnson, and H.T. Thao, "Compositional Analyses of Ion-Irradiation-Induced Phases in  $\delta$ -Sc<sub>4</sub>Zr<sub>3</sub>O<sub>12</sub>," *Nuc. Inst. and Methods B*, in press.
- Yeaman, C.B., G.W.C. Silva, G.S. Cerefice, K.R. Czerwinski, T. Hartmann, A.K. Burrell, and A.P. Sattelberger, "Oxidative Ammonolysis of Uranium(IV) Fluorides to Uranium(VI) Nitride," *J. Nucl. Mat.*, in press.
- Ponyavin, V., Y. Chen, J. Cutts, M. Wilson, and A.E. Hechanova, "Calculation of Fluid Flow Distribution Inside a Compact Ceramic High Temperature Heat Exchanger and Chemical Decomposer," *Journal of Fluids Engineering*, 2007, in review.
- Ponyavin, V., Y. Chen, A.E. Hechanova, and M. Wilson, "Numerical Modeling of Compact High Temperature Heat Exchanger and Chemical Decomposer for Hydrogen Production," *Heat and Mass Transfer*, 2007, in review.
- Ponyavin, V., Y. Chen, T. Mohamed, M. Trabia, A.E. Hechanova, and M. Wilson, "Design of a Compact Ceramic High Temperature Heat Exchanger and Chemical Decomposer for Hydrogen Production. Part I: Modeling," *International Journal of Heat Exchangers*, 2007, in review.
- Ponyavin, V., Y. Chen, T. Mohamed, M. Trabia, A.E. Hechanova, and M. Wilson, "Design of a Compact Ceramic High Temperature Heat Exchanger and Chemical Decomposer for Hydrogen Production. Part II: Parametric Study," *International Journal of Heat Exchangers*, 2007, in review.
- Beller, D., S. Landsberger, C. Lapp, M. Lineberry, J. Muckerheide, and H. Shaffer III, *A Critique of "Radioactive Wastes and the Global Nuclear Energy Partnership"*, TechSource, Inc., July 1, 2007.
- Beller, T., R. LeCounte, and D. Beller, "Analysis of Neutron Production in the High-Powered RACE Target," *Proceedings of the Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators*, AccApp'07, Pocatello, ID, July 30-August 2, 2007.
- LeCounte, R., T. Beller, and D. Beller, "Thermal Analysis of the High-Powered RACE Target," *Proceedings of the Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators*, AccApp'07, Pocatello, ID, July 30-August 2, 2007.

- Beller, T., R. LeCounte, B. Howard, and D. Beller, "High-Power Accelerator Target Design for the AFCI RACE Project," *Proceedings of the Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators*, AccApp'07, Pocatello, ID, July 30-August 2, 2007.
- Jammes, C., D. Beller, E. Stankovskiy, K. Sabourov, F. Harmon, and K. Folkman, "Experimental results of the RACE-ISU international collaboration on ADS," *Proceedings of the Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators*, AccApp'07, Pocatello, ID, July 30-August 2, 2007.
- Jammes, C., E. Stankovskiy, and D. Beller, "Modeling of the RACE-ISU subassembly to analyze neutronics experimental data," *Proceedings of the Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators*, AccApp'07, Pocatello, ID, July 30-August 2, 2007.
- Beller, D., F. Harmon, T.E. Ward, and F. Goldner, "Overview of the U.S. Reactor-Accelerator Coupling Experiments (Race) Project," *Proceedings of the Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators*, AccApp'07, Pocatello, ID, July 30-August 2, 2007.
- X. Tan, J.S. Lee, J. Ma, and W. Yim, "Disturbance Observer based Thermal Hydraulic Control of the Lead Bismuth Eutectic Loop," *Proceedings of the Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators*, AccApp'07, Pocatello, ID, July 30-August 2, 2007.
- Ponyavin, V., Y. Chen, A.E. Hechanova, and M. Wilson, "Modeling and Parametric Study of a Compact Ceramic High Temperature Heat Exchanger and Chemical Decomposer for Hydrogen Production," Sixth International Conference on Enhanced, Compact and Ultra-Compact Heat Exchangers: Science, Engineering and Technology, Potsdam, Germany, September 16-21, 2007.
- Kuchi, G., V. Ponyavin, Y. Chen, S. Sherman, and A.E. Hechanova, "Modeling of High Temperature Shell and Tube Heat Exchanger and Decomposer for Hydrogen Production," *Proceedings of 2007 AIChE Annual Meeting*, Salt Lake City, UT, November 4-9, 2007.
- Nagarajan, V., V. Ponyavin, Y. Chen, M. Vernon, P. Pickard, and A.E. Hechanova, "Numerical Study of Sulfur Trioxide Decomposition in a Bayonet Type Heat Exchanger and Chemical Decomposer," *Proceedings of 2007 AIChE Annual Meeting*, Salt Lake City, UT, November 4-9, 2007.
- Nagarajan, V., V. Ponyavin, Y. Chen, M. Vernon, P. Pickard, and A.E. Hechanova, "CFD Modeling of Bayonet Type High Temperature Heat Exchanger and Chemical Decomposer with Different Packed Bed Designs," *Proceedings of 2007 ASME International Mechanical Engineering Congress and Exposition*, Seattle, WA, November 11-15, 2007.
- Kuchi, G., V. Ponyavin, Y. Chen, S. Sherman, and A.E. Hechanova, "Flow Distribution on the Tube Side of a High Temperature Heat Exchanger and Chemical Decomposer," *Proceedings of 2007 ASME International Mechanical Engineering Congress and Exposition*, Seattle, WA, November 11-15, 2007.

### **Presentations:**

- Czerwinski, K. "Advanced Separations for GNEP," GNEP Facilities meeting, Idaho National Laboratory, February 2007.
- Czerwinski, K., "Needs for americium and curium isotopes in advanced fuel cycle research," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.
- Czerwinski, K., F. Poineau, T. Hartmann, G. Jarvinen, "Synthesis and characterization of technetium-zirconium alloys," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.
- Daniels, J., T.A. Sullens, K. Czerwinski, "Solid phase formation in iron, uranium, and silicate rich media," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, United States, March 2007.

Gostic, J.M., R.C. Gostic, R. Sudowe, and K. Czerwinski, "Characterization and evaluation of rapid column separation methods for automation," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.

Sullens, T.A., J. Daniels, and K. Czerwinski, "Sorption of neptunium and plutonium to Yucca Mountain tuff," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.

Gong, C.-M.S., F. Poineau, and K. Czerwinski, "Synthesis and characterization of the solid uranyl-acetohydroxamic acid complex," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.

Wright, A.D., and K. Czerwinski, "Nitrate effects on uranium and plutonium extractions," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.

Poineau, F., A.P. Sattelberger, and K. Czerwinski, "Synthesis and characterization of quadruply bonded technetium(III) dimers," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.

Smith, N.A., G. Cerefice, and K. Czerwinski, "Use of UV-Vis spectroscopy and TRLFS for material accountability in solvent extraction processes," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.

Rodriguez, E.E., F. Poineau, A.P. Sattelberger, A. Llobet, K. Czerwinski, and A.K. Cheetham, "Synthesis and characterization of technetium oxides," 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007.

Silva, C., C.B. Yeaman, G.S. Cerefice, and K.R. Czerwinski, "Reaction Mechanism of UN<sub>2</sub> Conversion to UN," 233<sup>rd</sup> American Chemical Society National Meeting; Chicago, IL; March 27, 2007.

Smith, N.A., G.S. Cerefice, and K.R. Czerwinski. "Use of UV-Vis Spectroscopy and TRLFS for Materials Accountability in Solvent Extraction Processes," 233<sup>rd</sup> American Chemical Society National Meeting, Chicago, IL, March 2007.

Silva, G.W.C., C.B. Yeaman, G.S. Cerefice, and K.R. Czerwinski, "Reaction Mechanism of UN<sub>2</sub> Conversion to UN," 233<sup>rd</sup> American Chemical Society National Meeting; Chicago, IL; March 2007.

Stock, S., J.M. Gostic, R.C. Gostic, K. Czerwinski, and R. Sudowe, "Quantitative comparisons of sample preparation methods for alpha spectrometry," 2007 American Nuclear Society Student Conference, Corvallis, OR, USA, March 29-31, 2007.

Stankovskiy, E., "Experimental Results and Computational Analysis of the RACE-ISU," 2007 American Nuclear Society Student Conference, Corvallis, OR, March 31, 2007.

Lakeotes, L., R. LeCounte, D. Beller, and R. Boehm, "Higher Actinide Cross-Section Sensitivity and Criticality Studies for the UREX+1 Process," 2007 ANS Student Conference, Corvallis, OR, March 31, 2007.

Johnson, A., "HLM efforts at UNLV, USA: LBE Corrosion of D9 and Other 316-Group Steels," ENEA Workshop on HLM-cooled Reactors and Systems, Rome, Italy, May 2007.

Silva, C., T. Sullens, P. Weck, F. Poineau, T. Hartmann, C. Yeaman, A. Sattelberger, G. Jarvinen, D. Clark, and K. Czerwinski, "Novel Routes for the Synthesis of Actinide Nitrides," ACE Workshop on AFCI Materials, Idaho State University, Boise, ID, May 2007.

Poineau, F., G. Jarvinen, and K. Czerwinski, "Synthesis and Characterization of Technetium Waste Forms," Idaho National Laboratory, June 2007.

Holliday, K.S., and K.R. Czerwinski, "Characterization of actinide containing zirconia-magnesia based inert matrix fuel," 62<sup>nd</sup> Northwest Regional Meeting of the American Chemical Society, Boise, ID, June 2007.

Du Mazaubrun, J., F. Poineau, K. Czerwinski, G. Jarvinen, and D. Ford, "Separation uranium/technetium for the UREX process," 62<sup>nd</sup> Northwest Regional Meeting of the American Chemical Society, Boise, ID, June 2007.

Czerwinski, K., "Radiochemistry Program at the University of Nevada, Las Vegas, Research and Education," Fluor Hanford, Hanford, WA, June 2007.

- Czerwinski, K., "Fundamental Research in Nuclear Forensics," Brookhaven National Laboratory, July 2007.
- Stock, S., J.M. Gostic, K. Czerwinski, and R. Sudowe, "Quantitative comparisons of sample preparation methods for alpha spectrometry," 52<sup>nd</sup> Annual Meeting of the Health Physics Society, Portland, OR, July 8-12, 2007
- Ma, L.-Z., G.W. Silva, C.B. Yeaman, G.S. Cereface, and K.R. Czerwinski, "Microscopic and Spectroscopic Characterization of the Uranium Dinitride (UN<sub>2</sub>) Synthesized Using a Low Temperature-Fluoride Route," Microscopy and Microanalysis 2007, Fort Lauderdale, FL; August 5-9, 2007.
- Ma, L.-Z., Silva, G. W., Yeaman, C. B., Cereface, G. S., and K.R. Czerwinski, "Microscopic and Spectroscopic Characterization of the Uranium Dinitride (UN<sub>2</sub>) Synthesized Using a Low Temperature-Fluoride Route," Microscopy and Microanalysis 2007, Fort Lauderdale, FL, August 5-9, 2007.
- Silva, C., C.B. Yeaman, G.S. Cereface, and K.R. Czerwinski, "Evaluation of Low-Temperature Fluoride Route to Synthesize Actinide Nitrides," 234<sup>th</sup> American Chemical Society National Meeting; Boston, MA; August 19-23, 2007.
- Holliday, K., and K. Czerwinski: Dissolution Behavior of Actinide Containing Inert Matrix Fuel, MIGRATION 07, Munich, Germany, August 2007.
- Poineau, F., G. Jarvinen, and K. Czerwinski, "Synthesis and Behavior of Metallic Technetium Waste Forms," MIGRATION 07, Munich, Germany, August 2007.
- Robinson, T.A., K. Czerwinski, and M. Draye, "Separation of curium from europium by cloud point extraction using 8-hydroxyquinoline," 234<sup>th</sup> ACS National Meeting, Boston, MA, August 2007.
- Wright, A.D., and K. Czerwinski, "Nitrate effects on uranium and plutonium extractions," 234<sup>th</sup> ACS National Meeting, Boston, MA, August 2007.
- Silva, G.W.C., C.B. Yeaman, G. Cereface, F. Poineau, and K. Czerwinski, "Evaluation of a low temperature fluoride route to synthesize actinide mononitrides," 234<sup>th</sup> ACS National Meeting, Boston, MA, August 2007.
- Pemberton, W.J., K. Czerwinski, and D.W. Hatchett, "f Element studies using cyclic voltammetry in room temperature ionic liquids," 234<sup>th</sup> ACS National Meeting, Boston, MA, August 2007.
- Poineau, F., A.P. Sattelberger, and K. Czerwinski, "Technetium Chemistry: Fundamental Studies and Applications to the Fuel Cycle," Cadarache, France, September 2007.
- Hechanova, A.E., "U.S. Global Nuclear Energy Partnership," plenary session, 10<sup>th</sup> International Conference, Nuclear Power Safety and Nuclear Education, Obninsk, Russia, October 1, 2007
- Hechanova, A.E., "Nuclear Fuel Recycling Research at the University of Nevada, Las Vegas," 10<sup>th</sup> International Conference, Nuclear Power Safety and Nuclear Education, Obninsk, Russia, October 1, 2007
- Gostic, J.M., R.C. Gostic, A. Crable, R. Sudowe, and K.R. Czerwinski, "Characterization and Evaluation of Extraction Chromatography Methods for Platform Automation," 53<sup>rd</sup> Radiobioassay and Radiochemical Measurements Conference, Jackson Hole, WY, October 2007.
- Gostic, R.C., J.M. Gostic, C.A. Bias, T. Hartmann, and K.R. Czerwinski, "Dissolution Behavior of Plutonium Particulates in BOMARC Soils," 53<sup>rd</sup> Radiobioassay and Radiochemical Measurements Conference, Jackson Hole, WY, October 2007.
- Gostic, J.M., R.C. Gostic, A. Crable, C. Barnes, R. Sudowe, and K.R. Czerwinski, "Effects of Flow Rate on Extraction Efficiency," Eichrom Users' Workshop at the 53<sup>rd</sup> Annual Radiobioassay and Radiochemical Measurements Conference, Jackson Hole, WY, October 30, 2007.
- Czerwinski, K., and R. Sudowe, "Radiochemistry and Nuclear Forensics at the University of Nevada, Las Vegas," United State Nuclear Forensics Panel, Washington, DC, October 2007.



Holliday, K., and K. Czerwinski, "Dissolution behavior of uranium containing inert matrix fuels."  
MRS meeting, Boston, MA, November 26, 2007.

### **Service:**

#### **Professional:**

- Chair, Vice Chair, and Executive Committee Members, American Nuclear Society Nevada Section
- Chair, Health Physics Society, Silver State Section
- Chair and Executive Committee Member, American Nuclear Society, Accelerator Applications Division
- Advisor, UNLV Student Section of the American Nuclear Society
- Members, Global Nuclear Energy Partnership, Safeguards, Waste Forms, Systems Analysis, and Fuels Development Working Groups
- Developed 12 multi-university research consortia for the Nuclear Engineering Research Initiative (NERI) Collaborative proposals
- Staffed the ANS Booth at the Las Vegas Grand Prix, April 6-8, 2007.
- Hosted NTS Tour for ANS Students, April 12, 2007.
- Organized and hosted the first Remote Sensing Laboratory and UNLV Nuclear Detector Symposium
- Organized and participated in the California Clean Energy Tour to the San Onofre Nuclear Generation Station, the General Atomics complex, and a nuclear submarine, August 9-11, 2007.
- Organized and participated in the Pahrump Fall Festival Town Advisory Board Booth, October 5-7, 2007.
- Joint appointment with Argonne National Laboratory
- Member, Separations and Actinide Science Board of Directors, Idaho National Laboratory
- Editor, Radiochemistry, Central European Journal of Chemistry
- Visiting Instructor, Actinide Chemistry, Department of Energy Radiochemistry Summer School, Brookhaven National Laboratory
- Peer Reviewer, *Nuclear Science and Engineering*
- General Chair, Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators, July 30 to Aug 3, 2007, Pocatello, Idaho.
- Member, American Nuclear Society President's Special Committee on Federal Investment in Nuclear Education
- Member, Board of Advisors for the Nuclear Engineering Department, Purdue University.
- Second Vice President and member, Board of Management, Eagle Alliance

#### **Community:**

- Participant, Clark County School District Partnership Program, Professionals and Youth Building a Commitment (PAYBAC)
- Participants, High School Science Bowl, February 8-9, 2007
- Participants, Clark High School Nuclear Science Outreach, March 5-6, 2007
- Participants, Silverado High School Nuclear Science Outreach, March 15, 2007
- Participants, UNLV Science Fair Finals, March 29, 2007

- Keynote lecture, “Safeguards, GNEP, and UNLV,” Health Physics Society Local Chapter Meeting, May 2007
- Staffed informational booth at the Las Vegas Family and Kids Expo, May 26-27, 2007
- Staffed informational booth on nuclear and environmental issues at the Pahrump Harvest Festival (Pahrump, NV), October 5-7, 2007
- Organized and hosted Boy Scout Nuclear Science Bowl Merit Badge Day, November 3, 2007. 40 Boy Scouts were awarded the Nuclear Science merit badge.
  - Visitors: warnick, dave bowman, bostick, riland, howard hall, ian hutchin, james suddereth, petulo, scott smith, ping li, Debbie monette, shelly freid, Mohar

#### UNLV:

- Hosted 13 visitors in areas related to various aspects of National Security.
- Organized the MCNPX Workshop conducted at UNLV in January.
- UNLV representative to Western Nuclear Science Alliance (DOE INIE)
- UNLV representative to Nuclear Engineering Department Heads Organization (NEDHO)
- Coordinated, UNLV M.S. in Materials and Nuclear Engineering degree program
- Member, UNLV Radiation Safety Advisory Committee
- Director, Radiochemistry Ph.D. program at the UNLV
- Awards, Jian Ma received the UNLV Presidential Award “Microbial Fuel Cell – Convert Wastes into Electricity”
- Classes taught:
  - G. Cerefice
    - RDCH 701 – Applied Nuclear Physics (FA07)
  - K. Czerwinski
    - RDCH 711 – Actinide Chemistry II (SP07)
    - CHEM 491/791 – Chemistry Seminar (SP07)
    - CHEM 312 – Introduction Radiochemistry (FA07)
    - RDCH 702 – Radiochemistry (FA07)
    - RDCH 710 – Actinide Chemistry I (FA07)
  - J. Ma
    - MEG 706 – Convection Heat Transfer (SP07)
- Thesis committee members for graduating students:
  - Timothy Beller, Department of Mechanical Engineering (MS)
  - Ryan LeCounte, Department of Mechanical Engineering (MS)
  - Xiu Ju (Julia) Tan, Department of Mechanical Engineering (MS)
  - Lisa Mullen, MIT Nuclear Engineering Department (Ph.D.)
  - Valery Ponyavin, Department of Mechanical Engineering (Ph.D.)
  - Debajoti Maitri, Department of Mechanical Engineering (Ph.D.)
  - Jayant Patil, Department of Mechanical Engineering (MS)
  - Rama Koripelli, Department of Mechanical Engineering (Ph.D.)
  - Srinivas Kohir, Department of Mechanical Engineering (MS)
  - Pankaj Kumar, Department of Mechanical Engineering (Ph.D.)