

# Connections

Department of Civil and Environmental Engineering

MICHIGAN STATE  
UNIVERSITY

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## Spanning the Globe—

### *As the World Grows Smaller, Civil & Environmental Engineering Expands Its Reach*

As a discipline, civil engineering has always been deeply connected to the society in which it is practiced. The traditional boundaries of such societies had long begun to blur before the current interest in the international economy. The term “globalism” has appeared so often in the recent language of business and education that it might seem to be a cliché. Yet within the Department of Civil and Environmental Engineering here at Michigan State, the commitment to international experience and education simply reflects a long-standing priority of the university at large. Given the fact that the problems of civil and environmental engineering will continue to spill across national boundaries, familiarity with the cultures and engineering practices of other countries takes on even greater importance than in the past.

Just walking down the halls of the Engineering Building or the Engineering Research Complex will reveal the extent to which our department has become truly an international department. Faculty alone represent nine different countries, and nearly two-thirds of all graduate students arrive here from overseas. We have several hundred international alumni. Beyond that, we strive to offer our undergraduate students, most of whom still come from the U.S., the opportunity to broaden their educational experiences with meaningful study-abroad programs and partnerships with universities in other countries, including Russia, Sweden, and Pakistan. A bit nearer to home, we recently developed a partnership with the University of Puerto Rico at Mayagüez.

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*MSU Civil and Environmental Engineering students pose beneath the world's largest free-standing statue, Mother Russia, in Volgograd, Russia. Standing from left to right: Salman Rathore, Jake DesJardins, Joel Davenport, Sean Stromberg, Brent Shlack, Mike Foess, and In Kyu Lim.*

## Study Abroad in Russia Enriches Experience of MSU Civil and Environmental Engineering Students

Our department has developed a study abroad program in cooperation with the Volgograd State Architectural and Engineering Academy, located in Volgograd (formerly Stalingrad), Russia. This summer, 14 Civil and Environmental Engineering seniors and graduate students have enrolled in CE 843, Simulation of Traffic Flow, which is taught by Professors Thomas Maleck and William Taylor. Students spend four weeks in Russia and then complete the coursework back at MSU.

In addition to three weeks at the academy in Volgograd, the group spends two days in Moscow and two days in St. Petersburg. During the program, students have the opportunity to cruise down the Volga River to the Caspian Sea, visit the circus, attend the ballet, tour the Kremlin and walk through Red Square.

Students in this program get a first-hand opportunity to learn about engineering methods in Russia, including visits to construction sites. In addition, they enroll in Russian 290, Independent Study in Russian Language and Culture, which is taught by graduate exchange students from Russia. This course begins on the MSU campus and continues in Volgograd.

Volgograd itself provides a historic backdrop for this experience. Located in southern Russia, on the Volga River, the city was founded in 1589 as a fortress to protect central Russia from nomadic tribes. Renamed after Josef Stalin, Stalingrad was the site of a horrendous and pivotal battle during World War II. After Stalin's death, the city was renamed Volgograd. Volgograd is home to five theaters, eight universities, and nearly 50 museums. The city stretches along the Volga for nearly 100 kilometers (70 miles). Students returning from this program feel that it really enhances their résumés. In addition to the immersion in Russian engineering and culture, according to Professor Maleck, "Students come back from Russia with a greater appreciation of their own culture and a more global perspective on their engineering careers."

The department hopes to build on this partnership and expand future course offerings there. If you would like more information on this program, please contact Professor Taylor (e-mail: [taylor@egr.msu.edu](mailto:taylor@egr.msu.edu)) or Professor Maleck (e-mail: [maleck@egr.msu.edu](mailto:maleck@egr.msu.edu)). Or visit the MSU Study Abroad web site at <http://studyabroad.msu.edu>.

## Visiting Research Associate Program Strengthens Ties to Civil Engineering in Russia

This spring our department hosted Vera Galishnikova, a doctoral student at the University of Volgograd, as a visiting research associate. Vera's research interests lie in the area of structural mechanics, specifically in methods for approximate analysis of periodic structures.

In Volgograd, Vera taught undergraduate engineering courses and worked as an engineer, specializing in the reinforcement of old structures such as industrial buildings and oil tanks.

Vera's link to MSU came through her father, Vladimir A. Ignatiev, a well-known engineer and rector (president) of Volgograd State Architectural and Engineering Academy. Dr. Ignatiev was familiar with our department, having visited here and having worked with Dr. Bill Saul. According to department chairperson Ron Harichandran, this information sharing is valuable, since for so long, the Cold War inhibited the normal exchange of engineering research between the engineers from the U.S. and Russia.

Vera says the semester spent here was enormously helpful in helping her focus her research and gave her a truer perspective of its place within the discipline. She greatly appreciated the kindness of faculty and staff who gave her careful feedback on her work and helped her make the adjustment of landing in a new country and culture for the first time. She quickly came to appreciate the access to electronic and paper resources afforded by the MSU libraries.

Vera says she enjoyed her stay in East Lansing. She made many friends and even found time to learn skydiving. She hopes to return before too long. We hope so, too.



*Dr. Bill Saul and Vera Galishnikova pose for one of many cherished souvenir photos.*

## Progress Report: the Civil Infrastructure Laboratory

### Great Lakes Cement Promotion Association, Inc. Pledges Support for Research

Support for research in the new Civil Infrastructure Laboratory received an enormous boost through a \$500,000 pledge from the Great Lakes Cement Promotion Association, Inc. The association is comprised of eleven cement companies within the Great Lakes Region. These companies produce about 17.9 million tons of cement per year.

According to Raymond C. McVeigh, Executive Director of the Association, these funds will consist of \$100,000 annual grants spanning five years. McVeigh commented that the association was particularly impressed by the structure of the laboratory's proposed advisory board—a mix of representatives from academe, industry, government—that he feels will provide a synergy for real progress.

McVeigh suggested that some fertile areas of research might include types and use of admixtures in concrete, strength and weight components, and reductions in curing times. The department is excited over this new partnership and the research it will support.

*Flanked by Department Chairperson Ron Harichandran and Professor Parviz Soroushian, Raymond C. McVeigh accepts an award recognizing the pledge of support from the Great Lakes Cement Promotion Association, Inc.*



*Ray McVeigh and Ron Harichandran inspect the site of the Civil Infrastructure Laboratory.*

## Lab Notes

- Guidance for research and teaching in the Civil Infrastructure Laboratory will be sought from an advisory board whose members will include leading donors and selected industry and government representatives.
- Several naming opportunities remain for areas within the new lab. Alumni, associations, companies and friends are invited to participate in this program and name available areas. For more information please contact Mark Brower, director of development, College of Engineering at (517) 355-8339.
- In January, 2001 Mr. Amit Varma will join the department as a new faculty member in the structures area. Mr. Varma is completing his Ph.D. at Lehigh University on the seismic behavior and design of high-strength, concrete-filled, steel-tube beam columns. He will bring valuable experience in large-scale testing of structural steel components and systems, and will be a significant user of the new laboratory.

# A Message from the Chairperson



*"We expect that the new Civil Infrastructure Lab will be a magnet for attracting and retaining premier faculty in the civil infrastructure area."*

Let me tell you some of the exciting things that have been happening in the department. Since the feature article of the December newsletter showcased our plan to build a new Civil Infrastructure Laboratory, let me start with that.

This lab has been a high priority for us for years, but we had to leap numerous hurdles to realize it. After obtaining administrative approvals to embark upon this venture, we designed the facility and put it out for bid in April of last year. The bids came in at \$2 million—\$500,000 higher than was originally estimated, and we must raise most of this money from outside. We have made significant progress in the last year. The Great Lakes Cement Promotion Association, Inc., whose members include eleven cement companies in the Great Lakes states, committed to give us \$500,000.

We have received more than \$350,000 in alumni gifts and pledges, and I would like to recognize some of our leading donors: Reginald F. Batzer ('54), Roger A. Conrad ('67), Leroy R. Dell ('66), Bruce K. Elenbaas ('67), Larry J. Fleis ('73), Richard W. Kriner ('55), Rodney Meade ('55), Leo V. Nothstine ('38), John C. O'Malia ('72), Charles H. Raths ('59), William F. Savage ('56), and Mark A. Young ('83). We are especially grateful for your generosity.

We also have received several in-kind gifts: Rich Anderson, mobilized his team at SOMAT Engineering to perform the soil borings and tests at the site; the Michigan Concrete Association will provide all the concrete for the interior of the building; the Michigan Concrete Paving Association will pave the parking lot and driveways; and James Hardie Industries will provide cement paneling for the interior and exterior of the building. Many of you have assisted our fundraising effort, thank you one and all. Although we have made tremendous progress, more work remains. I hope you will continue to think about this project as a worthy candidate for your annual giving.

Our department is changing rapidly. Several faculty members have retired, or are approaching retirement. Professors Bill Saul and Frank McKelvey retired at the end of last year, and Professor Frank Hatfield will retire next year. Professors Dave

Wiggert, Bill Taylor, Tom Maleck and Mack Davis are pondering retirement. So in the next five years, our department will look very different. The retiring faculty represent some of our most outstanding teachers and researchers, and we will miss them. Yet, we look forward to the challenge of restaffing the department with talented young faculty members from the top civil and environmental engineering programs in the country. We expect that the new Civil Infrastructure Lab will be a magnet for attracting and retaining premier faculty in the civil infrastructure area.

The last two years have witnessed considerable progress in strengthening our curricula. Partly based on input from employers of our students, we have revised existing courses and introduced new ones. A significant initiative is the enhancement of written, oral and visual communication. We hired a technical communications specialist, David Adams, to spearhead this effort. In collaboration with Professor Roger Wallace, David has revamped the laboratory sections of our introductory fluid mechanics course so that students are taught how to structure and write clear laboratory reports and memoranda. David also introduced a new technical communications course this last semester.

With the CEE department at the University of Michigan, we have developed a partnership based on the use of interactive video conferencing technology to broaden the programs at both institutions. Last fall our students learned about construction contracting from a class taught at UM, and this coming fall UM students will study highway operations in a class taught here at MSU.

Other new courses include construction engineering, civil engineering graphics using AutoCAD, engineering economics and ethics, and a site engineering class to be offered this coming fall that will include the use of AutoCAD, Microstation and GIS software. We wish to keep abreast of the needs of the profession, and welcome your input.

A major task ahead of us will be to strengthen our graduate and research programs. Graduate recruitment is a thorny problem nationwide. The job market for CEE graduates is so good at present that it is very difficult to entice our undergraduates to stay on for graduate work. We need to stay competitive in supporting exceptional graduate students and we welcome contributions, perhaps in the

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*A Message from the Chairperson--  
Continued from page 6*

form of deferred estate gifts, to create endowments for graduate fellowships. We must secure funds for graduate fellowships and strengthen links with other institutions that can supply students to our graduate programs. During the last year we have established a strong link with the University of Puerto Rico at Mayagüez, and now have several students from there in our graduate programs. This fall our graduate and research programs will be reviewed by external experts.

I think I have given you a flavor of the department as it is evolving. We have great students, faculty, and staff, and great alumni. I am proud to be part of helping our beloved department become a paragon of excellence.

--Ron Harichandran, Chairperson

## Events Calendar

### CEE Department

For tickets or information, contact Linda Steinman: (517) 355-5107 or [steinman@egr.msu.edu](mailto:steinman@egr.msu.edu)

#### September

- Tailgate and MSU-Marshall University football game on September 9. Please RSVP by July 30.
- Southeast Michigan Reception, Thursday, October 5, 2000, 5:30 to 7:00 pm - NTH Consultants, Ltd., Farmington Hills

### College of Engineering

For tickets or information, contact Lesa Smith: (517) 353-9394 or [smith151@egr.msu.edu](mailto:smith151@egr.msu.edu)

#### July

- Alumni Dinner, July 19, 2000, Chicago 6 p.m. - Como Inn
- GOLD (Graduates of the Last Decade Club) dinner, July 20, 2000, Chicago 6 p.m. - Gin Mill
- Battlecats baseball game, July 25, 2000, Reception at 5:30 PM, Game at 7:00 PM. Battle Creek, MI

#### August

- Alumni dinner, July 31, 2000, Holland, MI
- Alumni dinner, August 1, 2000, Ludington, MI
- Alumni dinner, August 2, 2000, Traverse City, MI
- Alumni dinner, August 3, 2000, Petoskey, MI
- Alumni dinner, August 14, 2000, Houston, TX
- Alumni dinner, August 15, 2000, Phoenix, AZ

#### September

- West Michigan Golf Outing, September 25, 2000. Egypt Valley Golf Club

## Alumni News

**Guy S. Vissing** (BS '48) is a senior project manager with the U.S. Nuclear Regulatory Commission (NRC) and has just completed forty years of service to the federal government with no plans to retire. *E-mail: [gvs@nrc.com](mailto:gvs@nrc.com)*

**W.F. Marcuson III** (BS '63, MS '64, PhD '70) has recently retired from the Army Corps of Engineers, having served as director of the Geotechnical Laboratory at the U.S. Army Engineer Waterways Experiment station. He is currently Zone II Vice President in the American Society of Civil Engineers (ASCE) and a member of the National Academy of engineering. In 1997 he received ASCE's Norman Medal and, in 1999, was selected as ASCE's Terzaghi Lecturer. He now works as a self-employed consultant. *E-mail: [marcusw@wes.army.mil](mailto:marcusw@wes.army.mil)*

**Joseph Jackson** (BS '76) is a project consultant and group manager at NTH Consultants, Ltd. He is the engineer of record for quality assurance/quality control of the Comerica Park superstructure. *E-mail: [jjackson@nthconsultants.com](mailto:jjackson@nthconsultants.com)*

**Harvey B. Coppage** (BS '79) is a vice president and regional manager for the Atlanta office of Black & Veatch. His work specialties include environmental and infrastructure projects. His office recently won a 10-year Superfund contract with the EPA to perform investigative and cleanup work at National Priorities List sites in the Southeastern United States. He is married with two children. *E-mail: [coppagehb@bv.com](mailto:coppagehb@bv.com)*

**James A. Mikulec** (BS '80, MS '82) is manager of product development for the Chevrolet and GMC full-size pickups at the Milford, MI proving grounds. He is interested in talking with Spartan alumni about road building techniques that affect the ride quality of full-size pickups. *E-mail: [jmikulec@provide.net](mailto:jmikulec@provide.net)*

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***Emeritus Professor Leo V. Nothstine (BS '38) and wife Rebecca stand to be recognized at this year's Alumni Banquet.***



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**Hatem Youssef Goucha** (BS '90) continued his studies, receiving an MS from the University of California at Berkeley and his PhD from the University of Texas at Austin. He is an offshore construction coordinator with Bechtel Corporation. *E-mail: [hygoucha@bechtel.com](mailto:hygoucha@bechtel.com)*

**Thomas J. Hrubby, Jr.** (BS '91, MBA '98) is a vice president at PSI and oversees all operations in their five offices in the Dallas-Fort Worth metroplex. These operations include environmental consulting, asbestos and industrial hygiene consulting, geotechnical engineering, and construction materials and testing services. *E-mail: [thomas.hrubby@psiusa.com](mailto:thomas.hrubby@psiusa.com)*

**David DeBerardino** (BS '93, MS '94), a delivery engineer for the Michigan Department of Transportation (MDOT) Port Huron Transportation Service Center (TSC), oversees the MDOT Construction Program, utility coordination, and will assist in future project development for St. Clair County. He is married with a two-year-old son and another child expected in November. *E-mail: [deberardinod@mdot.state.mi.us](mailto:deberardinod@mdot.state.mi.us)*

**Paul Carr** (BS '95) is a transportation engineer for HNTB Michigan, Inc., where he works on highway projects throughout Michigan. *E-mail: [pcarr@hntb.com](mailto:pcarr@hntb.com)*

**Yvonne D. Chang** (BS '95, MS '98) is a staff engineer for SECOR International, Inc. for whom she works on the design of remedial systems and performs risk assessments for the risk-based closure of a large industrial site. She is married to Scott Morris (a PhD student in Mechanical Engineering at MSU). *E-mail: [ychang@secor.com](mailto:ychang@secor.com)*

**Michael Buist** (BS '97) is a staff engineer for Golder Associates in Colorado and reports that his company has been hiring recently (for interested MSU graduates). *E-mail: [MBuist@golder.com](mailto:MBuist@golder.com)*

**Ashan Moeen** (MS '98) is a project engineer with McNamee, Porter & Seeley, Inc., where he works on various water and wastewater treatment applications in Michigan and Ohio. *E-mail: [moeenahs@hotmail.com](mailto:moeenahs@hotmail.com)*

**Kelly Wittman** (BS '98) is also a project engineer with McNamee, Porter & Seeley, Inc., working mainly in the transportation group. *E-mail: [wittman@mcnamee.com](mailto:wittman@mcnamee.com)*

**Darcin Akin** (PhD. '00) has been working for MDOT, but has recently accepted a tenure-track appointment as an assistant professor at Gebze Institute of Technology (GIT) in Turkey. *E-mail: [akindarc@msu.edu](mailto:akindarc@msu.edu)*

## CEE Alumni To Gather at First Fall Football Game

You and your guests are invited to attend the first MSU football game of the season against Marshall University of West Virginia. This game will be held on Saturday, September 9th at Spartan Stadium (game time to be announced). The CEE department has purchased a block of tickets and is making them available to its alumni and guests on a first-come, first served basis. The price per ticket is \$35 and includes a picnic lunch. Tickets can be purchased by mailing a check made out to "Department of Civil & Environmental Engineering, MSU" to

Linda Steinman  
Dept. of Civil and Environmental Engineering  
3546 Engineering Building  
East Lansing, MI 48824-1226

Checks must be received by July 30th or within a week of your reservation, whichever is earlier. You can make reservations by contacting Linda at (517) 355-5107 or [steinman@egr.msu.edu](mailto:steinman@egr.msu.edu).

### Share Your News

Throughout *Connections* you will read about what faculty, students, and other alumni are doing. We want to hear YOUR news as well. Fill out the form below and send it to us—we'll include your news in the next issue.

Name \_\_\_\_\_

E-mail \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Home Phone \_\_\_\_\_ Business Phone \_\_\_\_\_

Degree(s) and Year(s) of Graduation \_\_\_\_\_

Job Title \_\_\_\_\_

Employer \_\_\_\_\_

News about your work, family, achievements

You can also complete this form on the department's Web Site at  
<http://www.egr.msu.edu/cee/alumni/alumniup.html>

## Department News

Several faculty have won awards of note this year. **Neeraj Buch** garnered the James M. Robbins Excellence in Teaching Award for the Great Lakes District, as well as the department's William A. Bradley Outstanding Faculty Award and the university's Teacher-Scholar Award. **Roger Wallace** received the Withrow Award for Teaching Excellence.

Here is just a highlight of public service or outreach activities by department members. **Glen Anderson** serves on the Hogentogler Awards Committee of the American Society for Testing and Materials (ASTM). Neeraj Buch chairs the ACI Task Force on Repair and Rehabilitation of Rigid Pavements. **Mackenzie Davis** is a member of the Editorial Review Board of the *Journal of Air & Waste Management Association*.

**Frank Hatfield** was Chair of the American Institute of Steel Construction (AISC) Partners in Education Committee. **Richard Lyles** is editor of the Highway Division of the ASCE *Journal of Transportation Engineering*. **Susan Masten** served on the Advisory Committee for the 6th International Conference on Advanced Oxidation Technologies. **Parvis Soroushian** chairs the ACI Committee on Thin Reinforced Cement Products. **William Taylor** was instrumental in establishing study programs in Pakistan, Thailand and Russia. **Thomas Voice** helped to develop the M.S. in Environmental Science program at the University of Varna in Bulgaria and environmental engineering programs at the National University of Science and Technology (NUST) in Pakistan.

*Bill Taylor and Shujaat Hussain, president of NUST, discuss joint graduate programs.*



## New Faculty



Dr. Rigoberto Burgueño joined the faculty of the Department of Civil and Environmental Engineering at Michigan State University as an Assistant Professor in January, 2000. His area of expertise is the application of fiber reinforced polymers (FRPs) to civil infrastructure. His experience within this field ranges from mechanical behavior of conventional and advanced composite materials, development of design and analytical tools, large-scale experimental testing, design and analysis of structural components and systems, and construction procedures. Prior to joining MSU he was an Assistant Project Scientist at the University of California, San Diego where he led the analysis and design efforts for the implementation of California's first bridges composed of FRP composites under the supervision of Prof. Frieder Seible. He is a co-recipient of the CERF Charles Pankow Award for Innovation for the development of innovative FRP bridge systems. To read more about Dr. Burgueño's research, see page 10.



Dr. Syed A. Hashsham joined the department in August, 1999 as an assistant professor. Syed received his PhD. from the University of Illinois at Urbana-Champaign in 1996. He was a visiting research associate at MSU from 1996-98, and he returned to MSU

after a year as a post-doctoral fellow at Stanford University. Syed has joined the environmental engineering group within the department and developed a new graduate course, Biological Processes in Environmental Engineering. His research interests include the application of microarray technology to environmental issues, bioremediation, microbial ecology, and mathematical modeling of molecular data.



David Adams joined the department in August, 1999 as a technical writing specialist. David worked as a technical writer and taught technical writing for more than 20 years at such institutions as Unity College, the University of Maine, and within the College of Engineering at Cornell University. David is a Senior Member of the Society for Technical Communication, and past president of its Special Interest Group on Environmental, Health, and Safety Communication. David brings an unusual mix of experiences to his work, with a Master of Fine Arts (MFA) in poetry and four books of poems to his credit. This year David developed and taught a stand-alone technical writing course and is the editor of *Connections*, the department's newsletter.

## Student News

### Nobody Does It Better: MSU Concrete Canoe Team Sweeps Regionals

#### ***Spartan Paddlers Take Eight First-Place Awards at Regionals***

Racing a sleek vessel named *00Spartan*, this year's MSU Concrete Canoe Team swept to a first place overall finish in the regional contest held in Ann Arbor, MI over the first weekend in April. In addition to outscoring teams from nine other universities, the MSU team qualified for the national competition to be held at the Colorado School of Mines on June 24-26.

As you may know, the concrete canoe competition is sponsored by the American Society of Civil Engineers (ASCE) and Master Builders, Inc. The competition consists of an academic and a racing component. Team members not only design and build the canoe, but also race it under sometimes difficult early spring conditions. This year's team met both challenges better than any of its competitors. The team created its design paper and presentation with a James Bond motif (hence, the *00Spartan*),



*Members of the 1999-2000 Concrete Canoe team: Front, l-r; Talia Dodak, John Janiszewski, Stephanie Smith, Troy Kelts, Susan Rozema, Sarah Rozema, Dean Kanitz. Back row, l-r; Karen Ives, Alan Flak, Joseph Lehning, Kimberly Jacks, Norman Holm, Kevin Dubnicki, Alison Leach, Thaddeus Hall, Lavie Golenberg, Nick Mascia, Prof. Mack Davis (coach), Allison Hazen, Jeff Haybill.*

Co-captains Stephanie Smith and John Janiszewski brought senior leadership and experience to the team. Both stressed the hard work and research that lay behind the year-long effort, as well as the rewards of working as a team to produce a winning effort. Professors Mack Davis and Neeraj Buch served as co-advisors to the team. According to Buch, the biggest challenge of the contest is selecting the right mixture for the concrete. "It's not conventional concrete," he said. "This concrete canoe has cement, sand and rocks that are lighter than water."

If you would like to know how you can support the MSU Concrete Canoe Team, please contact Mack Davis at 517/353-6487 or Neeraj Buch at 517/432-0012.

*Spartan paddlers battle cold weather as well as the competition on the way to one of many victories at the Concrete Canoe regionals in Ann Arbor.*



## 2000 Steel Bridge Team Places 2nd in Regionals at U of M; 15th Overall in Nationals at Texas A&M

### ***Bridgers Grab Three Firsts at Regionals and a Second at Nationals***

This year's MSU steel bridge team finished 15th overall (out of 43 entrants) in the National Student Steel Bridge contest, sponsored by the American Institute of Steel Construction (AISC) and the American Society of Civil Engineering (ASCE).

Our team took a 2nd place in the category of construction, and a 7th in esthetics. This year's contest was held over the weekend of May 21-22 at Texas A&M University. The overall national winner was the University of California at Chico. The following web site gives complete results: <http://lowery.tamu.edu/y2kbridge/>.

Approximately 200 universities participated in this year's contest, with 43 advancing to the national competition. The MSU team qualified for the national event by placing second to Lawrence Tech at the regional contest, which was hosted by the University of Michigan in Ann Arbor. At that contest MSU took firsts in the categories of construction time, esthetics, and economy (tie), but was hurt by the overall weight of the bridge.

The MSU construction crew in Texas consisted of Rebecca Cline, Damon Dalby, Matt Dean, Greg Keenan, Mike Szumigala and Peter Walker. Matt Block, Bryan Turczynski and Michelle Wierzba, who contributed greatly to the team's effort, were unable to make the trip to Texas.

The MSU team received support from the following:

- Alumni of the MSU Steel Bridge Team
- American Institute of Steel Construction
- Associated General Contractors—Michigan Chapter
- Douglas Steel Fabricating Corporation
- Great Lakes Fabricators and Erectors Association
- HNTB
- Lansing Community College
- MSU College of Engineering.



*Members of this year's Steel Bridge Team at the nationals in Texas. Left to right: Matt Dean, Rebecca Cline, Damon Dalby, Mike Szumigala, Peter Walker, and Greg Keenan. Standing: MSU-CEE Alumnus Vince Fratinardo. Not pictured: Chris Evans, Bryan Turczynski, Michelle Wierzba.*

If you would like to find out more about how to support the bridge team, please contact Prof. Frank Hatfield at 517/355-5167 or at e-mail: [hatfield@egr.msu.edu](mailto:hatfield@egr.msu.edu).

## Student Awards and Achievements

A number of our students deserve special recognition for awards they received this year. **Stephen Callister** was awarded a USDA Graduate Fellowship in Water Science. **Brian Gombos** received a First Place Research Presentation (Engineering) at the University Undergraduate Research and Creativity Forum. **Chris Evans** received a Second Place in the same forum. **Chris** (with Technical Writing Specialist David Adams) also presented a workshop at the Annual Conference of the East Central Writing Center Association. **Lisveth Flores** was named a Thoman Fellow by the university. **David Herweyer** was named the department's Outstanding ENE Graduate Student, and **Doseung Lee** was recognized as the Outstanding CEE Graduate Student. The department's Academic Achievement Award went to the following students: **Kurt Ahlgrim, Thomas Bostwick, Talia Dodek, Wanda Lau, Timothy Likens, and Rebecca Munger.**

We also wish to recognize the new officers of the student chapter of ASCE: president, **Troy Kelts**; vice president, **Chris Evans**; secretary, **Ahmed Muntasir**; treasurer, **Marisa Patterson**; membership, **Shawn McElmurry**; public relations/newsletter editor, **Norman Holm**; and SEC representative, **Carolyn Quint.**

# Focus on Research

Beginning with this issue, we plan to highlight some of the research activities within the department. This time we have decided to focus on the research interests of our newest faculty member, Rigoberto Burgueño, who answered some basic questions about his research.



*“Properties of FRPs imply significant advantages in the rehabilitation of existing structures and the development of new ones.”*

## 1) How would you define the specific subject of your research?

My primary research interests relate to the implementation of advanced composite materials, or Fiber Reinforced Polymers (FRPs), to civil infrastructure. FRPs, consist of synthetic fibers (carbon, glass, or aramid) embedded in polymeric resins (epoxies, vinylesters, etc.). When cured these FRPs harden to produce unique material (or composite) with very attractive mechanical properties.

Although this has been my research focus during the past years, it is only part of my general interest in structural engineering and, in particular, bridge engineering. Within structural engineering, fiber reinforced polymers have sparked great interest due to their unique characteristics. However, these same advantages present challenges for complete understanding of the material performance and the development of adequate design and analysis approaches.

## 2) What are the implications of your research for your area of engineering? What might be the practical payoffs?

FRP composites were developed primarily for the aerospace and defense industries, but have drawn attention within civil infrastructure because of their high stiffness-to-weight and strength-to-weight ratios, corrosion resistance, and magnetic characteristics, among others. Properties of FRPs imply significant advantages in the rehabilitation of existing structures and the development of new ones. Structures can be retrofitted for seismic demands with minimal construction effort and use disruption. The rehabilitation and/or upgrading of existing structures—for example, bridge superstructure widening—can be achieved without changes

to the existing substructures due to the minimal weight increase. Finally, newly developed systems with FRPs allow for faster and easier construction processes, reduced weight (beneficial for seismic effects or stretching the long-span barriers), and promise a longer service life with reduced maintenance.

## 3) How long have you studied this subject and what is the current status of your research? What special or interesting problems have you encountered?

I have focused on the use of advanced composites for the past six years. My experiences at UCSD (University of California at San Diego) allowed me to be part of an excellent group leading the efforts for the development of retrofitting techniques and new structural systems validated by large-scale testing.

Throughout these experiences I've been able to verify some of the many unique characteristics of these materials, while also identifying several difficulties that must be overcome to guarantee the wide application of FRPs: the acceptance of industry standards in terms of constituents and properties; verification of promised durability; development of adequate analysis and design guidelines usable by practicing engineers, and the development of new structural forms that take advantage of the specific characteristics of FRPs with maximum efficiency. This latter issue is crucial, since the much higher constituent costs of FRPs (compared to conventional construction materials like concrete and steel) could limit their application. Developing innovative structural forms is key to solving this problem.

## 4) What do you anticipate as the future directions of your research?

I plan to continue my work on the structural characterization of hybrid FRP/concrete elements developed in prior work. In addition, I would like to pursue continued development of innovative structural solutions for bridge systems. These new systems may incorporate FRP technology, or conventional concrete and steel materials. Besides particular research projects, one of my primary objectives will be to complete and outfit the Civil Infrastructure Laboratory as soon as possible.

# Focus on Outreach

## Highway Traffic Safety Programs (HTSP) – A Continuing Education Opportunity

In 1998, Michigan had 7,408 construction zone traffic crashes. Twenty-five of these crashes were fatal crashes and another 1,748 were injury crashes. Construction zone safety has become a critical problem as the state continues to rebuild its highways.

In the last *Connections*, we gave a broad overview of the specialty transportation engineering/traffic safety classes offered by HTSP. For this issue we wish to highlight one of the classes and workshops that we offer: the one-day class and one-day workshop focusing on proper procedures for construction/work zones. The first day consists of our routine instructional setting. Through use of Part 6 of the *Michigan Manual on Uniform Traffic Control Devices*, attendees are taught the principles of work zone signing. The principal components of a work zone are discussed, including the advance warning area, the transition area coming into the zone, a buffer space (an empty space to afford workers better protection), the work space, and the termination area (which lets traffic flow normally again). Attendees learn how to develop and implement a traffic control plan. The course stresses the importance of uniformity for traffic control devices (signs, pavement markings, traffic signals, etc.), as well as the role of people in the design of safe construction zones.

The second day is a workshop which attendees have stated is interesting, and even fun. Six-person teams plan and develop a traffic control plan and then demonstrate to the class their developed layout. Teams use small layout boards to develop their approach and then a large (4'x8') layout board to show the class their work. This approach resembles a model railroad setting, with actual props being used to show the teams' designs. Signs, barricades, construction equipment, small cars, and other vehicles are used to demonstrate knowledge gained. So one actually gets to play with toys in our workshop and attendees agree that the workshop allows them to apply the knowledge gained in the first day in the classroom.

This class and workshop has been so popular that we have taken it on site to the Wayne County Road Commission twice and to the Bay City Transportation Service Center of MDOT once. We are scheduled to take the class and workshop to Genesee County in early June of this year.

If you wish to learn more about our specialty classes or the training we offer on site, contact either Tom Krycinski at 517-353-9782 or Laura Taylor at 517-353-1790 and we will be most happy to discuss our training program with you. In the meantime, watch for those orange signs and give our workers a "brake." Remember, traffic fines are now doubled in work zones.

## Technical Outreach Services for Communities (TOSC) Provides Ecological Risk Assessment Training to Wisconsin Community

A location of a former manufactured gas plant on the shores of Lake Superior provides the setting for a TOSC workshop on ecological risk assessment. The Great Lakes and Mid-Atlantic Center's Ashland, Wisconsin project has provoked interest by various northern Wisconsin environmental groups, including the Lake Superior Alliance and the Sigurd Olson Environmental Institute at Northland College. At the request of those groups, TOSC conducted a workshop on examining the ecological impacts to Ashland's Chequamegon Bay.

The primary ecological risk is from sediments and groundwater contaminated with polycyclic aromatic hydrocarbons (PAHs), a class of chemicals, some known to be carcinogenic. The near-shore Chequamegon Bay sediments contain substantial free-product PAHs, i.e., oily tars not dissolved in the surface waters. The tars have degraded the naturally-occurring microorganisms in the bay.

TOSC's workshop looked at the value of protecting the entire food web of the bay and how impacts at the bottom of the food web can radiate to higher levels. TOSC also covered the process of assessing ecological risk. Future work will include an independent review of two, conflicting ecological risk assessments and comment on some of the key areas of concern. For more on the project visit <http://www.egr.msu.edu/tosc/Frames/Ashland/AshlandProfile.html> or contact Kirk Riley at [rileyki@egr.msu.edu](mailto:rileyki@egr.msu.edu).

### Did You Know?

Some spring cleaning in one of our storage rooms uncovered a charming history of the department written by William A. Bradley in 1986. You can find a copy of this history online at: <http://www.egr.msu.edu/cee/about/history.html>.

## How to Find Us

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