

The Newsletter of the Department of Nuclear Engineering

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NANT Scholarships

The National Academy for Nuclear Training (NANT) Scholarship Program awards scholarships to college students who are interested in pursuing careers in the nuclear power industry. The scholarships are funded by all U.S. utilities that operate nuclear power plants and by companies that offer services to the nuclear industry.

For the 2002-03 academic year, 44 out of 74 new NANT undergraduate scholarships of \$2,500 have been awarded nationwide to nuclear engineering students. Eight (8) undergraduate students (11% of the total awards) in the Nuclear Engineering department at UMR are recipients of new NANT scholarships. These students are sophomores Matthew Dennis, Mary Ernesti, Bren Phillips, juniors Allison Adams, Jeremy Gorelick, Craig Heimericks, Hannah Yount, and senior Benjamin Amiri. Congratulations to all of our outstanding students!

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Nuclear Engineering has Moved

If you come back to visit the Nuclear Engineering department, you will notice some obvious changes in Fulton Hall. The Nuclear Engineering offices are now all on the second floor of Fulton Hall. Occupying the former NE office area on the first floor is the new School of Management and Information Systems.

The Nuclear Engineering department office is now located in 222 Fulton, with Laci Lower as the Administrative Assistant. The office of the Nuclear Engineering Department Chair, Dr. Kumar, is now located in 222A Fulton. The faculty offices remain in Rooms 203, 219, 224, 225, and 226. The laboratory space remains unchanged and is located in Rooms 105 through 110 in Fulton Hall.

The department has acquired new student offices. These are located in Rooms G14, 111, 204 and 205.

The Ameren UE lab now occupies Fulton 230 and the Computer Learning Center (CLC) has moved to Fulton 215. The CLC contains 15 new Dell Pentium-4 PCs with Windows XP, 1 Pentium-4 Dual Processor with Linux, and two Power Mac G4s. Room 215A Fulton is the new Nuclear Resource Center (NRC). The NRC is still in a state of flux right now, but when completed will have the latest periodicals, reference material, and computers for our nuclear engineering students.

If you are in the area, please feel welcome to visit us anytime.



Annual Phonathon October 17, 20 - 22, 2002

This year's Phonathon is scheduled for October 17, 20-22, 2002. Nuclear Engineering students will be contacting you during this four day period. Your generous contributions allow us to help our students with the costs of attending UMR and greatly aid our recruitment efforts. In addition, we can upgrade our labs by providing matching funds for equipment purchases. We look forward to talking to you again!

MORE TO COME 

Message from the Chairman

Greetings from the Nuclear Engineering Department! I am writing to share with you some of the challenges and accomplishments of the Nuclear Engineering Department for this past year.

One of the most exciting developments in the department is the hiring of a new faculty member, Dr. Heather Gepford, who joined the department in January 2002. Dr. Gepford received her Ph.D. in Nuclear Engineering in January 2002 from Georgia Institute of Technology. Dr. Gepford is also a Certified Health Physicist. With this addition to the faculty and our objective to address the needs of nuclear industry, the department is considering a name change to Nuclear Engineering and Health Physics department.

Another faculty change is the retirement of Dr. D. Ray Edwards. Dr. Edwards retired this year after 39 years at the University of Missouri-Rolla.

I am pleased to announce that this year's Nuclear Engineering Summer Camp 2002 was a tremendous success! There were 52 attendees from high schools in 14 different states. There were 29 campers from Missouri, 4 from Arkansas, 3 students each from Idaho and Nebraska, 2 students from Kansas, North Dakota, and Oklahoma, and 1 student each from Colorado, Iowa, Illinois, Minnesota, Pennsylvania, Tennessee, and Texas. Some of these students have already applied for admission to UMR for Fall 2003. Mr. John Graham, former President of the American Nuclear Society; Mr. Tod Moser, Adjunct Professor of Nuclear Engineering at UMR and Midwest Representative of Dominion Engineering, Inc.; Dr. Eric Loewen of INEEL; and NE alumni Erik Shores of LANL spent a few days at UMR helping the Summer Camp.

The NE Summer Camp is undoubtedly helping us increase our enrollment. For the 2002-03 academic year, there are 25 freshman students who have indicated an NE preference. This is the highest number of NE preference students in a long time, and it is the highest number of any department in the School of Mines and Metallurgy this year. We are obviously very proud of this enrollment.

Another item of pride for the department is that in 2002, of the 74 new National Academy of Nuclear Training scholarships (\$2500 each) awarded nationwide 8 were awarded to UMR NE students. The recipients of these scholarships were sophomores Matthew Dennis, Mary Ernesti, and Bren Phillips; juniors Allison Adams, Jeremy Gorelick, Craig Heimericks, and Hannah Yount, and senior Benjamin Amiri. Also, Jane Diecker, Julie Tucker, Tracia West, and Micah Hackett received scholarships from ANS ranging from \$2000 to \$4000.

With the help of gifts from alumni and campus computing funds, we have made substantial progress in upgrading our Computer Learning Center. In the next couple of years, our radiation measurement laboratory needs to be upgraded as well. Our major challenge is running the department with the virtual loss of all operating funds (E&E) this year due to cuts in funding from the state. It is critical, now more than ever, that we seek support from our alumni and other private sources to provide the best education to our students. Your help is gratefully appreciated. Please keep in touch.

Best Wishes from the Department,
Arvind S. Kumar

DOE/NEER Grants

Dr. Arvind Kumar has received a 3-year DOE/NEER grant on the "Effect of Localized Flow on Fracture of Reactor Components" starting August 2002. It involves the development of finite element and other modeling capabilities to examine and predict the consequences of changes in microstructure and mechanical behavior on the performance of reactor components and thus determine component viability and longevity under normal and transient reactor operating conditions.

This is the second year of a 3-year DOE/NEER grant awarded to Dr. Tsoulfanidis to develop neutron transport computational algorithms for an Accelerator Driven System (ADS). In an ADS, a beam of high-energy protons from a charged particle accelerator impinges upon a target and produces a source of high-energy spallation neutrons. The target is surrounded by fissionable material so more neutrons are produced through fission and the whole system is subcritical. The neutrons produced will be used to transmute radioactive wastes and produce power. In this research the variational nodal method is used as contained in the Argonne National Laboratory code VARIANT as a point of departure. Dr. Tsoulfanidis is developing methods that compute neutron fluxes in the presence of the streaming void presented by the accelerator tube and to calculate power distributions plus calculating the transmutation rate of the radioactive wastes.

THERE'S MORE 

Dr. Gepford's First Year

Howdy! My name is Heather Gepford, and I joined the nuclear engineering department in January 2002 as a new faculty member. In addition to a Ph.D. in nuclear and radiological engineering, I am also a Certified Health Physicist. My first semester at UMR was an interesting one, teaching reactor physics and learning my way around the system.

Although I was raised in a small rural community in northwest Iowa, it has taken a little time to become readjusted. (Our mailbox has been bashed/shot/stolen 4 times in six months!) After moving to Topeka, KS at the age of 12, I stuck around to complete my undergraduate degrees in physics and math at Kansas State University. I then packed my boots and moved to Austin where I completed an MSE in nuclear engineering at the University of Texas. My husband and I had fallen in love with central Texas, so I found a job with a nuclear gauge manufacturer (TN Technologies) outside of Austin. After 6½ years we decided it was time to move on, so I accepted a health physicist position with a dosimetry provider (Radiation Detection Company) in Sunnyvale, CA. Then we moved to Atlanta so I could pursue my Ph.D. at Georgia Tech. In case you don't know, 2800+ miles with a Ryder truck and two dogs is NOT a fun trip.

I am looking forward to this upcoming school year and the opportunity to interact with our increasing number of students. I went back to school to get my Ph.D. so that I could teach, and this semester's course load includes Nuclear Technology Applications, Introduction to Nuclear Engineering, and Fundamentals of Nuclear Engineering. I also have a number of students who will be working with me on a variety of research topics, from neutron dosimeters of various types to developing methods of communicating nuclear technology topics to the public in the 21st century. As the American Nuclear Society faculty advisor, I look forward to working with all of the students we have in the program.

Nuclear Engineering Summer Camp 2002

The third annual UMR Nuclear Engineering Camp was a huge success this summer. The Nuclear Engineering Department hosted two sessions, July 21-26 and July 28-Aug. 2. We sent camp flyers to high schools all over the country. Fifty-two (52) students attended the summer camp. The nationwide recruiting efforts of the members of the Nuclear Engineering Development Board were greatly appreciated.

Nuclear Engineering sophomore Mary Ernesti served as camp director. Mary, Justin McConnell, Taylor Bass, and Patricia Welker served as the primary camp counselors who led activities for the "campers" such as morning warm-up challenges using references to nuclear engineering terms that the students were learning during the week and a Computer Learning Center "scavenger hunt" on nuclear industry sites on the internet. The students performed a radionuclide identification experiment in the Radiation Measurements Lab, discovered sources of natural radioactivity across the UMR campus, and built a cloud chamber. The students were able to further expand their knowledge of different fields of nuclear engineering with tours of the Callaway nuclear power plant, UMR reactor, and the Phelps county hospital's nuclear medicine and radiology oncology departments.

Of the 52 campers 45 indicated that they applied or would apply for admission to UMR's Nuclear Engineering Department in Fall 2002, 03 and 04. The evaluation sheets filled out by the students on the last day indicated that they had a great time! Each student will receive an action packed video CD and a certificate of attendance as souvenirs of the camp. Our summer camp was a genuine success and we are definitely looking forward to the summer of 2003!

Dr. Tokuhiro's Summary

Hi! In March 2002, three sophomores in nuclear engineering passed the NRC Reactor Operator's Exam and are now licensed. Besides NE304, 306 and 308, UMRR has also initiated two projects, Reactor Remote Monitoring and Reactor Robotics Development and Deployment (R2D2). The former consists of incrementally developing means to remotely monitor the facility after hours. As for the latter R2D2 projects, plans for a first generation surveillance robot, is just getting underway. We have also been working with Omron USA in testing their FaceKey, a facial recognition (biometric) device to control access to one of the UMRR access points. As for irradiation-based projects, we have used neutron activation analysis to "fingerprint" local wines (St. James) and have been testing the radiation resistance (radiation hardness) of commercial-off-the-shelf (COTS) opto-electronic components and devices. Two graduate students are using particle image velocimetry to study flow in the near-wake of an air bubble and an oil droplet. These flows are of relevance to many types of natural and engineered systems including sequestration of carbon dioxide and oil spills. Finally, the reactor is gearing up for distance learning/training capability. If you would like to have a NE306 "refresher", you will soon be able to enroll remotely and arrange for on-campus training at your convenience over a one-year time span.

ONE MORE 

Alumni Set Another New Record for Contributions

Nuclear Engineering alumni set another new record with \$10,932 in gifts to the department during the 2001-02 phonathon. The new record surpasses the previous record of \$8,845 set in 2000-01. Of the 170 Nuclear Engineering alumni in the donor pool, 79 participated in the 2001-02 phonathon resulting in a 46% pledge rate. This is the highest pledge rate on the UMR campus. The average gift of \$138 also established a new record, beating out last year's record average of \$104. Most impressive is that gifts exceeded pledges of \$10,865, coming in at 101 percent!

"A great thank you for your generous support of the nuclear engineering program," comes from Dr. Arvind Kumar, chair of Nuclear Engineering. "As you know, there has been a severe funding shortage for higher education in the state of Missouri. Every gift that you give to UMR's Nuclear Engineering Department helps us attract more students and helps to close in the gap in our nation's needs for nuclear engineers. Your gifts also help us remain a leader in nuclear engineering education." This year's gifts will increase the number of undergraduate scholarships, help attract more students to nuclear engineering plus improve and upgrade our laboratory facilities.

Along with making a pledge, please take time to talk with our UMR students. They appreciate the encouragement and guidance you offer them. A few days after our call, you will receive a pledge letter by mail. Please include your company's matching gift form if your company is a matching gift contributor. Any amount you give will be greatly appreciated. Most importantly, you will make a very positive difference in the lives of our nuclear engineering students.



Throughout its history, MSM-UMR has benefited from the generosity of alumni and friends who have provided support through their bequests and other planned gifts. The Heritage Society is our way to recognize those who have invested in the university's future through planned gifts. These gifts include a variety of testamentary and lifetime arrangements that provide future support for the university and financial benefits for the donor.

Take advantage of Planned Giving through the Heritage Society. To request information on the benefits of membership or to learn more about ways to remember UMR through a planned gift, call the Office of Planned Giving at 800/392-4112.

The Nuclear Engineering department would like to thank and acknowledge the following alumni, friends and companies for their generous contributions between July 1, 2001 and June 30, 2002.

GIFTS LESS THAN \$100

Aceil, Smaeil M '84
Alford, David B '98
Alley, Michael E '96
Ballinger, Clinton T '87
Barnes, David K '83
Becka, Gary A '76
Blase, John J '74
Cypret, O W '74
Endsley, Charles M '75
Gode, Timothy D '91
Hadley, Stanton W '79
Hart, Charles M '86
Hinton, William K '76
Holtzschler, Dale L '72
Hovland, Rebecca M '98
Howard, Gianne E '89
Kalder, Charles J '72
Krause, Serena J '98
Kuspa, John P '72
Lawson, James A '89
Lojek, Jan R '69
McLaughlin, Matthew K '92
Minarich, Craig M '98
Phillips, Katherine A '90
Rackley, Kevin D '80
Richardson, Brian D '96
Sautman, Mark T '91
Schottel, Jimmy D '70

Shelton, Dale A '85
Shrestha, Bijaya '95
Singer, Richard J '75
Starke, Richard M '71
Szatkowski, Daniel J '89
Thro, John R '78
Van Asdale, Shawn M '94
Vandivort, Kirby L '95
Wahler, Vincent C '65
Wells, David W '97
Wilson, Rodrick D '00

GIFTS \$100 OR MORE

Baker, Kenneth L '77
Barkalow, Thomas W '74
Bartine, David E '66
Brian, William R '78
Browning, Jimmy J '85
Burchill, William E '64
Covington, Lorne J '86
Croessmann, Charles D '81
Daily, Charles R '83
East, Jacqueline M '89
Eshelman, Curtis D '86
Ford, Michael J '88
Garner, Harold R '76
Hayward, Robert L '75

Huecker, Jonathan D '93
Justis, Paul G '85
Kinn, Gregory S '87
Knaup, James W '84
Moffett, Donald L '74
Mueller, Gary E '76
Palmtag, Scott P '93
Pearman, John O '84
Reid, Billy W '77
Rempe, Joy L '81
Ross, James D '94
Sakowicz, Paul M '93
Schmidberger, Joseph F '00
Schnell, Donald F '86
Shelton, Jeffrey D '98
Simpkins, Alice A '89
Smith, Jeffery Joel '87
Smith, Lenard A '92
Smith, Rowdy L '86
Steinmetz, Keith A '94
Struve, James E '73
Taber, Brian K '91
Till, Henry A '68
Tsoulfanidis, Nicholas
Wolkenhauer, William C '62
The gifts received by the department from individuals total \$8,982.

The following corporations made gifts to the Nuclear Engineering Department during the same time period.

Alliant Energy Foundation
Ameren Charitable Trust
American Nuclear Society
Bechtel Foundation
Chrysler Corporation
Commonwealth Edison Company
Energy Operations, Inc.
Energy Services Incorporated
Lockheed Martin Corporation
PPL Electric Utilities Corporation
Parker Hannifin Foundation
Southern Company Services, Inc.
Studsvik Scandpower, Inc.

The matching gifts received by the department from corporations total \$1,950.