The News-tron Transport

NEWSLETTER OF THE NUCLEAR ENGINEERING PROGRAM AND THE AMERICAN NUCLEAR SOCIETY

VOL. 1          WWW.NUC.UMR.EDU          FALL 2006

Nuclear Engineering Summer Camp 2006

This summer the Nuclear Engineering department hosted its seventh annual summer camp. A total of 50 students from 11 different states attended and the two sessions for this year’s camp were held on July 16-21 and July 23-28, 2006.

The camp was a great success, and the recruiting effort of the students, alumni, and faculty were greatly appreciated.

During the camp, the students were exposed to a variety of activities. The activities included: Radionuclide Identification and Half-life experiments. These experiments were headed by Ron Morton, Mike Lampe, Kenward Callender, Kelly Geister, and the UMRR presentation based on information they gathered during the week in focus groups. This year’s focus groups included: Reactor Operations, Space Nuclear Power, Next Generation Reactor, and Nuclear Fuel Cycle. During the group meetings, campers interacted with faculty and student mentors to prepare a presentation on their respective focus groups to be given at the end of the week.

This year, AmerenUE granted permission to bring our campers for a tour to the Callaway Power Plant. During the tour, we visited the turbine building, talked with plant engineers, and learned about the technical specifications and history of the plant. This was a special opportunity that our campers will remember for years to come.

This year, the primary camp counselors were Alicia Canelos and Terry Yu. The counselors led activities such as evening quiz sessions that tested knowledge learned during the day and social events held afterwards. Many high school students who attended the camp indicated that they would like to be contacted in the future about entering UMR’s Nuclear Engineering program.

Many thanks to those who were involved with the many different aspects of the camp. The summer camp was a great success overall.
Letter from the Program Chair

Last year was a very good year for the Department of Energy (DOE) infrastructure improvement grant to our program in support of graduate student fellowships, undergraduate scholarships, summer camp expenses, new faculty development support, and laboratory equipment purchases. However, the DOE grant required dollar for dollar matching from private and state funding sources. We were fortunate to have substantial support from AmerenUE Callaway Nuclear Plant for a significant part of the matching funds with the remainder provided by your generous contributions and state funds. We are indeed very thankful to you and AmerenUE for the generosity.

I am pleased to tell you that our undergraduate and graduate students are academically superb. Six new NANT scholarships ($2500 each) were awarded to our undergraduates. It is important to note that only 69 new scholarships were awarded this year by NANT to students from 24 universities. In addition, one freshman student, Christopher Bellavia, received the 2006 American Nuclear Society (ANS) Incoming Freshman Scholarship Award, a highly competitive national scholarship. It is a matter of pride that our undergraduates perform admirably in national competitions.

Our graduate students have done equally well in receiving prestigious national and UMR funded fellowships. This year, Brandon Dietler, received the DOE Advanced Fuel Cycle Initiative (AFCI) University Fellowship in the amount of $42,500. Nationally, only 7 new AFCI Fellowship awards were made by DOE. Graduate students from more than 30 universities with NE programs competed for the AFCI fellowships. This is the second award won by our graduate students. Last year, Matt Dennis was the recipient of the AFCI award. We applaud the success of Brandon and Matt. In addition to these AFCI fellowship awards, two new Chancellor Fellowships were awarded to Jonathan Frasch and Tricia Mattson. This brings the total number of Chancellor Fellowship awardees to 4. The Chancellor Fellowships waive all UMR fees of the recipients up to 3 years. Indeed, we have very fine graduate students who deserve our admiration.

With increasing enrollment, our challenge is to provide personalized attention to all of our students. We must insist on the administration to provide us with additional faculty members who will teach specialized courses and provide research opportunities to our undergraduates.

In closing, I must say that I am truly proud of our students. I hope you will keep supporting our efforts by providing financial support for scholarships, laboratory equipment upgrade, new faculty development and summer camp expenses.

Anand S. Kimmer
Professor & Program Chair
Nuclear Engineering
Dr. Kim’s Two-phase Flow and Thermal-hydraulics Laboratory (TFTL) Update

We had another busy and productive year here at TFTL. The rectangular two-phase flow test facility is now being operated in its full capability, such that experiments under both the uniform and non-uniform inlet conditions are being performed with the new Graphical User Interface (GUI). The GUI is developed by our own NE undergraduate students, and it enables operator to control the local conductivity probe measurement, electromagnetic flow meter, pressure transducer and data acquisition process during the experiment via Personal Computer. I am sincerely thankful to the research support provided by the Department of Energy Innovations in Nuclear Infrastructure and Education (INIE) program. I am also particularly proud of our undergraduate students who have been working hard at TFTL and help establish the facility. Currently, there are five undergraduate students and one graduate student working at TFTL engaging various research topics.

In view of research development, two research proposals have been awarded by DOE. Both of them are expected to be funded in the FY07. The research entitled as “Interfacial area transport and regime transition of two-phase flow in combustor-dual flow channel” is awarded by DOE NEER. It is a three-year research project proposed to study geometrical effects in two-phase flow transport and performs detailed two-phase flow experiments in vertical upward to horizontal and horizontal to vertical downward combustor dual flow channels. The second project entitled as, “Separate effects experiments on multidimensional phenomena in the interfacial area transport” is awarded by DOE Junior Faculty Award Program (JFAP). This is also a three-year project and proposes to perform non-uniform inlet experiments in the existing rectangular two-phase flow facility to develop predictive models for multi-dimensional phenomena in two-phase flow transport. In addition to these, the existing research supported by US NRC and Bettis Atomic Laboratory, “Interfacial area transport in horizontal two-phase flow with flow restrictions” and “Two-phase interfacial structure development”, respectively, are going well. In particular, the outcome of NRC supported research is being published. Two international conference proceedings have been published and one journal publication is being reviewed. I am expecting to see at least two additional journal publications from this research.

I am also happy to see more undergraduate students are interested in two-phase flow and thermal-hydraulics. The experimental course, NE 301 entitled as “Two-phase flow in energy systems” had enrollment of 11 NE students (Total 12) in Winter semester of 2006, which is a significant increase from 3 NE students (Total 9) in Fall semester of 2004. With the continuing increase in the enrollment in two-phase flow course and research development, I am hoping to attract more students to our graduate program from our own undergraduate program in the future.

Figure 1. Matt McCreary and Bethany Faughn, undergraduate NE students, perform two-phase flow experiments using newly developed GUI.

Figure 2. Photographic images of two-phase flow with non-uniform inlet conditions captured in the rectangular test facility at TFTL.
Dr. Jeffrey King arrives at UMR!

I am very pleased to be joining the Nuclear Engineering Faculty at the University of Missouri-Rolla this semester. In the short time I have been here, I have grown very fond of UMR and impressed with the NE department. We are blessed with high caliber faculty and many excellent students. My first class, Nuclear Fuel Cycle, is going well and I look forward to teaching Reactor Physics in the Spring.

When not teaching, I have been developing a research program on compact nuclear reactors for space power and other applications. This program recognizes that small, compact, likely fast-spectrum reactors are going to have an important role to play in the nuclear mix as we proceed into the 21st century. Many engineering challenges confront us with this class of reactors and I am interested in studying the reactor physics, control strategies and coolant choices related to these reactors. I am also very interested in improving the nuclear system modeling infrastructure here at UMR and am serving as the Department's Beta-Test Liaison to the MCNPX development team at the Los Alamos National Laboratory.

I am proud to announce the establishment of the Space and Compact Nuclear Power Systems Laboratory in 212 Fulton Hall. This lab will provide space for my students and provide equipment for both the real and virtual modeling and simulation of compact nuclear reactor power systems.

I have enjoyed getting to know the students at UMR and look forward to serving as the Advisor to the UMR Student Chapter of the American Nuclear Society. Please feel free to drop in and say "Hi" whenever you have a chance.
NANT Scholarships

Congratulations to all of our outstanding students! Six (6) undergraduate students in the Nuclear Engineering department at UMR are recipients of new NANT scholarships of $2,500 each for the 2006-2007 academic year. These students are sophomores Ernest Giusa, Kristin Kaino, Matthew Kotowski and juniors Matthew Bernard, Victor Smith, and Terry Yu.

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. This year, the NANT undergraduate scholarships were awarded to 69 nuclear engineering students nationwide.

Fellowships

2006 - 2007 NANT Graduate Student Fellowship
Tricia Mattson

UMR Sorbon Chancellor's Fellowships:
Tricia Mattson
Jonathan Frasch
Michael Lampe
Ronald Morton

DOE Advanced Fuel Cycle Initiative University Fellows:
Brandon Distler (2006)
Matthew Dennis (2005)

2006 American Nuclear Society (ANS) Incoming Freshman Scholarship Award:
Christopher Bella via

Graduate Luncheon

ANS decided to host its first annual commencement luncheon on Saturday, May 13th, 2006. Over 100 friends, family, faculty, and students attended the event after commencement. Located at the Missouri Vineyards in St. James, MO, the luncheon was a great opportunity for our 2006 graduating seniors to celebrate with family, friends, and the Nuclear Engineering faculty and staff.

In addition to being a wonderful opportunity to celebrate, the luncheon was also a good fundraising opportunity because of donations given by the non-graduating students that attended. ANS is hoping that the luncheon will continue to be a fundraising success full of fun and festivity.
The State of the UMR American Nuclear Society
Chapter by Mike Lampe, President, ANS

Greetings from the UMR American Nuclear Society! I'm honored to have this opportunity to cover the UMR ANS Student Section successes and future events. However, before I continue, we should recognize our 2004-2005 President, Bren Phillips, for suggesting a newsletter and our Nuclear Engineering Program Chair Dr. Kumar who has included our organization in this newsletter. Without the support and encouragement of these two men, we may have never had the motivation to undertake this endeavor.

The ANS portion of the newsletter will cover some of the events that occurred after the last ANS newsletter. As you will read later, Alpha Nu Sigma, the Nuclear Engineering Honor Society, is making a comeback. Also, our chapter has recognized the need to keep better records of our events and membership activities, so we are using the new Activity Record which was created by the 2005-2006 officers. You will also read about the Highway Cleanup and how it has increased in popularity with our members, having 17 of them come out and pick up trash instead of the traditional half a dozen. We are looking forward to continued growth and success for these events and programs, as well as for other events and programs.

We continue to assert our dominance in educating the engineers of tomorrow. On October 14th, ANS in conjunction with the UMR Reactor, will host the nuclear engineering portion of Badge University, a program for middle school aged girls to learn about many different types of engineering. This program and others such as High School Reactor Tours, the Boy Scout Merit Badge Workshop, and Expanding Your Horizons that we dispel the myths of nuclear engineering and help foster an interest in nuclear-related fields.

This academic year we will be including some new events such as Twilight Fright, a clothes drive, and adopt-a-family. Twilight Fright is an event sponsored by Circle K International for grade school kids to go to for Halloween on October 27th. We would participate by having both selling liquid nitrogen ice cream and dry ice root beer, much like we did at the UMR Block Party on April 22nd. In an effort to contribute more to the community we will be collecting clothes around Thanksgiving to donate to a local charity. We will also be collecting gifts and donations around the end of the semester to give to a local family so they would have wonderful Christmas.

As you may already know, our society also sponsors social events. There's an article later in the newsletter about our annual ANS fish fry picnic. Other social events include the Floating/Camping Trip, and our potluck dinner. This year we have already started to sponsor more socials such as trivia nights, movie nights, and next semester we plan to go to Bushwhackers for paintball.

I must admit that I'm proud about our participation and planned participation in the 2006 ANS Summer and Winter Conferences, respectively. Amongst all the student groups, we had strong representation at the summer conference with 4 members, all of which gave a presentation at the conference. There are 17 members signed up to participate in the upcoming winter conference. I would like to thank the UMR NE program for supporting us at the summer conference and hopefully for support at the winter one.

Thanks to all our alumni for your continued support. If you ever have a chance, shoot us an email...we always need good speakers!

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\text{Did You Know?} & \\
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\text{Nuclear Engineering is growing a} & \\
\text{furious pace at UMR. Check out our} & \\
\text{current enrollment figures:} & \\
\hline
\text{Freshmen Preferred} & 43 \\
\text{Sophomores} & 29 \\
\text{Juniors} & 43 \\
\text{Seniors} & 26 \\
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\end{array}\]
Alpha Nu Sigma State of the Organization Address

Greetings from the President’s Desk:

I, Alfred Schovanec, President of Alpha Nu Sigma, am pleased to inform you that Alpha Nu Sigma has retained its recognized student organization status and is in the process of being rebuilt. Alpha Nu Sigma is UMR's academic achievement society for Nuclear Engineering students. Our primary mission is to recognize and encourage high scholarship, integrity, and potential achievement in the nuclear fields of outstanding students.

Alpha Nu Sigma Officers for 2006–2007

- President: Alfred L. Schovanec
- Vice President: Michael L. Lampe
- Treasurer: Beth J.B. Swafford
- Secretary: Zachary S. Miller
- Advisor: Dr. Snouh Usman

ANS Fall Picnic

On September 8th, ANS sponsored another successful annual picnic. There was a good turnout and grill master Seth Bradley (Pictured at right) pleased all of our stomachs with burgers and hotdogs. Side dishes included chips and cookies for dessert. The event was planned and executed by this year’s social chair, Jeff Harrouff, who, though normally fashionably late, came early to supply the food and start the grills. Besides food, many of the attendees could be found playing volleyball, including the new professor, Dr. King.

Most of the time playing was spent chasing after frisbee balls hit by the infamous ball basher, Alfred Schovanec III. Another attendee, Ron Brey, brought his baseball mitt and enjoyed a refreshing game of catch with a friend. After the sports wound down, many of the attendees sat together and discussed life and Nuclear Engineering. All in all, the picnic was a success and

Check out the new and improved UMR ANS website!
www.ans.umr.edu

Grill master Seth Bradley
New ANS Activity Points and Point System

In Spring of 2006, the ANS Student Section officers decided that a record of each member's participation in ANS activities should be tracked starting in Fall 2006. This record shall be called the Activity Record. The Activity Record will keep track of active members and assist Officers in the distribution of ANS funds for student trips (like USEC), conferences, and other membership expenditures. In addition, the tracking of members will allow voting members to know which of the officer candidates is most active in the UMR-ANS section.

Reaching Out to Freshmen

ANS participates in the preview, registration, and orientation activities on campus during PRO Day, which start in February and continue throughout the semester. During this event, the incoming freshmen spend a day on campus to register and become familiar with UMR. This is also the opportunity for them to see the various student activities on campus. This is a great way for ANS to meet the incoming students and recruit them into our group. There are about 8 of these events each year and ANS had a booth at each of them to expose incoming students to our organization.

Visit to the United States Enrichment Corporation (USEC)

For one of last year's ANS trips, 21 UMR ANS members embarked on a cross-state trip to the gaseous diffusion plant at USEC in Paducah, Kentucky. There the group was able to tour parts of the 750-acre facility and learn how the nation's only uranium enrichment plant provides the necessary amounts of SWU to power plants in the United States and internationally. For more information on what the group learned, please visit www.usec.com.
2006 – 2007 UMR ANS Student Section Officers

As our student section continues to grow, both by membership and activities, our officers and officer positions are adjusting. We currently have 12 officer positions which contribute to the ongoing success of our organization. Our officers are not only fulfilling their assigned duties but also volunteering to do additional work.

Our newest officer position is Public Information Officer. We have noticed that there is a lot of misinformation out on the internet and this officer would find an article and correct the misinformation by posting his own article on our website. Obviously there is way more misinformation about nuclear engineering, nuclear science, and radiation for this officer to correct all of it, but at least we are setting some of it straight.

Michael Lampe, President  Alfred Schovanec III, Webmaster
Reena Hunter, Vice President  Tricia Mattson, Corresponding Secretary
Zak Kulage, Secretary  Brandon Distler, Public Information Officer
Nathan Ayers, Treasurer  Jeff Harrouff, Social Coordinator
Beth Swafford, Historian  Victor Smith, Reactor Liaison
Travis Gitau, Outreach Coordinator  Sue Schroer, STUCO Representative

ANS Polo Shirts Now Available – And You Get a Newsletter Discount!

We are pleased to offer classy green polo shirts bearing the UMR ANS logo over the heart. They are perfect for any business casual environment or alumni function. Normally these shirts run $25 plus shipping. If you order using the form below (or write us and mention this newsletter) you can get them for $22 each, plus a nominal shipping charge.

Number of each size:

___ S  ___ M  ___ L  ___ XL  ___ XXL

(Total Number of Shirts ___) * $22.00 = _____ + $4.00 shipping = _____ Final Price

Please make checks payable to UMRANS. You can always contact us at ans@umr.edu with any questions or visit us at www.umr-edu

Mail Check and Order Form To: UMR ANS Shirt Sales
222 Fulton Hall
1870 Muser Circle
Rolla, MO 65401-0170
Annual Phonathon
November 5 - 8, 2006

Your generous contributions in the past had tremendously helped our students with the costs of attending UMR, greatly aid our recruitment efforts, and helped us upgrade our labs by providing matching funds for equipment purchases. This year’s Phonathon is scheduled for November 5 - 8, 2006. Nuclear Engineering students will be contacting you during this four day period. Your generous support this year will be highly appreciated. We look forward to talking to you again!

The Nuclear Engineering department would like to thank and acknowledge the following alumni, friends, and companies for their generous contributions between July 1, 2005 and June 30, 2006.

**GIFTS OVER $100**

BURCHILL, WILLIAM, E 1964
CROISSMANN, C., DENNIS 1981
DAILY, CHARLES, R 1983
EASSON, SHELDON, A 1975
EASTBURN, MICHAEL, R 1967
ESHELMAN, CURTIS, DAVID 1986
FERGUSON, PHILLIP, DEAN 1988
FERRERO, JAMIE, MARLENE 2003
GARNER, HAROLD, R 1976
MOFFETT, DONALD, L 1974
PHILLIPS, KATHERINE, ANN 1990
RADCLIFF, THOMAS, D 1980
SCHNELL, DONALD, F 1988
SIMPKINS, ALICE, ANN 1989
TILL, HENRY, A 1968
VAN ASDALE, SHAWN, MICHAEL 1994

**CORPORATE GIFTS $100 & UNDER**

ALLIANT ENERGY FOUNDATION
BECHTEL FOUNDATION
EXELON CORPORATION
PROGRESS ENERGY INC
SAVAGE MANAGEMENT INC
SAVAGE MANAGEMENT INC
TSOULFANIDIS, NICHOLAS
AMERICAN ELECTRIC POWER
ENTERGY SERVICES INCORPORATED
HORN RAPIDS LAND AND CATTLE CO.
HORN RAPIDS LAND AND CATTLE CO.
PROGRESS ENERGY INC
PSEG

**CORPORATE GIFTS OVER $100**

DAIMLERCHRYSLER CORPORATE FUND
LOCKHEED MARTIN CORPORATION
BECHTEL FOUNDATION
LOCKHEED MARTIN CORPORATION
NUCLEAR ADVISORY GROUP, INC.
NUCLEAR ADVISORY GROUP, INC.
AMERICAN NUCLEAR SOCIETY

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**What’s New?**

Keep us posted on what’s happening with you or if you have news to share.
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**National Ranking:** The outside world is beginning to recognize the true collection of talent, quality, and dedication located at UMR. Here are some of the rankings the University has received in the past year.

**U.S. News & World Report,**

*America's Best Colleges 2007* (August 2006)

- UMR ranks No. 54 among the nation's top public national universities (tied for 112th overall among public and private universities).
- UMR is tied for 48th on the list of best engineering programs at doctoral-granting universities and tied for 26th place among public doctoral-granting universities.
- UMR is the 2nd highest ranked public national technological research university.

*Best Graduate Schools 2007* (April 2006)

- UMR is ranked 68th among the nation’s best graduate engineering schools.
- U.S. News’s online rankings include five UMR graduate engineering programs:
  - Civil engineering, ranked 44th
  - Electrical engineering, ranked 51st
  - Materials engineering, ranked 47th
  - Mechanical engineering, ranked 50th
  - Nuclear engineering, ranked 15th