Two UNLV researchers were part of an international team of scientists from Russia and the United States who discovered the newest addition to the periodic table, element 117.

The team included scientists from the Joint Institute for Nuclear Research (JINR), the Research Institute for Advanced Reactors, Lawrence Livermore National Laboratory (LLNL), Oak Ridge National Laboratory, UNLV, and Vanderbilt University.

Six atoms of element 117 were produced by bombarding two known elements, calcium and radioactive berkelium, using an advanced particle accelerator at the JINR facility in Dubna, Russia. The team established the existence of the new element by studying the decay patterns of the six atoms produced.

“Discovering a new element is, in essence, the holy grail for nuclear chemists,” says Sudowe. “It tests our understanding of nuclear physics and will lead to greater knowledge of the chemistry of previously discovered heavy elements.”

According to Bennett, the byproducts of the discovery of element 117 also fed into her primary research interest, which involves analyzing another rare element known as dubnium.

Researchers found that as element 117 decays, in some instances it produces an isotope of dubnium with the longest half-life to date of more than 33 hours. This is more than six hours longer than produced in previous efforts, allowing researchers like Bennett their greatest opportunity to study how dubnium behaves chemically. A better understanding of the chemistry of dubnium and other newly created elements is necessary to determine where they fit on the periodic table of elements.

“It’s definitely exciting to play even a small role in the discovery of a new element,” Bennett says. “This experiment will open up new opportunities to improve our understanding of the chemistry of both recently discovered elements and those that have been on the periodic table for years.”

Since 1940, 26 new elements beyond uranium have been added to the periodic table of elements. Once an independent research team confirms the discovery of element 117 – which could take years due to the scarcity of berkelium – it will be named and officially placed on the periodic table.

An article documenting the discovery appears in the April 2010 issue of the journal Physical Review Letters.
Untreated Tooth Decay in Nevada Youth Higher Than National Average; Oral Lesions Associated with Tobacco Use on the Rise

Nevada youth who participated in UNLV’s Crackdown on Cancer (CDoC) Initiative had a significantly higher percentage of untreated tooth decay than the national average, according to a study conducted by researchers at UNLV’s School of Dental Medicine.

They also had a small but increasing rate of occurrence of precancerous and cancerous oral lesions associated with tobacco use.

More than 78,000 Nevada students, most between the ages of 14 and 18, were screened through the nine-year initiative, which included both research and outreach.

On average, children 13-15 years of age had approximately 30 percent more untreated tooth decay, and children 16-18 years had 35 percent more than the national average reported in the National Health and Nutrition Examination Survey, which assesses the health and nutritional status of U.S. adults and children.

The UNLV researchers are still assessing the possible causes for this higher than average prevalence, according to Marcia Ditmyer, a professor in the School of Dental Medicine.

“We suspect the strongest contributor to be lack of municipal water fluoridation in some Nevada counties, followed by exposure to environmental smoke,” Ditmyer says.

The oral cancer screenings through the CDoC program identified 2,150 tissue abnormalities, with the more severe ones referred for biopsy. The rate of oral lesions increased from 1.4 per 100 students in 2003 to 4.0 per 100 students in 2008.

The higher-than-national rate for youth tobacco use in Nevada in past years is suspected to be one of the factors associated with the increasing trends in precancerous and cancerous oral conditions, according to the researchers. However, the CDoC program has helped bring down the rate of tobacco use, says Christina Demopoulos, the CDoC grant administrator and one of the researchers involved in the study.

“At the inception of the program, Nevada was ranked number one in youth tobacco use,” she says, adding that the rates have declined more recently. The state rate of smoking prevalence among youths is now 17 percent, compared to a national rate of 19.5 percent.

However, the program is ending due to lack of funding, and the researchers wonder if the tobacco use rate will climb again. As part of the program, nearly 4,500 tobacco education presentations were delivered to more than 170,000 students. The CDoC program was supported by over $5.8 million in grant funding from the Fund for a Healthy Nevada and the Trust Fund for Public Health.

Nevada 2.0: Economic Diversification Subject of UNLV Conference

UNLV recently hosted “Nevada 2.0: New Economies for a Sustainable Future,” a conference designed to explore opportunities to diversify Nevada’s economy by examining similar efforts in nearby states. More than 400 political leaders, representatives of the business community, government officials, and university scholars attended.

The conference included presentations by guest speakers from Salt Lake City, Denver, Phoenix, and Dallas, as well as interactive panel discussions on the next steps Nevada should take to advance new business expansion. The value of research in jump-starting the economy was discussed, as well as the importance of strategic investments, improved capacities, and policy changes needed to develop and sustain a more diversified state economy.
A team of researchers has devised a new model that describes how some of Nevada’s unique gold deposits were formed, which may help exploration geologists find similar deposits around the world.

The deposits, known as Carlin-type gold deposits, are characterized by extremely fine-grained, nanometer-sized particles of gold incorporated in pyrite and distributed over large areas that can extend to great depths.

More gold has been mined from these deposits in Nevada in the last 50 years – over $225 billion worth at today’s gold prices – than was ever mined during the California gold rush of the 1800s.

The recent Nevada gold boom started in 1961 with the discovery of the Carlin gold mine, near the town of Carlin, located in Northern Nevada. It was discovered at a spot where early westward-moving prospectors no doubt missed the gold because it was too fine-grained to be seen.

Since the 1960s, geologists have found clusters of these “Carlin-type” deposits throughout northern Nevada. These deposits constitute the second largest concentration of gold on Earth after South Africa. Geologists have long speculated on how they were formed.

Recently, researchers from UNLV and the University of Nevada, Reno, combined results from decades of previous studies with fresh data of their own to reach new conclusions. The resulting publication appeared in the February issue of *Nature Geoscience*, which can be found online at http://www.nature.com/ngeo.

The research team relates formation of the gold deposits to a change in plate tectonics and a major magma event about 40 million years ago. It is the most complete explanation for Carlin-type gold deposits to date.

The researchers include Jean Cline, a professor of geology at UNLV and a leading authority on Carlin-type gold deposits; Adam Simon, an assistant professor of geoscience who provided new experimental data and his expertise on the interplay between magmas and ore deposits; John Muntean, a research economic geologist with the Nevada Bureau of Mines and Geology at the University of Nevada, Reno; and Tony Longo, a post-doctoral fellow who carried out detailed microanalyses of the ore minerals.

“The published research provides insights that may be applied by exploration geologists to locate similar deposits in other areas around the world,” Cline says. “It also provides suggestions as to why Nevada is the only currently known location for these unique deposits and their vast gold resource.”

The work was funded by grants from the National Science Foundation, the United States Geological Survey, Placer Dome Exploration, and Barrick Gold.

**Study Examines the Effects of Air Transport on Muscle Injury**

UNLV nursing professor Barbara St. Pierre Schneider was awarded $2.26 million from the U.S. Air Force to study the effects of air transport on skeletal muscle crush injury – an effort that could lead to new ways to treat wounded soldiers.

Thousands of wounded soldiers are evacuated by air transport each month from military bases and battlefields around the world due to injuries suffered during combat. During transport, injured muscle and other tissue are exposed to high-altitude conditions that can alter the body’s normal inflammatory response and could worsen injuries.

St. Pierre Schneider and her team are investigating how hypobaric...
hypothesis – a low-oxygen, high-altitude environment experienced during flight – alters the immune response.

“Hypobaric hypoxia may interfere with the repair of injured muscle and other tissue by altering the body’s immune response,” says St. Pierre Schneider. “In this case, countering strategies are needed so that our wounded service men and women can recover as quickly as possible.”

After a muscle is injured, the immune system triggers an inflammatory response that includes the activation of specialized cells called leukocytes, which, in part, clean up debris in the injured area and play a role in muscle repair. Hypobaric hypoxia may lead to an excessive inflammation, which can do more harm than good.

For this three-year study, St. Pierre Schneider’s team will use a mouse model to simulate the effects of hypobaric hypoxia and determine whether an exaggerated leukocyte response occurs in crush-injured muscle. Then the team will test whether estrogen – which has been shown to reduce the leukocyte response in injured muscle in previous studies – has a positive impact.

UNLV Hotel College Professor Researches How Faith Influences Fun

What do Catholics, Muslims, and New Paradigm Christians do for fun?

UNLV hotel college professor Jennifer Livengood examines the reasons why some individuals look to faith before choosing their next hobby and why some draw a line between church and entertainment.

Gaining a better understanding of the relationship between religion and pastimes provides insights into both the relationship between religion and church and entertainment.

Livengood’s research includes an examination of how the events of Sept. 11 affected American Muslims’ leisure participation and whether religious constraints affect the leisure options for Catholics and Muslims.

In her latest study, Livengood interviewed members of New Paradigm Churches – a branch of faith within Christianity – to understand what role spirituality plays in their leisure habits.

The results, published in the August 2009 Journal of Leisure/Loisir, found that the majority of the respondents view being with people of similar faith as a spiritual activity – even if the activity is unrelated to a church event. Livengood is currently researching how the hospitality industry can better meet the needs of Muslims.

Loeb Receives Regents’ Creative Activity Award

UNLV associate professor of music David Loeb has been awarded the 2011 Nevada System of Higher Education Regents’ Award for Creative Activity.

The award honors significant accomplishments that bring recognition as well as national and international stature to the Nevada System of Higher Education. The honoree receives a $5,000 stipend and a medal.

Loeb, who serves as UNLV’s director of jazz studies, conducts the university’s jazz ensembles and is an instructor of jazz piano and jazz composition. As a jazz pianist, he has performed with a number of renowned jazz artists, including Freddie Hubbard, Tom Scott, Bobby Shew, Bill Watrous, Tom Harrell, Nancy Wilson, Joe Williams, and Anita O’Day.

Loeb, who is the 21st UNLV recipient of the creative activity award, is a successful studio keyboardist and has played for such television shows as “Hill Street Blues,” “Quantum Leap,” and “Family Guy.” He has also performed for feature films, including “The Birdcage” and “Pocahontas.” He orchestrated for George Benson and Doc Severinsen and arranged music for the Academy Awards and the American Music Awards. He also composed music for notable PBS television documentaries and for Dolly Parton’s album, “Rainbow.”

Loeb has performed as principal keyboardist with the Hollywood Bowl Orchestra and accompanied several musical artists, including Andrea Bocelli, Garth Brooks, Celine Dion, Bette Midler, Quincy Jones, Jewel, Herbie Hancock, Placido Domingo, David Foster, Diana Ross, and Jessye Norman. He was also a guest conductor with the Philadelphia Orchestra for Grammy-award winning vocalist Dee Dee Bridgewater and with the National Symphony Orchestra for the Tony-award winning entertainer Ben Vereen.

Under Loeb’s direction, UNLV’s jazz studies program has received numerous honors and has achieved national recognition, including winning the prestigious DownBeat Magazine Student Music Award for large ensemble graduate college outstanding performance.