

Summer 2012

## HRC eNews – 2012 Summer

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## Announcements

The HRC website now has a News section, <http://hrc.unlv.edu/news>. Check here often for the latest press releases, videos and news coverage pertaining to HRC events, accomplishments and news.

Vice President for Research **Ron Smith** passed away on June 23, 2012. During his 40 years at UNLV Ron served as a department chair, associate dean, Dean of the Graduate College, Provost, and even as President for a short while. A memorial service will be held at UNLV September 28, 2012 from 4-7 PM in the Student Union Ballroom.

The UNLV Office of Veteran Services in Enrollment and Student Services transitioned to new leadership under **Major (Ret.) Ross Bryant** effective June 4, 2012. Ross is excited to build upon the successes the office has had under Sally Caspers. As the former commander of the UNLV Army ROTC and Deputy Director of the UNLV Institute for Security Studies, he has extensive experience in developing new programs and creating partnerships which benefit UNLV students.

Ross will continue in his role at HRC as the Homeland Security Initiatives Program Manager. His responsibilities will include collaborating with University of Southern Mississippi on a Super Bowl XLVII project, working with Louisiana State University to establish the UNLV West Coast Distribution Center and representing UNLV at all of the Governor's Nevada Homeland Security Commission meetings.

Individuals from Louisiana State University, Stephenson National Center for Security Research and Training visited UNLV on August 7, 2012 to tour the new National Center for Biomedical Research & Training (NCBRT) Distribution Center West Coast location and met with the HRC executive director **Oliver Hemmers** and program director for Homeland Security Initiatives **Ross Bryant**.

### Accelerator Center & Conference

The UNLV accelerator center facility has broken ground. All three phases of construction are fully funded through the UNLV President's Office and are expected to finish in Fall 2012. The accelerator, built by Varian, can be used in a variety of research fields, including health, renewable energy and nuclear. HRC is also obtaining a brand new Mi9, two M6 machines, an L300, an L1000 and hopefully a clinical accelerator as well.

## Submit your news

HRC eNews is an electronic newsletter to keep individuals informed about developments at the Harry Reid Center for Environmental Studies, located on the campus of the University of Nevada, Las Vegas. Quarterly issues of HRC eNews are available online.

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Photo by Steve Marcus - Las Vegas Sun.

A conference is being planned for April 2013 entitled, "Emerging Technology for Industrial Accelerators," which will highlight the economic opportunities for Nevada associated with the new technology provided by the accelerator center. Details will be forthcoming.

#### **Cybersecurity Program**

As of August 1, 2012 **Dr. Hal Berghel** is heading up the new Cybersecurity Program at the HRC. The program will focus on: credential and digital security and forensics, data hiding, information customization, and cyberpublishing.

#### **Nuclear Safety Engineering Program**

The Nuclear Safety Engineering (NSE) Program recently relocated within the HRC into 2000 square feet of office, conference, laboratory, and administrative space on the 1st floor formerly used by the Cultural Resources Program. The NSE Program currently includes research, graduate distance education in nuclear criticality safety (NCS) engineering, and professional continuing education in nuclear safety and nuclear safety systems engineering (NSSE). The NSE Program is supported by funding from the U.S. Nuclear Regulatory Commission, NSTec, LLC, DOE/NE Nuclear Energy University Programs, and the Advanced Test Reactor National Scientific User Facility at Idaho National Laboratory. Industrial collaborations with URENCO in New Mexico and Varian in Las Vegas also contribute to this program. **Dr. Denis Beller**, Research Professor of Nuclear Engineering, is the NSE Program Director, and **Dr. Charlotta Sanders**, Associate Research Professor of Nuclear Engineering with expertise in nuclear criticality safety and in radiation protection and shielding, is the Technical Director. Fall course offerings include a distance education course titled Nuclear Criticality Safety Engineering and a short course for Continuing Education credits (CEU) titled Nuclear Safety Systems Engineering. NSE will offer other graduate NCS and NS continuing/professional education courses in the spring and summer as well.

#### **Cultural Resources Program**

Beginning June 1, 2012 the HRC Cultural Resources Program began the process of transferring all archaeological holdings. The Southern Nevada Archaeological Archive (SNAA), formerly housed at the HRC, has moved to a new host facility resulting in the collections

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being transferred back to their legal guardians, in most cases various federal agencies. **Denis Beller** will be relocating his office and setting up both additional lab and office space in the area previously used by the program.

### **Ornithology Program**

The Ornithology Program headed by **Dr. John Klicka** has come to a close as of July 1, 2012. John has accepted a position with the University of Washington, Burke Museum of Natural History and Culture. The ornithological collection will be transferred to the Burke Museum.

### **Nevada Alliance**

The Nevada Alliance, a tenant of approximately 2 years on the 4th floor of the HRC, relocated out of the HRC in August 2012.

## **Accomplishments**

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The HRC, as the recipient of multiple research grant awards, was prominently featured recently in both local and national news. News features included:

Reid Announced \$1.6 Million for Nuclear Technologies Research at UNLV

<http://hrc.unlv.edu/news/052412.pdf>

New IE solar power facility aims to be 'game-changer'

[http://abclocal.go.com/kabc/story?section=news/local/inland\\_empire&id=8649109](http://abclocal.go.com/kabc/story?section=news/local/inland_empire&id=8649109)

[UNLV Selected for DOE Nuclear Energy University Program](http://news.unlv.edu/release/unlv-selected-doe-nuclear-energy-university-program)

<http://news.unlv.edu/release/unlv-selected-doe-nuclear-energy-university-program>

Reporters from the *Las Vegas Sun* visited the Harry Reid Center on May 30, 2012 for a look inside UNLV's Radiochemistry program. **Dr. Ken Czerwinski** and **Dr. Thomas Hartmann** were the focus of the article which highlighted grants totaling \$1.6 million from NEUP – Department of Energy. View the article

<http://www.lasvegassun.com/news/2012/may/31/new-federal-grant-bolsters-unlv-research-nuclear-w/>

The proposal "Thermodynamic and Microstructural Mechanisms in the Corrosion of Advanced Ceramic Tc-bearing Waste Forms and Thermophysical Properties" by **Dr. Thomas Hartmann** was awarded \$795,000 by the DOE Nuclear Energy University Programs (NEUP). This project team will harvest thermodynamic and microstructural data on the evolution of ceramic based waste forms. The data will be used to advance the current state-of-the-art methodology used for isolation and stabilization of fission products and improve on nuclear fuel recycling processes.

The proposal "Electrochemical Corrosion Studies for Modeling Metallic Waste Form Release Rates" by **Dr. Ken Czerwinski** was awarded \$790,000 by the DOE Nuclear Energy University Programs

(NEUP). This project aims to use advanced electrochemical methods to investigate the corrosion related degradation of metal alloys used for housing fission products. The data obtained from this study will allow for the prediction of the long-term behavior of the metallic host phase materials over geological time-scales.

**Dr. Ken Czerwinski** and **Ralf Sudowe** received a \$596,146 grant from National Security Technologies (NSTec) for development of synthetic debris for nuclear forensics.

**Dr. Mark Buttner** and **Dr. Patricia Cruz**, School of Community Health Sciences, received a 1-year award for \$569,160 for the continuation of the Clark County: Sample Analysis project conducted by the Nevada State Public Health Laboratory, UNLV Branch.

**James Pollard** received a \$542,825 grant from the USDA Forest Service towards product development support for the FIA National Information Management System.

The U.S. Nuclear Regulatory Commission awarded **Dr. Denis Beller** a 2-year \$198,600 grant for curriculum development for a graduate distance education program in Nuclear Criticality Safety Engineering (a 4-course track in the MSNE degree program accompanied by a UNLV Certification). **Dr. Charlotta Sanders** will lead the development of, and teach much of, the NCS graduate curriculum. She will also be developing professional/continuing education courses in Nuclear Safety and Nuclear Systems Safety Engineering (NSSE) in collaboration with the Nuclear Engineer Training Manager at the Nevada National Security Site.

**Steve Curtis** received a \$80,000 grant from the State of Nevada for Unmanned Aircraft systems (UAS) Test sites in the U.S.

**Robert O'Brien** received a \$75,000 grant from National Security Technologies (NSTec) for high output DD-DT support.

**Danny Lowe** received two grants from National Security Technologies (NSTec). One for \$12,000 towards K15 Neutron and Gamma Modeling PHASE 1,2,3 – Task 42. A second \$1000 grant was also awarded for the NCNS Down-Hole Accelerator Angled-Hole– Task 43.

**Dr. Denis Beller** submitted a pre-proposal to the Nevada NASA EPSCoR Program titled "SAFE Space Nuclear Rocket Test in Nevada," in collaboration with faculty, scientists, and engineers in UNLV's and UNR's ME Departments, DRI, NASA's Marshall Space Flight Center and Glenn Research Center, the Center for Space Nuclear Research in Idaho Falls, Los Alamos National Laboratory, and Aerojet Corporation.

**Dr. Allen L. Johnson** submitted a patent application on June 15, 2012 for the "Metal Eutectic Supported Metal Catalyst System and Reactions with the Metal Catalyst System."

**Dr. Ken Czerwinski** received a \$250,000 grant from Idaho National Laboratory and the U.S. Department of Energy for the 2012 radiochemistry fuel cycle summer school which takes place June 4 – July 13, 2012 and allows students to team up with researchers in the Radiochemistry program for various projects. Students will work with their mentors in the lab every afternoon beginning June 21 and will present the results of their research on the last day of class,

July 13, 2012. Presentations will begin at 9:00 am and will continue throughout the day and will be held in the Chemistry Building Room 102. Fuel Cycle Summer School Research projects are as follows:

<b>Fuel Cycle Summer School Research Projects</b>		
<b>Research Mentor</b>	<b>Project</b>	<b>Student</b>
Dr. Dan Rego	Organouranium Coordination	Brittany Carr
Keri Campbell, 3rd Yr	Laser Ablation of Actinide Oxides	Matthew Chagnon
Dr. Dan Koury	Simulation of Uranium-Zirconium Fuel	Andrew Conant Katie Cook
Dr. Gary Cerefice	Uranium/Neptunium Retention on Graphite	Milena Kalagorgevich Rebecca Springs
Dr. Eunja Kim	DFT Computer Modeling	Jon Macias
Dr. Ken Czerwinski	Americium Spectroscopy	Mary Mincher
Dr. Gerald Egeland	Heat Capacity Measurements of Uranium Oxides	Kevin Niemi
Erik Johnstone, 4th Yr	Technetium halide Synthesis	Jenna Starkey
Dr. Ken Czerwinski	Plutonium Polymers	Taylor Wagner
Vanessa Sanders, 4th Yr	Radiopharmaceuticals	Jeremy Unger

## Radiochemistry Fuel Cycle Summer School



*From left to right*

**Front Row:** Jon Macias, Andrew Conant, Jeremy Unger

**Middle Row:** Maryline Ferrier, Jenna Starkey, Milena Kalagorgevich, Rebecca Springs, Mary Mincher, Brittany Carr, Dr. Ken Czerwinski

**Back Row:** Keri Campbell, Katie Cook, Taylor Wagner, Matthew Chagnon, Kevin Neimi

Radiochemistry PhD student **Derek McLain** was accepted into the *Reactor Operator Summer School* at UC Irvine July 8-19, 2012. The summer school focuses on Irvine's TRIGOR reactor and is an intensive training course on its operation. UC Irvine is a member of the University of California Berkeley Nuclear Consortium grant through NNSA. This grant was awarded to **Dr. Ken Czerwinski** and **Dr. Sudowe** in July 2011 for five years.

Radiochemistry PhD students **Maryline Ferrier**, **John Despotopulos** and **Cathy Riddle** recently passed their qualifying exams and have advanced to candidacy. Congratulations!

Radiochemistry PhD student **Edward Mausolf** was awarded First Place in the 2012 Fuel Cycle Innovations Awards, Waste Forms category. This is an outstanding accomplishment for UNLV Research. Our students compete for these awards against students from universities such as MIT, Penn State, U of Michigan, Texas A&M, Cal Berkeley and Wash U to name a few. This is the second time Edward has placed in this competition. UNLV Radiochemistry students have been recognized by the Department of Energy for their fuel cycle work each of the three years the awards have been given. You can find more information about the awards program at: <http://www.fuelcycleinnovations.org/about.html>

**Janelle Droessler** won the Radiochemistry award for her oral presentation at the Student Conference of the American Nuclear Society held in Las Vegas in April 2012. The title of her presentation was "The Direct Dissolution and Electrochemical Study of Cerium in Ionic Liquid," and it featured some of her work with ultra-depleted uranium that was funded by the PNNL LSDS Project last year and DOE/NE's MPACT/NEUP this year. She also presented "The Direct

Dissolution and Electrochemical Study of U3O8 in Ionic Liquid," at the ANS Annual Meeting in Chicago, IL on June 25, 2012 and her paper of the same title was published in *Transactions of the American Nuclear Society, Vol. 106*.

UNLV Highlights recently featured two stories on the HRC:

- [Calling Dr. Czerwinski](#)
- [Going Nuclear](#)

In addition six HRC staff members were recognized in the [July 2012 UNLV Accomplishments](#) for research grants awarded.

**Kathy Lauckner** recently completed all of the requirements to earn her doctoral degree in Education Leadership, Work Force Education. Her dissertation is titled, "Model Provisions for a Successful Lead Poisoning Prevention Program: A Case Study for the Western United States." Lauckner's official graduation date was August 2012. She will celebrate with her family at UNLV's December 2012 convocation.

The Las Vegas Convention and Visitors Authority (LVCVA) has selected the HRC to develop a recommended best practices DVD for Guestroom Attendant (GRA) Safety and Security. The LVCVA's decision was based on **Ross Bryant's** demonstrated project management capabilities, experience with producing resort community collaborative training DVDs, and subject matter expertise necessary for creating such DVDs. The project is projected to begin September 1, 2012.

A new Forest Service agreement totaling \$1,072,500 has been signed and is underway as of August 27, 2012.

**Allen L. Johnson** presented the talk "Ray Tracing Analysis of a Solar Down Beam Research Facility" at the ASME 6th Conference on Energy Sustainability in San Diego on July 25, 2012.

**Margie Penden-Adams** has been appointed as Associate Editor for the new *Journal of Environmental Immunology and Toxicology*.

Doctoral candidate **Janelle Droessler** presented a poster at a meeting of the Nuclear Science and Security Consortium, of which UNLV is a member/partner. Citation: "The Direct Dissolution and Electrochemical Study of Uranium Oxide in Ionic Liquids," **Janelle Droessler**, John Kinyanjui, David Hatchett, **Denis Beller**, and **Ken Czerwinski**; poster presentation at the Nuclear Science and Security Consortium Meeting, U.C. Berkeley, August 14, 2012.

"Development of a UNLV Nuclear Criticality Safety Program in Conjunction with Support by URENCO USA," by **C.E. Sanders** and R.R. Lehman, has been accepted for presentation at the 2012 Winter Meeting of the American Nuclear Society to be held in San Diego, CA on November 11-15, 2012, and for publication in *Transactions of the ANS*.

**Denis Beller** conducted a lunchtime presentation titled, "Atomic Time Machines: Back to the Future of Nuclear Power Part II," at the 2012 Community Environmental Monitoring Program Annual Symposium held at the Desert Research Institute, Las Vegas, NV on



July 21, 2012. Also at the symposium, **Denis Beller** served as a panelist for a discussion of the Fukushima reactor disaster in Japan: "17 Months after Fukushima," along with Antonne Brooks, William (Ted) Hartwell, Michael Mohar, and **Steven Curtis** (moderator).

**Jerry Egeland's** paper titled "Letter to the Editors: Reducing fuel-cladding chemical interaction: The effect of palladium on the reactivity of neodymium on iron in diffusion couple" was accepted to the *Journal of Nuclear Materials*.

In July 2012, HRC affiliated research professor **Wayne Stolte**, located at the Lawrence Berkeley National Laboratory (LBNL), received an additional \$82,601 in funding from LBNL for the continued support and operation of the multi-user x-ray beamline at the Advanced Light Source (ALS) through August 31, 2013.

**Wayne Stolte** has had four recent publications:

-Electronic structure of polycrystalline cadmium dichloride studied by X-ray spectroscopies and ab initio calculations, *Materials Chemistry and Physics*, Volume 135, Issues 2–3, 15 August 2012, Pages 1036-1043, ISSN 0254-0584, 10.1016/j.matchemphys.2012.06.010. [Read more](#)

-Anionic and cationic photodissociation of the chloroform molecule excited in the vicinity of the Cl 1s edge, *Chemical Physics Letters*, Volume 543, 10 August 2012, Pages 34-40, ISSN 0009-2614, 10.1016/j.cplett.2012.06.040. [Read more](#)

-Resonant inelastic x-ray scattering of methyl chloride at the chlorine K edge, *Chem. Phys.* 136, 024319 (2012). [Read more](#)

-Angular and dynamical properties in resonant inelastic x-ray scattering: Case study of chlorine-containing molecules. *Physical Review A*, Volume 86, Issue 1, id. 013407. [Read more](#)

**Thomas Hartmann** was recently awarded two awards:

- Los Alamos National Laboratory for the Synthesis and Fabrication of Ceramic Pellets Project - \$75,000

-Amend. 7 from Idaho National Laboratory (INL) for the Lanthanide Transport and Solubility Measurements Project - \$17,958

**Daniel Lowe & Robert O'Brien** were recently awarded \$48,000 from NSTec for Task 45, the Support Forensic Prompt Program.

A new partnership is being developed between the HRC/UNLV and the Oak Ridge National Laboratory, University of Tennessee and Mississippi State University, for work on Cyber Security Initiatives.

**Steve Curtis** received a grant award of \$80,000 from the State of Nevada Governor's Economic Development Office for the Integration and Development of the Screening Information Request (SIR) Response to the Federal Aviation Administration (FAA) Selection Process for Unmanned Aircraft Systems (UAS) Test Sites in the United States.

**Kristina Lipinska's** BioFuels project received a project extension

until December 31, 2013.

Radiochemistry student **Edward Mausolf** was recently honored by the Department of Energy as part of the Innovations in Fuel Cycle Research competition, for investigating a radioactive byproduct of nuclear energy. [Read more](#)

## Events

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On May 5, 2012, Twelve Boy Scouts from California and Nevada earned their Nuclear Science Merit Badge at the 10th semi-annual workshop sponsored by the Student Section of the American Nuclear Society at UNLV. **Audrey Roman** organized the event and **Wes Boyd** was master of ceremonies. Radiochemistry graduate students taught the classes and provided the hands-on demonstrations to allow the scouts to earn their merit badge in a single day. Topics such as famous scientists in radiation science, terms, basic radiation physics, and nuclear power plant applications were taught during the workshop. A test was administered for the students and they were certified to receive the merit badge at the end of the session. The next workshop will be on November 10th, 2012 at UNLV and up to 40 scouts will be eligible to attend. So far the program has awarded more than 300 Nuclear Science Merit Badges to Boy Scouts from California and Nevada.

**Oliver Hemmers, Steve Curtis, Robert O'Brien, and Jaime Laxalt** attended the [UAVSI's Unmanned Systems North America 2012 Conference](#) August 6 - 9, 2012 at the Mandalay Bay Convention Center in Las Vegas, NV. UAVSI's Unmanned Systems North America is the premier forum for reviewing, assessing and discussing the current state of the unmanned systems market. The event brings together the key leaders and decision-makers in the industry.

The Harry Reid Center hosted the first annual **Cybersecurity Collaborations Symposium** at the Stan Fulton Building September 11, 2012. The symposium is part of a collaboration between the HRC/UNLV and Oak Ridge National Laboratory, the University of Tennessee, and Mississippi State University to pursue research opportunities in cyber security as it relates to National Security Requirements. Speakers in attendance included representatives from Oak Ridge National Laboratory, Mississippi State University, UNLV, and the Nevada National Security Site. Presentations will soon be available online.

### **Accelerator Symposium** **Save the date - April 17th - 18th, 2013**

HRC will be planning its first annual Accelerator symposium on April 17th -18th, 2013. The symposium entitled, "Emerging Technology for Industrial Accelerators," will feature workshops exploring the emerging technology of accelerators and their current applications such as:

- Cargo Security
- Non-destructive testing & inspection

- X-ray imaging
- Digital detectors
- Industry standards and practices
- Future trends

[Sign up for the mailing list](#) to receive more information on the conference as it becomes available.

## New Faces

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**Ms. Amy Smiecinski**, School of Community Health Sciences, will join the Nevada State Public Health Laboratory, UNLV Branch, as an associate laboratory lead.

**Ms. Jessica Gunter** recently joined the Nevada State Public Health Laboratory, UNLV Branch, as a biological laboratory technician. Jessica shares an office in HRC 207 with two fellow microbiologists.

**Jaime Laxalt** is a new staffer working on establishing an Unmanned Aircraft System (UAS) economic development process in Nevada. The HRC accepted the challenge of leading the NSHE system in the UAS research and academic program development process and to lead the planning effort for the State of Nevada. Jaime is working with **Steve Curtis** to produce the plans and organization structure that will pilot Nevada into the world of an economy boosted by the development of what is quickly becoming the wave of the future. Jaime comes to us with a rich background in program management and government affairs honed by her previous assignments in Washington D.C.

**Dr. Jian Ma** is collaborating with visiting professor **Jinping Li** from the Lanzhou University of Technology in China. Dr. Li will be assisting Jian with his algae research for the next year.

Effective August 29, **Danny Pecoraro**, a new, additional student worker will be joining the HRC Front Desk.



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