



Fiber optics opens up new world in measuring temperature

Scott Tyler has a mile-long thermometer and he's taking the temperature of Lake Tahoe, the Walker River, farmlands and forests.

Tyler, a University professor in the Department of Geological Sciences and Engineering, is using the thermometer, a standard issue fiber-optic cable, in innovative ways to study a wide variety of hydrological, climatological and geologic topics in Nevada and around the world.

His equipment uses a laser to send and receive certain wavelengths along the tiny glass fiber. Recording the amount of travel time in the cable allows Tyler to determine temperature at various intervals by the wavelengths that return. The process is called distributed temperature sensing.

"I have about 20 miles of fiber-optic cable, and we've used it in a variety of new applications to find out what's going on in the environment," Tyler said. "If we know the temperature, we can tell what's happening in an ecosystem. It's unbelievable the opportunities for research this has opened."

As part of the Walker Basin Project—designed to sustain the arid region's economy, ecosystem and lake—Tyler and his colleagues tugged on hip waders and lowered the fiber-optic cable into the Walker River. They spooled out one kilometer of cable through small ripples of water, deeper pools and areas of shade and sun.

"This technology is like no other in that we

can measure temperature along many points (high spatial resolution) at once and record it over a long duration at each of those points," Tyler said.

"We can determine where groundwater comes into the river by the water temperature. Due to the very high spatial resolution, we can pinpoint areas impacted by sub-surface agricultural return flows or groundwater levels; we can help determine water quality or if the river temperatures are adequate for spawning."

Researchers also target irrigation in the Walker Basin Project. Tyler and his crew loaded a spool of fiber optics onto the back end of a tractor and buried two kilometers of it in a Mason Valley field, about a foot underground. With radar, scientists can measure soil moisture in the upper inch of the ground, but no other methods are available to measure distributed soil moisture in the root zone over a large area, Tyler said. This data will support water-use efficiency studies in the basin.

In June, at Lake Tahoe, Tyler hung three cables 450 meters deep from a research boat to the lake bottom, gathering temperatures from every meter of depth. Scientists watched the fluctuating temperatures at the 100-foot level, the bottom of the "warm" water, as underwater waves sloshed back and forth across the lake every 20 minutes. The surface water was smooth and flat.

"We've always known that the wind causes

Scott Tyler, professor of geological sciences and engineering, inspects a fiber optic cable in the Walker River while postdoctoral researcher Christine Hatch takes readings.

the water to be pushed across the lake, but we've never seen it before," Tyler said. Seeing the patterns of water movement and temperature layers will help researchers understand nutrient movement at the interface of warm and cold water.

Besides his work in Nevada, Tyler's additional projects, conducted in collaboration with a number of researchers and universities worldwide, take advantage of the versatile properties of fiber optics.

These projects include: studying caves; measuring soil temperatures during a prescribed burn at Lake Tahoe forests; assessing the dynamics of San Francisco Bay salt marshes, coal mine reclamation and acid mine drainage in Germany; studying snowpack and snowmelt at Mammoth Mountain Ski Area in California and stream/lake/groundwater interactions at Lake Tahoe and several national parks; as well as analyzing water temperature at Devils Hole in Death Valley in a bid to protect the endangered pupfish. Tyler is also anticipating a project that would measure deep-ice and deep-water temperatures in Antarctica.

—Mike Wolterbeek '02

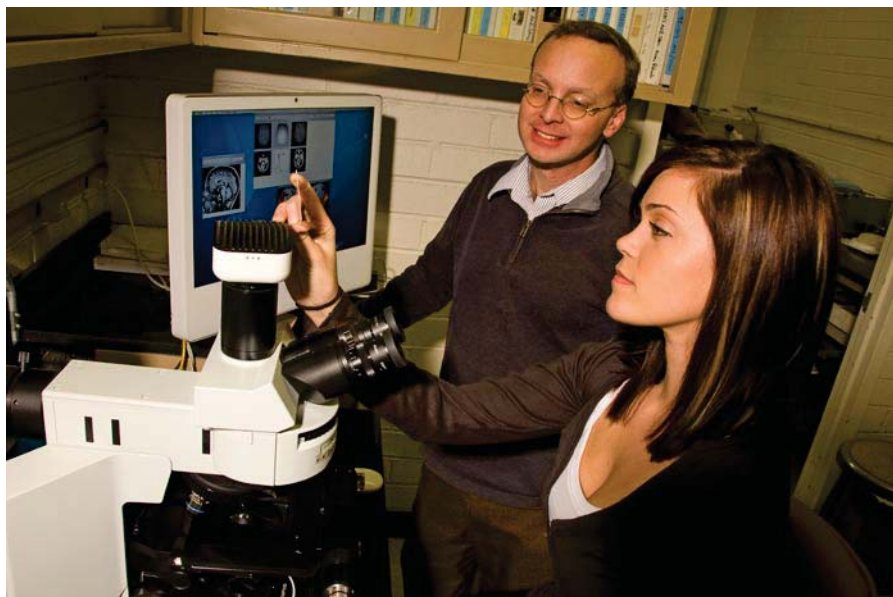
Nevada joins ranks of UCLA, Harvard, Duke with new neuroscience program

The University has added a new undergraduate degree program to its academic offerings—a bachelor of science in neuroscience.

The neuroscience major will provide students rigorous, broad training in brain and cognitive sciences, and create direct research opportunities with faculty. The program is interdisciplinary, with courses primarily in the psychology and biology departments.

“Neuroscience is such a multidisciplinary field and presents so many opportunities for students,” said Michael Webster, co-director of the program and professor of psychology. “It’s one of the most active areas of science right now, and there are so many directions you can go with it.”

Neuroscience is defined as any science dealing with the functions of the nervous system. Webster says that the University already has several psychology and biology faculty members with expertise in the neuroscience realm, so no new faculty or new funds are needed to begin the program. For example, Jeffrey Hutsler, assistant professor of psychology, is researching the cell structure and brain morphology in autism. Webster is researching



Jeff Hutsler, associate professor of psychology, works with neuroscience undergrad Sally Osborne.

visual neuroscience, looking at how people see colors and recognize faces. Psychology department colleagues Michael Crognale and Mark Wessinger also work in neuroscience.

In the biology department, associate professor Grant Mastick, neuroscience program co-director with Webster, is conducting research on how cells connect to each other as the brain is developing. Biology colleagues Scott Clark, Thomas Kidd and Vladimir Pravosudov also specialize in areas of neuroscience.

“Teaming up with psychology to create this major is a natural partnership,” Mastick said. “Here in the biology department, we try to understand the brains and behavior of animals. In psychology, they seek to understand the brains and behavior of humans. So, there’s a lot of crossover, as well as a lot to be learned from each other.”

Faculty members with neuroscience-related expertise in other University units, such as the School of Medicine and College of Engineering, are also available to the program, which

already has attracted 20 student enrollees.

“No other institutions in the state were offering an undergraduate program in neuroscience, so there was a real gap there,” commented Webster. “Across the country, graduate programs in neuroscience are more common. Undergraduate programs are less common, but more highly ranked schools, both research institutions and liberal arts colleges, are establishing them.”

The University joins colleges such as UCLA, Dartmouth, Harvard and Duke in adding an undergraduate neuroscience major. Approximately 30,000 trained neuroscientists work in the United States. The demand for neuroscientists is expected to increase as the country’s elderly population continues to grow.

“Ultimately, by better understanding the brain through the study of neuroscience, we hope to learn how to treat common neurological diseases,” Mastick said.

—Claudene Wharton ’86, ’99M.A.

National Council of Juvenile & Family Court Judges 40th Anniversary in Reno Commemorative Dinner Event

Honoring Nevada State Senator Bill Raggio

and

University of Nevada, Reno President Milton Glick

Event co-chairs:

Joe Crowley, former University president, and Nancy Fennell, Dickson Realty

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Faces on the Quad

ERIN EDGINGTON '08

A summa cum laude Honors Program graduate this past May, Edgington recently became the first University student to earn recognition as a Portz Scholar. The National Collegiate Honors Council selected Edgington's 60-page thesis, "Costume and Propriety in Madame Bovary: la 'Culture de Lin,'" as one of the top three research papers in its evaluation of 36 theses nationwide. She presented her research at the council's national conference in San Antonio, Texas, Oct. 22-26. Edgington graduated from Nevada with bachelor's degrees in French and sociology while completing the Honors Program. She is pursuing a master's degree at Indiana University-Bloomington.



TREVOR HARTZELL '08

The campaign manager for Associated Students of the University of Nevada President Eli Reilly during the 2008 campaign, Hartzell served as a senator for the College of Liberal Arts. A Spanish major and a French minor, the 20-year-old was ASUN's chief of staff, a position on the undergraduate student government's executive board. A rock climbing and biking enthusiast, Hartzell graduated in December, completing his coursework in two and half years. He is applying to Boyd Law School in Las Vegas as well as the Seattle University and University of San Francisco law schools. Hartzell is looking for a career defending civil cases and in immigration law.



—Pat McDonnell

MBA program receives another national nod

The Princeton Review has recognized the University's College of Business as outstanding in its 2009 guidebook of Best 296 Business Schools. The recognition stems from the quality of the college's MBA program.

According to Robert Franek of *The Princeton Review*, "We select schools for this book based on our high regard for their academic programs and offerings, institutional data we collect from the schools, and the candid opinions of students attending them who rate and report on their campus experiences at the schools."

"The greatest strength of the school is its practical, hands-on curriculum," said

one student who participated in surveys conducted by the Review.

The guidebook specifically recognizes the MBA program's professors, stating: "The University of Nevada, Reno's ranking as one of the top 150 research institutions in the U.S. attracts business professors who are 'very accessible and helpful,' as well as 'skilled in blending real-world experience with academic theory,' with an ability 'to promote critical thinking and teamwork.'"

In the book's two-page profile of the college, it also states that in 2005, three months after graduation, 99 percent of the college's MBA holders were employed, with an average starting salary of \$50,000.

Earlier this year, *BusinessWeek* ranked the part-time MBA program No. 17 in the United States.

—Claudene Wharton '86, '99M.A.

University awarded several major grants

The University of Nevada, Reno received several major grants recently to pursue a diverse range of research projects:

The National Science Foundation awarded a \$15-million, five-year grant to the University; Desert Research Institute; University of Nevada, Las Vegas; and Nevada State College to study climate change in Nevada. Nevada's National Science Foundation Experimental Program to Stimulate Competitive Research led the grant effort, and the Nevada System of Higher Education is providing an additional \$6.6 million for the project. An interdisciplinary "dream team" of researchers will build infrastructure to measure, analyze and model the effects of climate change in Nevada.

The University's Center for the Application of Substance Abuse Technologies has received a five-year, \$8.7-million grant to expand its integrated Center for the Application of Prevention Technologies. The center will use the funds, awarded by the federal Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Prevention, to enhance its efforts to prevent and reduce substance abuse and associated public health issues for several groups,

including 18- to 24-year-olds.

The U.S. Department of Energy has awarded more than \$5 million to the University's College of Engineering. More than \$2.5 million will enable research in spent nuclear fuel reprocessing and hydrogen production at the University's Center for Materials Reliability. Almost \$2 million will begin site work for the construction of a 23,000-square-foot addition to the James E. Rogers and Louis Weiner Jr. Large-Scale Structures Laboratory at the Center for Civil Engineering Earthquake Research. The project expands the center's capability for simulating earthquakes. The remaining \$738,000 enhances the University's ability to commercialize innovative energy technologies to further energy security and stimulate economic growth.

The campus' Student Conduct Office and Police Services department have teamed up with local law enforcement agencies and Join Together Northern Nevada to secure a three-year, \$854,000 grant aimed at reducing underage drinking at the University and the surrounding community. Program goals include changing social norms that encourage underage student drinking, reducing the availability of alcohol to underage students through enforcement and enhancing existing policies and practices that address underage student drinking.

—Claudene Wharton '86, '99M.A.



Photo by Theresa Danna-Douglass

Trio of Obama visits to campus in '08

From gymnasiums to elm-lined quadrangles and baseball fields, President-elect Barack Obama packed people in at the University of Nevada, Reno in 2008.

The Democratic presidential candidate and U.S senator made three visits to the University prior to the Nov. 4 general election. He and

Barack Obama speaks to a packed crowd on the Quad, Sept. 30 in one of his three campus appearances in 2008.

his wife, Michelle, spoke at the campus' Virginia Street Gym on Jan. 18. On Sept. 30, his campaign rally on the Quad attracted 12,000 people. A final event Oct. 25 at Peccole Park, home of the Nevada baseball team, drew about 11,000 people to hear Obama speak.

"Events like this contribute to a more informed electorate and certainly contribute to an engaging and educational atmosphere

for our students," University President Milton Glick said.

National political pundits shined attention all year on Nevada, with its five electoral votes, as a "battleground state" during one of the most memorable presidential campaign events in U.S. history.

—Pat McDonnell

Thompson named College of Science dean

Since the creation of the University of Nevada, Reno's College of Science in 2004, Jeff Thompson has served as associate or interim dean. Thompson will continue to lead the college's development, although now in the role of dean.

"Jeff has a strong resume of teaching and research productivity," said University Provost Marc Johnson, who named Thompson to the role in late October. "In conversations with members of the faculty of the College of Science, it was apparent to me that Jeff is a well-respected leader who has shown he has the vision, the enthusiasm and the talent to foster the future of one of our largest colleges."

Nearly all of the University's undergraduate students are at one point enrolled in a course offered through the College of Science. The college includes



Photo by Theresa Danna-Douglass

the departments of biology, chemistry, mathematics and statistics, and physics, as well as the geography, geological sciences and engineering and mining engineering departments in the Mackay School of Earth Science and Engineering.

"Under Jeff's leadership the College of

Science has advocated strongly for student success and has made some notable inroads in the areas of recruitment and retention," said University President Milton Glick. "He recognizes the critical role of research to the future of the University and the state and the importance of competitive funding to maintain and enhance the University's research profile."

Thompson has played an integral role in planning, design and construction oversight for the Davidson Mathematics and Science Center, now under construction on the site of the former Fleischmann Greenhouses at the southeastern edge of campus. The building is slated to open in fall 2010.

Thompson joined the Nevada faculty in 1991 and served as chair of the Department of Physics from 2001 to 2004. His research is in the area of atomic and molecular physics, and he continues to be active in the field.

—Jane Tors '82



Photo by Brant Allen, UC Davis

Diver Scott Hackley (UC Davis) collaborates with University of Nevada researchers to study the recent invasive clam species found at Lake Tahoe's Marla Bay in July 2008.

Lake Tahoe gets help fighting invasive species

When people see Lake Tahoe's sparkling waters, they may not think that some of the diverse species that live in and around the Western landmark are akin to alien invaders.

These species, called invasives, do not occur naturally in the lake and threaten its ecosystem, including water clarity, infrastructure and habitat for native species.

Faculty and students from the University's College of Agriculture, Biotechnology and Natural Resources are at the forefront of research efforts to help solve the problem.

Sudeep Chandra, an assistant professor in the Department of Natural Resources and Environmental Science, and graduate students who work under his supervision are trying to prevent damage to the lake by

invasive species like quagga mussels, bluegill and Asian clams. Chandra and his colleagues in the college collaborated with local organizations such as the Tahoe Regional Planning Agency to institute new regulations for the boat-washing stations around the lake. Effective Nov. 1, 2008, these regulations required an invasive species inspector to be present at all boat-washing stations, and mandate that boat owners decontaminate their craft if an invasive is found.

The new regulations will prevent watercraft from depositing species that they pick up from other bodies of water being carried into Lake Tahoe. Such species have appeared at Lake Mead in southern Nevada and San Justo Reservoir in northern California. These aquatic ecosystems are significantly threatened by rapidly multiplying invasives, as scientists continue to find such species in other bodies of water and fight the odds to eradicate them.

—Alix Cirac '08

University researchers turn biomass into fuel

Chemical engineering associate professors Charles Coronella and Victor Vasquez are researching whether leafy or woody biomass can be economically and efficiently converted into a fuel product such as synthesized gas. Their work on the pretreatment portion of the conversion process is part of a \$4.7 million study by the Gas Technology Institute.

Coronella said the researchers have experimented with wood and agricultural residue such as corn stalks and leaves, rice straw and switchgrass to make a product that is molecularly uniform and dense enough to optimize the gasification process of converting biomass to fuel.

"Biomass produces a dirty gas if it's not

pretreated," he said. "The molecular composition of biomass is not ideal for gasification." Their hydrothermal and dry heating processes produce a carbon-neutral, black, crumbly char, similar to coal but with none of the problems of bad chemical compounds. The product is shaped and sized to behave more like coal, for use in existing processing equipment.

As part of the project sponsored by the U.S.

Department of Energy, the University's research partner, the Desert Research Institute, is assessing the type and amount of biomass within Nevada and characterizing pretreatment byproducts. A small processing plant and a techno-economic analysis are also a part of the study.

"This work will directly address the



Photo by Mike Wolterbeek

Professor Charles Coronella with equipment that subjects biomass to 3,000 psi of pressure as part of the conversion process.

nation's high priority of increasing the supply of domestic and renewable energy by integrating advanced technology that improves the conversion of biomass into fuels and power," said U.S. Sen. Harry Reid, who secured funding for the project in an Energy and Water Appropriation bill.

—Mike Wolterbeek '02

Journalism school establishes Nevada high school press association

The Donald W. Reynolds School of Journalism has organized the first statewide association to promote excellence in journalism in Nevada's secondary schools. The Reynolds High School Journalism Association kicked off Oct. 4 with a half-day meeting of high school newspaper advisers and media professionals.

"The association promotes networking and professional development among teachers and leverages resources to promote high journalistic standards among students," said Jerry Ceppos, dean of the Reynolds School and Fred W. Smith Chair in Journalism. "This is a pivotal time to support Nevada education and a perfect role for a land-grant university."

The organization will support curriculum development, equipment acquisition, and statewide communication.

"The journalism school faculty is 100 percent committed to our new organization because there is a positive link between high school journalism and academic



Photo by Zanny Marsh

Prior to the launch of the Reynolds High School Association, Dean Jerry Ceppos observed that too many Nevada high school journalism advisers were on their own. Participants in the first statewide association meeting gathered Oct. 4, at the journalism school.

achievement," Ceppos said. "A Newspaper Association of America study this year showed that students who work on high school newspapers and yearbooks get better grades in high school, earn higher ACT scores and get better grades as college freshmen."

The potential to engage high school students in journalism interested Jackie Leonard of Reno, who donated \$10,000 to the organization less than one month after it was established.

"The program exposes young people to the University and the journalism school by supporting teachers and increasing student access to technology," Leonard said. "It is an excellent way to reach out to rural communities. I think that's important."

Leonard is carrying on a family tradition. In 2007, Gwen Leonard—Jackie's mother—established the Paul A. Leonard Chair in Ethics and Writing in Journalism and the

Paul A. and Gwen F. Leonard Memorial Scholarship.

The Reynolds School already is one of five sites for the Reynolds High School Journalism Institute, a two-week program that helps advisers hone teaching skills, recognize and incorporate media trends into teaching plans and newspaper production and encourage students to consider journalism as a career. In 2007, the journalism school received a \$430,000, three-year grant from the American Society of Newspaper Editors to design and offer the institute.

—Zanny Marsh

Contact Kristin Burgarello '97, director of development for the Reynolds School of Journalism, at (775) 784-4471 or kburgarello@unr.edu to donate to the Reynolds High School Journalism Association.

Changes afoot for Getchell Building

The University of Nevada, Reno's plan to reopen a renovated Getchell Library building in 2011 for much-needed student support services and fine arts space is contingent on Nevada State Legislature funding of \$10.5 million to implement code upgrades to the 46-year-old building.

The University submitted a capital-improvement project request to the State Public Works Board that includes a new sprinkler and fire alarm system,

improvements to the building's exits and upgrades for disabled patrons, including enhancements to restrooms. The renovated four-story building would not be used in its traditional role of library services (the University closed the facility in conjunction with the Aug. 11 opening of the Mathewson-IGT Knowledge Center), but might accommodate such offices as Student Success Services, Counseling Services, a proposed Women's Center, as well as music practice rooms and studio space for the art, dance and theatre departments, said Provost's Office official Paul Neill.

Discussions on the building's future use will be ongoing, Neill said. Some consolidation of student support facilities on campus is a University priority, along with providing needed space for School of the Arts departments that have outgrown their current facilities in the Church Fine Arts Building and the Virginia Street Gym. "Getchell is close to the historic University Quad, close to the residence halls, and it's on a major arterial pathway through the campus. It's an ideal location for a student support center," Neill added.

—Pat McDonnell