

Winter 2010

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Echoes Staff

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Echoes

ROSE-HULMAN INSTITUTE OF TECHNOLOGY

Winter 2010-11

Vol. 2010, No. 1



Studying How the Body Works

Orthopedic Biomechanics Lab Lets Students and Surgeons Make Discoveries

Largest and Most Diverse Freshman Class

Library Receives \$2.1 Million Renovation

Recognizing Rose-Hulman Ventures' Decade of Innovation



HEARD IN THE HALLS OF MOENCH

“Science—finding new knowledge; engineering—using that knowledge to solve problems; and entrepreneurship—scaling those solutions out into the world, that’s innovation. Innovation is why I’m here today in Terre Haute, where you aspire to excellence, impact and leadership in innovation.”

— **Bob Metcalfe**, Ethernet Inventor, Speaking to the Class of 2010 During This Year’s Commencement.

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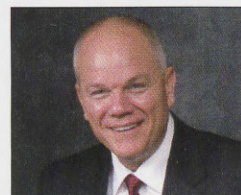
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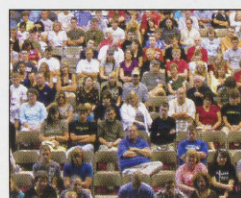


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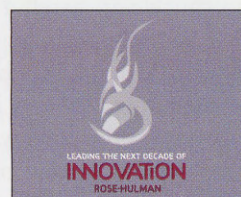
Thanks to a collaboration between the Joint Replacement Surgeons of Indiana Research Foundation and Rose-Hulman, students such as Kelsey Hughes and Derek Archer are playing a significant role in advanced biomedical engineering research.



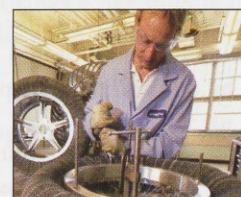
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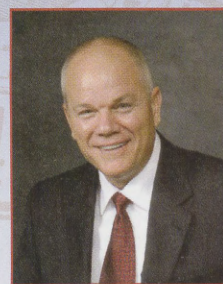
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A Place of Change... *for the Better*

By President Matt Branam



I've had to chuckle at myself a few times since returning to Rose-Hulman 30 years after graduation. This college was a crucible in which the life I have been living was formed. I had projected my memory of the way it was onto the reality of how it must be today. My projection was slightly out of focus. I now realize that my mental picture of Rose-Hulman was formed during only four of 136 years of constant change since this college was founded in 1874. Change is a major component of the Rose-Hulman DNA. By now, I am convinced that the future success and viability of our alma mater will be determined by our ability to keep pace with change the world demands of us.

While staying true to our long-standing formula for success in teaching at Rose-Hulman, we must systematize our responses to change—change in the technology we teach, change in the methodology of how

we teach, change in what ever-evolving students need from us, and change in how we respond to the demands of an ever-transforming world in which our graduates will flourish. Not only must we adapt to change, we must stand at the ready to lead as agents of change.

When I came to Rose-Hulman as a student 35 years ago, it was a very good engineering school. Back then, we were all males; we were almost all white; we were almost all children of working-class parents who thought they understood the world in which we lived. Today, Rose-Hulman has been ranked first-in-class for 12 years in a row; one in five students on campus is female; we have an increasing number of foreign nationals and students from underrepresented minorities. And most of our current students' parents are educated and experienced enough to know that the competitiveness of our nation depends on the painfully few who will get this kind of an education. So much change—yet the underlying formula for success at Rose-Hulman continues to be our guide: individual attention to the student, small classes, low student-to-faculty ratio, dedication to the basics, and plenty of hands-on opportunity to learn



while doing. I am pleased to report that this formula has been purposefully enhanced by the integration of communication, teamwork and leadership into the curriculum, and that we have embraced a new commitment to provide every student with an international experience.

Along with significant growth in the number of students on campus during the last few decades, we have cultivated a much more inclusive family culture that constantly seeks ways to increase the percentage of students who ultimately succeed. A residence hall with tutors for sophomores, a learning-center for on-demand real-time assistance, and a renovated, study-space oriented library are just a few examples of why we have an 83% graduation rate, the second highest in the state.

The numbers tell a critical story

I've enjoyed learning the business model of independent higher education in the United States, the special challenges of offering a continuously current technical education, and the unique structural financial challenges we face at Rose-Hulman. Like many of you, I've always assumed that Rose-Hulman was well endowed. I was wrong. Our college is nearly twice the size it was when I arrived as a freshman; stated differently, there are only about half the number of us alumni my age and older that one might expect to find building an endowment at a college this size. The alumni numbers "get well" with time, but if we are to remain at the top of our game, many of us need to better understand why it is

important for us to help secure the future of Rose-Hulman.

Allow me to share the numbers with you. Of our \$88 million budget at Rose-Hulman, \$26 million is spent on financial aid. Of that \$26 million spent on financial aid, only \$8 million comes from our endowment. The balance comes from fundraising, tuition and fees, room and board, and other ancillaries such as laptops and the bookstore. Fully 55% of our budget will be provided by tuition and fees—that's too much. Increases in expenses related to health care, utilities (electricity projected to increase by 14% this year), and other costs of doing business such as salaries and wages (held flat last year) have a magnified impact on tuition because other sources of revenue are lower or flat. Spending from the endowment is preset by a formula that has it reduced for the next few years in response to the dip in the balance of funds over the last two years. Our fundraising has been down considerably over the last few years as well.

If you think like I did before coming back to Rose-Hulman and learning firsthand how a college like ours is funded, you might assume that your education was a service provided for a fee you paid. Not so! Others who came before us were continuing to support our college and helped make our education possible by paying for about half of it through endowed and annual giving.

The stories behind the numbers

Each of us has a unique story; each of us has traveled a different path. For instance, at least one of us has traveled to the South Pole to manage greenhouse software; another's path has led her to virtual orbit around Mars—writing Mars

Total Financial Aid - \$26 Million

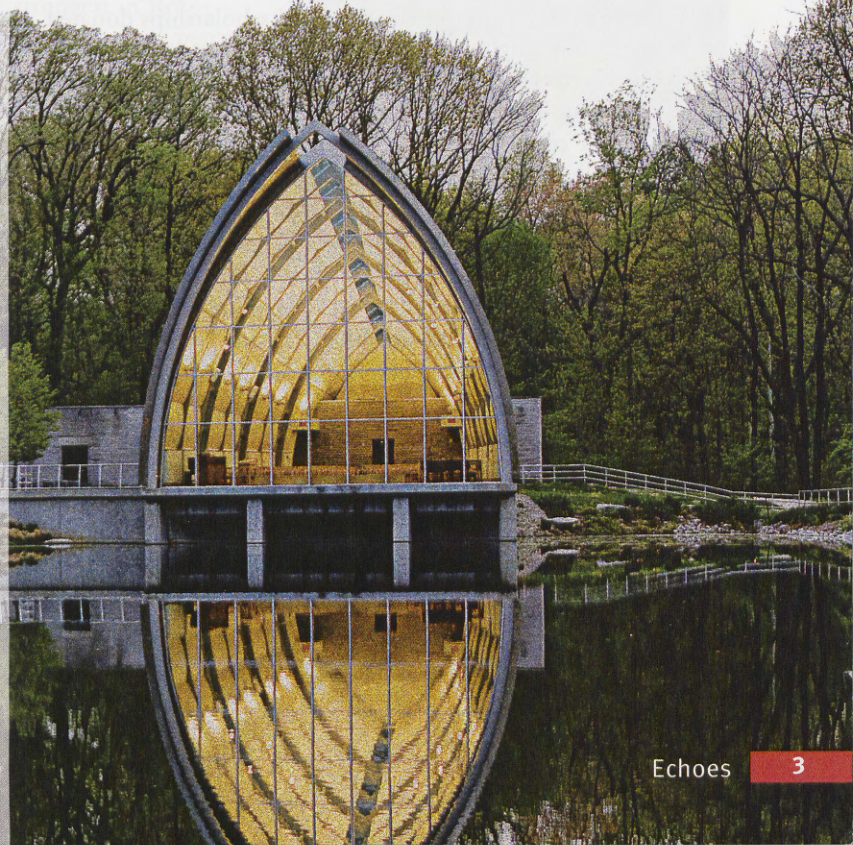


Our financial aid makeup is disproportionate. We should get much more from endowments.

Recent Alumni Giving



More of our 13,400 alumni have given in recent years. The trend needs to continue.



orbiter software at NASA. Among us are competitive winners, like the 1990 alumnus who has won multiple Indy 500s at the helm of Penske Racing and the 2008 alumna who recently won the racing circuit's Super Quick North Central Division championship for the 2010 season. Recently, an '86 alumnus was nominated by President Obama to a seat on the U.S. District Court for the District of Columbia. Since the summer alone, a 2001 Rose-Hulman alumnus has become associate director of the Hume Center for National Security and Technology; a '76 alum was appointed, by Secretary of Commerce Gary Locke, to the U.S. Department of Commerce's Manufacturing Council. Another alumnus garnered a \$4.5 million dollar investment in his robotic innovation; a 1996 alumnus took the helm of North Carolina's \$68 billion pension fund as its chief investment officer. We represent a thousand paths of excellence. But what we all have in common is the shared experience of a rigorous, intellectually demanding, top-notch technical education. And most of us believe that Rose-Hulman plays a unique role in educating tomorrow's leaders in technical fields, a role with tremendous importance to our economy and our country's competitiveness.

For innovation in engineering education, Rose-Hulman was cited nearly twice as many times as MIT.

We can help Rose-Hulman in this role by investing in the school and students. Many of us already do. Right now, for example, there are about 200 top students who might not be at Rose-Hulman today but for the endowed scholarships donated by alumni. One bright young woman stands out in my mind. She's quiet, even shy, but she entered Rose-Hulman on the Fast Track, showing the excellence and promise of Rose-Hulman's best. With a cobbled-together tuition package that included help from her mom, a secretary at a local church, and her dad, who taught high school in a town just up the road, she dove into her studies. But when her dad was diagnosed with cancer, this young woman began to fall financially further and further behind. Still, with everything that was going on at home, she managed to keep up her studies. Luckily for this young woman, she became the recipient of a beneficent gift from an alumnus in the form of a tuition scholarship. As a result, she is graduating Rose-Hulman this winter quarter, right on her Fast Track target. Well over 100 students at Rose-Hulman have similar stories, similar benefactors, and the same internal strength to persevere. This is the power of alumni giving.

The year before last, 23% of the 13,000 alumni of Rose-Hulman made a contribution to help carry our tradition of excellence forward. Last year, 31% of us chipped in to help make it possible. If you are thinking, as I did, that there is no

real need for your financial support, think again. In a quiet but confident way, Rose-Hulman is tooling up for longevity in the 21st century and for the sustainability of its unique qualities. And all I will add here is that the care and feeding of excellence comes with a price tag.

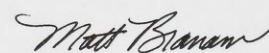
Putting rankings in perspective

U.S. News & World Report has ranked our alma mater the number one engineering school that does not offer Ph.D. level coursework. Our electrical engineering, mechanical engineering, civil engineering (go civils!), computer engineering and chemical engineering programs are rated number one at the department level. One of the first things I checked into when I returned to campus was where these ratings come from and what is behind them. I learned that the rankings are compiled from ratings of the deans of other schools that teach the same things we do at Rose-Hulman. They know our faculty from the papers they write, the presentations they make at conferences, the textbooks they write, the accreditation processes they participate in and from our world-renowned academic assessment processes. This past July, the Journal of Engineering Education printed a scholarly paper on innovation in the teaching of engineering. Department heads from across the country were asked to cite schools known for innovation in the classroom. In that study, Rose-Hulman was cited more times than any other school by a wide margin. In fact, we were cited nearly twice as many times as the school that was cited the third most, and that school was MIT. No, we aren't in a contest for rankings; and no, we aren't at risk of becoming complacent because of our rankings. But make no mistake: your alma mater is known for being the best at what we do, and that's not lost on anyone who cares to know.

Our students certainly care about the quality of the education they seek. We had record applications last year, and we had record enrollment this fall. This is perhaps the smartest class of freshmen we have ever attracted. It is certainly the most diverse, with students coming from 39 states and nine countries to Rose-Hulman for what we do. I highly suspect they are more impressed by our outputs than our rankings—our graduating class from last spring is 96% placed with an average starting salary of more than double the average student loan debt. Those are results that matter!

We have much to be proud of, and we have much work to do. Rest assured that the faculty, the staff and the students of Rose-Hulman are hard at work making it happen...and making it fun.

Be in touch,



Matt Branam



RECORD FRESHMAN CLASS ARRIVES

The largest freshman class was welcomed into the Rose-Hulman Institute of Technology family on Friday, August 27, as 552 members of the Class of 2014 arrived on campus to begin New Student Orientation for the 2010-11 academic year. The class is the most diverse in school history with the following characteristics:

- 21 percent of the class is non-Caucasian
- A record 37 international students
- A record 16 African-American students
- A record 16 Latino/Hispanic students
- The third largest number of female students (109)

The 65.9 percent admission rate is the lowest rate in eight years, showcasing Rose-Hulman's selectivity in accepting students from 3,858 applications.

The academic profile of the freshman class is one of the strongest in Rose-Hulman history with the top six percent of the high school graduating class being the median for this fall's freshmen; 41 students earning perfect math scores on the SAT/ACT entrance exams; and 70 students ranking first, second or third in their high school graduating classes, among those high schools that rank in class.

"We're delighted with the overall scope of the 2010-11 freshman class," said James Goecker, vice president of enrollment management. "Academically, the incoming freshman class is a strong group. The class also is filled with students who have been committed to community service and interested in entrepreneurship. They're ready to make their marks in engineering, science and mathematics at Rose-Hulman."



The international students come from the following countries: China, 24; South Korea, 5; India, 2; Saudi Arabia, 2; Greece, 1; New Zealand, 1; United Arab Emirates, 1; and Canada, 1.

As for U.S. geographical distribution, there are students from 39 states in the 2010 freshman class. This represents the least Midwest-centric class in Rose-Hulman history as 67 percent have come from the 10-state Midwest region.

Continued on page 8



#1 for the 12th Consecutive Year

For the 12th consecutive year, Rose-Hulman Institute of

Technology has been rated the top undergraduate engineering college in the nation that offers the bachelor's or master's degree as its top degree in engineering. The ranking is based on a national survey of deans and senior faculty conducted by U.S. News & World Report for its annual college guidebook.

In addition to the college's overall ranking, Rose-Hulman's individual engineering departments in chemical engineering, civil engineering, computer

engineering, electrical engineering and mechanical engineering were ranked the number-one undergraduate programs in their class. The rankings are based solely on a spring 2010 peer survey of deans and senior faculty.

"This is a very lively collegial competition, a race to excellence, among the nation's very best schools," said Rose-Hulman President Matt Branam. "What a wonderful testament to our faculty, our staff, our students, our alumni and especially our tradition at Rose-Hulman of innovation in education."

Branam pointed out some of the recent successes of the college, including

admission of its largest, most diverse, most globally representative, and most academically talented class this fall. The student Human Powered Vehicle Team achieved its third national title, Rose-Hulman Ventures celebrated its 10th anniversary, and 93 percent of the 2010 class has already been placed.

The U.S. News & World Report ranking is just one of the recent accolades Rose-Hulman has achieved in guides highlighting select colleges. Rose-Hulman also is in the 2011 version of "The Best 373 Colleges," published by The Princeton Review, and in the "2011 Fiske Guide to Colleges." ■

Rose-Hulman Ranks Among Top 373 Best Colleges

Rose-Hulman Institute of Technology's outstanding career preparatory programs, smooth-operating administrative structure and accessible faculty has the college once again ranked among America's top colleges and universities, according to the Princeton Review's annual guidebook, "The Best 373 Colleges: 2011 Edition." Only about 15 percent of America's 2,500 four-year colleges and two Canadian colleges are profiled in the book.

The Princeton Review asked 122,000 students at the top colleges to rate their schools on 62 topic areas covering academics/administration, quality of life, school type, demographics and extracurricular activities. The top 20 schools were ranked in each category.

Rose-Hulman ranked among the best in the following areas:

- Best Career Services – 9th
- Schools Run Like Butter – 13th
- Most Accessible Professors – 16th

Rose-Hulman students responding to the Princeton Review survey report the college earns its "reputation as an excellent undergraduate engineering school" with a combination of strong

academics and "personal attention, small class sizes, and a family atmosphere" that's rare among technological-oriented institutions.

Regarding professor accessibility, one student told the Princeton Review that "our professors are personal and focused on undergraduate education. They will know your name, ask if you are OK if you miss a class or two, and even pull up a chair next to your table at the bar."

That personal attention also extends to the Office of Career Services, which organizes three campus career fairs, numerous resume writing and interview skills workshops, and other services to help students earn full-time employment, summer internship and educational co-op opportunities. Members of Rose-Hulman's Class of 2010 had an 85 percent placement rate at graduation, and the Office of Career Services expects that rate to increase to 98 percent by the end of summer.

One student told The Princeton Review: "If you get a decent GPA (grade point average), you're almost guaranteed a job in the field of your choice."

Rose-Hulman also earned high marks in the Princeton Review guide book's

unique ratings—scores from 60 (lowest) to 99 (best)—in the following categories:

- Fire safety: 93
- Academics: 82
- Quality of life: 82

"We commend Rose-Hulman for its outstanding academics, which is the primary criteria for our selection of schools for the book. Our choices are based on institutional data we collect about schools, our visits to schools over the years, feedback we gather from students attending the schools, and the opinions of our staff and our 28-member National College Counselor Advisory Board. We also work to keep a wide representation of colleges in the book by region, size, selectivity and character," stated Robert Franek, author of the book and Princeton Review Senior Vice President/Publisher, in a prepared statement.

The ranking lists, rating scores and school profiles are posted on www.PrincetonReview.com. ■





FISKE GUIDE ONCE AGAIN RATES ROSE-HULMAN AMONG THE MOST SELECT

Rose-Hulman Institute of Technology is once again featured in The Fiske Guide to Colleges.

Written by former New York Times Education Editor Edward B. Fiske, the guide helps students make sense of the college admissions and selection process, and provides insight into the nation's best and most interesting colleges and universities. The 2011 edition features in-depth profiles of over 300

institutions—including Rose-Hulman.

Readers will discover Rose-Hulman's real personality, based on a broad range of subjects including student body, academics, social life and financial aid.

The two-page Rose-Hulman profile states that the institution "offers the rare combination of technical education and personal attention. Only Caltech, Clarkson and Harvey Mudd offer comparable intimacy and a technical

academic environment."

The guide also notes that Rose-Hulman was the first private college to offer an undergraduate degree in chemical engineering, and "it continues to innovate today... Rose offers an outstanding technical background and bright prospects for future employment. Students are smart, motivated, and highly competitive." ■

Rose-Hulman Ranks Second in Indiana & 40th Nationally for Providing Best Return on Investment

Rose-Hulman Institute of Technology ranks second in Indiana and 40th nationally in a new study examining U.S. colleges and universities providing the best return on investment. The typical Rose-Hulman graduate is expected to see an 11.3 percent annual return, with a 30-year net return worth \$1,016,000.

The study, conducted by the PayScale online salary and compensation

information company, supports the longtime belief that attending an elite, private university or majoring in a marketable career field—like engineering, science, computer science and mathematics—matters in terms of future earning power.

The ROI was calculated from 1.4 million college graduates across 852 public and private institutions. It was

based on the cost of college—tuition and fees, room and board, and books and supplies—and the estimated median pay for that graduate, plus four to six years to compensate for time spent in school. Costs don't account for financial aid. The 30-year returns are reflected in real terms and the annual ROI figures include a 4.3 percent yearly wage inflation. ■

HOMEWORK HOTLINE IS CALIFORNIA MODEL

Indiana Dreaming. That's what students at California's Harvey Mudd College are doing as Rose-Hulman's Homework Hotline has been replicated to help secondary school students in the Claremont area learn math principles.

This partnership features the top nationally ranked educational institutions that offer the bachelor's or masters' degree as their top degree in engineering (*U.S. News & World Report's College Guide*).

"We're happy to see Rose-Hulman's

Homework Hotline become a national model for helping middle school and high school students in other areas across the United States. This is another shining example of how Rose-Hulman, our enterprising students, and our faculty and staff members are helping improve math and science education," says Susan Smith, director of Rose-Hulman's Homework Hotline and Learning Center. Harvey Mudd's service started in February.

Rose-Hulman's Homework Hotline

has been helping Indiana students develop better problem-solving skills since 1991 through tutoring via toll-free phone calls, e-mails and online resources. The service has answered more than 280,000 calls since 2002, including 21,506 in the first four months of the 2009-10 school year.

More than 30 students are available between 7-10 p.m. each Sunday through Thursday by calling 1-877-ASK-ROSE or posting questions at www.AskRose.org. ■

EcoCAR Among Cutting-Edge Advanced Transportation Projects

Rose-Hulman Institute of Technology students and faculty are exploring cutting-edge technology in their exploration of vehicle solutions that will reduce energy consumption and decrease emissions through an advanced transportation systems (ATS) initiative that's being endorsed and supported by industry and government entities.

The ATS program is striving to inspire the next generation of engineers and scientists by giving them the tools and experience necessary to help America secure a more energy-efficient future. Students will learn modern automotive, aerospace and off-highway design methodologies and technologies through model-based system design and participating in national engineering design challenges in promoting sustainable energy resources.

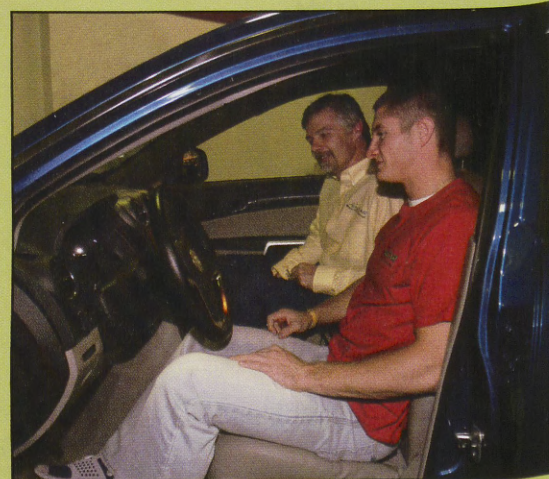
Almost \$3 million in financial, equipment and technical assistance donations have so far supported the program. Advanced lithium-ion battery maker EnerDel Inc. is providing an innovative, high-performance battery system for the EcoCAR team's hybrid vehicle applications. Duke Energy Foundation, ON Semiconductor, Delphi, Alcoa Foundation and ArcelorMittal have provided financial donations to encourage project development.

Rose-Hulman is the only Indiana college selected to participate in EcoCAR: The Next Challenge, a national engineering design competition to re-engineer identical production GM vehicles to achieve improved fuel economy and reduced greenhouse gas emissions, while retaining the vehicle's performance and consumer appeal.

Other ATS design projects include the human powered vehicle team, two-time national champions in the American Society of Mechanical Engineers' HPV competitions; the Rose Efficient Vehicle, which has earned technical and performance honors at Shell Eco-marathon and Society of Automotive Engineers' Supermileage competitions; the Institute of Aeronautics and Astronautics' Design-Build-Fly team; and the Team Rose Motorsports.

"With projects such as EcoCAR, as the auto industry moves forward with electrified transportation, Rose-Hulman is positioned to provide not only the past and current but also future leaders of the automotive industry," stated Mike Rowand, director of advanced customer technology for Duke Energy.

Rick Stanley (Mech. Eng., '78), president of EnerDel, added: "We think the advanced transportation



Behind The Wheel: EcoCAR Team Leader Cameron Hazel, a senior mechanical engineering major, discusses aspects of Rose-Hulman Institute of Technology's EcoCAR project with Art McGrew, engineering manager for General Motors' hybrid power train unit in Indianapolis. McGrew, a 1981 Rose-Hulman alumnus, is serving as the team's GM technical mentor.

systems program is a great tool for the outstanding Rose-Hulman education."

Other alumni attending an unveiling of the ATS Laboratory, located at Rose-Hulman's South Campus, included Bruce Kopf (Mech. Eng., '64), retired director of Ford Motor Company's THINK Technologies program; Quentin Kramer (Elect. Eng., '02), senior hardware engineer for Indy Power Systems; Dwayne Owens (Elect. Eng., '83) of Duke Energy; and Tom Dinkel (Mech. Eng., '72), treasurer of the Board of Trustees. ■

Continued from page 5

Typically, at least 75 percent of the college's incoming class is from this region. Top Midwest states represented in the freshman class include Illinois, 75 students; Ohio, 46; Michigan, 18; Kentucky, 12; and Minnesota, 10. Outside the Midwest, Rose-Hulman received a record 210 applications and 15 students from California, while Texas contributed 12 students, and

Colorado and Florida each contributed 11 students to the freshman class.

Rose-Hulman's admissions efforts exceeded all five of its goals for the 2010 freshman class, including increased applications (3,858); increased ethnic, racial and international diversity (21 percent improvement); increased number of female students (109); increased international students (37);

and increased number of transfer students (21).

Goecker emphasized that the record incoming freshman class hasn't caused any major changes to academic course offerings or residence life services on campus, and won't inhibit the college's personal approach to higher education. ■

New Design Better Represents Rose-Hulman to the World

Phase I of a new Rose-Hulman website rolled out in late September. Visitors to the site will note the redesign carried the following goals:

- Represent the Rose-Hulman brand more accurately and better compete with schools across the nation.
- Help increase positioning of Rose-Hulman in the world market.
- Improve the user experience.
- Bring consistency throughout the Rose-Hulman site.
- Create an environment that meets modern web design best practices.
- Be keyword-rich, search-optimization-friendly, user-focused, and web-specific.
- Easier to maintain and edit by staff members through incorporation of a content management system.

Phase I affects the top tiers of the site with an emphasis on admissions. Work also is under way to bring other portions of the site in line with the new design and navigation. The full project is scheduled for completion in February. Part of the plan is to install a Rose-Hulman intranet to better serve the on-campus community. Also, flexible, user-friendly templates are being developed that can be used by various departments.

Input for the design was taken from all campus constituencies – current students, prospective students, faculty, staff, parents, alumni, corporate recruiters and other friends of the



Institute. The site was vetted with representative groups throughout the process—from initial content decisions to navigation improvements to final design. Hundreds of people provided information and opinions that guided the process, according to Bryan Taylor, executive director of communications and marketing.

The new site represents Rose-Hulman in a fashion worthy of the nation's #1 undergraduate engineering, mathematics and science college, Taylor said. "The website is our window to the world. It is an important initial reference point about this special college. Therefore, it must make a strong first impression.

The new design does a better job of telling our story to the world in a way that speaks about the high quality of Rose-Hulman and how we fulfill our mission. The site also brings improved navigation and visuals to telling our story. Work will continue to develop our top communication port as we strive to move Rose-Hulman from being the best to being great."

In addition to assistance from the Rose-Hulman Office of Instructional, Administrative and Information Technology, the project involved Williams Randall Marketing.

To view the site, visit www.rose-hulman.edu. ■

ROSE-HULMAN OFFERS SOFTWARE ENGINEERING MASTER'S CLASSES IN INDIANAPOLIS

Rose-Hulman now offers a master's of science in software engineering (MSSE), with courses starting this fall in the Indianapolis metropolitan area. This program targets software professionals interested in building on and updating their knowledge, skills and credentials to meet emerging software challenges.

The master's degree program is designed to meet the demands and constraints of working professionals looking for part-time study as well as those devoted to full-time. A classroom-based experience is provided that encourages networking with other technical professionals pursuing advanced degrees.

Software is critical to most contemporary systems and the business sectors they serve, including automotive, banking, communications, financial, insurance, medical and pharmaceutical. Innovations in computing technology, coupled with software engineering advancements, trigger the need for

Continued on page 11

CAMPUS TAKES ON INTERNATIONAL FLAIR DURING SUMMER

The Rose-Hulman Institute of Technology campus took on an international flair last summer with more than 60 students, professors and administrators from Korea and China coming to the college as part of educational collaborations.

Those visitors featured 15 students from Korea's Seoul National University of Technology participating in a four-week educational experience; seven students from China's Huazhong University of Science and Technology serving as technical advisors for Rose-Hulman's Operation Catapult program; and 42 rising

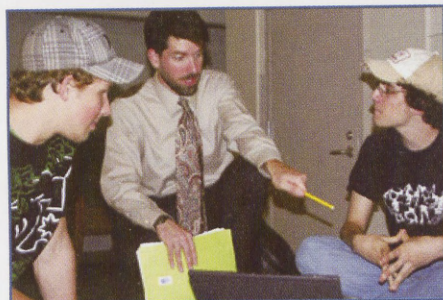
high school seniors from China's Jiangsu Province exploring American college options.

Rose-Hulman has expanded its international outreach in recent years. These efforts have improved the college's profile throughout the world and increased international student enrollment. A record 37 international-based freshmen are attending Rose-Hulman this fall, an increase from 23 students in 2009-10.

"Rose-Hulman continues to attract attention from international students and educators to our inventive and hands-on approach to undergraduate engineering,



science and math education," states Bill Kline, interim vice president of academic affairs/dean of faculty. "Rose-Hulman has increased its international presence through educational programs, led by our quality faculty, consortia with other leading institutions, and our study abroad programs." ■



Patents have been issued recently for two methods developed with the assistance of Rose-Hulman Institute of Technology Computer Science and Software Engineering Professor Matt Boutell to automatically categorize photographs.

The projects were conducted in collaboration with Jiebo Luo and Robert Gray of Eastman Kodak Company and Chris Brown of the University of Rochester.

Boutell's work on this project is groundbreaking and could open exciting new avenues for the 75 million people worldwide wishing to manage, share and create photo gifts.

Semantic scene classification helps persons categorize images into a discrete set of classes, such as beach, sunset or field scenes. Many classifiers rely on low-level image features, such as color, texture or edges, and achieve limited success

FACULTY MEMBER RECEIVES PATENTS FOR PHOTO MANAGEMENT

on constrained image sets. However, the domain of unconstrained consumer photographs requires the use of new features and techniques.

One source of information that can help classification is the context associated with the image. Boutell and others have explored three types of context: spatial context, which enables classification through the use of scene configurations (identities of regions and the spatial relationships between the regions); temporal context, which allows the use of information contained in neighboring images to classify an image; and image capture condition context, which uses camera parameters (flash, exposure time and subject distance) recorded at the time the photo was taken, to provide distinguishing cues about certain scene types.

Boutell developed and used graphical models to incorporate image content with these three types of context. These systems are highly modular and allow for probabilistic inference based on the statistics of large image collections. "We demonstrate the effectiveness of each context model on several classification problems," Boutell noted.

The official names of the patented projects were "Method for Semantic Scene Classification Using Camera Metadata and Content-Based Cues" (Patent #7,555,165) and "Method of Using Temporal Context for Image Classification" (Patent #7,680,340).

These projects paved the way for Boutell, a former high school teacher, to earn his Ph.D. in computer science from the University of Rochester in 2005. This followed master's degrees from Rochester, in computer science, and the University of Massachusetts, in mathematics education, and a bachelor's degree in mathematical science from Worcester Polytechnic Institute.

At Rose-Hulman, Boutell developed a new course in image recognition and a new section of the Introduction to Software Development course, using robotics programming. He also joined mechanical engineering and electrical and computer engineering faculty members in developing the college's new robotics program, which is proving to be popular with students and has produced graduates with a minor in robotics for the last two years. ■

ROSE-BUD PROGRAM FOCUSES ON BUILDING DIVERSITY

Math and science-skilled students often don't realize the impact they can make in this world. Originators of a new program at Rose-Hulman are hoping to make young people more aware of the tremendous power these skills have in impacting society. This program also helps academically talented students interested in majoring in electrical and computer engineering and who demonstrate a financial need gain a Rose-Hulman educational experience.

ROSE-BUD (Rose Building Undergraduate Diversity) Scholarship program, partially funded through a National Science Foundation (NSF) grant, especially encourages women and minorities but is open to anyone with financial need and who is educationally qualified, according to ROSE-BUD developers Carlotta Berry, assistant professor of electrical and computer engineering, and Deborah Walters, assistant professor of electrical and computer engineering.

Entering college freshmen and transfer students are targeted through relationships established with community colleges and high schools. Transfer students are able to attend the first two years at a community college, which is much more affordable, and then transfer through this scholarship program to Rose-Hulman to end up with the best possible education available, the Rose-Hulman experience, Berry said.

The Rose-Hulman student body in electrical engineering is "very scant," according to Berry, amounting to about 20 percent of the college's student body, which is comparable with other engineering colleges. It has been a long-standing goal of the NSF to get more students, especially women and underrepresented minorities, into the STEM (science, technology, engineering and mathematics) programs. "We share those goals, too," Berry said. Students can receive up to \$10,000 per year through the ROSE-BUD program.

But the ROSE-BUD scholarship program amounts to more than just

giving money through scholarships, Berry explained. "It's a complete program. It's not just handing money to a student and not giving them tools to succeed—I think the tools to succeed are more valuable than the money that gets them here," she added. Walters agreed, "The money gets them here but it's the tools—the skill sets—that take them into the marketplace."

Those tools include developing professional skills, including good communications, teamwork, and understanding ethics and professionalism. The students interact with professionals and upperclassmen through a variety of workshops and seminars and are guided by mentors.

If you know of an interested student or would like to help the ROSE-BUD program, feel free to contact either Carlotta Berry, assistant professor of electrical and computer engineering at berry123@rose-hulman.edu, or Deborah Walter at walter@rose-hulman.edu. ■

Continued from page 9

computing professionals to pursue advanced degrees and further professionalism.

Many engineers, scientists and other technically oriented professionals find themselves working in software engineering roles and wishing they had the educational background to better serve their roles, notes Shawn Bohner, director of software engineering in Rose-Hulman's Department of Computer Science and Software Engineering. Rose-Hulman's MSSE program is designed to serve this growing constituency.

Nationally, the demand for software engineers continues to outstrip supply. Locally, a recent Walker Research market study reports approximately 20,000 software professionals in the Indianapolis metropolitan and surrounding areas. Expectations for software engineers to be current and relevant for today's software projects

continue to grow with the software demands. Software professionals are seeking ways to systematically come up to speed on recent software advancements and learn how to manage software projects in the current economic climate.

Rose-Hulman's MSSE program provides an effective venue for software professionals to update their expertise portfolio. For those from other professional disciplines, the degree program provides a way to acquire a recognized software engineering credential that can serve in advancing their computing careers.

With the changing economic landscape, managing emerging technologies and change tolerant product lines is challenging. Software requires effective software architecture, design, technology, systems engineering and project management expertise.

"Not only do software professionals need to know how to develop a product, they need to know how to develop it to integrate with a changing world and evolve over time," stated Bohner. "These are key elements of Rose-Hulman's MSEE program as it is based on the new, nationally recognized Graduate Software Engineering Reference Curriculum."

Rose-Hulman's master's programs are particularly well suited for people returning to school who are reluctant to be in programs with large, impersonal classes. The college offers smaller classes with an emphasis on teaching a balance of principles and practicum to solidify a student's software education.

For more information about Rose-Hulman's MSSE program, persons should contact Bohner at (812) 877-8685 or through e-mail at bohner@rose-hulman.edu. ■



From left: Rob Coons, vice president and chief administrative officer; Rachel Crowley, librarian; Cody Barron, president of the Student Government Association; Bill Fenoglio, chair of the Rose-Hulman Board of Trustees; Matt Branam, president; and Bill Kline, interim vice president of academic affairs and dean of faculty

LOGAN LIBRARY RENOVATED TO INCREASE STUDENT SERVICES; PROVIDES MANY SUSTAINABLE FEATURES

The Logan Library has been located in the center of the Rose-Hulman Institute of Technology campus for more than 35 years. Now, the building has become an educational resource center after an extensive \$2.1 million renovation project that significantly increased student study and project space, consolidated the library collection, added a coffee bar, and improved the structural integrity of the campus landmark.

The renovation project, part of the college's comprehensive facility master plan, is a collaboration matching student feedback with the administration's desire to improve sustainability.

Through campus forums and surveys, students asked the administration to provide more campus study areas, especially for group projects. They also sought increased library operating hours.

"We listened to our students' wishes, studied the situation extensively, and came up with a creative and cost-effective solution," states Rose-Hulman President Matt Branam.

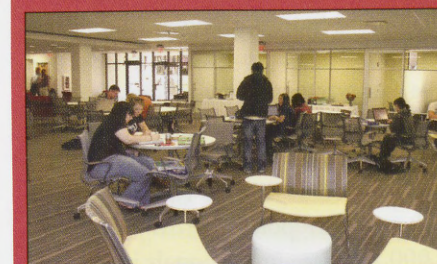
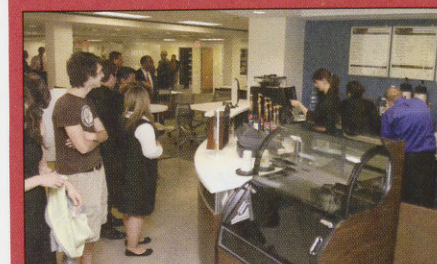
After the renovation, the Logan Library now features 70 seats on the main floor and six soundproof student project rooms,

an increase from 12 seats in the original library layout; two conference rooms; expanded facilities for the Digital Resource Center; and Logan's Coffee Bar.

There is also an automated library resource catalogue system and an updated current periodicals room. Library hours have been expanded to 2 a.m. on Sundays through Thursdays to better accommodate student schedules. The coffee bar is open from 6 p.m. to 2 a.m. on those days.


Improved building infrastructure aspects include a new roof, heating/ventilation/air conditioning and electrical system, expanded technology availability and several new sustainable amenities. A popular new feature is a water-bottle filling station, saving thousands of new plastic bottles annually. Sensors in the project rooms turn off lights when the room is not being used, providing energy cost savings. The new carpeting on the second and third floors was created from recyclable materials.

Rob Coons, vice president and chief operating officer, projects that the building's energy saving features should help cover the renovation costs within seven years.



Top: A view from the new Digital Resource Center; Middle: Students enjoy a coffee bar; Bottom: 70 new seats increase study space on the library's main floor.

Continued on page 13



Rose-Hulman Alumna Selected for Prestigious Orr Fellowship

Emily Eddy saw the Robert D. Orr Fellowship as an once-in-a-lifetime opportunity to learn business practices alongside some of Indiana's leading entrepreneurs. That's why the senior civil engineering major will spend the next two years working at Scale Computing, one of the nation's fastest-growing companies, in a position that highlights her strengths and passions in order to promote personal growth.

Eddy was one of 27 Indiana college seniors chosen to participate in the coveted entrepreneurial fellowship program, which strives to create future Indiana business leaders.

"I see entrepreneurship as a way to build upon my background in engineering. It is very creative problem solving," says Eddy. "I'm a big people person. Entrepreneurship is a lot of face time

with the client...I believe I could have a bigger impact in my career with an entrepreneurial background."

Scale Computing is led by Jeff Ready and Scott Loughmiller, 1996 Rose-Hulman alumni with experience launching and selling venture capital-backed technology companies in the last decade.

"I just want to learn as much as I can about the business side of running a successful business," Eddy said. "Being an Orr Fellow at a startup company, like Scale Computing, has so many built-in advantages. Every day should be filled with challenges and opportunities."

This marks the fourth straight year that a Rose-Hulman student has been chosen an Orr Fellow. ■

Continued from page 12

"We have recreated a vital part of campus and given it an extra 10 to 15 years, if not more," Coons said.

Since its reopening on September 30, the library has become a center of educational and social activity, with the project rooms becoming a popular meeting and study place. Alumni returning for Rose-Hulman's recent homecoming were delighted to see the library changes. Several alumni stated they would have used the library more frequently if the study spaces had been available during their campus years.

Most people are also surprised to find no books on the main floor. The library's existing book collection was consolidated

and placed on the renovated third floor.

"The (renovated) building showcases how libraries are evolving into knowledge and resource centers on college campuses," said Librarian Rachel Crowley. "The library will always be a place for books, but, through these additions, it has become much more student-friendly and student-useful."

Logan's Coffee Bar, operated by ARAMARK Food Services, provides specialty coffees, teas and smoothies.

The Learning Center, Homework Hotline's Communications Center and office space are located on the basement level.

The renovation project, which was

completed throughout the summer, was designed by architects from BSA Lifestructures of Indianapolis, led by Rose-Hulman alumnus Sam Reed. Garmong Construction of Terre Haute was the general contractor, while Hannum, Wagle & Cline Engineering (HWCE) of Terre Haute provided engineering expertise to the project. Alumnus David Hannum is the chairman and chief executive officer of Garmong and HWCE, while alumnus Ralph Wagle is president of HWCE. The library was named for John Logan, Rose-Hulman's 10th president.

For more information about the Logan Library, visit the library's website at www.rose-hulman.edu/Library. ■

FEATURE FACULTY OF THE YEAR



Building a network of teaching excellence

William Weiner, associate professor of applied biology and biomedical engineering

William Weiner, associate professor of applied biology and biomedical engineering, arrived at Rose-Hulman Institute of Technology and Terre Haute from New York through academic networking ties in 2000. Weiner says he has found where he wants to be and is doing what he wants to do—and apparently doing a very fine job at that. Out of 172 faculty members at Rose-Hulman, Weiner received the 2008 Dean's Outstanding Teacher Award.

As a graduate student at Syracuse University in New York, he became a teaching assistant. "That's what really opened my eyes to teaching and gave me a passion for it. I knew upon graduation I wanted to go to a university, but that opportunity shifted my emphasis from research to teaching." Armed with a B.S. in bioengineering and a Ph.D. in neuroscience, both from the Syracuse engineering school, he began looking at colleges and discovered that Rose-Hulman had just started its applied biology program. "I didn't know what the opportunities were, but with my background in engineering and a Ph.D. in neuroscience, I had a nice fit for a school like Rose-Hulman."

He discovered that Jameel Ahmed, who had been at Syracuse a year ahead of him, was on the faculty at Rose-Hulman. "We

also had a grad student who worked with a professor at Syracuse who had gone to Rose-Hulman as an undergraduate, and his thesis advisor at Syracuse was a professor who had been Christine Buckley's (Rose-Hulman associate professor of applied biology and biomedical engineering) thesis adviser when she was a student at Northwestern. There were a lot of things intertwining, so I pursued that application."

On receiving the 2008 Outstanding Teacher Award, Weiner was cited for his preparation, thoroughness and explanations to students. One of the things he finds most rewarding about teaching is being able to convey information in simple terms. He said he was always disappointed to find that many professors, through poor organization and communication, polluted things that were fairly straightforward. Remarks from students in the award nominations indicate Weiner has a special ability to make things easily understood. "Dr. Bill is a great teacher who can make anything simple enough for anyone to understand," was a sentiment echoed numerous times.

"I'm on their side and we're all in this together," he said. "I like to throw the carrot first. Why not go out of your way and demonstrate to these students you want them to do well? These are good-

intentioned students, wanting to work hard...I want students to feel comfortable and be able to approach with questions." He obviously gets this concern across well to his students, as well. Student comments in the nominations also included things such as "He is a teacher you know you can go get help from and not feel bad about not understanding some things" and "Weiner is a champion for the students in and out of the classroom."

It is very apparent he is a favorite among the students—and vice versa. When asked what he especially liked about Rose-Hulman, he replied, "It's hard to know what not to like about Rose-Hulman. It's exactly what I hoped it would be. All the priorities are in the right places and it's just so supportive."

Weiner has served on committees including faculty affairs and graduate studies, the commission on the assessment of student outcomes, and the employee relations committee. He also has served as advisor to Alpha Tau Omega fraternity and the National Society of Black Engineers as well as overseeing the application process for the Goldwater Scholarship Program for excellence and academic merit in mathematics, science and engineering.

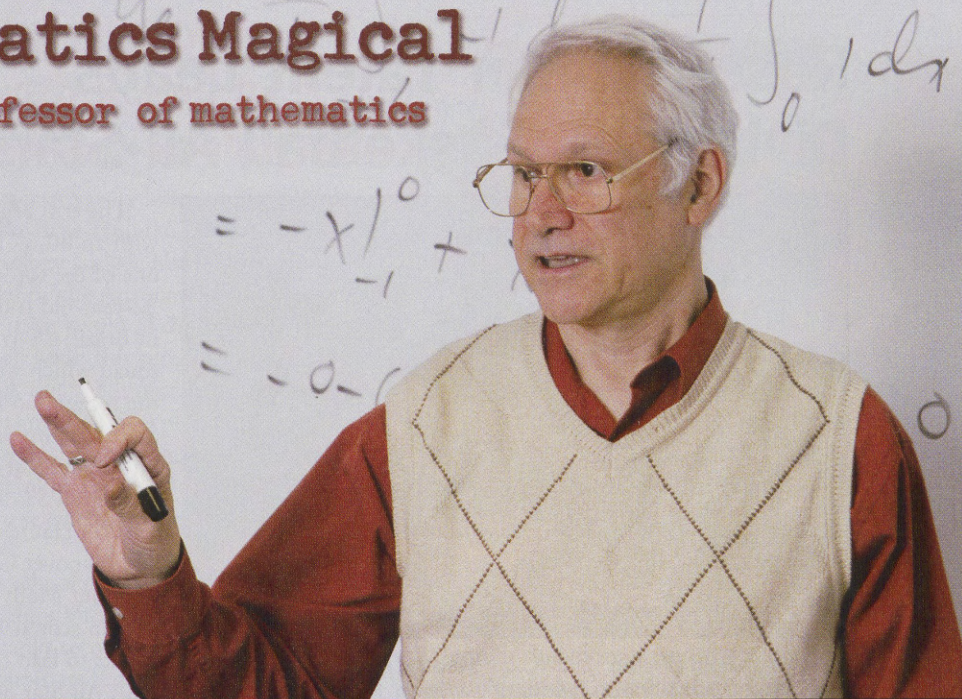
Weiner's scholarly record includes 13 refereed publications and eight conference presentations. ■

Making Mathematics Magical

Elton Graves, associate professor of mathematics

Elton Graves may not make jackrabbits appear from a hat, but what the veteran Rose-Hulman Institute of Technology mathematics professor does to teach calculus, differential equations and linear algebra may be magical.

It's his creative use of jackrabbits and coyotes to describe integrals that has made Graves deeply appreciated by students, respected by peers and honored by mathematics scholars throughout the nation—along with being recipient of the 2009 Dean's Outstanding Teacher Award and continuing a proud tradition of teaching excellence in the Department of Mathematics.



"I go into class to have fun. If I have fun, then the students should have fun," said Graves during a recent interview. "The students motivate me. Yes, I have been teaching calculus for more than 20 years, but the concepts that I'm teaching are new to my students... If you make the subject interesting and show them demonstrations on how math principles actually work—so they can visualize it—they pay attention and come away learning the subject."

Graves' predator-or-prey model (where those pesky jackrabbits come in) and use of students sliding on vinyl car seats are legendary. So is the extra caring that he takes to ensure that his students understand subject material, even coming in on a Saturday morning.

"(Graves) tried to instill a love of math and a desire to learn more and do better," said Bridget Goergen, a senior chemical engineering major. "He's always been someone I can go to for encouragement, advice or even just a friendly smile. He is the kind of professor that his students will remember for the rest of their lives and the kind of professor that really makes an impact on them."

Zach Wiersma, a sophomore applied biology major, stated: "(Graves) presented math not just as a bunch of problems, but as a thought process that could branch out into all areas of life."

And sophomore applied biology major Lindsey Saxton added: "(Graves) really is interested in his students and almost takes it personally when you do poorly."

Not surprisingly, it was his own high school and college mathematics teachers that inspired Graves' love of mathematics and problem solving. He earned a bachelor's degree from Willamette University, his master's degree from the University of Minnesota and completed doctoral studies at Washington State University and Idaho State University. Graves has been a staple of the Rose-Hulman faculty since 1981, serving as director of the Fast Track Calculus program (for enterprising freshman math scholars), advisor for the Pi Mu Epsilon math honor society, chair of the Admissions and Standing Committee and a freshman academic advisor. He has also inspired future mathematicians as the Indiana director of the American Mathematics Competitions, administering the American junior high school (AMC 8) and high school (AMC 10 and AMC 12) mathematics exams, and coordinated the Indiana Society of Professional Engineers' Wabash Valley MATHCOUNTS competition for middle school students. "I believe many of the problems facing society have technological solutions, and it is going to be engineers, mathematicians and scientists who are going to solve them.

My contribution is helping to find and inspire those students who are going to be those problem solvers," Graves said. "Rose-Hulman students are special, not by solving problems fast, but because they get the right answers. For most there is not a problem that they can't solve. Those are the students that I really enjoy teaching, and Rose-Hulman generates a lot of these among its alumni. They're being called upon to make a difference."

For his efforts, Graves has received the Distinguished Service Award from the Indiana Section of the Mathematical Association of America, the Distinguished Educator and Service Award from the American Society of Engineering Education (ASEE) Mathematics Division and became the first educator to earn the ASEE Mathematics Division Best Paper Award (2009).

Graves also became the seventh math professor to receive the Dean's Outstanding Teacher Award, joining colleagues Roger Lautzenheiser (2001) and Diane Evans (2007).

"(The Outstanding Teacher Award) is something that I have coveted for years, because it's what Rose-Hulman is all about: teaching excellence. It's the award that every member of our faculty should aspire to have on the mantle," Graves said. ■

Rose-Hulman Talent Leads Division III Basketball All-Stars in Brazil



Rose-Hulman team members (L to R) Suzy Sundling, Nicole Klass, Jon Prevo, Alisa Dickerson and Jill Floyd represented the Fightin' Engineers on the Division III Women's Basketball All-Star Trip to Brazil.

The United States Division III All-Star Women's Basketball Team, under the direction of Rose-Hulman head coach Jon Prevo, completed its five-game trip to the nation of Brazil in August.

Coach Prevo was joined on the coaching staff by assistants **Jill Floyd** ('08) and **Suzy (Carlson) Sundling** ('07). The squad also included Rose-Hulman senior **Nicole Klass** and junior **Alisa Dickerson**.

The trip began with an 80-67 loss to one of the top under 22-year-old teams in Brazil, a Divino squad which won the recent Sao Paulo State Championship on August 5 at Jundiá in Sao Paulo.

Terre Haute native and Hanover College standout Molly Martin scored 19 points to lead the USA All-Star Squad, with Courtney Carroll (15 points)

and Erica Nord (11 points) also reaching double figures. Dickerson scored eight points and Klass added two in the opener.

Game two featured a 74-52 loss to Sao Caetano du Sol, the most experienced and talented team faced by the Division III All-Stars on the tour, at Jundiá. Martin scored 14 points, with Carroll contributing 13 to the effort. Dickerson

pitched in with five points for Team USA.

The third matchup occurred August 7 and featured an 82-78 win by the Division III All-Stars over XV / Cosam / Bom Prixe. Team USA rallied from a three-point halftime deficit to earn the tightly contested victory. Jasmine Greene paced the team with 18 points, Martin and Carroll scored 13 each, and Christina Byler contributed 10 points to the effort. Klass scored six points, and Dickerson contributed four points to the team performance.

The fourth contest featured a trip to the Brazil Naval Academy in Rio de Janeiro on August 9, with Mangueira earning a 65-56 victory over Team USA. Carroll scored 18 points, with Teel (10) and Greene (10) also reaching double figures.

The All-Star Team capped the trip with a come-from-behind victory by a 72-69 margin over Mangueira. Melissa Teel scored 19 points, with Carroll (15) and Martin (13) also reaching double figures. Dickerson contributed six points to the effort. ■

AN OPTION OF OPPORTUNITY

This year-end offers a new, money-smart opportunity to people interested in making the most of their charitable remainder trust. It is called the Endowment Option that allows your trust to purchase units of the Rose-Hulman endowment. Growth in the endowment results in larger income payments to trust beneficiaries, and it results in a larger remainder gift to Rose-Hulman.

For the college, your investment means an increased growth

potential in the endowment and, for you, the possibility of increasing trust income for life. Your generosity will allow you to achieve your financial and philanthropic goals while helping pave Rose-Hulman's path to greatness in engineering, science and mathematics education.

To participate in this vision for a greater Rose-Hulman, contact David Haynes, director of planned giving, at 812-877-8453 or at david.haynes@rose-hulman.edu. ■

Jordan Goslee Earns HCAC Woman of the Year Honor



Softball pitcher Jordan Goslee was named the HCAC Woman of the Year.

Rose-Hulman graduate Jordan Goslee was named a Heartland Collegiate Athletic Conference honoree for the 2010 NCAA Woman of the Year Award, in results released by the NCAA. Goslee was selected to the top 110 nominees of 452 names submitted.

Goslee earned four first-team all-HCAC selections as Rose-Hulman's top softball pitcher from 2007-10. She was also named HCAC Pitcher of the Year in 2008.

Other accolades for Goslee include the first perfect game in softball school history in a 2009 contest; career school records for pitching wins (38), strikeouts (513) and shutouts (15); and ranking first, second and third in single-season school history in strikeouts. ■

Check out the latest stats at www.rose-hulman.edu/sports

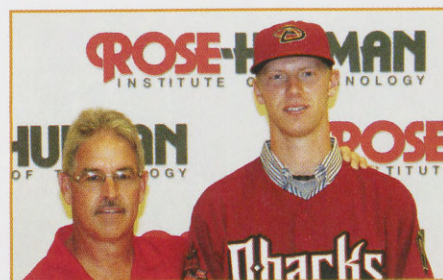
Derek Eitel Drafted in 17th Round by Arizona Diamondbacks

Four-year varsity letter winner **Derek Eitel** set Rose-Hulman Institute of Technology athletic history after being selected by the Arizona Diamondbacks in the 17th round of the Major League Baseball Draft this summer.

Eitel, the 511th overall selection of approximately 1,500 players who will be chosen this past spring, became the first Rose-Hulman student-athlete in school history selected in a professional sports draft.

His school records include career marks for innings pitched (320.1) and wins (29). Eitel ranks second in school history with 299 career strikeouts and ranked third in school history with 92 strikeouts this past spring.

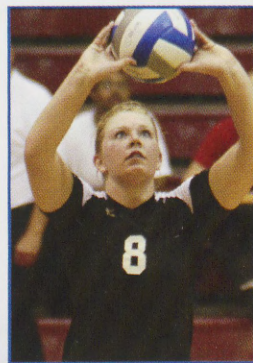
Eitel helped Rose-Hulman reach the NCAA Division III Mideast Baseball Regional in '08, '09 and '10, including Heartland Collegiate Athletic Conference tournament titles in '09 and '10.



Rose-Hulman head baseball coach Jeff Jenkins joined MLB draftee Derek Eitel at the draft day press conference.

In his NCAA Division III Tournament career, Eitel finished 2-0 with a 1.11 earned run average and 26 strikeouts in 24 innings of work. He also served as the starting pitcher in all three NCAA tournament victories in Rose-Hulman baseball history.

Eitel's journey through the Minor Leagues included stops for the rookie league Missoula Osprey and the Class A South Bend Silverhawks. Eitel appeared in 11 contests with eight starts and a 2-2 pitching record for the rookie league team in Missoula. In his first three appearances in South Bend, Eitel tallied a 1.38 earned run average with 17 strikeouts in 12 innings of work. ■



Leah Pelzel led the volleyball team in assists and grade point average during the 2009 season.

SWIMMING, VOLLEYBALL TEAMS EARN ACADEMIC HONORS

The Rose-Hulman swimming and volleyball teams were honored for their athletic and academic accomplishments by their respective national coaching organizations.

The volleyball squad earned Academic Team recognition from the American Volleyball Coaches Association after achieving a combined team grade point average of higher than 3.30. The Fightin' Engineers were also the highest ranked team in terms of grade point average in Indiana.

Rose-Hulman joined DePauw University as the only Indiana based NCAA Division III institutions to qualify for Academic Team honors. Seventy-five of the more

than 400 volleyball teams within NCAA Division III qualified for the award. The volleyball squad was also the only Heartland Collegiate Athletic Conference institution represented on the Academic Team list.

The men's swimming and diving team combined for a 3.20 team grade point average to rank 41st nationally in NCAA Division III. The Fightin' Engineers were also the highest ranked team in terms of grade point average in Indiana.

The women's squad also received All-Academic recognition after combining for a 3.12 grade point average.

Rose-Hulman joined DePauw University as the only Indiana based NCAA Division III institutions to qualify both the men's and women's squads for the All-Academic Team.

Rose-Hulman was also the only Heartland Collegiate Athletic Conference institution represented on the All-Academic list. ■

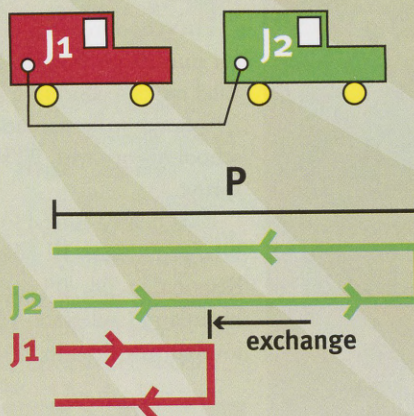
Bailey Challenge

By Professor Emeritus Herb Bailey

THERE ARE 10 KINDS OF ROSE ALUMNI—THOSE WHO UNDERSTAND THE BINARY BASE AND THOSE WHO DON'T.

The problems for this issue are not about a number base but are about a jeep base camp on the edge of a desert. Each jeep has a gas tank holding enough gas for 400 miles and is full at the desert edge. There is no additional gas available. The goal is to get one jeep to penetrate the desert as far as possible with all jeeps returning to base camp. We denote by P this penetration in miles. They may share gas along the way. An example, with two jeeps, is shown in the figure. J_1 and J_2 leave base camp, travel together for a bit, and then J_1 refills J_2 . J_1 retains enough gas to return to base. J_2 continues into the desert retaining enough gas for the return to base camp. Various forms of the refueling problem have been around for 60 years, and many papers have been published. Some of these

involve more mathematics than I can handle. Your problems for this issue require some algebra and some ingenuity. Since the desert tribes are hostile, you may not leave supplies for use by returning jeeps and you cannot wait for returning jeeps.



PROBLEM 1

Find maximal P with only a single jeep starting from base.

PROBLEM 2

Find maximal P with two jeeps starting from base.

PROBLEM 3

Find a sharing method such that 3 jeeps starting from base can attain $P = 1000/3$.

BONUS (Only for those that are not already tired of jeeps.)

Find the sharing method to give the largest P with 4 jeeps initially at base camp.

We have listed the 50 solvers of the problems from the previous issue. The warm-up asked for the least number of pitches in a "complete" Major League baseball game. Full credit was given for the answer 52. For example, 8 $\frac{1}{2}$ innings including a homerun by the first batter on the home team and then 51 batters connecting on their first pitch, only to be thrown out. Some of you pointed out **Rule 8.04**: "When the bases are unoccupied, the pitcher shall deliver the ball to the batter within 12 seconds after he receives the ball. Each time the pitcher delays the game by violating this rule, the umpire shall call a ball." Many could score but three are picked off each half inning. Total pitches for the game would be 0. Any final score could be achieved.

FIRST SOLUTION: Was to determine the least number of standard integer gram weights needed to weigh parcels of integer gram weights from 1 to 8000. Standard weights and parcels never on the same pan. This can be done with the 13 weights 1, 2, 4, ..., 2^{12} . The 1 gram can be deleted, for example, 3 grams is between 2 and 4 grams. We give full credit for 12 or 13.

A SECOND SOLUTION: The answer is 9 weights, for example 1, 3, 9, ..., 3^8 .

Send your solutions to Herb.Bailey@rose-hulman.edu or to Herb Bailey, Math. Dept., Rose-Hulman, 5500 Wabash Ave., Terre Haute IN 47803. Please include your class year if you are an alum. (saves me lookup time)

Solvers of the previous problems are listed on page 35.

FEATURE | INNOVATION CELEBRATION

LEADING THE NEXT DECADE

LEADING THE NEXT DECADE OF
INNOVATION
ROSE-HULMAN



GOVERNOR DANIELS RECEIVES ROSE-HULMAN'S INAUGURAL EXCELLENCE IN INNOVATION AWARD



Governor Mitch Daniels was honored for his "courage and innovation" when he received Rose-Hulman Institute of Technology's inaugural Excellence in Innovation Award during a celebration at the Indiana Roof Ballroom in Indianapolis.

"As a leader, Governor Daniels understands the role of education in improving the lives of the people of our state," Rose-Hulman President Matt Branam said in presenting the award to the governor at the event, which was attended by more than 700 people. "As an innovator, the governor understands that emerging technologies are the lever for creating new jobs and improved jobs...the kind of jobs our Rose-Hulman graduates are working hard to fill."

Daniels has "elevated appreciation for academic rigor, creating a state program to recognize the best math and science students in our high schools," Branam said. "That makes Rose-Hulman better, which helps us make Indiana better."

"Because he (Daniels) has so expertly cultivated a climate that encourages innovation...it is my great honor to present our 2010 Rose-Hulman Excellence in Innovation award to our governor, the Honorable Mitchell E. Daniels, Jr.," Branam said.

In accepting the award, Daniels thanked Rose-Hulman "for the contributions you make, the inventions you produce and the jobs that come from them. But even more than that, thank you for the excellence you represent and the standard you have held up, which I hope all Hoosiers and the generations now arriving on the scene will note and emulate and seek, each in his or her own way, to try to achieve."

"Thanks and good luck for another many decades of leadership and excellence in innovation," Daniels said.

Honoring Daniels was the culmination of an event titled "Leading the Next Decade of Innovation," which included a tribute to the 10th anniversary of Rose-Hulman Ventures. Also at the gala, former president and professor emeritus Samuel F. Hulbert was recognized for the innovative spirit he brought to campus during his 28 years with Rose-Hulman.

Another tribute included the unveiling of a memorial to the late August "Gus" Watanabe, M.D., who was instrumental in launching the applied biology program at Rose-Hulman. His widow, Peg, was present for the tribute, which was delivered by dinner chairman James R. Baumgardt, Rose-Hulman alumnus, an emeritus member of the college's Board

of Trustees and the former chair of the Board's committee on Rose-Hulman Ventures.

The celebration was organized by Branam to engage various members of the Rose-Hulman community in looking to the future of innovation and the college's role in it. He became the 14th president of the 135-year-old engineering, science and mathematics college on December 4, 2009. A 1979 Rose-Hulman civil engineering graduate, Branam is the first alumnus to serve as permanent president at Rose-Hulman.

Major sponsors for the event were AIT Laboratories and Indiana Chemical Trust. Leadership sponsors included Greg and Amy Gibson, David and Katherine Hannum, and the Cornelius Family Foundation. President's Sponsors were Bill Fenoglio, chairman of the Board of Trustees, Nancy and Niles Noblitt, Joann and Jack Ragle, Susan and Donald Scott, and Clyde Willian.

To view photos of the event, visit <http://www.rose-hulman.edu/news/2010innovationphoto/01.htm>. For more information, visit the Decade of Innovation web site at www.decadeofinnovation.com. ■

INNOVATION CELEBRATION

February 27, 2010

▼ Graduate Student Thomas Reives shares his Rose-Hulman experience. President Matt Branam, left, and Sara Erhart, president of the Student Government Association, present the inaugural "Excellence in Innovation" award to Indiana Gov. Mitch Daniels. Former President Samuel F. Hulbert tells the crowd that Rose-Hulman's best days are ahead.

◀ President Matt Branam, center, visits with Nico Bastolla and his father, Mike. Rose-Hulman Ventures helped develop a minimally invasive surgery tool that removed a tumor from Nico's brain. Dinner Chairman James Baumgardt unveils a memorial tribute to the late Dr. August "Gus" M. Watanabe, M.D., who played a role in launching applied biology at Rose-Hulman. Participating in the unveiling is Watanabe's widow, Peg Watanabe.

▼ More than 700 people pack the Indiana Roof Ballroom in downtown Indianapolis for the "Leading the Next Decade of Innovation" celebration.

Out of This World Technology

Benzing Helps Invent 'Spring Tire' For Moon, Possibly Earth

Jim Benzing was dreaming of becoming an engineer the last time America had a vehicle riding across the surface of the moon.

Now, his ingenuity and can-do spirit have helped The Goodyear Tire & Rubber Company and the National Aeronautics and Space Administration (NASA) develop an airless tire to transport large, long-range vehicles across the surface of the moon—and possibly revolutionize transportation on Earth, too.

Benzing, a 1977 mechanical engineering alumnus, served as Goodyear's lead innovator on the new "Spring Tire," designed to carry much heavier vehicles over much greater distances than the wire mesh tire previously used on the Apollo Lunar Roving Vehicle (LRV). The new tire will allow for broader exploration and the eventual development and maintenance of a lunar outpost. The tire was installed on NASA's Lunar Electric Rover test vehicle and put through its paces at the Johnson Space Center's "Rock Yard" in Houston, where it performed successfully. Further testing is under way.

"This tire is extremely durable and extremely energy efficient," notes Benzing,

a principal engineer with Goodyear. "The spring design contours to the surface on which it's driven to provide traction. But all of the energy used to deform the tire is returned when the springs rebound. It doesn't generate heat like a normal tire."

Development of the original Apollo lunar mission tires, and the new Spring Tire, were driven by the fact that traditional rubber pneumatic (air-filled) tires used on earth have little utility on the moon. This is because rubber properties vary significantly between the extreme cold and hot temperatures experienced in the shaded and directly sunlit areas of the moon. Furthermore, unfiltered solar radiation degrades rubber, and pneumatic tires pose an unacceptable risk of deflation.

Further complicating matters were requirements for the Spring Tire to handle 10 times the load capacity and 20 times the durability of the original lunar mission tires. This was a significant change in requirements that required innovation, according to Vivake Asnani, NASA's principal investigator at the Glenn Research Center in Cleveland.

"With the combined requirements of increased load and life, we needed to

Continued on page 27

The Technology behind the Spring Tire...

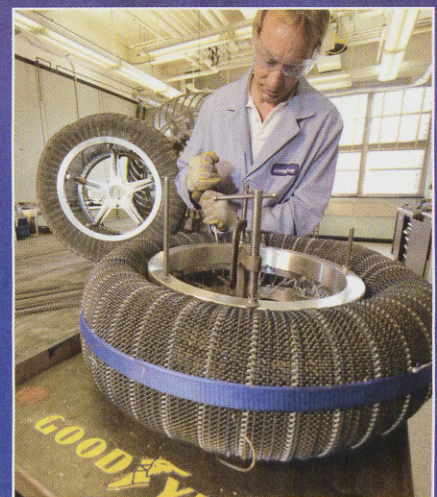
The Spring Tire lives up to its name, with 840 load-bearing springs and an intricate wiring system allowing the tire to carry much heavier vehicles over much greater distances. The tire was designed without a single point failure mode, meaning that a hard impact that might cause a pneumatic tire to puncture and deflate would only damage one of the 840 load-bearing springs.

Along with having this ultra-redundant characteristic, the tire has a combination of overall stiffness yet flexibility that allows

off-road vehicles to travel rapidly fast over rough terrain with relatively little motion being transferred to the vehicle.

The tire is eight inches wide, 28 inches in oval circumference and weighs 42 pounds. The tire's characteristics are a great improvement over the wire mesh tire previously used on the Apollo Lunar Roving Vehicle. The new tire will allow for broader exploration and the eventual development and maintenance of a lunar outpost. ■

Jim Benzing on the cutting edge.



VEHICLE ELECTRIFICATION

Alumnus Thrives at the Heart of “Exciting Stuff”

Although Richard Stanley, a 1978 mechanical engineering graduate of Rose-Hulman, claims to have taken the more normal “traditional” engineering career path for most of his life, his unusual successes and media notoriety tell the story a little differently. It might be a “traditional” electrical engineering path until the past few years, but certainly not the norm. Not too many people pop up on Forbes.com when you do Internet searches on them, but Stanley does.

Known for his outstanding leadership, creating new business lines through all types of economies, consistently delivering growth and profitability with over 30 years of global manufacturing and management experiences in the automotive industry, Stanley has a track record that many can only dream about, but he gives much of the credit to Rose-Hulman and the strong, innovative education he received here.

“Rose-Hulman gave me a broad capability in problem solving and an interest in innovation—I didn’t anticipate I would work in engineering all of my life, but I like the technical aspects and I’m curious by nature,” Stanley said.

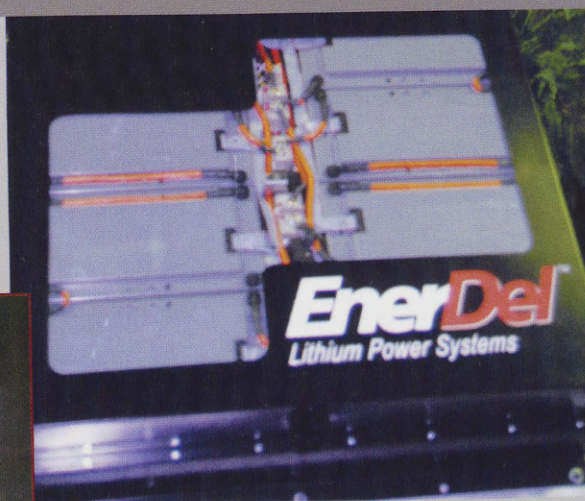
Stanley started his career with General Motors’ Delco Remy Division, where he had a 16-year rise in a variety of senior engineering and management positions, including serving as senior vice president and general manager of automotive systems. In 1998 he became president of Remy, Inc., the largest division of Remy International, formerly Delco Remy International. During his time at the helm, the company saw a 58 percent rise in revenue from \$500 million to \$800 million through innovative organic growth, corporate acquisitions and entry into emerging markets, namely



technologies associated with hybrid vehicles. For two years prior, he was president of the ATC Drivetrain arm of ATC Technology Corporation.

In September 2009 Stanley was appointed president of EnerDel, Inc., a subsidiary of Ener1, Inc. “EnerDel is playing a fundamental role in transforming the basic technology of automotive transportation. In the space where I’m in, it’s the heart of exciting stuff—vehicle electrification. It’s no longer 5-10 years away. In other parts of the world things are coming together and enough is happening now that you’re going to be seeing vehicles on the road—plug-in hybrids and pure electric vehicles—within the next two to three years.” Stanley and EnerDel are poised to be a large part of this change.

His role grew this fall when he was named Chief Operating Officer of Ener1. EnerDel’s two factories in Indianapolis are the first U.S. commercial-scale automotive lithium-ion battery manufacturing plants. The U.S. Department of Energy recently awarded EnerDel a \$118.5 million grant from the federal stimulus program. They are ready to transition into production



and manufacturing, Stanley said. “I’m passionate about what we are doing here.”

The automotive industry and the energy sector as a whole, are seeing an important paradigm shift designed to break dependence on foreign oil, address concerns of global warming and emissions, Stanley said. Ener1 is at the forefront, possibly two years ahead of other similar U.S. industries.

Rose-Hulman’s Advanced Transportation Systems (ATS) program has recently caught the attention of Stanley. The ATS program is involved with issues and questions associated with petroleum displacement, emissions reduction, and sustainability. The program supports five engineering competition groups.

“Experienced engineers (in plug-in hybrids and pure electric vehicles) are hard to find,” Stanley said. He sees Rose-Hulman as a great source of students with hands-on experience because of the new ATS lab and EcoCAR challenges, one of the EcoCAR competition groups that work with electric vehicles. “It provides a great opportunity for us to connect with undergraduate students,” he said. EnerDel has provided the EcoCAR team with a high-performance battery system for the team’s hybrid vehicle applications. The relationship is an industry/academia friendship that promises great results and longevity. ■

PROMISING FUTURES: ALUMNI-LED ENTREPRENEURIAL SUCCESSES FEATURED ON FORBES LIST

VEXTEC



Robert Tryon and Loren Nasser, Vextec founders.

Success continues for two entrepreneurial companies led by Rose-Hulman Institute of Technology alumni named to Forbes magazine's 2009 America's Most Promising Companies list.

Topping the prestigious listing was VEXTEC, a Brentwood, Tenn., company founded by mechanical engineering graduates Loren Nasser ('82) and Robert Tryon ('81).

At No. 16 was Scale Computing of Indianapolis, founded by 1996 computer science graduates Jeff Ready and Scott Loughmiller, and featuring former student Ehren Maedge as director of operations.

VEXTEC (www.vextec.com) is the only company in the world that can accurately and efficiently predict the performance, durability and true lifetime cost of a single component or an entire fleet—before they're ever built.

Founded in 2000, VEXTEC has pioneered and patented innovations in material science and probability theory to form the foundation of its Virtual Life Management (VLM) technology. Manufacturing companies from such diverse industries as aerospace, heavy equipment, automotive, electronics and medical implants benefit from VEXTEC's unique ability to predict product life cycles and failure, and most importantly, their financial consequences.

"VEXTEC's technology promises to

hasten the pace of innovation," stated Brett Nelson, Forbes Entrepreneurs Editor. "This young company represents the very spirit of entrepreneurship in America."

Scale Computing (www.scalecomputing.com) is another entrepreneurial success story. Founded in 2007, the company creates data storage systems for corporations, hospitals, schools, law firms and government entities. Unlike other hardware, Scale's products are expandable in increments of one-, two- and four-terabyte storage nodes, eliminating the need to overinvest in rapidly depreciating equipment. The systems sell for one-half to one-fifth the price of equivalent products made by competitors, making them extremely affordable.

Since being named to the Forbes list last year, VEXTEC and Scale Computing have continued making news. VEXTEC was recently awarded its third patent for the intellectual property upon which the company's VLM technology was built. This development furthers VEXTEC's ownership stake of probabilistic, microstructure material forecasting technology.

"We're building off the success of the Forbes list," Nasser noted. "I have opened up C-level strategic discussions with two worldwide airlines, several oil production companies, and a couple of medical implant manufacturers. Also, I have been contacted by over 100 venture investment firms and several risk management companies closing."

Rose-Hulman's relationship with Nasser and Tryon continues as VEXTEC has a testing laboratory near campus and is a client business of the Terre Haute Innovation Alliance. Two other alumni working for the company are Rich Holmes (Mech. Eng., '76), senior lifing specialist, and Matt King (Mech. Eng.,

'02), staff engineer.

Meanwhile, Scale Computing has released two major products, signed up over 50 resellers, scored big-name customers like Motorola, forged relationships with two distributors, opened new corporate offices and taken its revenue from \$35,000 in 2008 to \$2 million by the end of 2009. The company's success can also be attributed to its innovative and smart market approach that produced rapid growth.

Ready, no stranger to entrepreneurial success, added that Scale Computing has been able to leverage the recognition attached with the Forbes list in several ways—adding credibility when working with partners and customers, and increasing visibility in the media, the storage industry and across Indiana.

"We are actually working with the other 19 companies that were recognized to create a 'fraternity' of sorts so that we can help each other exceed the expectations of Forbes' Most Promising Companies," Ready said.

Read more about Forbes' 2009 Most Promising Companies list at <http://www.forbes.com/entrepreneurs/promising-companies>. The site includes video interviews with Nasser and Ready. ■



Loughmiller, Maedge and Ready of Scale Computing.

SCALE

COMPUTING

ON STATION WITH INNOVATION

Rose-Hulman Commits to Innovation Leadership

Rose-Hulman Institute of Technology administrators, faculty and staff members, students and alumni are proud of the college's continued No. 1 national ranking in undergraduate engineering education through a survey of deans and senior faculty conducted by U.S. News & World Report magazine for its annual college guidebook.

However, Rose-Hulman officials are just as proud of its reputation as a leader in engineering education innovation—affirmed in a study featured in the current issue of the Journal of Engineering Education.

Research Notes Rose-Hulman's Innovative Spirit

For the article "Diffusion of Engineering Education Innovations: A Survey of Awareness and Adoption Rates in U.S. Engineering Departments," Maura Borrego and Simin Hall of Virginia Tech joined Jeff Froyd of Texas A&M University in asking more than 2,000 engineering academic department heads, academic deans and professional society leaders the following question: "Which colleges or universities are considered leaders or innovators in engineering education?"

The result: Rose-Hulman was cited more times than any other institution for innovative engineering education practices.

"Improving engineering education to produce engineers who are better prepared for the future global economy is vital to the nation's competitiveness," stated Borrego, Hall and Froyd in their study report.

Rose-Hulman administrators and faculty members agree, believing that for the Institute to achieve its mission of academic excellence, Rose-Hulman must be a leader in innovation. Teams spent this summer examining innovation in education and other career fields and hosted a Spirit of

Innovation Workshop on campus before starting this school year. Leadership in innovation means that the college must excel in several areas including the practice, education and scholarship of innovation.

"It is through academic excellence and leadership in innovation that Rose-Hulman will define the future of engineering education and, therefore, we will have an impact on the world around us," stated Bill Kline, interim vice president of academic affairs and dean of faculty. "A focus on innovation can serve as the catalyst to continue to improve what we teach, how we teach and the educational experience that we provide to our students."

Understanding the innovation processes has helped Rose-Hulman reflect on and improve ways in which faculty members prepare students to be innovators.

"The time for innovation is now, and the academic environment at Rose-Hulman is prime for this movement," stated Rebecca DeVasher, assistant professor of chemistry and biochemistry. "We (the educators) have both support from our administration and extremely

Living-Learning Community Proposed

One faculty group has proposed a living-learning community Home for Environmentally Responsible Engineering (HERE) project for a cohort of freshmen. This community will allow students to engage in discussions of sustainability in the classroom as well as in residence halls. Faculty members may have offices in the residence environment, and students will learn key skills of sustainable development and become more aware of issues concerning human health and the environment.

"This idea is new to engineering education, and it is this type of innovative thinking that will bring together new ideas for emerging technologies that solve the problems we face as a global society," DeVasher points out.

Another proposed idea is the development of a Faculty Catapult program, a week-long immersion experience during which faculty can work on projects, develop their creativity and explore new areas of learning like sustainability.

"It is through academic excellence and leadership in innovation that Rose-Hulman will define the future of engineering education and, therefore, we will have an impact on the world around us."

— Bill Kline, Interim Vice President of Academic Affairs and Dean of Faculty

talented students that allow us the opportunity to be innovative. We must seize this opportunity. At Rose-Hulman, we pride ourselves in being the best in engineering education, and innovation is the key to us being our best."

"Our students come into our classrooms facing new challenges as they learn new subjects. Our goal should be to put ourselves in their shoes," said Julia Williams, professor of English and executive director of the Office of Institutional Research, Planning

"There is no bigger challenge for engineering, math and science education than to provide the world with graduates who can develop innovative solutions to the world's challenges."

– Jameel Ahmed, Associate Professor of Applied Biology and Biomedical Engineering

and Assessment. "We envision Faculty Catapult as one way to ensure that our faculty members are always learning; that learning will translate into better classroom experiences for our students."

Groups of faculty members interviewed innovators in other fields—creative arts, cooking and architecture to name just a few—to capture ideas that could be integrated into the Rose-Hulman's core academic principles.

"It's a global world out there. We work hard to help our students become globally knowledgeable and competitive—and I believe that innovation skills are a critical part of that professional development," stated Kay C Dee, professor of applied biology and biomedical engineering. "Workforce tasks that require strong technical skills will be completed wherever in the world they can be completed fastest and cheapest. Tasks that require technical skills and forward and lateral thinking,

creative problem-solving, interdisciplinary approaches—the really interesting tasks—will be conducted by teams of professionals who possess innovation skills (observing, questioning, connecting, creating, etc.). That's where the future gets made, and that's where I want our students to be... I've learned a lot over this past summer, and I'm really looking forward to taking some risks and trying some new things in my classrooms this fall."

Jameel Ahmed, associate professor of applied biology and biomedical engineering, added: "There is no bigger challenge for engineering, math and science education than to provide the world with graduates who can develop innovative solutions to the world's challenges. Rose-Hulman graduates have repeatedly proven themselves to be innovators, and we would like to do an even better job of providing our students with innovation skills while they are in

school. By focusing our efforts on building innovation skills in our students, we will help them have a greater impact on the world around them."

Students appreciate the innovative atmosphere already on campus and look forward to some of the faculty task force's ideas being implemented into Rose-Hulman—in and out of the academic environment.

Go Do Something Cool

"Where Rose-Hulman really excels in innovation is how the school links theory to the real world," stated Andy Milluzzi, a junior computer engineering student who spent the summer working on creative projects for National Instruments, including developing a large LEGO® model (with approximately 15,000 LEGO bricks) for the company. He also had the opportunity to interview famed theoretical physicist Michio Kaku, co-founder of the String Field Theory. "Rose-Hulman classes are taught like: Here is the concept, here is a real-life example, now go do something cool. The real key to Rose-Hulman is in that last step: Once you have an idea, the professors go out of their way to help you realize it. I really think that attitude towards teaching is what fosters creativity and innovation on campus." ■

Continued from page 23

make a fundamental change to the original moon tire," stated Asnani in a Goodyear news release. "What the Goodyear-NASA team developed is an innovative, yet simple, network of interwoven springs that does the job. The tire design seems almost obvious in retrospect, as most good inventions do."

Benzing joined the development project nearly two years ago.

"I like challenges. Really, it was an offer that I couldn't refuse," he said.

Initial "Slinky-style" designs, featuring interwoven wires coils, satisfied load capacity requirements, but failed durability

testing. The technological breakthrough came when Benzing realized that a series of small springs, when added to the wire frame, could ensure constant tension within the structure of the tire — through a series of 100 screw pitches and 100 points of contact. This innovative idea provided the desired durability.

"There are so many points of contact, distributing the load across so many areas, that it creates an almost indestructible unit," said Benzing, whose name is on the patented technology.

NASA has been so impressed with the tire that it highlighted this technology

development in its annual Hallmarks of Success video series. The series features NASA's most positive corporate team efforts with many of the technologies being shown to policymakers in Washington, D.C.

"Designing something that could someday be on the moon is beyond anything that I ever dreamed possible," Benzing said. "Totally changing an industry has always been my goal. I think you're going to hear some really exciting things coming from this technology in the future. When that happens, it will drastically change the tire industry." ■

STUDYING HOW THE BODY WORKS

Orthopedic Biomechanics Lab Lets Students and Surgeons Make Discoveries

The stresses put on pelvic and knee bones following joint replacement surgery show up as bright colors in biomechanical models on computers in the Orthopedic Biomechanics Laboratory at Rose-Hulman Institute of Technology, opening exciting new worlds of scientific discovery for biomedical engineering students and several of the nation's top joint replacement surgeons.

The laboratory is a unique collaboration between the Joint Replacement Surgeons of Indiana (JRSI) Research Foundation, based at the Center for Hip & Knee Surgery in Mooresville, Ind., and Rose-Hulman. The program was established with the help of Dr. Michael Meneghini (Civil Eng., '95) to provide undergraduate and graduate engineering students with valuable research opportunities in the field of orthopedics.

So far, the program has exceeded expectations, with nine research manuscripts from the laboratory being accepted since 2005 for publication in peer-reviewed medical and engineering journals, and for the first time, two students were given the opportunity to present their work from the laboratory at the Biomedical Engineering Society's annual meeting. Last November, research from the lab was presented to over 2,000 orthopedic surgeons and researchers at the American Association of Hip and Knee Surgeons' annual meeting.

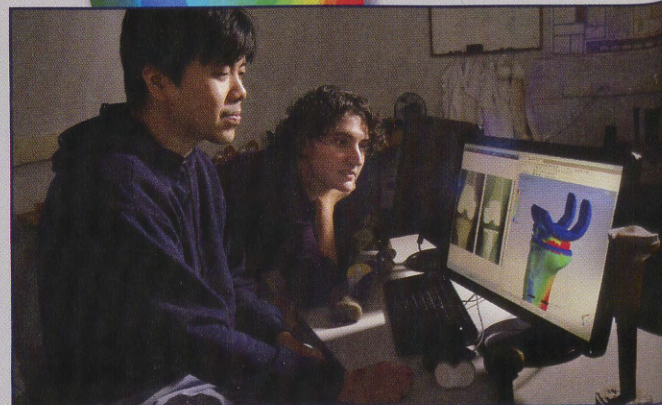
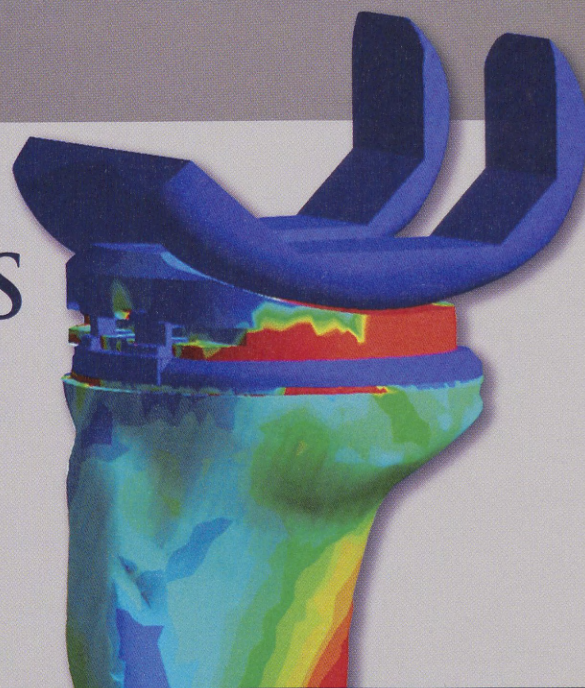
Also, such state-of-the-art technology as a Medical Imaging and Finite Element Analysis Workstation is allowing students

to perform virtual surgery and computational models on patient-specific bone geometries. The laboratory is located in the John T. Myers Center for Technological Research with Industry at Rose-Hulman.

"Our students are playing a significant role in several areas of advanced research, covering areas of hip and knee arthroplasty and computational modeling of these systems," stated Renee Rogge, associate professor of applied biology and biomedical engineering.

Rogge joins Christine Buckley, associate professor, and Kathleen Toohey, assistant professor, in mentoring students who have studied such topics as "Pelvic Loading Following Total Hip Arthroplasty: A Biomechanical Analysis of Cup Position, Cup Design and Hip Position During Simulated Gait," "Thermal and Mechanical Optimization of PMMA Bone Cement" and "Finite Element Analysis of a Composite Tibia Model Using a CT-Generated Mesh." Adding valuable expertise to these projects have been surgeons from one of Indiana's well-established orthopedic groups: Merrill Ritter and Michael Berend of The Center for Hip and Knee Surgery Physicians at St. Francis Hospital, and Scott Small (Mech. Eng., '05), JRSI Research Foundation's engineering director.

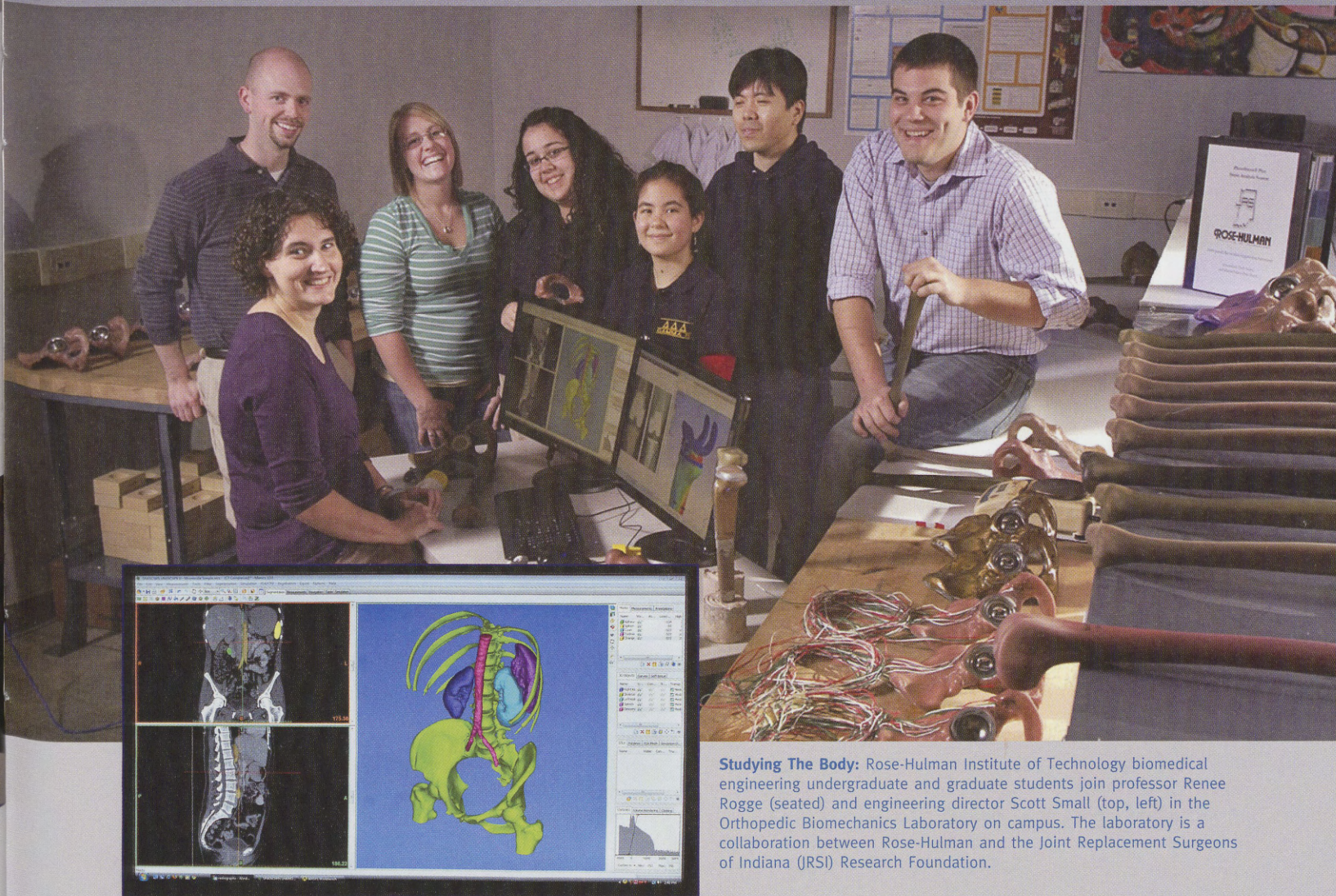
"Having our undergraduate-level



Putting Education To Practice: Graduate student Susumu Tokunaga (front) and professor Renee Rogge examine the computational modeling of knee arthroplasty that will assist with research projects to examine the effects of prosthesis size, design, material and surgical alignment on implant survivability.

students get the opportunity to work with surgeons with such expertise in their fields certainly enhances the educational experience," Buckley said. "These surgeons are dealing with these issues every day in patient care. This knowledge is invaluable to the learning process."

Berend, a world-renowned joint replacement surgeon, stated: "The unique relationship with Rose-Hulman has allowed a true exchange of information, educational opportunities and scientific thinking between surgeons and students. We have been able to combine our clinical experience with over 23,000 joint replacements with the latest engineering research techniques and experimental models. The combination of these



Studying The Body: Rose-Hulman Institute of Technology biomedical engineering undergraduate and graduate students join professor Renee Rogge (seated) and engineering director Scott Small (top, left) in the Orthopedic Biomechanics Laboratory on campus. The laboratory is a collaboration between Rose-Hulman and the Joint Replacement Surgeons of Indiana (JRSI) Research Foundation.

disciplines hopefully helps the students see what can be accomplished in the future. It has been a real privilege to see the engineers discover many new insights into joint replacement performance.”

Recently, Rogge instructed an orthopedic biomechanics course that allowed junior and senior biomedical engineering students to create 3D models of human femurs using CT scan data, implant a custom femoral component during virtual surgery, and perform a computational stress analysis of the system.

Margaret Kelly, biomedical engineering graduate, used the lab to design a testing protocol that examines surface strains in the ilium, ischium and pubis based on

different orientations of the acetabular cup during total hip replacement. She also was able to view surgeries and work with Berend.

“Because of my experiences with JRSI, I was able to make a smooth transition into my (co-op at Biomet Inc.) and begin contributing to the company immediately,” Kelly stated. “JRSI prepared me for my work at Biomet by giving me real-world, cutting-edge experience in the field of orthopedic joint replacement.”

Didem Tunc, a biomedical engineering graduate, was among five students involved in an undergraduate research course which developed in-depth projects addressing a variety of topics within

orthopedic biomechanics. Other students involved were graduates Leah Howard, Darcie Thomas, Michael Volitch and Sarah Younger.

“It’s exciting to see how the applications of biomechanics and engineering are applied in a process that can help others. There may be small steps that can create big results,” said Tunc. “My work in the lab has shown me that I can do research and contribute to helping others.”

Supporting the integration of technology into the research program have been Rose-Hulman alumni Howard Freers (Mech. Eng., ’48), Niles Noblitt (Biology, ’73) and Greg Gibson (Civil Eng., ’84), and trustee Jack Ragle. ■



Ventures Celebrates 10 Years of Innovation

With a \$29 million Lilly Endowment grant, Rose-Hulman Ventures was created to answer engineering education's call for putting theory into action, as well as to foster creation and growth of Indiana-based companies. Ten years later, the program is a recognizable symbol for Rose-Hulman's leadership in innovation.

Operating in a 35,000-square-foot building at Rose-Hulman's South Campus, Rose-Hulman Ventures meets real and urgent product-development needs, mainly on a fee-for-services basis. While some clients are startup companies, well-established companies and nationally known corporations also provide opportunities for students.

Over 749 students have been hired to work in 2,216 internships with 117 clients. Rose-Hulman Ventures has brought over \$20 million to Rose-Hulman, and the program puts \$750,000 into students' pockets every year through paid internships. This real-life, project-based program offers students professional

experiences that set them apart in a competitive engineering market.

As Real-World As It Gets

Rose-Hulman Ventures takes educational hands-on projects to a new dimension. It is a unique operational model for university/industry interaction, producing solutions to technology challenges, keeping intellectual property with the client, while maintaining confidentiality.

When students walk through the doors, they enter a model of the industrial world. They are part of professional staff and a multidisciplinary team with a dedicated infrastructure including office and lab space, workstations, lab equipment and software tools. As in the real world, engineering doesn't end with product design. Testing, documentation, monthly progress reports and communication with top management are also requirements.

"We have real companies, real people who need real results and they are knocking urgently on our door for those results.

These young people must deliver," said Brian Dougherty, engineering manager.

The portfolio of projects spans many industries and technologies, including determining how to design a kidney-measuring tool, how to develop a product to improve the survival chances for victims of heart disease, and how to develop a device that makes removing otherwise inoperable brain tumors easy work.

It's a world of new problems that need engineering tools and exceptional engineers to solve them.

Theory Into Practice

A Rose-Hulman Ventures experience on top of a rigorous, hands-on, nationally recognized education is similar to tempering metal: it adds strength and value. "Our students get this real-world, hands-on experience before leaving campus," said Mitch Landes, manager of client programs at Rose-Hulman Ventures. "It makes those exceptional students a much different and much more valuable employee," he added.

It is the Rose-Hulman Ventures philosophy that students need practice under the guidance of a company. "Physicians do it—they're required to do a residency," Dougherty explained. "After seeing the results of this program over the past 10 years, I don't think the answer to engineering is simply tacking on another two-year degree, but it is practical experience. It's working for a company. It's being part of a multidisciplinary team. It's meeting deadlines. It's being responsible for writing weekly progress reports and learning those soft skills that engineers sometimes lack. It makes our graduate so much more valuable to employers and to society." ■

FAST FACTS:

- Rose-Hulman Ventures bridges the gap between research and the marketplace.
- Rose-Hulman Ventures leverages the engineering challenges of companies as an innovative way to educate undergraduate engineering students.
- Virtually all of the projects in the program are "innovation stage" projects as opposed to research focused.
- An online survey of Rose-Hulman Ventures clients conducted by Walker Research revealed that Rose-Hulman Ventures creates positive business impact for companies – 94%.
- Approximately 45% of Rose-Hulman Ventures clients are in the area of life sciences.
- The technical expertise at Rose-Hulman Ventures was used to launch new products or to penetrate new markets in six countries.

WARREN AND JOYCE MICKENS ESTABLISH DIVERSITY SCHOLARSHIP

Alumnus and Board of Trustee Member Warren Mickens and his wife, Joyce, have established a scholarship fund with the goal of making a Rose-Hulman education available to students currently underrepresented in the Rose-Hulman population.

Candidates for scholarships from the fund shall be selected based on the following criteria:

- Individuals underrepresented in the current student population, specifically African American, Hispanic and biracial;
- Demonstrated financial needs; and
- Academic credentials.

Mickens is a 1977 mechanical engineering graduate who went on to receive an MBA from Harvard Business School in 1982. He also has received an honorary doctor of engineering from Rose-Hulman, and he began serving as a trustee in 2000.

Both Warren and Joyce share the belief that for graduates to be fully prepared, they must appreciate and acknowledge fellow students, faculty and staff who fully represent the widely diverse world in which they will live and work. ■

Kim A. Perkins Joins Rose-Hulman to Lead Annual Giving Program



Kim A. Perkins, a seasoned marketing, sales and public relations professional, has joined the institutional advancement

staff at Rose-Hulman Institute of Technology as director of annual giving and donor relations. She comes to Rose-Hulman from St. Luke's Sugar Land Hospital in Sugar Land, Texas, where she was director of physician and community relations.

In her Rose-Hulman duties, Perkins is responsible for raising money through the annual giving program where she oversees fundraising promotions, solicitations and donor stewardship.

Perkins' background includes volunteer relations, marketing, communications and public relations at various hospitals

in the Houston area. She successfully completed a startup of a 100-bed acute care hospital, St. Luke's Sugar Land Hospital in Sugar Land, Texas.

Career highlights include appearing on NBC's Today Show and London's BBC as a spokesperson for a national entertainment chain. She also received numerous community awards in Houston, including the Houston Proud Partner Award and the Houston Chamber of Commerce Star Award.

"Kim's communication skills and background with volunteers provide a real plus to our annual giving program," said President Matt Branam. "We already are seeing positive trends in our annual giving and donor relations thanks to her efforts."

Perkins is a Terre Haute native and a graduate of Terre Haute North Vigo High School. She has attended Indiana State University, Lamar University and Indiana University. ■

Scholarship Established to Honor Frank Guthrie

A scholarship endowment fund has been established in honor of the late Frank Guthrie, professor of chemistry and former department head who died in June of 2009.

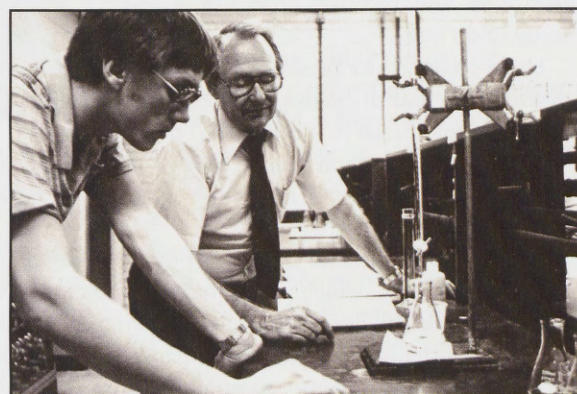
The scholarship fund is targeted at students who have chemistry or biochemistry as their first major. The award will recognize outstanding students who demonstrate significant promise as scientific professionals, in both academics and service. Initial funds for the scholarship have been provided by Guthrie's wife, Marcella. Several friends, family, colleagues and alumni have supported the fund as well.

Professor Guthrie served with distinction at Rose-Hulman from 1952 to 1994. He was among those who worked to establish an accredited bachelor of science degree program in chemistry at Rose-Hulman.

His Rose-Hulman career also included service as department head and health professions advisor.

Guthrie also was a recognized contributor to his profession outside Rose-Hulman. He was an active member of Alpha Chi Sigma and the American Chemical Society, serving in various leadership positions in the ACS Analytical Division and Wabash Valley Section. He also was a past president and active member of the Indiana Academy of Science.

Service was a key part of Guthrie's life as well. He helped found and was faculty advisor to the Rho Phi Chapter of Phi Gamma Delta fraternity. He also held



Guthrie giving lab advice.

leadership positions in his church and other community organizations, including the Boy Scouts of America.

For information about how to support the fund, contact David Haynes, director of planned giving, at 812-877-8453 or david.haynes@rose-hulman.edu. ■

CAREER ACHEIVEMENT WINNERS 2010



Brian Runkle, Barry Schneider and Michael Hoffa with President Branam accepting their awards.

Hoffa Helping Hologic Make a Difference in Women's Healthcare

Michael Hoffa knows that his team of engineers, technicians and managers at Hologic, Inc., is making a difference in the health care of millions of women throughout the world. And, he wakes up each morning ready to do more.

Hoffa serves as vice president of product development and site manager for Hologic's Interventional Breast Solutions (IBS) division, which provides a comprehensive suite of technologies with products for breast biopsy and radiation treatment for early-stage breast cancer.

Hoffa is responsible for the entire product development staff of the IBS division, which was first operated by Suros Surgical Systems. He led all design-related engineering and service activities for the Indiana startup company, being responsible for new product development, sustaining engineering, preventative maintenance, and technical service for all products. He played a lead role in the company growing from 50 employees and \$16 million in sales in 2004 to being acquired by Hologic for \$280 million in 2006.

"We're not going to cure cancer, but we're trying to make sure that women are tested (through breast cancer diagnosis and treatment) in the most compassionate manner possible," Hoffa



says. "My job is to keep Hologic at the forefront of technology to help others."

Today, Hologic holds the number-one position in nine technology areas serving women's health. That list of patients includes members of Hoffa's family.

"So, what I and my (Hologic) team do hits home at every family gathering. I look around and count my blessings that my engineering skills have helped my family, and I know (the team) has impacted so many other families as well," Hoffa said. "Not many people can have a job as satisfying as mine."

Impacting lives through medical device development has played a key role in the mechanical engineer's career. He spent 12 years with Cook Medical, being responsible for the worldwide concept-to-market product and development team management of all efforts within the company's stent and balloon angioplasty product lines. He also served as the production engineer for the first coronary stent marketed in the United States, and helped Cook become the industry leader in the development of multiple coronary and peripheral stents.

"I'm very fortunate that I can earn a paycheck while doing something helping mankind and being innovative as well," says Hoffa, whose name is part of patents on five stent and medical devices, with an additional 20 published patent applications currently on file. ■

GE Success Story: Brian Runkle

As an electrical engineering alumnus, it's not surprising that **Brian Runkle** has spent his career with the General Electric Company. However, he isn't producing refrigerators, aircraft engines or power generating devices. Instead he is helping set a sound financial infrastructure for the company to meet the world's economic challenges.



Managing director of operations for GE's industrial bank, Capital Financial Inc., Runkle is responsible for creating, implementing and overseeing vendor and affiliate service agreements, integrating new acquisitions and opportunities, and ensuring that both meet legal and regulatory standards. He also develops the bank's operational policies, provides timely reporting to GE executives and directors, and leads a cross-functional team to assess and prepare other GE Capital platforms to originate into the bank.

This position is the latest in a variety of functional roles for Runkle featuring quality control, marketing and engineering.

"I came in wanting to be the best engineer that GE had ever had," says Runkle. "While I may now be in the financial world, I'm a process engineer at heart—and still trying to be my very best. Engineering is problem solving and that philosophy fits well in any business environment. Whether solving a complex equation as part of an electrical experiment or evaluating cash flows, the

ability to break down the options and make decisions based on the data is imperative."

Runkle's career has included leadership of GE Machine Tool Services (1999-2001), overseeing equipment sales, application engineering and technical service in Indiana, Kentucky and Tennessee. As president and general manager for GE Driver Development (2003-2004), he led the turnaround of the driving simulation technology unit and executed its sale. And, Runkle served as president of GE Commercial Finance's Public Finance unit (2004-07), an entity which provided financing for state and local governments, nonprofit organizations and commercial entities qualifying for industrial development bonds. By financing both capital assets and real estate, GE Public Finance helped organizations manage their capital expenditure budgets, continue to provide valuable services to their communities, and grow their organizations.

"I've got others convinced that I'm a finance guy," says Runkle, who gained business training through a master's degree in business administration. "Throughout this career journey, I have learned the key elements of business success: quickly assess your options, decide the correct course of action, put together a quality team and execute the plan...I have felt incredibly stretched in every role with GE. If I feel a little bit uncomfortable in any new role, then I know it is a good fit." ■

Raising the Bar in the Steel Industry: Barry Schneider

Barry Schneider's decision in 1985 to attend Rose-Hulman was not a "well-received decision" by his "Notre Dame" family, he said. Not only was his brother finishing his freshman year at that university, but his dad, an uncle, a cousin and both grandfathers had graduated from there. "What are you thinking?" his grandfather asked him. "Rose-WHAT?"



It was a tough sell at first, he said laughingly. But when his mom and dad visited campus with him and saw what Rose-Hulman had to offer and that Rose-Hulman was the right place for him, there was no problem.

He first learned of Rose-Hulman through a football poster that hung in his high school locker room. He wanted to be an engineer but being able to play football throughout college was a real drawing card, he said. "The application fee was waived, so I applied. I never thought I would be accepted."

He said it is a decision he has never regretted. Not only did he receive a quality engineering education that has stood him well, but lessons he learned from playing football at Rose-Hulman keep cropping up to serve him even today as vice president and general manager of the Engineered Bar Products division of Steel Dynamics, Inc. "My academic education and problem-solving skills were developed in an environment that was second

to none," he added. The academic accomplishments at Rose-Hulman positioned him well for career success but, he adds, "The perseverance and camaraderie that I experienced with teammates on the football field has been the drive on so many occasions of my life."

After graduating from Rose-Hulman with a mechanical engineering degree in 1990, Schneider entered the steel industry working for LTV Steel where he added to his technical education and began learning how to manage people. In 1995 he accepted a position with Steel Dynamics, Inc., a startup company in Butler, Ind. Schneider was given increasingly responsible positions with Steel Dynamics, Inc., reaching, in 2007, the position of vice president and general manager for the Engineered Bar Products Division in Pittsboro, Ind., where he leads a team of 380 people. Profitability, cost control and efficiencies have all increased annually under his leadership.

Schneider has a creative flair along with his common-sense problem-solving skills. He enjoys playing guitar and sculpting, recently receiving recognition for a sculpture he made that was featured in a nationally circulated Guitar magazine.

Along with career and hobby, Schneider is also very active in community service in his hometown of Brownsburg, Ind., where he resides with wife, Verna Dean, and their two children, Stone Everard (15) and Gates Patricia (12). ■

ALUMNI CLASS NOTES

Rosebuds

1993

Jim Hughes (EE) and his wife, Joanne, had their first child, James Joseph, on December 10, 2008.

1998

Don Bales (CE) and wife, Bonnie, welcomed Ellie Irene into the world on November 10, 2009. Big sister Faith (4) and big brother Franklin (2) are very happy.

2000

Bryan Egli (CE) and his wife, Kimberly, welcomed their first child, Grace Jordan, on June 14, 2008.

2001



Christine (Trossman) (ME) 2001 and **Aaron Eppert (CS)** 2001 announce the birth of David Eppert, born May 16, 2009. ■

Marriages

2001

Jason Kray (ME) married Elizabeth Landru on June 20, 2009. The ceremony took place under the midnight sun on Eagle Summit near Central, Alaska. It was attended by friends, family and several thousand mosquitoes.

2002

Jason A. Caron (ME) and Holly Estes were married in Southington, OH on 26 July 2008. RHIT was well-represented with groomsmen including Class of '02 graduates Peter Smith (ECE), Matthew Domoradzki (ME) and Benjamin Brunner (ME).

Phil Stevenson (EE/ME) and Idalia Ovalle were married on February 20, 2010, at Assumption Catholic Church in Houston, TX. Phil and Idalia both work as mechanical engineers for Schlumberger in Sugar Land, TX. Idalia received bachelor and master degrees in ME at the University of Houston, while Phil received a master's degree in ME at Purdue University.

2006



Left to right: Natalie (Whiteman) Stephen (CE), Kathy Nicoson, Lauren (Oakley) Shipman (CE), Cassidy (Sutton) Dages (CE), Lauren Hauges (CE) and Nicole Sanders (CE).

Cassidy Sutton (CE) married Tyler Dages on Saturday, April 25, 2009.

2007

Alex Jeffrey (ME) and Hillary Hansen were married on July 19, 2009.

Ryan Robinson (CE) was married on May 9, 2009. He and his wife honeymooned in Barbadoes. Ryan is employed with R. W. Armstrong.

2008

Rachel Adele McHenry (ChE) 2009 of Terre Haute and **Eric Steven Brynsvold** (2008) of

Austin, Texas, were united in marriage at 3 p.m. Saturday, June 6, 2009, in the First Christian Church at Sullivan, Ind. The bride is the daughter of Paula and Walter McHenry of Terre Haute. Brynsvold is the son of Cheryl and Mark Brynsvold of Cedar Hill, Texas. He is employed as an engineer by National Instruments at Austin. The couple resides in Austin.

2008

Samantha R. Dick (BE/ME) married **Matthew DeVries (EE/ME)** on July 20, 2009 in the White Chapel. ■

ROSE-HULMAN SURPASSES ALUMNI GIVING RATE GOAL

Rose-Hulman Institute of Technology surpassed its 30 percent alumni giving rate goal during the college's 2009-10 fiscal year, which closed at the end of June. The rate is a seven percent increase over the previous year's rate, according to Kim Perkins, director of Rose-Hulman's annual fund for the Office of Institutional Advancement.

The actual giving rate was 30.6 percent, and it marks the first time in four years the rate has reached the 30 percent mark, according to Perkins. Nationally, the average alumni giving rate is only in the 10

percent range, according to the Chronicle of Higher Education.

"The strong response from our alumni speaks to the value attributed to their Rose-Hulman educations," Perkins said. "Even during an economic downturn, our alumni stepped up to make a difference in the lives of our current students."

Perkins attributed the increase in the alumni giving rate to consistent messaging and to making sure alumni understood Rose-Hulman's needs so it can maintain its position as one of the top colleges in the country. She noted the alumni

giving percentage is one criteria used to make ranking assessments by various publications.

Other activities throughout the year included a phonathon, special mailings, an active class agent program, and electronic newsletters.

"A strong alumni giving rate shows the world that our alumni believe in what Rose-Hulman has done for them and in what it can do for future engineers, scientists and mathematicians," Perkins said. ■

Alumnus Michael R. Gambrell Appointed to U.S. Manufacturing Council



Rose-Hulman Institute of Technology alumnus **Michael R. Gambrell**, executive vice president of manufacturing and engineering operations for The Dow Chemical Company, has been appointed by Secretary of Commerce Gary Locke to the U.S. Department of Commerce's Manufacturing Council.

Gambrell, a 1976 chemical engineering graduate of Rose-Hulman, is a member of Dow's Executive Leadership Committee, which is responsible for corporate strategy and financial performance. The Vincennes, Ind., native also is a member of the Company's Strategy Board, Dow's Geographic Leadership Council, and the Sustainability team within Dow. He is an ex officio member of the Environment Health & Safety Committee of Dow's Board of Directors.

Through this appointment, Gambrell joins labor leaders, CEOs and top

executives from other leading U.S. manufacturing companies in advising the Secretary of Commerce on matters relating to the competitiveness of the U.S. manufacturing sector.

The Manufacturing and Services division of the International Trade Administration will oversee the administration of the Council, which will provide a forum for regular communication between government and the manufacturing sector.

"No industry sector contributes more to this nation's economy than manufacturing," said Gambrell in a company news release. "Dow has over 110 years of experience in driving innovation, job growth and community success through manufacturing. We aim to bring that experience to bear for the benefit of all Americans through our participation on this Manufacturing Council."

Gambrell joined Dow in 1976 as a chemical engineer in research and development in Midland, Mich. He held a variety of manufacturing and engineering positions between 1979 and 1988. In 1989, he was named business director for the North America Chlor-Alkali Assets Business and in 1992, was named general manager for the plastic lined pipe business. In 1994, he was named vice president of operations for Latin America. He returned to the U.S. in 1996 as corporate director for technology centers and global process engineering and was named global business director of the Chlor-Alkali assets business in 1998. In 2000, he was named business vice president for EDC/VCM & ECU management and in 2003 was named business vice president for the Chlor-Vinyl business. He was named senior vice president for chemicals and intermediates division in 2003. Gambrell was named executive vice president of basic plastics and chemicals portfolio in September 2005, responsible for the company's asset light strategy in addition to executive oversight responsibilities for India, Middle East and Africa Region. In 2007, Gambrell added responsibility for the company's manufacturing and engineering organization. In 2008, he assumed functional responsibility for manufacturing and engineering operations.

In 1996, Gambrell was recognized by Rose-Hulman with the Career Achievement Award and returned to campus in 2009 to present the Dennis Paustenbach Lecture. ■

BAILEY CHALLENGE Solvers of the last issue problems are:

Continued from page 18

ALUMNI: J. Hurt, 1948; C. Hirschfield, 1954; D. Camp, 1955; C. Cooper, 1956; B. Waggener, 1957; D. Bailey, 1959; R. Ireland, 1961; J. Tindall, 1961; B. Lovell, 1963; L. Hardwick, 1965; B. Kevorkian, 1966; C. Hague, 1966; C. Divine, 1967; R. Bloch, 1968; J. Born, 1970; W. Pelz, 1971; B. Crellin, 1975; J. Schroeder, 1976; N. Miles, 1976; S. Warner, 1978; K. Borgman, 1982; K. Shafer, 1983; R. Schmidlin, 1984; D. Johnson, 1987; T. Chadwick, 1987; M. Lancaster, 1987; R. Parks, 1989; C. Abdnour, 1989; K. Koziol, 1992; E. Geib, 1993; D. Ewing, 1996; P. Koc, 1997; M. Pilcher, 1998; P. Swickard, 1998; M. Roesle, 2001; M. Henderson, 2002; D. Harrington, 2002; T. Thompson, 2002; T. Smith, 2002; J. Wentland, 2003; B. Kiefer, 2003; J. Przybylinski, 2006; I. Brown, 2006

FRIEND: N. Flatter, B. Bartley, G. Miller, D. Voltmer, M. Gaintner, R. Horton, G. and D. Stafford, J. Ley, B. Burchett, K. Smith, J. Segal

Class Notes

1976

Michael McGowern (CE) retired from the Indiana National Guard with the rank of Colonel on March 31, 2009, after serving a total of 32 years. He is currently civilian engineering manager for Camp Atterbury/Muscatatuck Center for Complex Operations with primary duties for integrating strategic and master planning activities for the Training and Mobilization Complex.

1979

David Spear (ME) has been named executive vice president for IP Gallery in Atlanta, Ga. In this position, David will be responsible for IP Gallery's strategic direction, marketing, sales and overall growth for North America.

1983

Terry Schuster is now the regional director of Sales for EnergyConnect, Inc. Terry will remain in Naperville, Ill., and will manage the Midwest Region. EnergyConnect delivers industry-leading demand response technologies and services to commercial, industrial and institutional energy users enabling them to manage their use of electricity in response to market prices or regional power shortages.

1985

Steve Varner (CE) has been promoted to area manager of E&B Paving Inc., leading its Indianapolis office effective January 1, 2010. He previously was a senior estimator/project manager in E&B's Noblesville, Ind. Office.

Robert Wilkins Receives Obama Nomination to U.S. District Court

Rose-Hulman Institute of Technology alumnus **Robert Wilkins** faced little opposition to becoming a U.S. District Court judge for the District of Columbia during a confirmation hearing before the Senate Judiciary Committee on July 28 in Washington, D.C.



Wilkins' nomination met with friendly questions from Sens. Sheldon Whitehouse (D-R.I.) and Al Franken (D-Minn.) in a joint review hearing with federal judge nominee Beryl Howell that lasted less than one hour.

Wilkins was supported at the hearing by former Indiana Sen. Birch Bayh, family members, friends and legal colleagues.

A 1986 chemical engineering alumnus, Wilkins was nominated by President Barack Obama earlier this summer for a seat on the U.S. District Court bench. He is a former special litigation chief at the District of Columbia Public Defender Service, and a trial and appellate lawyer for the Venable LLP law firm. He specializes in corporate defense/white collar, technology and commercial litigation practice groups.

Wilkins, a 1989 Harvard Law School alumnus, has a distinguished legal career that has included being an attorney with the Public Defender Service for the District of Columbia. He was chief of the service's special litigation unit

from 1996 to 2000, leading over 30 trial cases, arguing numerous appeals, handling judicial investigations, and coordinating impact litigation and government relations. This led the Legal Times to call him "the office's premier advocate for defendants' rights" and later named him one of the 90 Greatest Washington Lawyers of the Last 30 Years.

A founding member of the D.C. Access to Justice Commission, Wilkins served on the D.C. Advisory Commission on Sentencing, the D.C. Truth-In-Sentencing Commission and the D.C. Juvenile Justice Advisory Group. He joined Venable in 2002 and has represented clients in bribery cases, grand jury subpoena investigations and patent infringement suits.

Wilkins also served as president of the National African American Museum & Cultural Complex, helping to plan and create the National Museum of African American History and Culture within the Smithsonian Institution. He formed a nonprofit corporation that helped establish a Presidential Commission to plan the museum and then chaired its site and building committee. The museum is set to open in 2014.

At Rose-Hulman, Wilkins received the Herman A. Moench Distinguished Senior Commendation during the 1986 commencement. He also received the Rose-Hulman Alumni Association's Honor Alumnus Award in 2005 for his service to his alma mater and professional achievement. ■



Robert Patti (EE/PH)

SEMI announced Patti as the recipient of the 2009 SEMI Award for North America in January, which is the association's highest honor for technical contributions to the semiconductor industry.

1994

Mark Young (CE) accepted an in-house attorney position with Dragados USA in Miami, Fla., in July. Dragados is a subsidiary of ACS, which is a large international contractor based in Spain.

1997

Jerry Milliman (CE) was in Afghanistan until January with the Air National Guard. He transitioned out of full-time Air Force about two years ago and began working full-time with a civil engineering firm in Colorado Springs. He and his wife and two daughters live north of Colorado Springs, Colo.

1999

Rahul Lyer (ME) since November 2009 has been employed by Tritek Holdings LLC in Norcross, Ga. as a mechanical engineer. Prior to this appointment, Ruhul worked for Tepro Industries, Inc. a unit of Kinugawa Rubber Industrial LTD. of Japan as a quality engineer. Ruhul is also waiting for results of his PE exam in Thermal and Fluid Systems.

Kirk Myers (CE) is pursuing a graduate degree at Virginia Commonwealth University in urban and regional planning. He and his wife, Erika, live in the Richmond area.

2000

Jon Walls (CE) moved to Dallas, Texas, in July 2008 to work for Rogers-O'Brien construction as a mechanical, electrical and plumbing project manager.

2001

Chris Bauer (CE) returned to Hunt Construction after finishing the Rays Spring Training facility.

Grant Bryant (CE) recently accepted a position with Hoosier Energy in Merom, Ind. Also, Grant married Lisa Smith on January 30, 2010. They reside in New Lebanon, Ind.

2002

Shad Schoppert (CE) recently took a commission (Lt/O-3) with the United States Public Health Service as an engineering project manager. He works with the Alaska native Tribal Health Consortium managing projects for villages in rural Alaska.

Also, he and his wife, Anna, welcomed Braeden Nathaniel to their family on September 19, 2009.

2003

Air Force Capt. **Sonia M. Bechtloff (ME)** has been deployed overseas to a forward operating base to serve in support of Operation Enduring Freedom, anti-terrorism military operations involving U.S. troops and allied coalition partners. U.S. troops serve in Asia, the Arabian Peninsula, the Horn of Africa, islands in the Pacific and Europe. Bechtloff, a chief of construction with six years of military service, is normally assigned to the 375th Civil Engineer Squadron at Scott Air Force Base, Ill.

Walt Flood (CE) has passed the PE in Indiana.

Wendy Packard (CE) (Walt Flood's wife) has opened her own law office in Chicago.

Jason Meyer (CE) is working for the Metropolitan Water Reclamation District of Greater Chicago and is

HONORING A DECADES-OLD TRADITION: THE GIACOLETTO FAMILY

A Rose-Hulman tradition of more than seven decades is being honored with establishment of the **Dr. Lawrence J. Giacoletto** chair in electrical engineering. The chair is being endowed in honor of the late **Lawrence J. Giacoletto**, a 1938 electrical engineering major who died in 2004.

The chair recipient is to be a full-time, tenured faculty member of the Department of Electrical and Computer Engineering who has demonstrated exemplary achievement inside and outside the Rose-Hulman community.

The Giacoletto tradition runs strong at Rose-Hulman. Lawrence's brother, John, was a 1931 electrical engineering graduate of Rose-Hulman, and just this past spring grandnephew Joe graduated from Rose-Hulman with a degree in mechanical engineering. He works at Cummins Engine in Columbus, Ind.

A native of Clinton, Ind., Lawrence followed his older brother John through the Clinton schools and on to Rose-Hulman Institute of Technology, where he graduated in 1938 with high honors. In 1952, he received his Ph.D. in electrical engineering at the University of Michigan.

From 1941 through 1945, Giacoletto served in the Army at the Signal Corps Engineering Labs. In 1946, he joined RCA



Labs as a research engineer. He played a central role in the development of RCA's new color TV system. He later developed the hybrid-pi transistor for RCA. In 1956, he left RCA to join Ford Motor Company's Scientific Laboratory. Five years later, he took a position as professor of electrical engineering at Michigan State University. He retired from MSU as professor emeritus in 1987. During his

career, he obtained more than 20 patents and was the author of many papers published in technical journals, as well as the book "Differential Amplifiers."

Larry also made the time to establish CoRes (Cooperative Research) Institute in Okemos, Mich., where he did research on automotive electronics, including electrically powered vehicles. He invented the homopolar alternator, which converts mechanical energy into electrical energy.

The endowed chair is being made possible through the generosity of Giacoletto's wife, Maxine, and his daughter, Carol. ■

pursuing a master's degree at Northwestern University. He is also co-authoring a watershed management ordinance for Cook County.

Michael Phillips (CE) recently received news that he passed the Structural-I exam. He also received additional state PE licensure in Georgia.

2004
Jacob Gennicks (CE) passed the PE. He is currently working for Sunrise Coal, an underground mine in Carlisle, Ind. He and his wife have two boys and are expecting another baby.

2005
Michael Thompson (CE) passed the PE exam and is an assistant city engineer for West Lafayette. Michael oversees storm water utility projects and new construction review.

Kyle Caplinger (ChE) has been named research engineer, thermal process, research, for Archer Daniels Midland Company. In his new role, he will be responsible for designing and conducting experiments in the pilot plant. Kyle joined ADM in 2008 and most recently served as production assistant, Glycols Plant, Decatur, Ill.

Andrew Twarek (CE) recently passed the PE exam in Michigan and plans to take the PE (SSII) in Ohio this fall.

2006
Cole Marr (CE) is in the MBA program at the Indiana University Kelley School of Business in Bloomington, Ind.

2007
Joel Anderson (CE) spent two weeks with Engineers Without Borders in rural Ecuador last summer.

Adam Knaack (CE) graduated in May from Notre Dame with a master's degree.

2008
Nate Bloss (CE) is serving in the Peace Corps in Namibia. He reports that reaching school is rough but getting better, and progress on projects is slow but moving forward. ■

Send Class Notes to Bryan Talyor at bryan.talyor@rose-hulman.edu or call him at 812-877-8258.



Alumnus **Dean Woodward** walked away a \$5,000 winner as a contestant on "Who Wants to be a Millionaire" earlier this year on an episode of the popular syndicated television show.

The show, featuring host Meredith Vieira, gives contestants an opportunity to win a million dollars by correctly answering a series of multiple choice questions with an escalating value.

"It was a wonderful, but nerve-wracking experience," states Woodward, a 1989 chemical engineering alumnus. "The pressure in the hot seat is intense, mainly because of the timer. Even though the questions in the early rounds are easier, you can't take time to think and be sure, so that usually burns lifelines early."

Alumnus to Donate Game Show Winnings

Woodward used his "Ask the Audience" lifeline to correctly answer the \$5,000 question (Category: 2009 Movies; Question: What would be the title of the 2009 film "Julie & Julia" if it used the first names

of the actresses in the title roles? Answer: Amy & Meryl) and used his "Ask The Expert" (journalist/author Rene Syler) to successfully answer the \$12,500 question (Category: Sitcoms; Question: Which of these TV comedies features a boss credited with popularizing the catch phrase "That's what she said"? Answer: The Office).

Then, getting to the \$15,000 level, Woodward used his "Double Dip" lifeline on a question from the category Bird Brains. It asked "Also known as corvids, what highly intelligent birds have even been known to use tools?" The choices were: A. Parrots, B. Penguins, C. Owls, D. Crows. His first guess was Owls, which was incorrect. His next guess was Parrots,

which was also incorrect.

That meant the game was over for Woodward, who fell back to the \$5,000 level for his winnings.

Woodward lives in Chapel Hill, N.C., and is an intellectual property legal counsel for RTI International, based in Raleigh, N.C. He and his wife, Vanessa, have two sets of fraternal twins (Julian and Dylan, eight years old, and Kelsey and Connor, three years old) and three dogs—creating a noisy and chaotic household. Woodward says he definitely owes Vanessa some flowers for "shouldering the load" with the household while he was in New York City.

Woodward plans to donate 100 percent of his winnings—possibly matched by Vanessa's employer, GlaxoSmithKline—to two children's hospitals: Shriners Children's Hospital in Springfield, Mass. (where his father was treated as a kid for polio) and Duke Children's Hospital in Durham, N.C. (where his four kids were born, all premature). ■

Obituaries

1934

Andrew J. "Jack" Newsom (ARCH) died August 28, 2009, at Clark's Residential Care Home in Hyde Park, Vt., at the age of 99. Most of Jack's career was spent as director of plant engineering for Schwitzer-Cummins in Indianapolis, Ind. He is survived by his wife, Mary Louise Watson; a daughter, Maryanne Newsom-Brighton; and a grandson, Casey Newsom.

1937

Carl R. Wischmeyer (EE) died October 7, 2009, at age 93. Carl earned a master's degree from Yale University. Carl was awarded an honorary degree from Rose-Hulman in 1970. He taught electrical engineering at Rice University and was the first Master of Baker College. In 1969 he became the director of education for Bell Telephone Labs in New Jersey and later retired to Sugar Land, Texas. He is survived by his sister, Margaret Taylor; children Mary Grace Hamill, Ed Wischmeyer, Kay Autrey; grandchildren and great grandchildren.

1938

Joshua A. Greenland, Jr. (ME) passed away August 20, 2009, in Sunnyvale, Calif. He worked for Delaval Turbine Co. in various capacities for 42 years before retiring in 1980. He is survived by his wife, Nancy Ingraham Butler; two sisters, Annagale Dortch and Emily Wilson Greenland; daughters Evans Wyro and Emily Marshall; son, Joshua Greenland; two stepsons and many grandchildren and great grandchildren.

1941

J. Arnold Jones (ME) passed on his birthday, September 2, 2009, at the age of 91 in Fort

Myers, Fla. He was president and CEO of Everybody's Oil Corp./Tire Barn founded by his father in 1930. He is survived by his wife of 25 years, Betsy Jones; children Anne LaRue, Louise Hawthorne, Christopher A. Jones and Phillip A. Jones.

William E. Barrick (EE/ME) passed away May 8, 2009, at St. Luke's Hospital in New Hartfield, N.Y., at the age of 90. After graduation from Rose-Hulman, William earned a master's degree in electrical engineering from the University of Illinois. He retired after 37 years with General Electric. He is survived by his wife, Martha L. (Schwab); daughters, Ruth Ann Barrick Star, and Sarah Barrick Trachy; and many other relatives.

1942

Frederick Charles Bradshaw (EE), 91, died June 29, 2009, at Sarah Jane Living Center. He worked at DuPont in Niagara Falls, N.Y., after graduation. He then worked at Westinghouse in Lima for 34 years as an electrical engineer, designing small motors in the Industrial Division, and followed with 12 years at Franklin Electric Co. in Bluffton, Ind.

1943

Charles K. Bresett (EE) died August 1, 2009, in the Indiana State Veterans' Home in West Lafayette, Ind., at the age of 88. Charles' family was in the grocery business from approximately the 1880s until Charles retired in 1960. He earned a master's degree from Rensselaer, served for 10 years in the Navy, 20 years in the Air Force, and after retiring from active duty, worked as director of public works for Carrollton,

Texas. Survivors include his wife, Delores; five children; and nine great-grandchildren.

1945

Joseph B. Durra (ChE) died Aug. 13, 2010, at home with his children.

1948

Francis X. (Mick) McDonald (EE/ME) passed away at Marquette Manor in Indianapolis, Ind. on November 2, 2009. Mick was born in Clinton, Ind. After graduation he joined the faculty of Rose-Hulman before joining the Allison Division of General Motors in 1952. He retired in 1989 after a distinguished career as director of flight safety. Mick was married for 40 years to Mary Ann who preceded him in death. Mick and Mary Ann had five children.

Richard P. Burandt (EE) died last August. He was a retired employee of Commonwealth Edison and lived in Chicago at the time of his death.

Orville L. Stone (EE) died last August at the age of 88. He resided in Houston, Texas, at the time of his death, and was a retiree from Schlumberger Oil Well Surveying Co., where he worked for more than 40 years.

1949

Dr. Donald R. Coughanowr (Ch.E.), 81, died on Sept. 20, 2009. A Heminway Medal Scholar, Coughanowr was author of one of the first textbooks on the topic of process systems analysis, which was one of the most popular undergraduate textbooks on the subject. In 2008, he was recognized by the American Institute of Chemical Engineers

as one of the 30 authors of groundbreaking chemical engineering books. His academic career included 21 years as head of the Chemical Engineering Department at Drexel University.

Max Duggins (ME) died last year. He served as a Lt. colonel in the U.S. Air Force from 1952-1980. He is survived by his wife, Gisela.

1950

William C. Weaks (ME), 80, of Terre Haute, passed away early on Monday, Feb. 1, 2010, in his home. He was a staff sergeant in the U.S. Air Force. He also owned his business working on and selling antiques. Survivors include eight children, 13 grandchildren, one great-grandson, and two step great-grandsons.

James F. Morris (CE) died last year. Survivors include his wife, Margaret. He was employed by Marathon Oil Co. in Martinsville, Ill., from 1950 to 1985.

1951

Tom E. O'Brien (CE) died last year at the age of 82. His career included working with Union Carbide in Texas City, Texas, as a structural engineer, and at the company's corporate offices in New York City. After retiring from Union Carbide, he was president of Tell City Shipyards, Tell City, Ind., and then he was chief inspector with APL in New Orleans. His wife of 63 years, Jo Anne, survives him.

John E. Anderson (CE), 81, died last year. He was a retired civil engineer at Patrick Air Force Base.

1952

D. Kenneth W. Porter (EE) died last summer at the age of 82. A Hemingway Medal winner, he received a Rose-Hulman doctor of engineering degree in 1989. He was the vice president and director of research and development for the Government Electronics Group of Motorola, where he worked for 35 years. He is survived by his wife, Christine.

1955

Robert E. Mogle (EE), 76, passed away January 12, 2010, at Community Hospital North. After graduation, he joined RCA in Camden, NJ, for 2 years, and then retired from Naval Avionics Center in Indianapolis after 30 years.

1956

William S. Gaither (CE) died in Tucson Ariz., on September 11, 2009. He earned three graduate degrees from Princeton. Bill served as the President of Drexel University. He led in the preparation and publication of the Golden Modulus for the 50th Anniversary celebration of the Class of 1956.

1959

John W. Fagg (EE) died on August 17, 2009, from primary progressive aphasia. He received an MBA from Southern Methodist University. His career began with Collins Radio in Richardson, Texas. He was later a vice president at Rockwell, Int. and at Alcatel. Most of his career involved microwave communications technology.

1961

Frank J. Zone, Jr. (ME) passed away on October 19, 2009, at UMass Memorial Medical Center in Worcester, Mass.

Frank served during Vietnam as a captain in the US Air Force. He was a principal engineer at Babcock Power since 1971.

1969

Michael "Skip" Douglas (MA) died March 25, 2009, at Parkview Hospital, Ft. Wayne, Ind. He was employed by the Allen County Public Library.

1973

Donald E. Lewis (Ch.E.), a resident of Shoals, Ind., died in October 2009.

1976

John Stephen Ruppel (EE), 55, passed away on February 14, 2010, at Parkland Hospital in Dallas, Texas, due to complications during neurosurgery. He is survived by his wife, Joanne Moshis, and five children; three sisters; four brothers; and many nieces and nephews. John earned a master's degree from Illinois Institute of Technology. John retired from Motorola after 31 years of service.

1977

William P. Torrence (ME), died last year at the age of 56. He was a retired mechanical engineer, having worked for General Tire Co. in Charlotte, N.C.

1982

Brayton E. Smoot (ME), 49, passed away at Memorial Medical Center in Las Cruces, N. Mex., on July 3, 2009. He worked for the U. S. Federal Government, Department of the Army, White Sands Missile Range where he served as a laser engineer with the High Energy Laser Systems Test Facility. He is survived by his wife, Sally L. Smoot, children, parents and siblings.

1983

Anthony B. Felts (EE), 55, died March 2, 2009, at his home in Bloomington, Ind. Tony had battled throat cancer since 2008. He was an electrical engineer at Crane for more than 20 years. Survivors include his wife, Karen McGill Felts, a brother, sister-in-law and three nieces. He earned a bachelor's and master's degree in Mathematics from Indiana State University as well as a bachelor's degree in electrical engineering from Rose-Hulman.

1985

Elio Oradei (ME), passed away on May 5, 2009, following a long fight with cancer. He worked for Fabbrica d Armi Pietro Beretta until 1995, first in its subsidiary, Beretta USA, and then at headquarters near Brescia, Italy. Returning to his native town of Pergola in the Marche region, he entered the nautical sector. Elio was responsible for quality control for Pershing, Itama and Custom Line of Ferretti Group, an Italian yacht building conglomerate.

1986

Timothy R. Shoemaker (CS), 45, died April 29, 2009, in Westfield, Ind. Tim was the founding owner/board of directors and former vice president of Software Engineering Professionals, Inc. He is survived by his wife, Vicki Lou (Lewis); three daughters; a son; his parents; a grandmother; sister and brother.

1989

Neil A. Holcomb (ME), 42, died May 15, 2009, in Detroit, Mich. Neil was the president of Mustang Owners Club of S.E. Mich. and a member of the Triangle Fraternity. He

is survived by his wife, Kathy; brothers Michael and Kirk; uncle Austin Holcomb and others.

1995

David A. Schubert II (EE), 35, of Valparaiso passed away June 14, 2009. He earned his MBA at Notre Dame. David was currently manager of operations in Lake County for NIPSCO's Electric Line Department where he served for 15 years. He is survived by his wife, Allison Cavallo; their four-year-old twins, Matthew and Abigail; his parents; four sisters; his grandmother; and his father- and mother-in-law. ■

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DECEMBER

8 LEAHY CHRISTMAS SHOW

JANUARY

10 RUSSIAN NATIONAL BALLET

14 THE HOUSE JACKS

21 PUNCH BROTHERS

featuring Chris Thile

29 POPOVICH PET CIRCUS

FEBRUARY

2 DR KABOOM

10 RUTHIE FOSTER

18 THE UMBILICAL BROS.

MARCH

11 DEPUE DEHOYOS

18 METROPOLIS

22 STAR TREK LIVE!

25 THE 39 STEPS

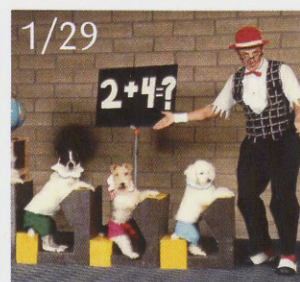
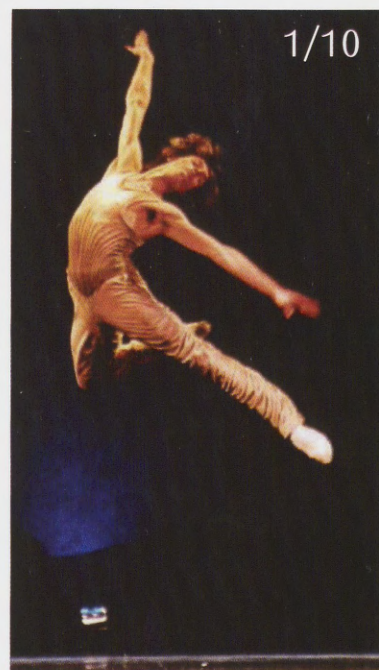
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PARTING SHOT

What's Your Favorite Winter Campus Memory?

Did you skate on a frozen Speed Lake? Bundle up against the cold, forever thankful you weren't on a giant campus? Did you "Ski Terre Haute"? As you think back on memories during this holiday season, know we're sending you warmest wishes.