

Professor Researches Nanotechnology at UNLV

A sheet of paper is about 100,000 nanometers thick. One nanometer is one billionth of a meter. At such scales, more electrical optical properties are available than bulk matter. But it's the minute scale of this measurement that makes nanotechnology destined for big impact on the future.

The field of nanotechnology deals with the understanding and control of matter at dimensions of roughly one to 100 nanometers. It's projected that in the next 10 years, \$1 trillion worth of products worldwide will be affected by nanotechnology. To benefit from this new industrial revolution, universities and research organizations worldwide have been making significant investment in nanotechnology research. UNLV is not left behind in this important field. During the past two years, Biswajit "BJ" Das, Ph.D. has spearheaded the effort to develop a world-class program in nanotechnology to ensure that UNLV and Nevada will be part of this industrial revolution. Das, who joined UNLV in 2003, is an eminent researcher in the field of nanotechnology and is internationally renowned as co-inventor of 'Datta-Das,' a transistor, and for pioneering the field of spintronics.

Since joining UNLV in 2003, Das has developed an elite research program in the field of nanotechnology. By leveraging research funding and corporate donations, he has been able to establish a state-of-the-art nanofabrication facility at UNLV. Although he admits it's been hard work, fortunately, he's had a partner in his wife, Ruby, who has worked diligently with him to develop the program.

"I cannot emphasize enough Ruby's



Professor Biswajit "BJ" Das researches nanotechnology at UNLV.

contribution in development and growth of the nanotechnology program at UNLV," he says. "Ruby had prior experience with large scale project management, and it is very fortunate that she decided to step in. She is extremely instrumental in developing the nanotechnology research program."

The program has attracted national and international attention. The nanotechnology research group has made new discoveries and expects to continue to do so in the future. From the very beginning, Das' philosophy has been to acquire only the necessary equipment and a number of unique capabilities that would form the core nanotechnology infrastructure at UNLV, and avoid

duplicating capabilities available elsewhere.

"We have limited resources, and to be able to compete with more established universities such as Purdue and UCLA, we need to define our niche area and become the best in that," Das says.

To expand his group's research base, he established access to the national nanotechnology user facility at University of California, Santa Barbara. From the beginning, Das has emphasized commercial manufacturability as a prime research focus.

According to Das, "Commercial manufacturability is a big challenge in nanotechnology. For commercial manufacturability, the fabrication techniques used for nanotechnology have to be compatible with the silicon integrated circuit industry, and most of the current techniques are not."

So, Das and his team set out to develop new fabrication techniques that are compatible with the silicon integrated circuit industry with custom-built equipment developed by Das. One such example is the UNLV nanodeposition system. This highly flexible equipment provides the ability to create complex, multi-layered structures of nanoparticles of a variety of materials and multiple layers of metals, semiconductors, and insulators. Using this equipment, they have recently made a major nanotechnology breakthrough, for which they are currently working on a patent.

Das' research group is working on a number of device applications, including quantum, dot-based light emitting diodes that will be more efficient than

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Message from the Dean



College of
Engineering Dean
Eric Sandgren

Much interest has been generated by a report from the National Academies of Science and Engineering entitled “Rising Above the Gathering Storm.” The report paints a troubled portrait of the economic future of the United States due in large measure to the lack of students pursuing careers in engineering and the sciences. President Bush picked up on the same theme in his latest State of the Union Address. An identical message was delivered at a recent dean’s council meeting in Washington, D.C. The recommendations seem to sidestep the major issue of why our best and brightest students are not pursuing careers in engineering and computer science. Furthermore, one wonders why such a large percentage of those enrolling in engineering and science switch majors to non-engineering/science fields.

The problem centers around the fact that science and engineering are not a part of the popular culture. We must make engineering and computer science education more exciting and weave high tech career fields back into the popular culture and imaginations of our youth. The world has moved on, and engineering and computer science education must move on as well if we are to be successful as a profession and as a nation.

In the Howard R. Hughes College of Engineering we are looking for ways to make engineering and science careers more exciting and attractive to our potential students. Through collaboration with other colleges at UNLV such as business, fine arts, and hotel management, we are starting to make some visible progress.

We are implementing a number of new programs in order to rekindle interest in technical careers. The most publicized program is entertainment engineering. A new undergraduate curriculum has been developed and will be sent forward for approval in the near future. A minor in entertainment engineering is already available. When viewed from the entertainment side, engineering becomes a creative and exciting career choice. This program is offered in close cooperation with the College of Fine Arts. It seeks not only to interest those students who might enroll in a traditional engineering program, but more importantly, those who would not have considered an engineering program at all.

A new program, the School of Informatics, was recently approved and focuses on the applied side of computer science with emphasis on entertainment and security. This is the

area which encompasses the majority of job growth in the engineering field and is also an interdisciplinary program, which broadens the scope of a traditional engineering education.

Our newest thrust is in entrepreneurship, which has received a tremendous boost thanks to the generous donation of Robert L. Mendenhall of Las Vegas Paving Corporation. This program seeks to expose students to all critical aspects of launching a product and even their own business. This program will expand our previous efforts in entrepreneurship and design. If we are successful, the next Bill Gates may well come from our college. Each of these new ambitions is designed to make our engineering education more relevant to the student as well as to the employers of our students. The goal is to produce technically competent students with communication, teamwork, business, and creative skills. This background will help our profession sustain the economic growth we have come to expect.

As for trying to move engineering and science into the popular culture of our youth, we are involved in several far-reaching community initiatives. The college has stepped up to host the 2007 Las Vegas Regional FIRST Robotics Competition which will bring more than 1,100 high school students onto campus for the third year. FIRST is a national program which seeks to encourage teams of students to become engaged in science and engineering through the design and fabrication of a robot that competes against other teams in a large, open venue much like a national sporting event. Additionally, the college is heavily involved in the LEGO® League, similar in concept to FIRST but aimed at students at the junior high school level.

Lastly, one new thrust is in the infancy stage of development, but seeks to move engineering into the public perception, much like Patricia Cornwell and CSI (created by a UNLV graduate) did for forensic science. This is a cooperative venture with the colleges of fine and liberal arts and hopefully will represent a groundbreaking national effort. More on this venture will appear in future messages so stay tuned. So while the focus on the lack of students entering engineering is now a big national story, it is one in which the Howard R. Hughes College of Engineering has been working on for quite some time. Just another instance of being ahead of the curve.

We hope you enjoy reading all about the new programs and initiatives currently happening in the college. Thank you for your continued support.

Recent Board of Regents Approvals

UNLV School of Informatics

A new multidisciplinary school within the College of Engineering was approved at the January NSHE Board of Regents meeting.

The School of Informatics will launch its master's and doctoral programs next fall and the bachelor's program in 2007. The school is in the process of hiring new faculty and reviewing graduate applications. "This is a busy time," Associate Dean of the College of Engineering Hal Berghel reports. "Regent approval came in the middle of a fiscal year so we're trying to build whatever momentum we can while waiting for next year's resources. But then, if this were easy, anyone could do it."

Upon entering the program, majors must declare a "cognate area" of interest in which they select multiple disciplines. For example, one student might select fine arts, humanities, the sciences, or engineering. Hotel administration and security represent the most popular areas of interest so far among students. As a result, these concentrations will be developed first.

The initiation of the undergraduate program has been delayed because of the higher resource demands. "With fewer students at the graduate level, we're able to start a quality program with fewer

resources," Berghel said.

Berghel, who will oversee the program through its initial stages, anticipates rapid undergraduate growth, much like Indiana University's School of Informatics, which grew from no majors in 2000 to 1,500 in 2005. Industry leaders participated in the model curriculum development, Berghel explains, so the program is set up to transition students into the workforce as smoothly and effortlessly as possible. Students of the program must complete an internship with a local business, agency, or organization to fulfill the graduation requirements, giving the students real-world experience and marketability.

Berghel was a founding member of the Computing Research Association's Workshop on Information Technology and conducted their surveys on the evolution of information technology schools from 1999-2004. These results are summarized in his article "A Paradigm Shift in Computing and IT Education," which was one of the first major publications to document this shift.

Further information may be obtained at www.informatics.unlv.edu.

Center for Information and Communication Technology (CICT)

The Center for Information and Communication Technology (CICT), directed by Shahram Latifi, Ph.D., will serve the common interests of the academic and business communities by providing a focus for research and education in information and communication technologies. UNLV and the center will address the specific information and communication technology needs of established and emerging companies in Southern Nevada. The center intends to be a significant voice that will bring to campus a greater awareness of today's industrial concerns, as well as provide support for the research tools and facilities to deal with future challenges.

The center develops programs that include major research efforts, joint research, and the development of projects collaborating with industry partners. It will be involved in government-sponsored events, conferences, and seminars, and will provide consulting and technical support services for start-up businesses. CICT strives to enhance the competitiveness of technology-based companies, focusing on Nevada-specific industries like entertainment engineering, tourism, and transportation, CICT develops solutions to IT problems, especially those unique to Las Vegas and Southern Nevada. One example is that integrated engineering expertise can provide solutions — such as the security of transporting tourists between airports and the hotels.

Currently there are nine UNLV faculty members associated with the center — eight from the Department of Electrical and Computer Engineering and one from the School of Computer Science. CICT members bring together a wealth of research and

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All Ten Nominated AFROTC Cadets Headed to the National Field Training Program

AFROTC Col. Mike Hogan is proud to announce that eight 200-level cadets and two 300-level cadets were accepted into the national field training program. Field training is a four- to six-week tour that determines whether or not an individual has what it takes to make it to the next level. During the training, they will participate in a number of activities that evaluate their mental and physical abilities as well as assess their leadership skills. Upon graduation, the cadets are then accepted into the Air Force. Congratulations goes to Jessica Claypool and Robert Wilcox in the level-300 category; and Melissa Batterson, Christopher Curtis, Allen Estalilla, Samanta Fossett, Nathan Lehman, Jacob Ludwig, Isaac Square, and Victor Villa from the 200-level group.

Civil & Environmental Engineering

On March 4, the Civil and Environmental Engineering Department in conjunction with the student chapter of the American Society of Civil Engineers (ASCE), hosted “The Southern Nevada Student Model Bridge Building Contest.” A total of 370 bridges were submitted by 50 different Clark County District schools, exposing nearly 2000, or 10%, of the district’s students to the field of engineering.

Students competed in elementary, middle school, and high school categories and the top six winners received a traveling trophy. This year’s top high school was the Southern Nevada Vocational Technical Center; Greenspun Junior High received “Best Middle School Performance,” and Fay Herron Elementary was awarded “Best Elementary School Performance.”



Fay Herron Elementary School team members took top award as “Best Elementary School.”

Mechanical Engineering

The American Society of Mechanical Engineers (ASME) student chapter continues to prepare for the Human Powered Vehicle Competition (HPVC) entry, with plans to enter a four-wheeled, fully-faired (completely enclosed for aerodynamic purposes) vehicle. The HPVC is a contest in which university student sections of ASME design and build vehicles that operate solely by human power, such as a bicycle. The competition is scored in three categories including a design report and presentation, which accounts for the largest percentage of a team’s final score; a top-speed event, and an endurance event.



UNLV’s human powered vehicle is developed by students in mechanical engineering.

School of Computer Science

New Computer Security Lab

A new computer security lab has been developed for a number of security-related courses beginning in the fall 2006 semester. The lab will also be used for security-related research projects.

Computer and network security has become an essential part of computer system management and the need for security skills has been growing rapidly. Thanks to this new lab, students will be able to understand the common attack methods that can compromise computer security through demonstrations and lab projects, and learn how to protect their computer systems through hands-on exercises.

The lab is sponsored by Microsoft Research through the 2004 Trustworthy Computing Curriculum Award and managed by Professor Yoohwan Kim and Associate Dean and Professor Hal Berghel from the School of Computer Science, and Professors Mei Yang and Yingtao Jiang from the Electrical and Computer Engineering department.

“What is the ideal research project?”

Have you ever asked yourself, “What makes an ideal research project?” Distinguished Professor and Director of the Center for Energy Research, Robert Boehm, Ph.D., offers his insight.

According to Boehm, “The ideal research project pursues a project of societal value, assists developers in becoming more competitive, represents a government-university combined effort, facilitates the introduction of new technology to the market, supports local industry, educates students; both undergraduate and graduate, and leads to contributions to the technical literature.”

The Center for Energy Research (CER) is pursuing several projects that have many of these characteristics. One project in particular is being funded by the National Renewable Energy Laboratory (NREL) with costs being shared by Los Angeles

developer, Amonix, which developed a 25 kW concentrating photovoltaic system for power generation. Currently, three UNLV students are involved in research to help Amonix improve its technology to increase energy efficiency and cut down on costs. One of their units was installed at the UNLV solar site two years ago. It has operated nearly trouble-free in the intervening period, while a number of technical tasks have been accomplished, primarily by student research assistants.

Nevada Power became interested in the technology and has now installed three of these units at its Clark Generating Station, near Russell Road and I-215. Energy research students will monitor and oversee the operation of these units. More of these units may be installed locally to assist Southern Nevada in meeting increased power demands with clean and renewable energy.

Engineering Geophysics Laboratory Studies Earthquakes in Southern Nevada

In August 2004, the Earthquakes in Southern Nevada project emerged with the assistance of the UNLV Research Foundation. This project, sponsored by the U.S. Department of Energy, recognized the significance of earthquake hazards in our area. The UNLV Research Foundation committed resources to this work, not only for the benefits the Las Vegas community would realize, but also for the long-term viability of teaching and research related to earthquake hazards and risks at UNLV.

A team of 22 people from three different universities are dedicated to the multidisciplinary work of earthquake research, education, and preparedness. UNLV’s own Ron Sack, Ph.D., is the structural engineering co-investigator in partnership with Arya Ebrahimpour, Ph.D., from Idaho State University. Together, they are using a methodology called “Rapid Visual Screening (RVS) of Buildings for Potential Seismic Hazards” and the HAZUS, a natural hazard loss estimation methodology software, to assess the seismic vulnerability of critical public buildings in Clark County, Nev. Both the RVS method and the software were developed by the Federal Emergency Management Agency (FEMA) to assess structural systems and soil characteristics. The local seismic risk assessment surveyed more than 1,000 different buildings including 46 fire stations, three hospitals, 10 police stations, 184 elementary schools, 51 middle schools, and 31 high schools. They generated lists of individual buildings prone to significant damage during a major seismic event and will determine which general building types in the region are most susceptible to earthquakes.

Additionally, associate professor Barbara Luke of civil and environmental engineering is leading an effort to study the amplification effects that local soils have on incoming earthquake energy. Luke will create a seismic hazard map for

the Las Vegas Valley. She and her team blanketed the valley with seismic measurements to characterize the dynamic response of the soils. They are also scouring public records for similar measurements made by developers, and will correlate the information to geotechnical and geologic data logged in boreholes drilled by others. The resulting dataset will be fed into dynamic response analyses to output seismic amplification and help identify the areas of the valley where earthquake shaking is expected to be the most severe.

Noted seismology researcher Catherine Snelson, Ph.D., is utilizing new seismic sources and recordings to image the rocks, structure, and faulting as deep as 200 feet to further understand the connectivity of the local fault system. Working in conjunction with geologist Wanda Taylor, Ph.D.’s project to identify the faults at the surface, she will collect seismic data to obtain the cross-sectional view below the surface. The data will then feed directly into the models that Luke and Taylor produce to test amplification within the region.

The project also includes outreach into local K-12 schools and other public venues, where additional seismographs teach about seismic risk. These tools also provide new data sources that are archived at UNLV and UNR and then sent onto the national seismological database.

Taylor and the geology team are assessing faults in Southern Nevada to determine whether they pose a seismic threat, the magnitude of earthquake that each fault may generate, and the time frame in which the next earthquake may occur on each fault. In addition, this team is working on characterizing the sediments at shallow soil depths. Their work will coordinate with that of Luke’s team to provide parameters that allow

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Local Firm Committed to Engineering Students' Success

Ask anyone who works at Carter & Burgess, Inc. about their company and he or she would probably say they work for a local engineering firm committed to the local community. Folks in the College of Engineering know just how true that is.

We feel that it is our responsibility to support the local university to assist in cultivating top talent for the future,” says Dennis Waibel, senior vice president and managing principal of the Las Vegas office.

The company currently has 14 full-time UNLV alumni on staff. It also employs numerous interns throughout the year with the goal of bringing these interns on as full-time staff once they receive their degree.

In addition to hiring students once they get their degree, Carter & Burgess, Inc. is also committed to helping students along their way by contributing \$1,000 to the engineering scholarship fund every year.

“With a shortage of public funding, private firms need to support our public institutions so the next generation of students receives the education they deserve,” says Waibel, who sits on the College of Engineering’s Department of Civil and Environmental Engineering Advisory Board.

Carter & Burgess, Inc. also donated funds to help build the new Science, Engineering and Technology Building

“With a shortage of public funding, private firms need to support our public institutions so the next generation of students receives the education they deserve.”

on campus. “We feel it’s an important project for the growth of UNLV’s College of Engineering,” Waibel says. “We hope that other local firms will support this effort as well – in order to bring top talent to Nevada, we need to improve the caliber of our engineering programs.”

On the company’s overall involvement in the community, Waibel says, “In addition to making monetary donations to worthy causes, we also feel that it’s important to volunteer our time. This is a great way to build camaraderie among our team while helping someone else.”

Last year, Carter & Burgess, Inc. helped organize the first UNLV Civil and Environmental Engineering Golf Classic. With the help from numerous local engineering and construction firms, the event raised nearly \$20,000 to purchase much-needed equipment for the college’s civil and environmental engineering department. This year’s tournament is scheduled for Fri., Dec. 1 at the Black Mountain Country Club.

Carter & Burgess, Inc. specializes in civil, mechanical, electrical, and structural engineering; and surveying services to the public and private sectors. The company also offers architecture services through a related entity – C&B Nevada, Inc. Its One Source, One Firmsm operating philosophy emphasizes a close strategic relationship with clients over the lifecycle of projects from conception through operation, with uniform experiences across all offices and teams.



Dennis Waibel

Earthquakes in Southern Nevada

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better estimates of ground shaking and greater control on and knowledge of the distribution of soils of specified seismic responses and amplifications. Taylor is presently working to qualify the new fault data for the national Quaternary fault database.

Gaye Coté, Director of Outreach for Earthquakes of the Southern Nevada project, is coordinating efforts to educate the general public regarding the earthquake hazards and risks in Southern Nevada, including what they can do to improve

their chances of survival during and after an earthquake. Her team pursues outreach opportunities and then develops event-specific presentations and workshops to suit the venue and the audience. Faculty and students from the Department of Civil and Environmental Engineering and Department of Geoscience offer community presentations on earthquakes and their associated hazards, such as ground shaking, surface rupture, and liquefaction; how structures behave during earthquakes; how to protect yourself, your home, and your community against earthquake damage; and, earthquake facts about Nevada and the Las Vegas valley.

Campaign Update: Black Box Theater

The creative minds that invent Las Vegas shows like Cirque du Soleil's O and KÁ will soon have a place to test those ideas before they light up the stage. The Black Box Theater in the new Science, Engineering and Technology Building, scheduled to open in the spring of 2007, enables entertainment engineering students in the Colleges of Engineering and Fine Arts to experiment and create innovative techniques in theatrical design, lighting, and sound engineering. The modular theater, used for testing design and researching creative activities, will be the only one of its kind in the world.

"Science and technology is becoming so advanced that the Colleges of Engineering and Fine Arts can't currently meet the standards of teaching that come with this new equipment," says Dan Cook, entertainment engineering professor in the College of Engineering. "The new Black Box Theater will allow these colleges to offer a curriculum that keeps up with current industry standards and best practices."

This playroom of imagination will allow students to work with professional entertainers and engineers on state-of-the-art equipment. It also gives industry partners the ability to test entertainment technology, which the students will participate in as well.

"The students will be working with equipment that is currently being used in the entertainment industry. This gives students something to put on their resume once they graduate, making them more marketable," says Cook.

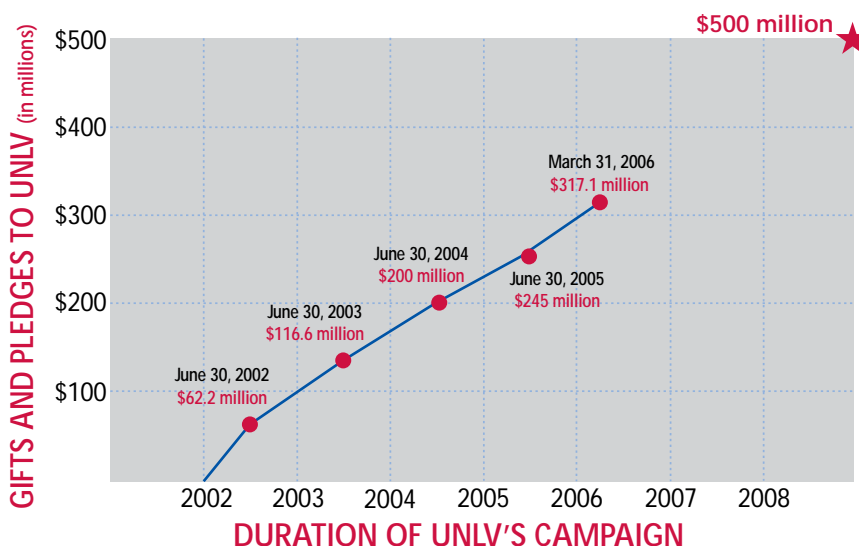
The Science, Engineering and Technology Building is a major step in increasing momentum for Nevada's economic diversification effort. The building will showcase a breadth of compelling programs and will attract students into high-demand fields, such as computer science, environmental science, and electrical engineering.

The Black Box Theater has been designated by the Howard R. Hughes College of Engineering as an important funding priority for Invent the Future, UNLV's first comprehensive campaign to raise \$500 million. To learn more, log on to campaign.unlv.edu.

College of Engineering

Campaign Funding Priorities

- Entertainment engineering—
Black Box Theater
- Science, Engineering and Technology (SET) Building
- Technology program
- Center for Entrepreneurship
- Renewable energy and research



Invent the Future is UNLV's first comprehensive effort to secure the promises of tomorrow through a \$500 million fundraising initiative. With your help, private funding for students, faculty, research, facilities, and programs will map a course for Las Vegas' next decade.



Engineering Donor Honor Roll

This roll of honor recognizes contributors to the College of Engineering from October 19, 2005 through May 25, 2006. The college wishes to thank the following individuals, corporations and foundations for their generous support. Every gift to UNLV is important and valued. It is our wish to recognize all donors correctly. Please notify the UNLV Foundation at (702) 895-3641 of any discrepancies. Thank you for your support.

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			Robert Schowers '75	
			Seagate Technology	
			Joel Searles '03	
			Dion Segler	

FIRST Attracts High School Students to Engineering, Technology



The FIRST (For Inspiration & Recognition of Science and Technology) Robotics Las Vegas Regional Competition returned to UNLV for the second year in a row to immerse high school students in the fascinating world of design, engineering, and technology. From March 30 through April 1, forty-three high school teams from 11 states competed for the regional championship and a trip to the national championship in Atlanta, Geo.

“There is no doubt that the social, industrial, and educational landscape of our great nation has been dramatically altered over the last few decades,” explains Eric Sandgren, dean of the Howard R. Hughes College of Engineering. “Our inability to motivate and train students for employment in technical fields has placed this country at considerable risk. It is time to reinvent engineering and science education, and there’s no better place than a city like Las Vegas and a program like FIRST Robotics.”

Under the direction of Sandgren, Department of Mechanical Engineering Chair Mohamed Trabia, Ph.D., Professor Brendan O’Toole, Ph.D., and staff colleague Kevin Nelson and several mechanical engineering students mentored six Las Vegas high school teams to prepare for the competition.

In January, each team received an identical kit of parts and software and was challenged to design and build a robot less than 120 pounds and not larger than five feet high, wide, or long. Once the robots were built, they were programmed to compete in this year’s game “AIM HIGH.” The two-minute game was played by two three-team alliances on a large field where they guided their robots to throw balls into two corner goals for points. Many spectators described “AIM HIGH” as the ultimate high-tech sporting event.

Cimarron-Memorial High School defended their championship, earning the honor of representing Las Vegas at the National Championship in Atlanta. Their lead adviser and a member of the regional planning committee, Joe Barry was named 2006 volunteer of the year. Cimarron-Memorial also received the Radio Shack Innovation Control Award. Del Sol High School, under the guidance of mechanical engineering student Stacy Raagas and College of Engineering model designer and machinist Kevin Nelson, received the Xerox Creativity Award.

Additional information about FIRST may be found at www.lvfirst.org or www.USFIRST.org.

ALUMNI PROFILE: PAUL VILLALUZ The Artistry of Engineering

“Engineering is an art,” says former undergraduate student and recent graduate student Paul Villaluz ’97, ’06.

Villaluz is a civil engineering artist and believes that instead of paints on a palette or notes on a page, engineers use their knowledge of applied math and science to provide elegant and economical solutions for many diverse problems. “Our everyday tasks can markedly affect the overall quality of life,” he says. “I have always been fascinated with the notion of being able to help others behind the scenes.”

Not only is Villaluz an engineering artist, but he also has achieved much success as a vocalist. He began his singing career in the choirs at UNLV in 1993. He is also the voice behind the National Anthem at Las Vegas Wranglers home hockey games. Additionally, he has performed with the Las Vegas Philharmonic, participated in 12 local musical productions, and recorded three holiday CDs for the Green Bay Packers, Chicago Bears, and Denver Bronco football teams.

Villaluz provides engineering expertise to planning the annual Fall Transportation Conferences, and also lends his vocal talent to various college events, including the Honors Convocation this spring. Prior to the event, he and three

other UNLV graduates, two of which are also engineering graduates make up the band “Traffic Jam,” and entertained our FIRST Robotics teams.

Each newsletter will feature an alumnus of the Howard R. Hughes College of Engineering. If you are interested in submitting your profile, please contact Christine Wallace at christine.wallace@unlv.edu.



“Traffic Jam” performing with FIRST emcee, Mark Leon (second from left). Band members (from left to right) are Cynthia Beauchamp ’03, Paul Villaluz ’97, ’06, Darrell Soltero, Kathy Kingston ’89, and Kevin Tomlinson ’97.

Recent Graduate “Reaches for the Stars” with Double Major

by Camille Calimlim, Speaker at May 2006 Commencement

Commencement was both exciting and bittersweet, and speaking at this year’s graduation ceremony was a wonderful way to complete my experience at UNLV. It was my honor to represent the Howard R. Hughes College of Engineering.

UNLV was an easy and natural choice for me since I am from Las Vegas and had the Millennium Scholarship opportunity to help defray the cost of my education. The hard decision, however, was my major. With my parents both having engineering degrees, they “encouraged” me to pursue a civil engineering degree. However, I was certain to be a communication studies major. Obviously I chose civil engineering, and two and a half years into my engineering degree, I decided to pursue both degrees and still graduate on time. I always say my communications background is my “rebellion” against my parents. I also believe that engineering is in the people as it is in the formulas, and communication is important in establishing a rapport, a relationship between clients and co-workers. I am fortunate that I have the aptitude for both career fields.

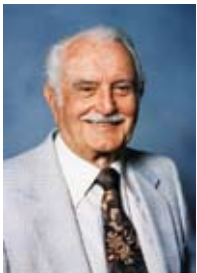
I would be remiss to pretend that my accomplishments were

done without any assistance. I owe my deepest gratitude to my mentors and my professors, specifically Jaci Batista, Ph.D. and Thomas Piechota, Ph.D. My sincere thanks also to the Department of Civil and Environmental Engineering, and the Howard R. Hughes College of Engineering. But most importantly, my gratefulness always to my family and my parents for keeping me grounded, so that I may keep reaching for the stars.



Dean Eric Sandgren congratulates Camille Calimlim.

Las Vegas Community Loses Engineering Patriarch J.A. Tiberti



J.A. Tiberti

UNLV and the Howard R. Hughes College of Engineering mourn the passing of J. A. Tiberti, who died on May 3, 2006, at the age of 87.

J. A. Tiberti was a leader in the Las Vegas community and as the founder of Tiberti Construction Company was one of the most prominent builders in the valley. He was a staunch supporter of UNLV, and

made a \$1,000,000 gift in 1979 to help create the Howard R. Hughes College of Engineering. He was responsible for constructing 10 buildings at UNLV, including the Thomas T. Beam Engineering Complex.

Tiberti was member of the UNLV Foundation Board of Trustees, the College of Engineering Advisory Board, and the Construction Management Advisory Board. His dedication, leadership, and tremendous personal charm will be missed by the many people whose lives he touched.

CICT

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development expertise in the areas of computer architecture, logic design, embedded systems, field programmable gate array (FPGA) synthesis, digital signal processing, image processing, data compression, data encryption, data mining, database management, computer networks, wireless communication, sensor networks, and network security.

All inquiries regarding CICT research projects should be directed to Shahram Latifi, Ph.D., who can be reached at (702) 895-4016 or via e-mail at latifi@egr.unlv.edu.

Robert Mendenhall Honored with Doctorate of Laws

Robert L. Mendenhall was the recipient of an honorary Doctorate of Laws degree during the 2006 Commencement Ceremony at UNLV. Mendenhall is the founder and president of Las Vegas Paving Corporation and a donor to the Howard R. Hughes College of Engineering. He invented and patented the asphalt recycling process, as well as numerous other inventions that benefit the construction industry and help conserve natural resources. Mendenhall has served as a judge for the Senior Design Competition and supports the Senior Design Dinner.

Senior Design Competition Honorees Offer Solutions to Engineering Challenges

The year-long Senior Design Competition concluded with an annual dinner to recognize and applaud the efforts of students who designed and implemented solutions to real-world engineering challenges. The dinner, held May 5 at Cox Pavilion, serves as the official award ceremony where winners are announced for the Harriet and Fred Cox Engineering Design Awards. The Senior Design winners are determined by a team of industry partners that serve as judges. Honorees from the fall and spring semesters receive a cash prize and a commemorative award for their efforts.

More than 250 students, parents, faculty, and industry partners attended the event and participated in a friendly competition, where each table of guests designed something with LEGO® pieces. Their LEGO® creations served as table centerpieces and were judged by the William K. Moore Elementary LEGO® Club. This year's winners designed a prototype of the H-1 Racer replica that hangs in the Great Hall housed in the Thomas T. Beam Engineering Complex.

H. K. Desai, president, CEO, and chairman of the board for QLogic Corporation, a company that has supplied more than 50 million products for servers, workstations, RAID subsystems, tape libraries, and disk and tape drives since 1993, was the featured speaker. Desai holds a master's degree in electrical engineering from the University of California, Berkeley, and a bachelor's degree in electrical engineering from Maharaja Sayajirao University in India.

Students, faculty, and staff from the Howard R. Hughes College of Engineering thank Fred and Harriet Cox for their extraordinary support of the Senior Design Program. The college also recognizes the generous support of the 2006 sponsors: Las Vegas Paving Corporation, Emulex Corporation, International Game Technology (IGT), American Pacific Corporation, Bank West of Nevada, Bally Technologies, Howard Hughes Corporation, PBS&J, Penta Building Group, Stantec Consulting, Tronox LLC, Venture Catalysts, and G. C. Wallace Company.

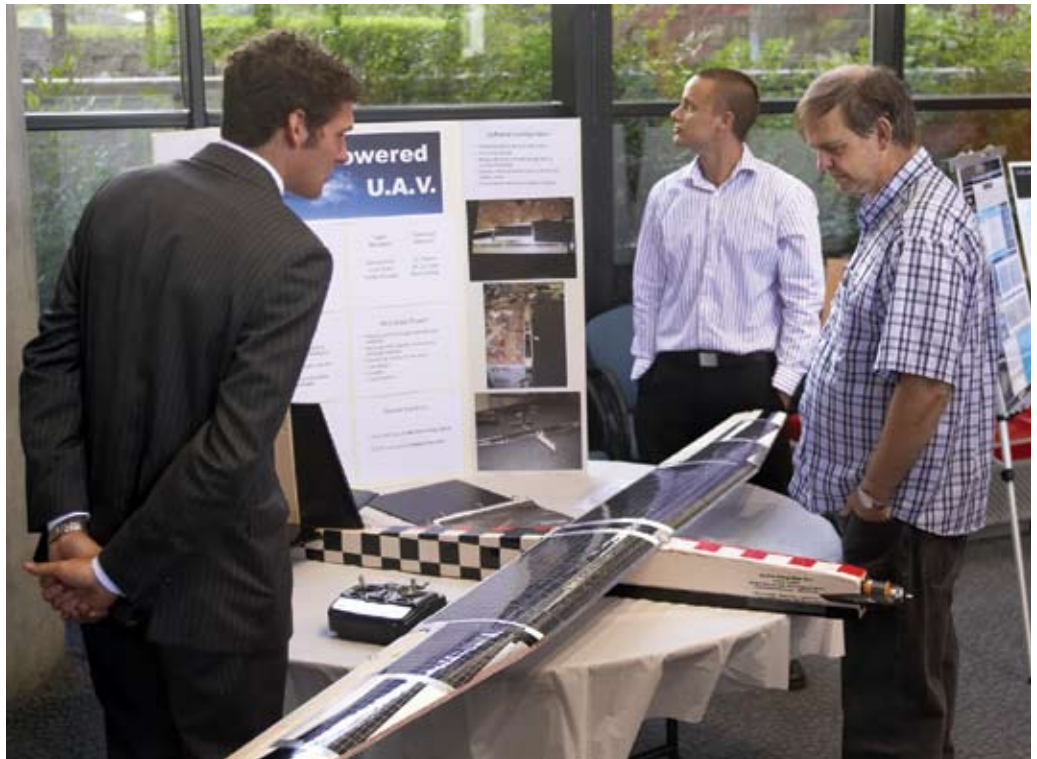
The fall 2005 judges were: Adam Godorov, project manager at Nevada Power Company, Kevin McOsker, principal engineer at the Clark County Department of Development Services, and Michelle Miller, project manager of nuclear nonproliferation at Bechtel Nevada. The spring 2006 judges were: Michael Blois, manager of value engineering at Bechtel SAIC Company, Blake Gover, director of electronics engineering, Young Electric Sign Company (YESCO), Ronald Hill, office manager at the Washington Group, and Robert L. Mendenhall, CEO of Las Vegas Paving Corporation.



Fall 2005 grand prize winners Houton Osemwengie and O'Dealya Price.



Engineering students conduct final test before their presentation.



Keven Forcade, electrical engineering lab director, reviews the solar powered UAV prototype.



True POS Restaurant Self Ordering System Grand Prize Spring 2006.



Dean Eric Sandgren (right) and Fred Cox (left) thanked featured speaker H.K. Desai.



The William K. Moore Elementary Lego® consultants lent their expertise at the May event.

2005-2006 Senior Design Winners

FALL 2005

GRAND PRIZE

“W.A.T.S.- Automatic Plant Watering System”

O’Dealya Price and Houston Osemwengie

FIRST PLACE

“Design of a Multiuse Trail in Henderson”

Department of Civil and Environmental Engineering
Thomas Ackeret, Jenner Costello, Jeremy Crew, and James Graves III

“H.O.M.I.S.-Home Security Robot”

Department of Electrical and Computer Engineering
Chris Hicks, Samuel Martinez, Jr., and Kraig Otani

(Tie for first place in the Department of Electrical and Computer Engineering)

“Automated Car Visors”

Department of Electrical and Computer Engineering
Alfred Hau and Doug Wettekin

“Direct Hydrogen Injection”

Department of Mechanical Engineering
Hiroshi Aoshima, Bryan Ganitano, and Marc Newmarker

SECOND PLACE

“Auto Avoidance System”

Department of Electrical and Computer Engineering
Ignacio Aguilar, Joe Huerta, and Martin Villasenor

SPRING 2006

GRAND PRIZE

“True POS Restaurant Self-Ordering System”

Department of Electrical and Computer Engineering
William Downer, Jon Ross, and Mike Sadowitz

FIRST PLACE

“UNLV South Parking Garage”

Department of Civil and Environmental Engineering
Jonathan Seeley and Akash Sehdev

“Ultra GPS-Advanced GPS Logging”

Department of Electrical and Computer Engineering
Glenn Mercier and Ryan Smith

“CETON-Cooled Electron Target Optimized for Neutron-production”

Department of Mechanical Engineering
Tim Beller, Brice Howard, and Ryan LeCounte

SECOND PLACE

“Blowdown Water Treatment and Reuse”

Department of Civil and Environmental Engineering
Zachary Hills, Holly McNaught, and Cheryl Runyan

“SODIS: A Disinfection Strategy Combining Solar Disinfection and Organic Acids”

Department of Civil and Environmental Engineering
Camille Calimlim, Rob Davies, and Chariti Welch

(Tie for second place in the Department of Civil and Environmental Engineering)

“Eye Tracking Device for Real Time Remote and Vision System”

Department of Electrical and Computer Engineering
Steve Mikhail, Aaron Ponzio, and Tan Wu

“Next Generation Football Helmet”

Department of Mechanical Engineering
George Ladkany, Kent Nakata, and Lawrence Ruggieri

Student Organizations

American Society of Mechanical Engineers

The student chapter of the American Society of Mechanical Engineers (ASME) received a Diversity Action Grant (DAG) from the National ASME organization. The DAG project aims to increase the number of women and minorities pursuing engineering by awarding funds to universities whose student sections of ASME design a project to expose and inspire underrepresented groups to pursue a career in engineering. The UNLV ASME student chapter held the first of several planned seminars in March, and included two days of featured lectures, presentations, and hands-on interactive activities in several engineering labs. The event received local publicity from KNTV. An August seminar is scheduled for the Del Sol High School students who participated in the March 2006 FIRST Robotics Las Vegas Regional Competition.

Institute of Transportation Engineers Receives Coveted Award

The UNLV College of Engineering's Institute of Transportation Engineers (ITE) chapter earned the "District 6 2006 Best Student Chapter" award for the 2006 academic year based on the high level of student participation, regular chapter activities featuring guest speakers, transportation-related field trips, technical presentations and published papers presented by students, research conducted by student members, and member service to society.

The chapter received a \$300 cash award for their chapter funds along with a \$1,000 travel allowance to attend the next meeting in Hawaii. The district includes 35 chapters across the 13 westernmost states in the United States. The chapter, which has increased its membership from 32 to 59 members, also received this honor last year.

Mohamed Kaseko, Ph.D., advises the group along with a team of faculty and professional staff members who assist the students with their planning and research.

Society of Automotive Engineers Prepares for Mini-Baja®

The Society of Automotive Engineers (SAE) recently reorganized its student group and held elections in April. The group plans to enter the 2007 Mini-Baja® competition, which consists of three regional competitions that simulate real-world engineering design projects and their related challenges. UNLV students will generate financial support to design and build an off-road vehicle that must survive the severe punishment of rough terrain and weather elements. In addition, teams compete to have their design accepted for manufacture by a fictitious firm.

The 10-horsepower Intek Model 20 engine the students will use for the project was donated by Briggs & Stratton Corporation. For more information about SAE and the competition, please contact Brendan O'Toole, Ph.D. at bj@me.unlv.edu or visit the organization's Web site at <http://students.sae.org/competitions/minibaja/>.

American Society of Civil Engineers

The student chapter of American Society of Civil Engineers (ASCE) received numerous awards this academic year, according to faculty adviser Tom Piechota, Ph.D. These honors include:

- A letter of honorable mention for the student chapter from the national headquarters for the ASCE.
- A certificate of commendations for Piechota and practitioner adviser Chris Luquette, who is employed by Sigma Engineering Solutions.
- A fourth place "Overall Award" at the steel bridge competition held for the Pacific Regional conference. The team also earned a first place for "bridge stiffness," and third place for aesthetics.

Nanotechnology *continued from page 1*

existing LEDs because nanotechnology enhances electrical and optical properties. Another application is a high-performance infrared detector that will be used in space-based reconnaissance systems. Das also plans to expand to biomedical applications of nanotechnology. He believes that nanotechnology has tremendous potential in biomedical applications such as advanced drug delivery systems, implantable devices that automatically administer drugs and sense drug levels, cancer tagging mechanisms, lab-on-a-chip, real-time diagnostics for physicians, and regenerative neurotechnology.

Das has also been involved in training students in nanotechnology. In addition to directing graduate student research, he involves a number of undergraduate students in his research program. Das has also developed a new undergraduate course in nanotechnology that he is teaching every year and will be teaching a new course on nano-bio sensors beginning fall 2006.

Das eagerly awaits the completion of the new Science, Engineering and Technology Building, scheduled to open in 2007, so that he can continue building the nanotechnology facility. Once the new facility is completed, most of the nanotechnology equipment will be housed there from the nanotechnology facility. Additional information on the nanotechnology research program can be found at www.unlv.edu/labs/nanotrnp.

Honors and Awards in the Howard R. Hughes College of Engineering

- Robert Boehm, Ph.D., received the 2005 Rudolf W. Gunnerman Silver State Award for Excellence in Science and Technology. He also received the 2006 Leadership Award for Research and the Outstanding Individual — Las Vegas Regional Chapter award from the US Green Building Council — Las Vegas Regional Chapter.

- Yitung Chen, Ph.D., mechanical engineering professor and associate director of the Center for Advanced Computational Methods (NCACM) hosted a NSF-CBMS conference titled “Mathematical and Numerical Treatment of Fluid Flow and Transport in Porous Media” in late May. Information is available at www.ncacm.unlv.edu/cbms/.

- Stephen Frazer joined the college May 15 as the new senior systems administrator. Frazer most recently served as a computer consultant in Nye County.

- Laxmi Gewali, Ph.D., received the 2005-2006 Outstanding Service to the School of Computer Science award.

- Varun Jain was named the 2005-2006 Outstanding Electrical and Computer Engineering Teaching Assistant.

- Moses Karkouzian, Ph.D., received the 2005-2006 Outstanding Teacher of the Year award from the Department of Civil and Environmental Engineering.

- Mohamed Kaseko, Ph.D., from the Department of Civil and Environmental Engineering, Brendan O’Toole, Ph.D., from the Department of Mechanical Engineering, and Rama Venkat, Ph.D., from the Department of Electrical and Computer Engineering were selected as the Tau Beta Outstanding 2005-2006 Teacher of the Year honorees.

- Yoohwan Kim received the 2005-2006 Outstanding School of Computer Science Researcher of the Year Award.

- Graduate students Kumarswamy K. Nakelswamy and Jagadeep Thota; and Brendan O’Toole, Ph.D., Mohamed Trabia, Ph.D., and Trevor Wilcox were awarded the 2006 Best Paper Award for the Society for Advancement of Materials Processing Engineering (SAMPE) Conference,

and received a certificate of recognition and a check of \$250 as an award. Samaan G. Ladkany, Ph.D. is the faculty mentor for the student chapter.

- Jeffrey Markle '98, '01, joined the Department of Mechanical Engineering as lab director. He has an extensive industrial experience in the MEMS area, with emphasis on single-chip pressure sensors for automotive applications.

- Darrell Pepper, Ph.D., mechanical engineering professor and director of the Center for Advanced Computational Methods (NCACM) has been appointed as an Alternate Member of the 2006-2007 Engineering Accreditation Commission (EAC).

- Emma Regentova, Ph.D., was named the 2005-2006 Outstanding Electrical and Computer Engineering Professor.

- Srunjanbabu Sridharala, mechanical engineering Ph.D. candidate and Valerian Kwigzile, civil engineering Ph.D. candidate, both received a UNLV Graduate Research Training (GREAT)

Assistantship for summer 2006 and will receive a monthly stipend of \$1,333 for three months.

- Mechanical engineering graduate students Jagadeep Thota and Srujanbabu Sridharala received third place for their paper, “Optimization of a Light-Weight Composite Explosion-Proof Vessel for Use in Air Transport.” The paper, presented at the 2006 Regional Student Conference — Region VI involved Finite Element (FE) modeling of the explosion-proof vessel and the technique used to optimize the FE model. The work presented was done under the guidance of Mohamed B. Trabia, Ph.D., and Brendan J. O’Toole, Ph.D.
- Angelo Yfantis, Ph.D., was named 2006 Outstanding School of Computer Science Teacher of the Year.



Newsletter photography courtesy of UNLV Photo Services and Rodd Buckle Photography.

Transitions

Civil and Environmental Professor Gerald Frederick Retires
Gerald Frederick, Ph.D., served the Howard R. Hughes College of Engineering beginning in 1993. He taught courses in reinforced concrete design, statics, seismic design, steel design, structure analysis, and structural foundation. Frederick typically taught three to four courses each semester; mostly evening classes. During six of his 13 years with the college, Frederick received the Department of Civil and Engineering's Outstanding Teacher of the Year award. At a reception held in his honor Frederick received a UNLV rocking chair, a plaque, and the formal announcement that President Carol C. Harter approved Frederick's new title of professor emeritus.

In Memoriam. Faculty and colleagues mourn the loss of Leo Phanord, an undergraduate computer science major, who died May 8.

Center for Materials and Structures (CMS)

The interdisciplinary Center for Materials and Structures (CMS) is headed by Brendan O'Toole, Ph.D., with faculty from throughout the various engineering departments and other colleges within the university. The mission of CMS is to conduct materials and structures research and to also provide educational and outreach activities in support of the local and national needs for highly trained personnel in the materials and structures fields. The center currently conducts research that affects the development of guided missiles helping to construct safer military vehicles while also making sure to protect the electronics inside of them.

"How Can I Help the College of Engineering?"

Alumni and other friends support the Howard R. Hughes College of Engineering through attendance at special events, gifts to specific programs, and undesignated gifts for Dean Eric Sandgren to use as "venture capital" to support emerging needs in the college.

These undesignated gifts are part of our annual giving program — an ongoing effort to increase yearly donations to support the Howard R. Hughes College of Engineering directly. We invite you to support this vital effort through:

Membership in the Dean's Associates program. Your gift of \$1,000 or more to the dean's unrestricted source of funding makes the greatest impact in the Howard R. Hughes College of Engineering. We are pleased to recognize donors at this level with membership in the Dean's Associates program.

Pledges through the Rebel Ring Phonathon. In the spring, students will phone our alumni and other friends to share college and department news, and ask for support specifically for these programs.

Online gifts. Your gift to the Howard R. Hughes College of Engineering may benefit your tax return. Make a gift online at foundation.unlv.edu and we will mail you a receipt suitable for your tax records. UNLV is a federally-recognized 501(c)(3) organization.

We are pleased to recognize you for your gift through any of these programs in our newsletter. For more specific information on how your gift helps the Howard R. Hughes College of Engineering, please contact Calleen Norrod Johnson at (702) 895-2913.

We Want to Hear from You

Send us your personal and career updates.

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Degree _____ Graduation Date _____

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Please fax or mail this form to:

Calleen Norrod Johnson, CFRE, Director of Development, Howard R. Hughes College of Engineering, University of Nevada, Las Vegas, 4505 Maryland Parkway, Box 454005, Las Vegas, NV 89154-4005, Fax: (702) 895-4059

Minority Engineering Program Hosts Annual Luncheon and Awards Ceremony

The 15th annual Minority Engineering Program (MEP) awards luncheon was held on April 29 at the Moyer Student Union. Sixty guests attended to recognize the academic and intellectual achievement of MEP students. The luncheon also acknowledged faculty, staff, board members, and other community partners for their support. A. C. Hollins, Jr., a Department of Energy Contractor for 33 years, was the featured guest speaker.

“Outstanding Academic Achievement” certificates were awarded to students who earned a grade point average (GPA) of 3.0 or better while enrolled in 12 or more credit hours during spring and fall 2005 semesters. Certificates of recognition for outstanding academic achievement were also provided by U.S. Sen. Harry Reid’s office.

Additionally, freshman Arinze Usowihe, sophomore Juan Plata, junior Arrielle Mathis, and senior Nesley Orochena received individual plaques for their success in having the highest GPA in their respective classes.

Alvin Morris was named the “Outstanding MEP Student” based upon his academic performance, leadership, active participation in MEP activities, and his willingness to help others.



The MEP program began in 1989 and currently has an enrollment of 160 students, including (seated, left to right) Kazeem Omidiji, Alvin Morris, Ramona Sanders, Chandra Blackmon, and Arrielle Mathis; (standing, left to right): Christopher Contreras, Crain Correia, Jonathan Sanchez, Manuel Portocarrero, Shawnta Horton, O’Dealya Price, Brandon Johnson, Jordan Ariche, Mackie Allen, Arinze Usowihe, Aaron Baca, Derrick Pace, Bianca Davis, and Niveen Shlayan.