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A FINAL FAREWELL

After a few months of work as documented in previous editorials, our ad hoc committee appointed by Chancellor Carney has prepared the final draft of our National UTC vision, mission, and theme. An abridged version of the document prepared by the committee is reported here:

Center vision

To maintain and upgrade the transportation infrastructure of the 2nd millennium and to start the development for the one of the 3rd millennium.

Center mission

To conduct research and development and education and technology transfer activities related to the theme of the center.

Center theme

To address national needs in the areas of transportation

infrastructure and safety focusing on the following areas:

Advanced materials

including constructed facilities security, which will involve the following:

- a) development, manufacture, and application of modern construction materials
- b) installation processes and engineering design
- c) standardization and code approval of products and design protocols

Transition-state fuel vehicle infrastructure

leading to a hydrogen economy, which will involve the following:

- a) safety codes, standards, and regulations
- b) infrastructure development and deployment

Non-destructive evaluation (NDE) technologies and methods

including monitoring and evaluation of new and repaired structures and system components.

Rationale

UMR has determined that it is of critical importance to its own mission and future as well as to the economical success of the state of Missouri to focus on advanced materials:

- a) Will help with the upgrade and maintenance (including security hardening) of the existing infrastructure.
- b) Will contribute to the development of the new infrastructure.

Similarly, NDE methods and techniques are a core

area of expertise at UMR, and their development and deployment will help society with the health monitoring of the existing infrastructure and will become an integral part of the new infrastructure to ensure its acceptance and safety.

Finally, the center will tackle the challenge of alternative fuels (including hydrogen) in a systematic approach as the only viable methodology for the safe deployment of the new form of transportation.

Abridged

In a nutshell, the center is ready to tackle new challenges while maintaining a solid foothold in its previous thematic areas. One more time, we need to recognize that this has become possible because of the significant level of funding that a National UTC entails, thus equaling an extraordinarily bright future for UMR researchers and students.

Starting in July, our National UTC will also have a new director in the person of the Vice Provost for Research, Dr. Wayne Huebner. Dr. Huebner will be assisted by two technical directors, namely, Dr. John J. Myers, Associate Professor in the Department of Civil, Architectural, and Environmental Engineering; and Dr. K. Krishnamurthy, Professor in the Department of Mechanical Engineering

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UPCOMING EVENTS

5th National Seismic Conference on Bridges & Highways*

September 18–20, 2006
San Francisco, CA
mceer.buffalo.edu/meetings/5nsc

Artificial Neural Networks in Engineering Conference

November 5–8, 2006
St. Louis, MO
web.umr.edu/~annie

10th North American Masonry Conference

June 3–6, 2007
St. Louis, MO
www.masonrysociety.org/NAMC

Sixth International Conference on Case Histories in Geotechnical Engineering

August 4–9, 2008
Washington D.C.
www.6icchge2008.org

*See story on page 2





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and Associate Dean for Graduate Studies and Research in the School of Engineering. While Dr. Huebner will have the overall administrative responsibility for the center and be the interface with our governing agency at the US DOT, RITA, Drs. Myers and Krishnamurthy will take technical responsibility for the thrust areas of advanced materials-NDE technologies and transportation fuels, respectively. The contact information for the new leaders is given below:

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For any questions or clarification, please feel free to contact our ever-present administrative assistant, Gayle Spitzmiller, by phone at (573) 341-7170 or by e-mail at spitz@umr.edu.

Well, the arrival of new blood and fresh energy can only mean that the now former director, that is me, better find other challenges. I will move to the University of Miami as Professor and Chair of the Department of Civil, Architectural, and Environmental Engineering. In a sense, this is a going home type of move. UM is my doctorate's alma mater and is the institution where I started my academic career as an assistant professor. Of course I am very excited, but I have to admit that it is with a knot in my throat that I revisit these nine years at UMR of which eight were spent as the director of the UTC. It has been the most fulfilling experience that one can imagine from both personal as well as professional points of view. My only hope is that the many people who have touched me over this period of time share at least a fraction of this sentiment. A few days ago while watching the soccer match, USA-Italy, as part of the World Cup, I thought of a strange analogy: who knows, in a not distant future, we could see the Miners play the Hurricanes for a collegiate football Superbowl—no pun intended! We'll cross paths again.

All the best,

--Tony



Valerio, Tony,
& Nestore at the
farewell party
(see page 4)

5TH NATIONAL SEISMIC CONFERENCE

Early-bird registrations are currently being accepted for the 5th National Seismic Conference on Bridges & Highways (5NSC). The period for receiving a discounted registration fee has been extended until July 15, 2006.

The event will be held September 18–20, 2006, in San Mateo, CA (near the San Francisco airport). The key organizers are the Federal Highway Administration (FHWA), the Transportation Research Board, California Department of Transportation, and the Multidisciplinary Center for Earthquake Engineering Research at the University at Buffalo. University of Missouri-Rolla's UTC has demonstrated strong support for the conference and is a platinum corporate sponsor.

The 5NSC is the fifth in a series of biennial workshops sponsored by the Federal Highway Administration focusing on the highway infrastructure. The conference's purpose is to increase awareness of seismic and geological hazards and to enhance the technical expertise of engineering professionals, so they can have the latest tools to mitigate the risk of failure or damage to our bridges and highways. This year's theme is "Innovations in Earthquake Engineering for Highway Structures."

Corporate support from engineering firms, institutions, and companies who provide products and services for use in the field have joined forces to make this conference possible. Additional sponsorships remain available. Space at the concurrent conference technical exhibit is also available on a first come, first served basis.

Caltrans' Chief Engineer Rick Land welcomes all: "In this commemorative year of San Francisco's Great Earthquake of 1906, it is fitting that the 5th National Seismic Conference on Bridges & Highways be held in the Bay area. Come enjoy San Francisco's current state of recovery while getting the latest information on the state of seismic research and practice around the world."

For more information on registration, the conference schedule, corporate sponsorships, or technical exhibit space, please visit the conference Web site at <http://mceer.buffalo.edu/meetings/5nsc>.



SEISMIC RETROFIT WORKSHOP

The in-house workshop on the Seismic Retrofit Design of Continuous Span Steel-Girder Highway Bridges took place on April 4, 2006, in the Hearing Room of the Missouri Department of Transportation. A total of 26 engineers from the central and district offices throughout the state of Missouri attended the workshop. The workshop covered the background of two seismic retrofit strategies—strengthening and damping. While strengthening was familiar to most participants, seismic response reduction by damping was a new topic. Both base isolation and supplemental damping devices were reviewed in detail. The background review was followed by the development of metallic dampers, design procedures, the laboratory validation of a full-scale damper unit, and several implementation issues.

The workshop was part of the technology transfer effort of the recently completed research project, MODOT Study No. RI01-028. The final report (No RDT 05-007) can be downloaded from the MODOT website (<http://www.modot.mo.gov/services/rdt/byDate.htm>).





WE'LL MISS YOU, DR. NANNI!



You're probably wondering...what kind of goodbye does an endowed chair professor and respected director receive? A big party that's what!

On May 23, 2006, family, colleagues, and friends of Dr. Tony Nanni gathered at Dr. Wayne Huebner's house for food, fun, and games. Dr. Huebner grilled up some yummy chicken, burgers, and hot dogs, while party attendees brought side dishes and desserts. The fun and games part of the evening included "hillbilly golf," badminton, Frisbee, and skeet shooting (see photos).



Dr. Nanni was also presented with a plaque honoring him for his service to the University Transportation Center, Center for Infrastructure Engineering Studies, NSF Repair of Bridges with Composites, and the university as a whole over the past nine years. Fellow colleagues shared a few thoughts and stories to show their appreciation for Dr. Nanni and his work (see photos). All agreed that although saying goodbye is difficult, we wish him the best in his new endeavor at the University of Miami, Florida.

The staff would like to thank those who came to help celebrate Dr. Nanni's time at UMR for making the party a success. Thank you to those who contributed time, money, food, and effort, as we couldn't have done it without you. A special thanks to Wayne and Jackie Huebner for the generous use of their house and land for the party.





FLY ASH IMPACTS

Fly ash is a mineral residue and product of coal combustion. According to www.wikipedia.com, “coal can range in ash content from 2–30 percent, and of this around 85 percent becomes fly ash.” Dr. Jianmin Wang will soon begin fundamental research looking at the potential environmental impacts of fly ash during ash beneficial applications (*e.g.*, road construction).

The title of the project is “Leaching Behavior of Coal Combustion Products and the Environmental Implication in Road Construction.” Using a speciation-based approach, Dr. Wang plans to look at the leaching (the process of extracting a substance from a solid by dissolving it in a liquid) of trace elements, especially arsenic and selenium, from fly ash under different environmental conditions.

While this project will focus mostly on the fundamental side, it has broad implications in terms of fly ash beneficial use. Researchers are excited to use UMR’s unique facility with its new HPLC-ICP-MS system, the most advanced on the market. This project is funded by the Electric Power Research Institute (EPRI) and the UTC.

For more information about this project, contact Dr. Wang by e-mail at wangjia@umr.edu.

ALKALI-RESISTANT CFP GLASS FIBERS

Drs. S. T. Reis and R. K. Brow, with J. Shi, a Master’s degree candidate, of UMR’s Materials Science Department have been working on a research project to develop alkali-resistant calcium iron phosphate (CFP) glass fibers for concrete reinforcement. This project is sponsored by the US Department of Energy, under OIT/DOE Award DE-FC36-04GO14046 to Mo-Sci Corp. with the University of Missouri-Rolla as sub-contractor, and by the UMR University Transportation Center.

Glass fiber-reinforced cements (GFRC) are composite materials that are used in relatively thin cross sections such as wallboards, facades, and tiles. The light weight composites bring about savings in time and handling, transportation, and installation costs compared to conventional concrete products. Alkaline-resistant (AR) glass fibers are used in GFRCs. Current commercial AR glass fibers are based on high-zirconia silicate compositions. Unfortunately, these commercial fibers often degrade after about six months in cement environments.

Optimizing the glass-fiber composition is one way to address the problem of GFRC embrittlement with aging. The objective of this program was to develop alkaline-resistant, iron-phosphate glass fibers for use in reinforcing concrete and cement products. Because of their lower temperature viscosity characteristics, iron-phosphate glass fibers offer the added advantage of considerable energy savings associated with manufacturing more refractory commercial, alkaline-resistant, zirconia-containing silicate glass fibers.

As of this month, researchers have prepared and characterized over 100 different Ca-Fe-Phosphate (CFP) glasses and have identified compositions that produce chemically durable fibers at lower temperatures (100–300°C lower) than commercial zirconia-containing silicate AR glasses. The CFP glasses have desirable physical properties and withstand chemical attack in high pH environments. In collaboration with Mo-Sci Corp., the research team has drawn continuous fibers from melts with desirable viscosity characteristics, and these fibers are now being tested in glass fiber reinforced cement (GFRC) composites.

For more information about this project, contact Dr. R. K. Brow by e-mail at brow@umr.edu.



MINORITY ENGINEERING & SCIENCE SUMMER PROGRAMS

MINORITY INTRO TO TECHNOLOGY & ENGINEERING SUMMER CAMPS

This summer, the Minority Engineering & Science Program (MEP) together with the Center of Pre-College Programs conducted two Minority Intro to Technology & Engineering (MITE) summer camps. These one-week institutes were designed to enable minority students who are currently high school sophomores and juniors during 2005–2006 school term to obtain a clear picture of engineering as a profession. Students become acquainted with various fields of engineering, science, and technology, and with the demands faced in these fields. Another goal of MITE is to acquaint students with the type of effort required for college study.

GREAT OPPORTUNITY

The student groups live in the university residence halls and participate in a number of activities that expose them to the university's degree programs and facilities. "This is a great opportunity to showcase our well-known science and engineering programs," said J.P. Fransaw, Coordinator of MEP at UMR. "The program makes for a very busy week for the students, but they seem to really enjoy the experience."



MITE Students: Group 2



MITE Students: Group 1

DISCUSSION & HANDS-ON ACTIVITIES

The MITE students experience lectures from UMR faculty and staff members, are given tours of the campus facilities, and participate in academic discussion groups. Most of the activities focus on a variety of hands-on experimental science projects and engineering workshops.

SCHOLARSHIP

Most of the fifty students in this year's MITE camp were from Missouri and the St. Louis area; however, students also came from Texas, Illinois, Kansas, and Maryland.

Each of the program's rising high school seniors is invited to start the UMR admissions and scholarship application process at the end of the program. Fransaw elaborates, "I expect most of these students will qualify for a UMR scholarship and are likely to attend UMR as freshmen next fall."

The participating students are selected for the camp after a review of their high school transcripts and after expressing an interest in pursuing a college education in a science, technology, engineering, or mathematics field.

FOR MORE INFO...

For more information on next year's MITE or other minority programs, contact the MEP office at mep@umr.edu or visit the Web site at <http://campus.umr.edu/mep>.



MINORITY ENGINEERING & SCIENCE SUMMER PROGRAMS

ONE-DAY SUMMER EXPERIENCES

In addition to the MITE Camps, two one-day experiences were designed for urban youth—the League of United Latin American Citizens (LULAC—Kansas City, MO) and the Infinite Scholars program (St. Louis, MO). These programs provided a glimpse of Engineering, Math, and Science for high school students.



Jennings High School Students



LULAC Participants

HIT THE GROUND RUNNING

The finale project of the summer is the Hit the Ground Running Program/Minority Engineering Summer Enrichment Program. Hit the Ground Running is a summer learning program that offers new students an exciting perspective on learning that will sharpen and enhance their academic skills. This program is an excellent opportunity for incoming students to learn about coursework expectations, campus life, and community involvement at UMR. Participating students take courses in Chemistry, Mathematics, and English for 3 hours of course credit; learn about research and leadership opportunities; and will participate in team-building activities and field trips. The experience helps students develop leadership skills, make new friends, and develop constructive strategies for succeeding academically at UMR.

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