

Summer 2010

## HRC eNews – 2010 Summer

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# UNLV | HARRY REID CENTER

HRC eNews — 2010 Summer

## .....ACCOMPLISHMENTS/ANNOUNCEMENTS:.....

Melanie Coffee will be leaving the museum to pursue a master's degree in museum studies. She has been a part of the museum team since May 2008 and will be greatly missed. We wish her well in all her future endeavors. Melanie's last day will be Aug. 12.

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The HRC Nuclear Materials Group (leader **Dr. Thomas Hartmann**) provided a crucial contribution to a joint publication with Idaho National Laboratory: Thermo-physical properties of DU-10 wt.% Mo alloys by Douglas E. Burkes a\*, Cynthia A. Papesch a, Andrew P. Maddison a, Thomas Hartmann b, Francine J. Rice a, *Journal of Nuclear Materials* 403 (2010) 160-166.

Abstract: Low-enriched uranium alloyed with 10 wt.% molybdenum is under consideration by the Global Threat Reduction Initiative reactor convert program as a very high-density fuel to enable the conversion of highperformance research reactors away from highly enriched uranium fuels. As with any fuel development program, the thermo-physical properties of the fuel as a function of temperature are extremely important and must be well characterized in order to effectively model and predict fuel behavior under normal and off-normal irradiation conditions. For the alloy system under investigation, the available thermo-physical property data is relatively inconsistent and often lacks appropriate explanation. Available literature on this alloy system comes mainly from studies done during the 1960s and 1970s, and often does not include sufficient information on fabrication history or conditions to draw conclusions for the current application. The current paper has investigated specific heat capacity, coefficient of linear thermal expansion, density, and thermal diffusivity that were then used to calculate alloy thermal conductivity as a function of temperature. The data obtained from this investigation was compared with available literature on similar U-Mo alloys and in most cases are in good agreement. A link to the full article may be found here: <http://tinyurl.com/28r74bf>

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A. Wright, P. Paviet-Hartmann, *Review of Physical and Chemical Properties of Tributyl Phosphate/Diluent/Nitric Acid Systems*, Separation Science and Technology, 45: 1-10, 2010, accepted for publication Method for online process monitoring for use in solvent extraction and actinide separations, Warburton, Smith, KRC, was accepted for publication in the September issue of *Sci. Tech.*  
*Microstructural Evolution in Irradiated Uranium-Bearing Delta-phase Oxides A6U1012*, LANL(Ming, Valdez, Wang, Dickerson, Uberuaga) and UNLV collaboration (Holliday, KRC) accepted for publication in *J. Nucl. Mat.*

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Award funding has been received from NASA in the amount of \$750,000 to begin Oct. 1, 2010. The project is called "Efficient thermal management and temperature amplification for lunar based systems," and participants include **Jian Ma** and **Yitung Chen**.

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**Jamie Warburton** won first place in the Fuel Cycle Paper Competition in the Nuclear Material and Control Instrumentation Division at ANS! Amber Wright got third place in the Innovations in Fuel Cycle Research Award program under the Fuel Separations and Waste Forms subject area. Way to go, Jamie and Amber!

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**Al Sattelberger** was recently named fellow of the American Chemical Society. Congratulations, Al!

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**Wendy Pemberton, Dave Hatchett, and Ken Czerwinski** announce that their patent application for *Method for forming U metal in RTIL* is complete!

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On July 7, **Paula Garrett** presented to the Master Gardeners of Southern Nevada's monthly meeting on how to create a wildlife backyard habitat. Paula also discussed her yard and winning the 2009 SNWA Landscape Award in Wildlife Habitat.

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HRC Associate Executive Director **Anthony Hechanova** has accepted a new position as head of the Nuclear Technology Division at the Institute of Applied Technology — Polytechnic Academy in Abu Dhabi, United Arab Emirates (UAE). The Institute of Applied Technology was founded through royal decree in 2005 to create a world-class Career Technical Education in English at the secondary and tertiary levels that will produce the scientists, engineers, and technicians needed for the UAE to build a knowledge-based economy. Dr. Hechanova joined the Harry Reid Center for Environmental Studies in 1995 and was the founding director of the Nuclear Science and Technology Division in 2001. He played a significant role in supporting two new academic programs at UNLV: the Ph.D. Program in Radiochemistry and the M.S. Program in Materials and Nuclear Engineering. Today, much of the academic infrastructure supporting these two programs was funded through programs managed by Dr. Hechanova.

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**Mr. Paul Seidler** has been appointed acting program manager of the UNLV Transmutation Research Program. Seidler is president of Robison/Seidler, a Nevada-based company that has been providing strategic planning, policy, and government relations services in the energy, water, public lands, nuclear, and facility-siting fields since 1992. Throughout his career, he has been frequently called upon to resolve technical-based crisis situations across the country. His client list includes top corporations, universities, and a wide range of government agencies and trade associations. Seidler also serves as executive director of the Nevada Alliance for Defense, Energy, and Business, a member-based association that supports technology-oriented economic development in Southern Nevada. He holds a master's degree from the University of Chicago Irving B. Harris School of Public Policy and is an expert in the fields of nuclear and renewable energy and the transportation of spent nuclear fuel. He previously served as senior director at the Nuclear Energy Institute (NEI), the trade association for the nuclear industry based in Washington, D.C., and was manager of Government Affairs for Science Applications International Corporation. He and his wife, Bridget, and four children have been residents of Henderson, Nev., since 1989. Seidler has many interests, including coaching and officiating youth and adult sports and playing competitive volleyball, and he is a budding contemporary artist.

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**Rebecca Paulson** has accepted a programming position with the UNLV purchasing department. Rebecca began working at the Barrick Museum in September 2001, programming databases and assisting with web administration. In February 2006, she started to work as an administrative assistant to Tony Hechanova. In January 2009, she accepted a position with Craig Palmer to provide ecological programming support. We wish her well in her new position and hope she has some time to drop by to see us on occasion, particularly if she brings by her new baby son, Corwin!

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The XPS machine has been relocated to the HRC and installed. Initial samples can be run. Currently, it is not set up to do radioactive samples, but plans to implement appropriate methodologies to do that are under way.

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UNLV researchers **Oliver Hemmers** (Co-PI), Kyle Bowen, **Wayne Stolte** (Co-PI), Iraidia Demchenko, and Dennis Lindle (PI) are studying a new form of linear dichroism. Their research shows a difference in the angular distribution patterns of photoelectrons between the two chiral enantiomers of camphor. This difference is attributed to a new chiral nondipole parameter. With this first measurement, a new form of linear dichroism has been identified. Additional collaborators are from the California Institute of Technology, Lawrence Berkeley National Laboratory, Rayonnement University in France, Institute of Physics in Poland, and Uppsala University in Sweden. First research results are presented at the Division of Atomic Molecular and Optical Physics American Physical Society 2010 Conference. Additionally, this research is part of a National Science Foundation funded research program, titled "Geometrical and Dynamical Effects in X-ray Interactions with Molecules." The NSF funding was recently extended in the amount of \$435,000 for another three-year period. Including this new funding period, the total funding period now totals 19 consecutive years of funding to promote this research program.

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Lincoln County Archaeological Initiative, Round 3, Bureau of Land Management grant program. Project: Inventory and Evaluation of Four Historic Cemeteries in Lincoln County, Nev. Amount of award: \$47,950.  
Lincoln County Archaeological Initiative, Round 3, Bureau of Land Management grant program. Project: Lincoln County Archaeological Collections Inventory and Upgrade. Amount of award: \$106,000.

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**Sherry Faye, Amber Wright, and Tom O'Dou** have satisfactorily completed their comprehensive exam and have advanced to candidacy in the Radiochemistry Ph.D. program.

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**Wendy Pemberton's** caricature has been added to the wall of radiochemistry program graduates.

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The Nuclear Forensics Summer School ended June 18. The school was a joint program with Los Alamos National Laboratory, Livermore National Laboratory, University of Nevada Las Vegas, and Washington State University. Ten participants from across the United States attended. The goal of the summer program was to develop, initiate, and implement a comprehensive, experimental, hands-on training curriculum in topics essential to nuclear forensics as a means of attracting students to pursue graduate studies in technical fields relevant to nuclear forensics. More information about the radiochemistry program can be found at <http://radchem.nevada.edu/>.

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**Dr. Ken Czerwinski** was promoted to full professor effective July 1, 2010!

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The U.S. Energy Department on Thursday awarded two UNLV research programs \$1.45 million in grants. The works of chemist **Paul Forster** and engineers **Jian Ma** and **Yingtao Jiang** are among 42 research programs nationwide to receive money from the Nuclear Energy University Program. The grants are aimed at boosting the efficiency of power plants and environmental protection in the industry and at solving key problems in nuclear waste reprocessing. You may read more in the *Las Vegas Sun*: <http://www.lasvegassun.com/news/2010/may/25/unlv-researchers-takerole-boost-not-undermine-nuc/>

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An article featuring **Ken Czerwinski, Ed Mausolf, Erik Johnstone**, and the radiochemistry group appeared in a recent edition of the *LVRJ*. The article discusses the groups' research efforts in reprocessing nuclear fuel. You may read the article here: <http://www.lvrj.com/news/unlv-researchers-seeking-ways-to-reprocess-nuclear-fuel-93914284.html>

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For the next four weeks, the UNLV Radiochemistry program is hosting the Nuclear Forensics Summer School. The school started Monday, May 24, 2010, and has 10 students from all over the United States. The school was developed by Los Alamos National Laboratory; Livermore National Laboratory; University of Nevada, Las Vegas; and Washington State University. The goal of the summer program is to develop, initiate, and implement a comprehensive, experimental, hand-on training curriculum in topics essential to nuclear forensics as a means of attracting students to pursue graduate studies in technical fields relevant to nuclear forensics. A link to the summer school information is on the UNLV Radiochemistry website: [radchem.nevada.edu](http://radchem.nevada.edu)

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Since the HRC acquired its accreditation to teach the new EPA renovation rule, **Kathy Lauckner** has trained over 1,000 workers to be aware of the rule and the methods of working lead-safe while renovating pre-1978 housing and school facilities. The new requirements have been met with mixed reviews, but in general, the work force understands the need for the education and is very thankful that the HRC is involved and offers the training across the western region. Kathy is traveling to Oklahoma in July to address a congregation of lawyers and housing officials to bring them up to date on the new requirements and to help them establish a training coalition. Recently, there has been some opposition in the U.S. Senate to this new rule, and Kathy has asked Senator Reid to vote against the amendment circulating that would postpone the enforcement of this rule by the EPA. This law is long overdue, and the senator has been a strong advocate for lead safety.

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The Nuclear Materials Group (lead: **Dr. Hartmann**) contributed to a joint publication with INL researchers: D.E. Burkes, R. Prabhakaran, T. Hartmann, J-F Jue, F.J. Rice: *Properties of DU-10 wt.-% Mo alloys subjected to various post rolling heat treatment*. Nuclear Engineering and Design (240), 1332-1339, (2010).

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Research Prof. **Denis Beller** is in Idaho with students **Kimberly Clark** and **Anthony Santo Domingo** on a 10-week Faculty-Student Research Team project sponsored by the Advanced Test Reactor National Scientific User Facility and the Nuclear Criticality Safety Program

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#### .....EVENTS:.....

On Aug. 12, the Barrick Museum will participate in the annual **Mirage Educators Appreciation Day**. In this event, teachers receive information from various museums, parks, and associations on what they have to offer teachers in the way of field trips and educational resources.

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The second annual **Nevada Renewable Energy Consortium (NVREC) Meeting** will be held from 9 a.m. to 2 p.m. Friday, Aug. 20, in the Stan Fulton Building on the campus of UNLV (located on the southeast corner of Flamingo Road and Swenson Street). The event will focus on the current three NVREC program areas: Solar, Biomass, and Geothermal. Participants from the Nevada System of Higher Education will present their statewide ongoing and collaborative research and engineering projects during a poster session. NSHE researchers who are interested in collaborative renewable energy research partnerships within the state of Nevada are encouraged to attend. More information at <http://osep.unlv.edu/nvrec/>.

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On Aug. 21, Paula Garrett will participate in another **Family Cactus Gardening** class at the Springs Preserve. This will be the second class Paula has co-taught on behalf of the UNLV Arboretum to educate the public about cactus and succulent gardening.

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**Monday Morning Coffee @ the Museum!**

Aug. 23 through Dec. 8, 2010

Location: Marjorie Barrick Museum

Join us for FREE coffee Monday mornings.

FREE COFFEE MONDAY! Need a good cup of coffee to start the week off right? Stop by the museum 8:30 to 11:30 a.m. Mondays and enjoy some on us!

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**Welcome Back to Campus Open House**

Aug. 25, 2010

Location: Marjorie Barrick Museum

Come by and learn more about the museum.

The museum is holding a party to welcome students back to campus. We'll provide food, entertainment, and art! Come by and learn about the museum and how you can become involved.

Aug. 25, 10 a.m. to 2p.m.

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**Opening Reception for Stephen Hendee's "Ice Next Time"**

Aug. 27, 2010

Location: Marjorie Barrick Museum

**Join us for an opening reception and gallery talk with Las Vegas artist Stephen Hendee**

**Aug. 27, 6 to 8 p.m.**

The Ice Next Time is an exhibition of fictional post-apocalypse textiles, clothing, and artifacts. The objects are presented with postdated interpretive panels describing the narrative arc of catastrophe, social disruption, and civilization's eventual return. Hendee said about the project, "This exhibition subverts speculative representations of the apocalypse to highlight the dependence we have on digital media, which has augmented our collective memory and experience." In our world filled with mass media entertainment, virtual communities, and instantaneous communication, this exhibition focuses the viewer to consider what it would be like to experience a world returned to direct interaction, unassisted memory, and cultural autonomy. Exhibition will be on display at the museum through Oct. 23.

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**Second-Generation Biofuel Lecture**

Aug. 31, 2010

Location: Marjorie Barrick Museum Auditorium

Dr. Brian P. Hedlund to Lecture on Second-Generation Biofuels

Novel thermophilic microorganisms and cellulases for improving second-generation biofuel technologies.

Dr. Brian P. Hedlund — 7:30 to 8:30 p.m. Tuesday, Aug. 31

The current focus on the development and implementation of clean, renewable replacements for fossil fuels rivals technological challenges of recent decades, such as the race to put a man on the moon and the completion of the human genome. This presentation will cover second-generation biofuels, focusing on novel thermophilic ("heatloving") microorganisms and enzymes.

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**Algae as Biofuel Lecture**

Sept. 7, 2010

Location: Marjorie Barrick Museum Auditorium

Dr. Cushman to Lecture on Using Green Algae for Biofuel

Using Green Algae for Biofuel Production and Carbon Recycling.

Dr. John C. Cushman — 7:30 to 8:30 p.m. Tuesday, Sept. 7

Green algae are ideally suited as a nonseasonal, renewable energy resource for the arid western U.S. because they can be more productive than terrestrial crop feedstocks, can be grown on marginal lands with municipal waste in brackish or saline water unsuitable for traditional agriculture, can leverage geothermal and solar resources, and provide widespread potential for recycling of CO<sub>2</sub> from biomass, coal, or gas — red power plants. This lecture will discuss current research methods to optimize algal production and compare production harvesting systems.

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The **2010 UNLV Clean Energy Forum** will take place at the Cox Pavilion Sept. 8. The event focuses on clean energy production in Nevada and the U.S. Southwest and on clean research projects nationwide. Subject matter will focus on financing, national policy, current technologies, and nuclear energy. For more information, visit <http://osep.unlv.edu/energyforum/>.

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### **Sugars for Biofuel Lecture**

Sept. 14, 2010

Location: Marjorie Barrick Museum Auditorium

Dr. Nobles to Lecture on Using Sugars for Biofuel Production

Cyanobacterial Sugars for Biofuel Production.

Dr. David R. Nobles — 7:30 to 8:30 p.m. Tuesday, Sept. 14

Through genetic modifications, strain selection, and novel culturing techniques, several strains of cyanobacteria have been developed that are capable of synthesizing and secreting large amounts of cellulose, glucose, and/or sucrose. Through these products, biofuels can be produced. Join us in a discussion of this process and the potential capabilities of biofuel production.

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Sept. 17 through Oct. 8, Aurore Giguet will be teaching **Decoding the Codex Bodley** this fall through Educational Outreach.

For centuries prior to the Conquest of Mexico, ancient Mixtec (Mees-tek) scribes wrote sacred books in an obscure pictographic format, painting images on deerskin "pages" without using words that are referred to as "codices" (or "codex" singular). Unfortunately, only a few of these precious books survived destruction. The Mixtec Indians live in modern-day Oaxaca, Mexico. Their traditions and history date back thousands of years. Before the arrival of the Spanish in AD 1521, the Mixtec had become a mighty military and economic power in Mesoamerica. Their codices are complex and dramatic — a story of royal lives and marriages blended with stories of warfare, murder, betrayal, and bloody sacrifice. Notable too is the lineage record of their kings that goes back into the mists of the mythological past to the first ancestors created by the gods themselves. The Mixtec codices represent one of the last intellectual frontiers in cultural-historic-linguistic exploration. Decipherment with a link to actual historic chronology and archaeological data only began in the mid-1940s. Research continues today but is limited to only a few scholars worldwide.

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### **Renewable Energy Lecture**

Sept. 21, 2010

Location: Marjorie Barrick Museum Auditorium

Dr. Rhee to Lecture on the Sustainability of Using Renewable Energy

Can We Live Off Sustainable Energy? A Quantitative Approach

Dr. George Rhee — 7:30 to 8:30 p.m. Tuesday, Sept. 21

This lecture will address the key issue of whether we can sustain our current rate of energy consumption by replacing fossil fuels with renewable energy sources. Emphasized will be the need to quantify the

problem by estimating the per capita energy consumption by category such as transport, heating, electricity, etc. We will discuss both the scientific and political dimensions of a viable energy plan for our country that does not include fossil fuels.

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### **Blood Drive at the Museum**

Sept. 23, 2010

Location: Marjorie Barrick Museum

#### **Give the gift that costs nothing to give.**

You can be a special person to someone you will probably never meet. When you give blood, you are helping someone who is ill or injured. When you donate blood, you won't get any diseases, because it is perfectly safe to give, but you will get a good feeling about what you're doing.

**Sept. 23, 10 a.m. to 2 p.m.** in the Exhibit Hall

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### **Horror Film Festival**

Oct. 1–22, 2010

Location: Marjorie Barrick Museum Auditorium

#### **Join us Friday Nights for Horror Film Fest**

Join us for the Marjorie Barrick Museum-Horror Film Festival

Hosted by UNLV Film Department and Short Film Archive Associate Professor and feature film writer-director David Schmoeller.

**Fridays, Oct. 1–22, 7 to 9 p.m.**

OCT. 1

**SHORT:** OH, MY GOD!

**FEATURE:** EVIL DEAD II (directed by Sam Raimi, director of Spiderman series)

OCT. 8

**SHORTS:** DOODLEBUG (director of INCEPTION and BATMAN, THE DARK NIGHT); PLEASE KILL MR. KINSKI (short doc

by host David Schmoeller)

**FEATURE:** TOURIST TRAP (based on student Oscar-nominated Short by David Schmoeller)

OCT. 15

**SHORT:** SPECIAL DELIVERY (Oscar winner, Best Animated Short)

**FEATURE:** PUPPETMASTER

OCT. 22

**SHORT:** RYAN (Oscar winner, Best Animated Short)

**FEATURE:** SCREAM (directed by the master of horror, Wes Craven)

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### **Lunchtime Garden Tour**

Oct. 22, 2010

Location: Marjorie Barrick Museum — Donald H. Baepler Xeric

#### **Take a Lunchtime Tour of the Xeric Garden**

With the return of fall, we start spending more time outdoors. Take a tour through the Donald H. Baepler Xeric Garden for tips and tricks of how to maximize your garden during these cooler months. Join us **Friday, Oct. 22, from 12:15 to 12:45 p.m.** Meet in the lobby of the Barrick Museum. Call 895-3381 for more information. Registration is not necessary.

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### **Homecoming Week Open House**

Nov. 10, 2010

Location: Marjorie Barrick Museum



.....NEW FACES:.....

Jaime Chaves is a new postdoc working with John Klicka and the Ornithology program.

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The **Radiochemistry Ph.D. Program** located at the Harry Reid Center continues to expand with the addition of five new students this fall. Here's a little info about our new recruits:

**Balazs Bene** is originally from Hungary and graduated as a chemical engineer at the Budapest University of Technology and Economics. He comes to UNLV by way of NIST, where he has been a guest researcher since 2008. Balazs plans to study under Dr. Ralf Sudowe.

**Keri Campbell** is not new to Las Vegas or UNLV. She has a B.S. in chemistry and a minor in mathematics from UNLV and is excited to continue her studies in the RadChem Ph.D. program. Keri's research has been within the area of fuel cycle separations, and she plans to continue this research in the Ph.D. program.

**Bradley Childs** is a native of Knoxville, Tenn., and holds a bachelor's degree from South Carolina State University with a major in chemistry/radiochemistry. He has had several internships in the radchem field, including performing research in the biomedical Isotope Facility at LBNL in Berkeley, Calif.

**John Despotopoulos** comes to Las Vegas from the University of Oregon, where he received a B.S. in chemistry. He was selected for an internship at LBNL, where he studied the heavy and superheavy elements. He plans to continue this research discipline under the direction of Dr. Ralf Sudowe.

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Jamie Gilmore, will begin work June 1 in the Microbiology Laboratory on the new Sample Analysis project.

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Lt. Richard Bashay, a public health officer, started work last month in the Microbiology Laboratory.

.....CONTACT:.....

HRC eNews is a quarterly 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. Current and past issues of HRC eNews are available online.

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