

Winter 2012

Volume 2012 - Issue 1 - Winter, 2012

Echoes Staff

Follow this and additional works at: https://scholar.rose-hulman.edu/rose_echoes

Recommended Citation

Staff, Echoes, "Volume 2012 - Issue 1 - Winter, 2012" (2012). *Rose Echoes*. 83.
https://scholar.rose-hulman.edu/rose_echoes/83

This Book is brought to you for free and open access by the Other Institute Publications at Rose-Hulman Scholar. It has been accepted for inclusion in Rose Echoes by an authorized administrator of Rose-Hulman Scholar. For more information, please contact weir1@rose-hulman.edu.

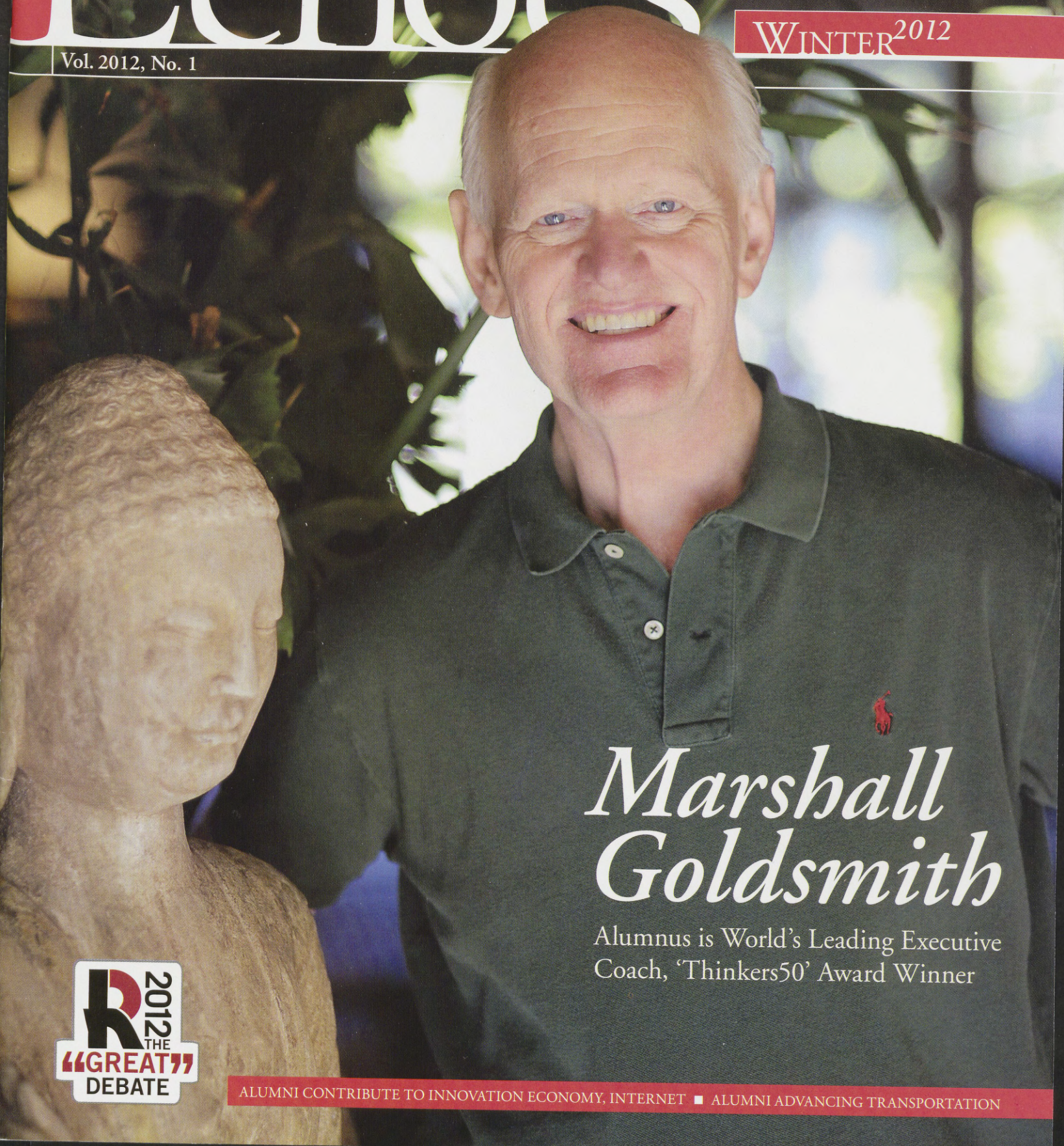
SPECIAL ISSUE: LEADERSHIP

ROSE-HULMAN INSTITUTE OF TECHNOLOGY

Echoes

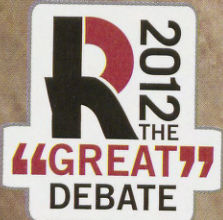
Vol. 2012, No. 1

WINTER²⁰¹²

A portrait of Marshall Goldsmith, an older man with white hair and a friendly smile, wearing a dark green polo shirt with a small red logo on the chest. He is standing in front of a blurred background of green foliage. To his left is a large, light-colored stone bust of a person's head and shoulders.

Marshall Goldsmith

Alumnus is World's Leading Executive Coach, 'Thinkers50' Award Winner



ALUMNI CONTRIBUTE TO INNOVATION ECONOMY, INTERNET ■ ALUMNI ADVANCING TRANSPORTATION



VOICES FROM

“Today’s young people take information in from many sources, in different ways, in short bursts. How do we respond to this in the delivery of education?”

“WE NEED GRADUATES WHO CAN WORK ACROSS PLATFORMS AND WITH A DIFFERENT WORLD VIEW.”



“Exceptional technical competence alone is not enough.”

THANK YOU to those who have participated so far in *The “Great” Debate*—our yearlong conversation on Rose-Hulman’s role in facing global challenges in a technological age. These conversations are among our community of alumni, current students, parents, faculty, staff, retirees, employers, and peer institutions. Read more from President Matt Branam on pages 2-3. This is your invitation to make a difference to a place we love on issues of real importance to the world.

THE “DEBATE” CONTINUES. HAVE WE HEARD FROM YOU? HERE’S HOW:

1. Attend one of our events. (See box at right).
2. Send your input anytime to thegreatdebate@rose-hulman.edu
3. Stay in touch during the months ahead and follow our progress at www.rose-hulman.edu/thegreatdebate

JOIN ONE OF THE FOLLOWING DISCUSSIONS

Indianapolis—March 10 and April 21
 Washington, D.C.—March 17
 Detroit—March 24
 Chicago—April 14
 San Francisco—June 9
 New York City—June 16

Sign up at www.rose-hulman.edu/thegreatdebate

columns

Message from the President	2-3
Bailey Challenge	24

leadership

Marshall Goldsmith: Thinking Big	4-5
Q&A: Taking a Critical Look at Leadership.....	6
Alumni Leader Profile: Harvard's Felda Hardymon.....	7
Faculty Focus: Tom Mason Inspires Future Entrepreneurs.....	8-9
Alumni Leader: Cyan Inc.'s Mike Hatfield.....	10
Student Leadership Development	11-12
Student Leader Profile: Molly Rice	13
Student Organization Feature: Engineers Without Borders.....	14

alumni

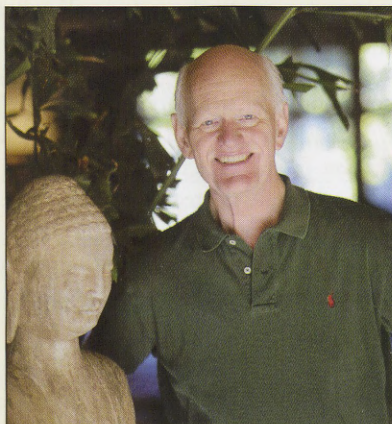
Advanced Transportation Trailblazing Alumni	15-17
Alumni Newsmakers	25
Alumni Photo Album	26
Class Notes.....	27-31
Alumni/Development News.....	32
Alumni Giving Back Through Scholarships	Inside Back Page

campus news

The 'Great' Debate Begins	Inside Cover Page
Inside the Student Innovation Center.....	18-19
Academic Feature: Nanotechnology Development.....	20-21
Campus News.....	22-23
Parting Shot	Back Page

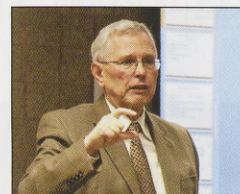
Connect with the digital world

Stay connected with Rose-Hulman through the digital world by scanning the mobile barcode at right. It will connect you with lots of up-to-date information on our website (www.rose-hulman.edu).



ON THE COVER

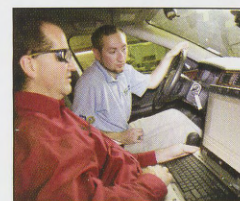
Alumnus Marshall Goldsmith (Math Econ, '70) is one of the world's leading executive coaches. He was a pioneer of the 360-degree feedback technique. His success is built on a no-nonsense approach to leadership and a Buddhist philosophy. He was the winner of the 2011 Thinkers50 Leadership Award, a study involving 35,000 respondents that was published by *The Times of London* and *Forbes*. Goldsmith was featured near his California home by freelance photographer Jon Clark.



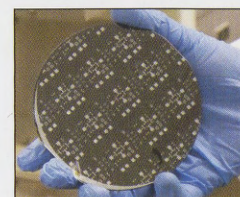
Page 8



Page 13



Page 18



Page 20

PUBLICATION CREDITS

President: Matt Branam
Vice President of Communications and Marketing: Mary G. Barr
Vice President of Institutional Advancement: Rickey N. McCurry
Alumni Association President: Jim Nordmeyer, Class of 1978
Office of Alumni Affairs: Ali O'Leary, Assistant Director, and Bretta McDaniel, Administrative Assistant
Office of Institutional Advancement: Dick Boyce, Director of Corporate and Foundation Relations; Danielle Merkel, Executive Director of Advancement Services; Chris Aimone, Director of Planned Giving; Hugh Baker, Regional Advancement Director; Scott Williams, Regional Development Officer; Jennifer Kenzor, Assistant Director of Annual Giving and Donor Relations; Kathy Cooper, Administrative Assistant; Jodie Harmon, Manager of Gift Accounting; Felisa Javier-Holt, Manager of Prospect Research; and Dawn Allee, Database Specialist
Office of Communications and Marketing: Dale Long, Director of News Services; Marianne Messina, Director of Web Content; Hyung-Jung Chang, Web Developer and Publications Specialist; and Diann Ringo, Coordinator of Communications
Communications/Alumni Contributor: Kevin Lanke, Assistant Athletic Director for Sports Information and Communications
Issue Editor: Dale Long
Contact e-mail: Dale.Long@rose-hulman.edu
Contributing Writers: Mary Barr, Michael Davids, Terri Hughes-Lazzell, Steve Kaelble, Dale Long, Stacey Muncie, and Diann Ringo
Photographers: Jon Clark, Cyan Optics, James Garber, John Gardner, Neal Hamberg of Harvard Business School, Jim Hanson, David Honan, Mike Lanke, Dale Long, Samantha McGranahan, Terry Miller, Chris Minnick, Ali O'Leary, and Shawn Spence

Echoes is published by:
Rose-Hulman Institute of Technology
 5500 Wabash Avenue, Terre Haute, IN 47803



It is the policy of Rose-Hulman Institute of Technology to admit students on the basis of their academic ability. Rose-Hulman Institute of Technology does not discriminate based on race, religion, color, national origin, sex, age, citizenship status, disability, veteran status or sexual orientation.

MESSAGE FROM THE PRESIDENT



Blazing Trails from 'Best' to 'Great'

At Rose-Hulman, we have a tradition of leadership in higher education that is alive and well in 2012. We are in the midst of *The "Great" Debate*, a yearlong conversation on the future of our school. Within this debate we will chart the path from "best" to "great."

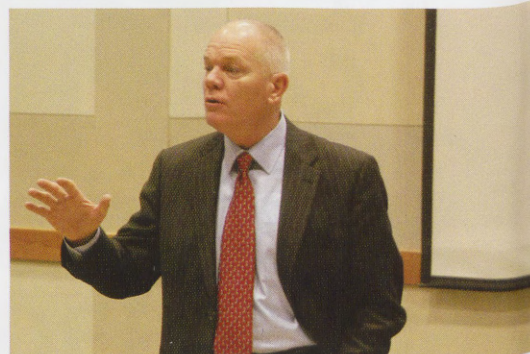
Your input is needed in *The "Great" Debate*. You, the alumni, parents, faculty, staff, and friends of Rose-Hulman are among the smartest, best educated, and most innovative people in the world. Your ideas will help us continue to lead the way in teaching engineering, science, and math at the undergraduate level.

We are wrestling with how best to prepare our students for the challenges and opportunities their future holds. We are reconciling the difference between our aspirations and our realities at Rose-Hulman, and we are studying the leading edge

ideas, and experiences, we can envision a future for Rose-Hulman that will be truly great for our students and will enhance the impact our alumni have on the world.

In the Fall issue of *Echoes*, I recalled for you some previous plans that guided our school through times of tremendous change—*The Institute Commission on Self Study*, conducted in the '70s, and the *Commission on the Future of Rose-Hulman*, in the early '90s. We are all grateful to those of you who participated in crafting those plans. Your vision steered this little engineering school in Terre Haute through past waves of change and challenge, and earned us national recognition as the best undergraduate engineering school in America for 13 consecutive years.

But, in today's world, 13 years is a very long time. Thirteen years ago technology's dot com bubble was intact; the Twin



by President Matt Branam

of engineering, science, and math education to ensure we continue to lead the way.

If we can tap your collective wisdom,

MESSAGE FROM THE PRESIDENT

If we can tap your collective wisdom, ideas, and experiences, we can envision a future for Rose-Hulman that will be truly great for our students and will enhance the impact our alumni have on the world.

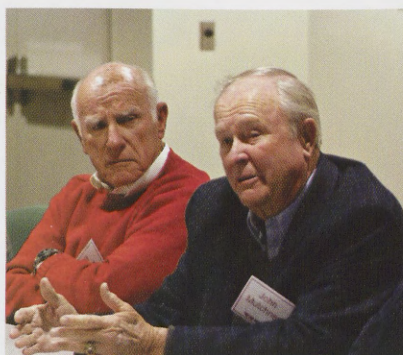
Towers dominated their skyline; my cell phone was a clam shell; Congress was contemplating a surplus; unleaded gasoline cost a dollar a gallon . . .

You get the idea.

Innovation, globalization, and hyper-connected networking have changed our lifestyles. Disruptive technology, disrupted markets, soaring oil and gold prices, and raging deficits have played significant roles in the way we do business, and the BRIC (Brazil, Russia, India, and China) countries have emerged as major economic competitors and partners. Our country has changed the way it handles calamity, fights disease, communicates news, delivers value, socializes, plays games, learns information, and how it goes to college. Yet demand for what

Thomas Friedman and Michael Mandelbaum. I hope you will read it too. I have found Thomas Friedman to be an intelligent, relatively unbiased reporter with unparalleled access to thought leaders across the world. Through our reading of a common book, we can all enjoy a common vocabulary in *The "Great" Debate*, and we can all better discuss the future of the education we believe our world demands that we teach.

So far in *The "Great" Debate*, we have reviewed thousands of pages of research on the current state of the art in engineering, science, and math education. We have also read publications developed by numerous engineering and scientific organizations about the future of engineering. We have met with alumni in three cities (Naples, Los Angeles, and Dallas) so far, with several



we do at Rose-Hulman continues to increase. We have seen another record number of applications for admission this year. Those applications come from addresses and computers throughout the world.

So, we have to understand, as best we can, the major shifts taking place in the world around us. Today, we are witnessing a change in higher education—distance learning, online education, inverted classrooms, dual-degree programs with global partner schools, e-books, peer-to-peer learning, for-profit universities, and problem-based learning. Colleges and universities that will be strongest tomorrow will assess the ever changing landscape and improve what they are doing today.

There is no question in my mind that we are entering a period of disruption in the business model of higher education. But, I am less concerned about that than I am about our students and how the education we provide will serve them going forward.

In order to gain insight into the world into which our students will graduate, and to inform *The "Great" Debate* with the reality of just how much change we can anticipate, I have asked our faculty, staff, and trustees to read *That Used To Be Us*, by

other meetings planned during the next few months. We have met with more than 280 of our faculty and staff, dozens of students, and parents, and we have analyzed surveys of more than 20 percent of our alumni. There are many ways to get involved and impact the future of your school by sharing your experiences and ideas. We are determined to reach a majority of our constituents. Please join *The "Great" Debate* by attending one of our upcoming events. (See the list of cities inside the front cover page of this issue.)

Rose-Hulman is our school. As alumni, we have a great responsibility to ensure that our students of today, and tomorrow, benefit from a Rose-Hulman education as much as we have.

Let's make it happen. Make it fun.

President Matt Branam is a 1979 Rose-Hulman alumnus. ■



Keep track of what's happening with The 'Great' Debate at www.rose-hulman.edu/thegreatdebate

A photograph of Marshall Goldsmith, an older man with a balding head and a friendly smile, sitting in a large, dark leather armchair. He is wearing a green polo shirt and khaki pants. His hands are clasped in his lap. Behind him is a large wooden bookshelf filled with numerous books. The lighting is warm and focused on him.

Leadership

COVER STORY

Thinking **BIG**

Leadership Guru, Author Marshall Goldsmith
Helps Others Find Pathways to Success

by Steve Kaelble

You just can't plan a career like Marshall Goldsmith's. When he left Rose-Hulman in 1970 with a degree in mathematical economics, Goldsmith didn't know where he was headed, other than to graduate school. Best-selling author? Top leadership guru? Not only would he have never dreamed it possible, it could never have even occurred to him.

Yet that's what he has become, and it didn't take that long for Goldsmith to move from graduate school to the world of executive education and coaching. A mentor was Paul Hersey, an executive development expert known for shaping the situational leadership model. Hersey was a widely sought professional speaker who one day found himself double-booked.

"He said, 'Can you do what I do?'" Goldsmith recalls. "I said, 'I'll do my best.'"

That's how, at age 28, Goldsmith unexpectedly launched a career of professional speaking, executive coaching, writing, and lots of travel. Last year—10 million frequent-flyer miles and more than 30 books later—Goldsmith was recognized by Thinkers50 as the world's most influential leadership thinker.

That begs the question, how does the most influential leadership thinker come up with his ideas?

"Everything I learn, I learn from my clients," he says of the high-level executives he coaches. "These are real people doing real work in the real world, and I always feel that I learn more from them than they learn from me. These are things you can't learn in school."

Goldsmith has a way of pulling together the diverse experiences of these leaders

and helping make their lessons sensible to everyone. These range from lessons on the global nature of leadership, the value of building alliances, and the importance of becoming aware of one's own behavioral flaws and potential areas for improvement. Enhancing interpersonal relationships is a theme in his best-seller, *What Got You Here Won't Get You There*, and developing a powerful positive spirit drives his latest book, *Mojo: How to Get It, How to Keep It, How to Get It Back if You Lose It*.

The notion that everyone can change is part of the Buddhist underpinnings enlightening Goldsmith's executive coaching. Leaders learn to release past behaviors, ease up on ego and the need to control, and understand the interdependence of all members in an organization.

"I help important people to get better," he says. The first task is to help them determine what behaviors they need to change.

It's not just a matter of introspection. His methods include candid interviews with people who interact with the person being coached. Goldsmith helped pioneer the 360-degree feedback technique which solicits input from people all around the client. He works with clients to set goals. Then, he coaches them as they pursue those targeted changes.

Though Goldsmith didn't sketch a detailed career path while attending Rose-Hulman, it turns out his studies in mathematical economics have been quite helpful in his coaching. "I use measurement in everything that I do," he explains. ■

WHAT GREAT EXECUTIVES SAY ABOUT WORKING WITH GOLDSMITH:

"We were a very successful team that took our performance to the next level. With Marshall's help we identified our two areas and went to work. We used everyone's help and support, exceeded our improvement expectations, and had fun! A team's dedication to continuous improvement combined with Marshall's proven process ROCKS!"

— Alan Mulally, CEO, Ford Motor Company

"Marshall is a dynamo. He helps highly successful people get better and better and better. His advice helps me enormously at work, but it makes an even bigger impact at home. My wife and kids stand up and applaud Marshall for helping me become a better husband and dad. What could be better than that?"

— Mark Tercek, Managing Director, Goldman Sachs & Co.

"Marshall is the coach's coach. No one is more of a listener, who learns from us (his students) from what we say or do not say. Taking from what he has heard, he molds for all of us a program to make us and our people better for having been in his presence."

— Alan Hassenfeld, Chairman, Hasbro

"While Cessna focused continuous improvement on business results, Marshall helped me focus on our leadership team's continuous improvement. The impact is amazing. His practical no nonsense approach is making a positive impact both professionally and personally on all of us. I have never had so much fun working on such a tough topic."

— Jack Pelton, CEO, Cessna

GOLDSMITH NAMED TOP LEADERSHIP THINKER

Marshall Goldsmith received the prestigious 2011 Thinkers50 Leadership Award as the world's most influential leadership thinker. The award was sponsored by the *Harvard Business Review*.

Thinkers50 co-founders Stuart Crainer and Des Dearlove, former columnists to *The Times* (London), track bi-annually the definitive list of the world's top business thinkers. The ranking has served the global business community by showcasing the world's top business thinkers.

See the list at www.thinkers50.com.



SPECIAL FEATURE Leadership Q&A With Marshall Goldsmith

Leadership is not just for leaders anymore. Top companies are beginning to understand that sustaining peak performance requires a firm-wide commitment to developing leaders that is tightly aligned to organizational objectives—a commitment much easier to understand than to achieve. Organizations must find ways to cascade leadership from senior management to men and women at all levels.

Marshall Goldsmith responded to a series of questions from Rose-Hulman administrators, faculty, and staff members about the value of leadership in improving a company, an educational institution, and its employees.

What advice would you offer to current students seeking to develop their leadership skill set?

MG: My advice would be:

- Read as much as you can about the process of leadership and the lives of great leaders.
- Get as much practice as you can while at Rose-Hulman—leading teams, leading non-profit organizations, and watching others in leadership roles.
- Get a summer internship, if you can. Try to have the opportunity to meet and work with great leaders.
- Learn to get feedback on how you are perceived by others and to accept this feedback in a positive, non-defensive way.

How will globalization and hyperconnectivity change the nature of leadership in the future?

MG: One of my books is *Global Leadership: The Next Generation*. In this book my co-authors and I asked 150 high potential leaders from around the world to describe the differences between the leader of the future and the leader of the past. The top five greater challenges for leaders in the future were:

- Global thinking
- Cross-cultural appreciation
- Technological savvy
- Building alliances and partners
- Sharing leadership

What are the core truths and major myths regarding leadership?

MG: My great teacher and mentor, Paul Hersey, taught me that “leadership is working with and through others to achieve objectives.” The key word in that

definition is the word “others.” One of the greatest leaders that I have ever met is Alan Mulally, CEO of Ford Motor Company (2011 *CEO Magazine* CEO of the Year). While great individual achievement might be all about “me”—Alan has always believed that great leadership is all about “them.”

What leadership resources and experiences do you find most valuable?

MG: I think that in tomorrow’s global business environment, it is critical to work in different countries and to learn to appreciate different cultures. More than half of my speaking engagements are outside of the United States. Some specific books that I would recommend include *The Leadership Challenge*, by James Kouzes and Barry Posner; *Management of Organizational Behavior*, by Paul Hersey and Ken Blanchard; *Hesselbein on Leadership*, by Frances Hesselbein; *The Leader of the Future-2*, edited by Frances Hesselbein and Marshall Goldsmith; and *What Got You Here Won’t Get You There*, by Marshall Goldsmith

How do you think leaders can best motivate team members?

MG: I have written an article about this called, “Team Building without Time Wasting.” I suggest that leaders involve team members by:

- Assessing “where the team is” versus “where the team needs to be” in terms of teamwork, partnership, and cooperation.
- Determining what specific behaviors everyone on the team can work on

improving—to improve overall teamwork.

- Practicing feed forward—learning to get ideas from team members without arguing and learning to learn as much as possible without committing to agree with each idea.
- Encouraging each team member to follow-up with each other team member on selected areas for change.
- Measuring positive change over time and celebrating success!

How do leadership challenges change over the course of a person’s career?

MG: With every promotion, leadership becomes more about people and interpersonal relationship and less about technical skill. With every promotion each of your words and even non-verbal gestures are observed and make a difference.

One of my coaching clients, JP Garnier, was the CEO of Glaxo SmithKline, one of the world’s largest pharmaceutical companies. When I asked him what he learned about leadership as a CEO he said, “My suggestions become orders. If they are smart, they are orders. If they are stupid, they are orders. If I want them to be orders, they are orders. If I don’t want them to be orders, they are orders anyway.” When I asked JP to name the most valuable lesson that he learned from me he said, “Stop and ask myself one question before I speak: ‘Is it worth it?’”

Could you offer any advice on how Rose-Hulman can help groom alumni that will lead the future technological frontier?

MG: My suggestion is for Rose-Hulman faculty and staff to go out of their way to work on developing leadership in the undergraduate student body. Provide classes, developmental opportunities, and encouragement for leadership development. Recruiters already know that Rose-Hulman grads are very smart and technically competent. Adding leadership skill will be a huge plus for undergraduates. ■

ALUMNI LEADER PROFILE:
FELDA HARDYMON

Innovation Economy Offers Opportunities for Creativity

by Steve Kaelble

"There's nothing like a recession to raise the entrepreneurial spirit in smart people," says Dr. Felda Hardymon, a venture capitalist, Harvard Business School professor and 1969 Rose-Hulman mathematics graduate. Hardymon spends a lot of time gauging entrepreneurial spirit and has concluded that there's a lot to like about today's business climate.

Huh? *Today's* business climate?

"Open a newspaper and all you read is how terrible everything is," Hardymon acknowledges, noting tepid growth and stubbornly high long-term unemployment. "But there's another economy out there that's growing very fast and is short on people, and that's the *innovation economy*."

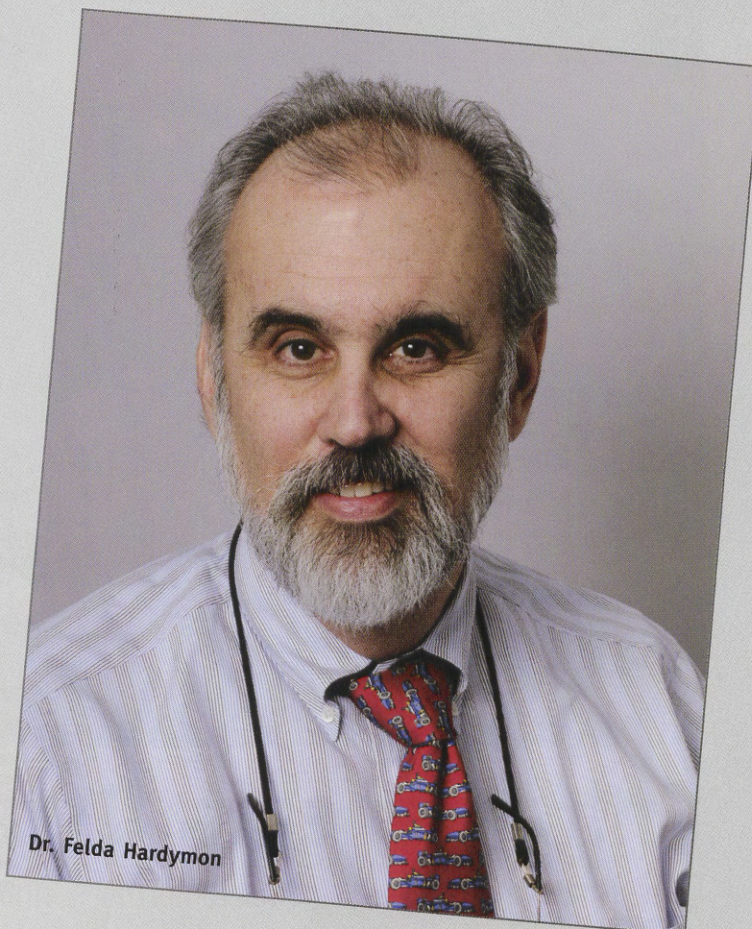
Hardymon is a partner at Bessemer Venture Partners, a global venture firm with \$4 billion under management. The firm's money is in about 140 innovative companies right now, "and at least 120 are short on people and having trouble hiring."

Among the biggest developments fueling today's innovation economy is what Hardymon calls "big data"—the emerging technology required to effectively store the huge volumes of

"Every day, I'm meeting people who are creating the future. No one knows exactly what's going to happen, but they have a hand in shaping it."

electronic data being produced these days. "Ten years ago there were a handful of commercial databases in the public sphere that were larger than 10 terabytes," he notes. Today, "Facebook collects more than 10 terabytes a week."

Small, entrepreneurial companies are discovering and commercializing solutions to these kinds of challenges, and they're creating lots of jobs in the process, Hardymon says. The ones that succeed "have people working at one problem 16 hours a day because they have to. It's not just their agility—they outwork the competition."



Dr. Felda Hardymon

Hardymon has observed countless companies, from his academic posts and the front lines of the business world. By the time he finished his Rose-Hulman studies, he knew he wanted an academic career, so he earned master's and doctoral degrees at Duke University.

He returned to school to earn a Harvard MBA, then landed a job in 1979 with the venture capital arm of General Electric. The innovation economy was thriving. "There was so much innovation going on," he recalls, adding, "That's what's happening again now."

In 1981, he joined Bessemer. There, he invested in a wide range of young companies in software, communications, and retailing, from American Superconductor to Wavesmith. In 1998, he returned to teach at Harvard, beginning a dual academia and venture capital career. He has since developed venture capital curriculum and has his name on several academic books.

Hardymon now enjoys the best of both worlds. He can teach, write, and even take time off from Harvard to be a visiting professor in London. But he still gets to interact directly with the innovation economy, and for him, that's awe-inspiring. "Every day, I'm meeting people who are creating the future," he says. "No one knows exactly what's going to happen, but they have a hand in shaping it." ■



Professor Tom Mason makes a point during one of the classes he teaches on entrepreneurship.

Entrepreneurs Don't Grow on Trees

Rose-Hulman Students Become Tomorrow's Innovation Leaders

by Thomas Mason, Ph.D., Professor Emeritus, Engineering Management

People believe that great innovation is primarily the result of great ideas. However, evidence shows great innovation is excellent execution of a multitude of tasks that change the way our

world works. New knowledge enables technology advancements, but progress requires management of technology delivery systems—dynamic sets of relationships involving markets, value

chains, regulations, and cultures.

Entrepreneurs meet the challenges of these complex systems through product development, acquisition of personnel, financing, effective marketing, sales and



ANDREW CONRU (ME, '90)

Angel Investor/Entrepreneur
Founder/CEO, Compute.org Foundation

Conru has spent more than 15 years building Internet-related companies. From 1996 to 2007, he served as CEO of Friend Finder Network, the world's largest personals network site with more than 260 million registered members. One of his first projects was creating online shopping carts, and

other enterprises have focused on web video/chat services, social networking, and gaming sites. Conru currently works on a number of projects, including Compute.org, a non-profit foundation that sponsors the development of software applications for world causes. He also likes helping other people succeed.



JEFF READY (CS, '96)

Founder, Scale Computing
Former Entrepreneur-In-Residence,
Indiana Venture Center

Ready defines the word "entrepreneur," founding four companies and an industry trade-group before he turned 29. His first company began in a Rose-Hulman residence hall, and his Aureate Media, re-launched as Radiate, became one of the largest

internet properties. Ready's next venture, Corvigo, developed the first systems for stopping junk email. Later, he served as vice president at Tumbleweed. Since 2008, he has been CEO of Scale, a developer of scalable, fault-tolerant storage systems. The entity was named to *Forbes'* list of America's Most Promising Companies in 2011 and 2010.

service, and the application of sustainable business models. This is true for two-person startups or executives in large companies. Rose-Hulman graduates are well suited to these roles, but they need to have leadership skills to fulfill them.

While individuals like Henry Ford and Steve Jobs get credit for revolutions, it takes highly performing teams to implement disruptive technologies. It's not necessarily technical genius, but effective leadership that builds great companies and changes the world.

Studies of entrepreneurship have shown that leaders must consistently articulate an inspiring vision, get commitment and collaboration from high-quality team members, motivate people to embrace and sometimes take advantage of change, and cultivate an environment of trust for everyone connected to the venture. These outcomes are not easy to achieve, and some who are great in starting small companies are not suitable to lead organizations as they grow. The ones who can adapt to changing requirements tend to be very aware of themselves and their context and are able to alter their words and behavior to different conditions. This provides the right vision and elicits team performance.

Recent research on models of entrepreneurial behavior suggests that "expert entrepreneurs" do not try to implement plans based upon predictions of the future. Rather, they develop skills to control situations as they arise to bring about desirable results. This is not really

surprising. For decades, investors in startups have emphasized the quality of entrepreneurs as team leaders, rather than the strength of ideas or business plans

built around those ideas. In most cases, success comes not from the original plan, but from making correct modifications as more knowledge becomes available.

Learning to think like entrepreneurial leaders should be an integral part of students' development. Fortunately, most Rose-Hulman students arrive with high intelligence, team orientation, and a desire to accomplish great things. They can grow as leaders by taking advantage of the many opportunities at Rose-Hulman Ventures, in team-based technology competitions, the Leadership Academy, our course in entrepreneurship, and senior capstone projects.

Rose-Hulman Ventures, for example, uses an approach known as "leading from the side." This encourages project team members to assess developments and adjust approaches with guidance, rather than direction, from the professional project engineer and faculty mentors. This type of leadership fosters a culture

for effective development of innovations and prepares the students to be the kind of leaders they will need to be after graduation.

Learning to think like entrepreneurial leaders should be an integral part of students' development. By acquiring skills as an undergraduate, they have early awareness of how to best use their impressive knowledge of science and technology to solve the world's most important problems.

Not every student gets access to a Rose-Hulman Ventures internship or similar opportunities. But the successes of young alumni are already proving the value of entrepreneurial leadership development as an integral component of the Rose-Hulman experience. Now, the institute needs to find resources for its own innovations to prepare more leaders to take on the world's most pressing problems.



Dr. Tom Mason has served as a consultant on business and strategy for technical entrepreneurship, while also being the Entrepreneur/Educator in Residence for the Indiana

Venture Center from 2007-08. He received TechPoint's Mira Award for Education Contribution by an Individual (2010). ■



DUSTIN SAPP (CPE, '01)

**Co-Founder, TinderBox
Former Founder, Nolnk and Vontoo**

Sapp is an entrepreneur experienced in building and growing software startup companies. He has established expertise in operations, product development, and customer identification. Sapp's first company, Nolnk Communications, was formed with Rose-Hulman classmates. He has gone on

to launch two additional startups. Vontoo is a market-leading provider of permission-based, on-demand voice messaging solutions. His latest venture, TinderBox, is a web-based application that makes it easy for individuals and companies to create, manage, and track business communications.



JEFF GILBERT (ME, '85)

**President/CEO, Software Engineering Professionals
Peer Group Chair, Vistage International**

Gilbert is an operations generalist involved in several startups and industries. In 1998, he co-founded SEP, a lean engineering firm which develops software systems and products for mostly Global 2000 clients. Gilbert has used the SEP model to successfully launch business and technology

ventures in the medical and energy markets, including Theron Inc., Optical Vitals, and EnerGenuity. Recently, he has had more time to work with other companies and leaders in his role as Vistage group chair.

ALUMNI LEADER PROFILE:
MIKE HATFIELD

Trailblazing Entrepreneur Transforms the Internet and Us

by Steve Kaelble

Michael Hatfield admits to being a little disappointed when an internship between his junior and senior years at Rose-Hulman landed him in the communications area of aviation giant McDonnell Douglas. To him, working directly with the company's fighter jets seemed much more exciting than dealing with communications networks.

Fast-forward about three decades. Today, Hatfield is an incredibly successful technology entrepreneur with a particular specialization in . . . you guessed it, communications networks.

Hatfield, who earned his undergraduate degree in electrical engineering and mathematical economics, is president and CEO of Cyan Inc., his third successful communications systems startup. Before that, he was founder and CEO of Calix Inc., maker of high-speed access systems for communications service providers. That was the follow-up to Cerent Corp., the provider of high-speed fiber-optics systems acquired by Cisco Systems in 1999 for about \$7 billion.

So, the real thrill for Hatfield was not working on fighter jets after all, but rather building new companies and helping them take flight. He knew all along he wanted to be involved in launching businesses, probably tech-based companies.

"If you only react to what is, you're going to be too late."

"I enjoy starting with a blank sheet of paper, putting together a plan, putting a team together, and executing it," he observes.

It made sense to get a technology degree as a solid foundation, add some business sense through mathematical economics, and pick up leadership experience around campus.

A big development unfolding as Hatfield finished school in the mid-'80s was the breakup of the Bell System. "I came to see that things were about to change," he says, "and networks caught my attention."

"Change" is quite the understatement. Not only was the



Michael Hatfield

telecom business changing, but the networks were evolving from local and long-distance voice communications to wireless voice connections and data links, and fiber optics. Hatfield handled the changes well, working at "Baby Bell" Ameritech, DSC Communications, and Advanced Fibre Communications before becoming more entrepreneurial.

Hatfield's startups reflect the industry's non-stop changes, focusing on different parts of the internet. Cerent addressed the need to move huge volumes of data and voice traffic through the core of the internet. Calix focused on technology for what's known as the "last mile" of the connection, from a communication provider's central office to the customer's home. Cyan fills in the middle ground between the internet's core and the last mile.

What's tricky about change is identifying the next great place to be.

"If you only react to what is, you're going to be too late," he says, calling on a football analogy: The quarterback must throw not to where the receiver *is*, but where he *will be*.

Hatfield's not quite ready to go public with where that receiver will be next, when it comes to internet and communications technology, but it's clear the future is red hot.

"There were a lot of people who thought the internet was going to be like the CB radio of the '90s," he recalls.

Those naysayers were incredibly off the mark. ■

Leadership Skills Developed Around Every Campus Corner

by Terri Hughes-Lazzell

Creating leaders is as much a part of the education process at Rose-Hulman as work in the classrooms or laboratories. Providing avenues to build leaders can be found in nearly all aspects of campus life, from sports and competition teams to Army ROTC and the Leadership Academy program.

Chad Conway, a senior mechanical engineering student, has honed leadership skills in several areas, and those skills have already translated into opportunities to lead others in the work place—even while an intern.

A Leadership Academy graduate, Conway used skills learned on campus to obtain internships with Tesla Motors, a designer and manufacturer of electric vehicles.

“I did a six-month co-op with Tesla in Europe and it was the goal setting that helped me get there. Then, the Leadership Academy experience helped make me a leader there,” he says.

When his project manager moved to another project, Conway stepped into that role, with Tesla employees as part of his group.

Conway gained other leadership skills while serving as team leader of the EcoCAR vehicle development team, a collegiate advanced vehicle technology engineering competition. This is a position held by graduate students at most colleges. He also was philanthropy chairman for Pi Kappa Alpha fraternity.

“It’s definitely a step up to be able

to take on leadership roles in the undergraduate level,” Conway says.

Alisa Dickerson has found herself in leadership positions throughout her Rose-Hulman experience, as well. She is a two-year captain of the women’s basketball team, a Resident Assistant (RA) in the residence life staff, and has been a counselor for Operation Catapult, a program that Rose-Hulman hosts each summer for aspiring engineers and scientists.

Motivated to become a better leader, Dickerson has taken advantage of every opportunity. As basketball team captain, she has developed as a vocal leader.

“It has put me in a position to practice speaking up and giving constructive

Leadership



Becoming Better Leaders: As leaders of the EcoCAR team, Chad Conway (top left) explained technical aspects about the advanced transportation vehicle to U.S. senators and representatives; Alisa Dickerson (left) has been a leader on the basketball court as a two-year team captain; and the Leadership Academy helps develop student leadership (above) through several exercises.

criticism or sharing experience," Dickerson says. "Rose-Hulman instills the benefits of evaluations and how to professionally address work issues. Basketball has been a boost for me to practice these skills, and make sure people are doing their part while still maintaining a necessary level of respect."

As an RA, Dickerson has worked with many different types of people. She advises other students to push themselves from their comfort zones and get involved in different activities. "Push yourself to be great, but don't lose yourself in the process," she says.

Also, teachers want to see students push themselves.

"Education is not just in the classroom, but happens 24/7 while here," says Dr. Jameel Ahmed, associate professor and interim department head of the Department of Applied Biology and Biomedical Engineering. He helped co-found the Leadership Academy, which has students voluntarily working to expand their leadership skills.

"Students tell us it's great to think about things they never do and develop people skills," Ahmed says.

Leadership Academy, open to any student, fosters skills in communication techniques, effective leadership by seeing multiple points of views, goal setting, and self-understanding.

"Every student grows here," Ahmed says.

The Leadership Academy includes an assessment component loosely based on our Army ROTC program.

Speaking of which, ROTC offers another opportunity for students to develop leadership skills while being observed and receiving "meaningful feedback as a leader," says Samuel Peffers, former commander of the ROTC unit and retired Army officer. He is now director of planning for Rose-Hulman.

Upon graduation, ROTC cadets enter active military, the Reserve or National Guard as a 2nd Lieutenant. There they become a platoon leader, responsible for 30 to 40 people with two layers of supervisors below them.

"These graduates bring skills into their work,

as well as the experience of having the opportunity and confidence to lead," Peffers says.

Other opportunities for leadership development at Rose-Hulman are available through student government, Greek life, and student clubs. ■

**"Push yourself
to be great."**

*Alisa Dickerson, senior
mechanical engineering*

Can-Do Person

Civil Engineering Senior
Leads by Example

by Stacey Muncie



Molly Rice

STUDENT PROFILE

Molly Rice

Marion, Indiana

**Senior Civil Engineering Major;
Consulting Engineering Certificate**

ROSE-HULMAN ACTIVITIES:

- President, Cecil T. Lobo Chapter, American Society of Civil Engineers, 2011
- Women's Varsity Soccer, 4 years
- Vice President of Administration, Delta Delta Delta Women's Fraternity
- Treasurer, Concrete Canoe Team
- Student Government Association Judicial Council
- Tau Beta Pi
- Chi Alpha Sigma
- Pi Mu Epsilon
- Blue Key National Honor Society
- Society of Women Engineers
- Habitat for Humanity
- Lacrosse

AWARDS/HONORS:

- Rose-Hulman Dean's List – Every Quarter
- ASCE Alumni Award
- Student Leader of the Quarter, 2011
- Indiana Section ASCE Award
- Heartland Collegiate Athletic Conference Academic All-Conference Honoree
- Cecil T. Lobo Scholarship
- Indiana Society of Professional Engineers Scholarship
- Asphalt Pavement Association of Indiana Scholarship

Molly Rice seizes every opportunity to succeed and lead. In high school, she was involved in sports, numerous student activities, and clubs. That can-do attitude fits in well at Rose-Hulman, where she has found a wealth of opportunities to become a future civil engineering leader.

For, as she states, “Here, I’m a name, not a number.”

Rice has taken full advantage of every opportunity to achieve, and in the process has emerged as an influential student leader on campus.

The senior has been involved in everything from women’s soccer to student government. Her most satisfying experience has been president of the Cecil T. Lobo student chapter of the American Society of Civil Engineers (ASCE). That experience allowed her to share a passion for engineering and service, while developing her leadership skills.

As ASCE president, Rice was responsible for overseeing and coordinating fundraising, community service, education, and social activities for the chapter, ranked among the country’s best.

“Leadership is about getting people’s input,” she explains. “As a leader, you take those thoughts and put them together to create something that makes people want to follow. It’s about adapting, not being selfish, but selfless.”

Rice noted the contributions of civil

engineering professors Dr. Jim Hanson and Dr. Jim McKinney in developing her leadership skills. Hanson has taught her that leadership is not the same as management. As a mentor to the ASCE chapter, McKinney revealed the value of hard work and dedication to leadership.

“Management is about accomplishing activities and mastering routines while providing order and consistency,” Rice says. “Leadership is about influencing a group to achieve common goals, which involves being a good listener, working well with others, taking control, being well-rounded, and setting a good example.”

Rice channeled her desire to lead and serve into such activities as the Delta Delta Delta sorority and Habitat For Humanity. Service is a natural part of being a civil engineer.

“Civil engineering isn’t so much about recognition—it is about service. Civil engineers make the difference,” she says.

Upon graduation, Rice will become a structural engineer for Moffatt & Nichol Engineering, and plans to eventually earn a master’s degree. But she doesn’t see commencement as the end of her journey. She looks forward to the next challenge.

“I want to use my leadership abilities to adapt to any obstacles that come my way,” she says. ■



Making A Difference:
Students worked with Indianapolis architects and Dominican Republic residents to construct a roof for a new medical clinic.

Engineers Without Borders

Students Cross Global Horizons and Barriers to Assist Others

Story by Stacie Muncie | Photographs by Dr. John Gardner

Since 2009, members of Rose-Hulman's chapter of Engineers Without Borders (EWB) have been making a difference in the lives of citizens in the Dominican Republic community of Batey Cinco. The group's projects have ranged from constructing a hurricane- and earthquake-proof roof to providing a sanitation system for a former sugar plantation building getting new life as an in-patient medical clinic.

Though EWB's projects are primarily structural in nature, only two members are civil engineering students. That doesn't stop the dedicated members from working wonders in this gratifying hands-on international program.

Chemical engineering major Abby Grommet was drawn to EWB because of her interest in humanitarian work.

"I thought it would be an interesting and relevant way to get involved and use my engineering skills in a real-world situation," Grommet says.

She's not alone. The group's president, Angelica Patino, a biomedical engineering

major, also wanted to use her engineering skills to help others. She also has enjoyed the chance to travel.

Last summer, EWB started installing a septic system for the clinic—just in time for hurricane season. Although a brush with Hurricane Irene caused some anxious moments for friends and family back home, the team of four students and two mentors was never in real danger.

"The only problem was—every single day—heavy rains," Patino explains. "That really set us back on some of our construction. We'd dig, it would rain, and water would fill up the hole."

Grommet adds, "We were bailing water by hand from a nine-foot pit."

With a limited time to complete the project, EWB members had to use every opportunity to catch up.

"Sometimes we'd stay until the very last bit of light was left for us to see," Patino says. "If you don't finish something it just doesn't get finished, and leaving the project unfinished is the worst-case scenario."

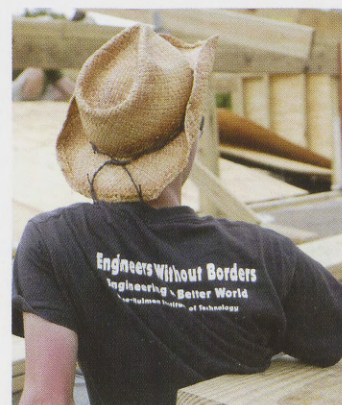
EWB members' goal is bigger than just finishing the project. "It's not like you do a project and leave. You monitor the project afterward, and by doing that you have a bigger impact on the community," Patino explains.

For students, playing a key role in establishing the Batey Cinco Casas clinic has offered unique hands-on learning and teaching opportunities. "We teach (community residents) things so that when we leave they can build something for themselves," Patino says.

From 2006-2008, EWB chapter members built a brooder house and training center in Obodan, Ghana.

EWB's national organization requires chapters to maintain a relationship with the communities they serve for four or five years. Students plan to build latrines this summer to further address Batey Cinco Casas' sanitation needs.

Keep track of Engineers Without Borders activities at www.rose-hulman.edu/ewb. ■



Kyle Mason lowers an electric motor into the engine compartment of the EcoCAR vehicle for the 2011 competition.



Advancing Transportation

Alumni Innovators Lead Push toward *Automobile 2.0*

by Michael Davids

When celebrities race an electric Ford Focus on the *Tonight Show with Jay Leno*, Toyota announces a new Prius product line, a polar bear hugs a new car owner in a Nissan commercial, and the voice of Tim Allen waxes poetically about the Volt, “the electric car that goes far ... really far.” You have to ask yourself, “Is this the beginning of a revolution in drivetrains?”

This is Automobile 2.0.

Chief executives of Indiana’s automotive industry and the state’s technology institutes met recently at the Indiana Automotive Council. One of the group’s most pressing issues is the supply of engineering talent. Jeffrey Owens, president of Delphi Electronics & Safety, told Dr. Phil Cornwell, Rose-Hulman’s vice president for academic affairs, that “we have an ocean of need and only

trickle of graduates prepared to fill our open positions.”

As corporations around the world race to bring environmental-friendly cars to the consumer market, Rose-Hulman graduates are in great demand. In fact, our professors, students, and alumni have had the inside track in this race for more than a decade.

“This is truly an exciting time for engineers,” says mechanical engineering

professor Zac Chambers (ME, ’94), who supervises the Advanced Transportation Systems (ATS) program. “Not since the inception of the automobile has the powertrain landscape been so disparate or so open to innovation.”

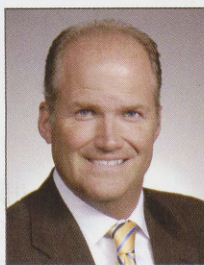
The ATS program is at the heart of this race on campus. Rose-Hulman is among 16 North American colleges and universities participating in EcoCAR2: Plugging in to the Future. This



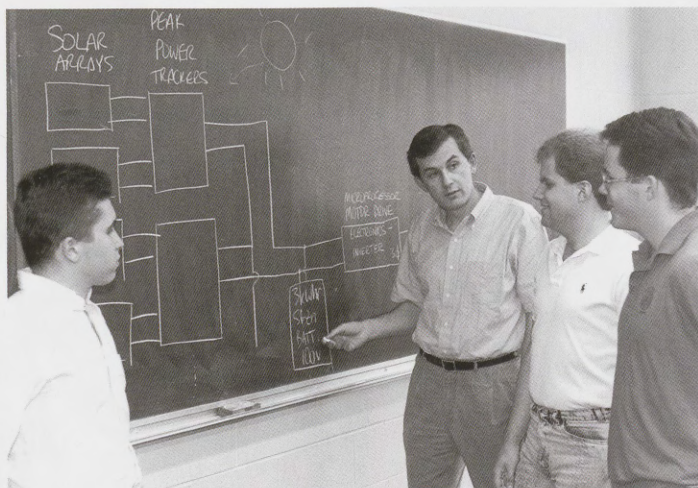
“I see reducing the nation’s dependence on foreign oil, the building of the smart grid, and the introduction of alternative fuels as important steps to America’s defense.”

Eric Dietz, ’84

EDUCATIONAL ENTERPRISES



Solar Car Roots: Mike Thoeny, Global Engineering Director-Electronic Controls for Delphi Electronics & Safety, got his first design experience on Rose-Hulman's inaugural Solar Phantom race team (in middle, right).



unique, three-year educational partnership between General Motors

and the U.S. Department of Energy gives students the opportunity to work in a real-life product development cycle. We were specially singled out for this competition and one of a few institutions that has undergraduates leading the team.

"The most amazing thing about EcoCAR was being able to lead the development of new automotive technologies as an undergraduate," says Chad Conway, a senior mechanical engineering major and team leader for the EcoCAR Challenge (2009-11). He leveraged his experience into being an intern at electric vehicle innovator Tesla Motors for the past two summers. "Thanks to my experience with EcoCAR, within a few weeks at Tesla, I was leading an engineering team," Conway recalls.

EcoCAR Co-Faculty Advisor Dr. Marc Herniter discusses the difference Rose-Hulman provides this way: "EcoCAR provides a real-life development project where our students work as a team to analyze performance trade-offs, do cost-benefit analysis, and try to reach a consensus that the team can agree upon. This is a learn-by-doing and a lead-by-doing project."

EcoCAR isn't the first team competition in the automotive sector to provide hands-on experience in hybridization and electrification. In fact, it was the start of Rose-Hulman's solar

car race team that got Mike Thoeny (EE, '89) his first experience in the automotive design world. He's now Global Engineering Director-Electronic Controls for Delphi Electronics & Safety.

"I heard about the GM Sunrayce USA event and thought it would be a great opportunity to learn and to get Rose-Hulman engaged in this elite activity. So, I worked with a small team to get organized, write the proposal, and solicit donations. I learned a lot about initiative, business, and leadership from this experience," Thoeny recalls. Rose-Hulman would become a leading force in collegiate solar-car racing. It placed third in the 1999 Sunrayce.

At GM Delco Electronics (now Delphi), Thoeny designed electronic controls for chassis and electrification projects, including early work on GM's first electric car, the EV1. Today, he works on advanced powertrain electrification systems and controls that will make the cars of tomorrow safer and more intelligent. His team developed Delphi's RACam—an integrated radar and camera system that provides "active" safety. "Cars with our intelligent systems will warn drivers of imminent collisions, and if they do not react in time, will be able to prevent or lessen the impact of collisions. It's exciting to know our team's efforts are saving lives," he explains.

Two GM engineers, Greg Hubbard (ME, '94), senior manager for hybrid and electric drive controls, and Anthony Heap (EE, '97), global technical specialist for

hybrid operating strategy, also cut their teeth working on the Solar Phantom team. Between the two, they have more than 150 patents registered and pending. They also shared the 2005 Boss Kettering Award as one of GM's top innovators for their work on a Two-Mode Hybrid System, and played key roles in bringing the Chevy Volt, the 2011 Motor Trend Car of the Year, to market.

"Working on the solar car really piqued my interest in hybrids, so that's what I focused on in graduate school at MIT," says Hubbard, who worked on composite structures for the 1993 solar car team and was a starting offensive lineman on the football team. Meanwhile, Heap was the chief mechanical engineer for the team that placed fifth in Sunrayce '97.

It has been predicted that energy and fuel needs in the United States may soon outpace the global supply. No one thinks this gasoline addiction can last forever, and some experts say that by the next decade Americans will experience ever dwindling supplies. If electrification is at least one of the answers to this problem, then cheap, long-lasting, plentiful batteries are the missing link.

Richard Stanley (ME, '78) has been at the cutting edge of the push for hybrid technology and batteries for over a decade. As the former president at Remy, Inc., he developed new product lines in the field of automotive hybridization. Then, in 2009, he became president and later chief operating officer of EnerDel, one of the world's first turn-key suppliers of large format lithium ion batteries for automotive hybrids and pure electric vehicles.

Electric drivetrains are nothing new for retired Ford engineer, Bruce Kopf (ME, '64), the pioneer at Ford who helped develop their first electric vehicle in the '90s. The electric Ford Ranger was built to meet California's call for zero-emissions vehicles. He later helped develop Ford's first fuel cell prototype as the director of engineering for "Think," Ford's alternative fuel division.

Back in Indiana, J. Eric Dietz (CHE, '84) is helping drive innovative educational programs in advanced transportation. He is the professor of information technology

integration at Purdue University's Center for Advanced Ground Vehicle Power, and he developed Purdue's EV Grand Prix competition as a relatively inexpensive and fun way to get students across the world interested and involved in electric cars.

Dietz came to advanced transportation as a way of improving the nation's security, after serving as executive director for Indiana's Department of Homeland Security. "I see reducing the nation's dependence on foreign oil, the building of the smart grid, and the introduction of alternative fuels as important steps to America's defense," he says.

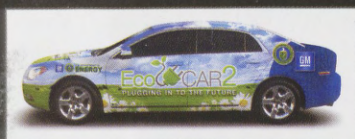
These are just a few of the Rose-Hulman engineers leading the innovations for the Automobile 2.0. A stroll through the 2012 Detroit Auto Show would find that the race is on. Nearly every manufacturer in the world has embraced electrification and/or hybrid technology. Now you know where a lot of that innovation is coming from—Rose-Hulman alumni.

Michael Davids is Chief of Staff for the President's Office at Rose-Hulman. ■



Electric Vehicle Pioneers: Bruce Kopf (left) helped develop Ford's first electric vehicle, while Richard Stanley developed state-of-the-art battery technology for Remy Inc. and EnerDel.

ATS TEAMS ARE ON THE MOVE . . .



ECOCAR

The EcoCAR team earned technical and design awards after employing both hybrid electric power trains and alternative fuels

in its quest to re-engineer a 2009 sport utility vehicle, decreasing well-to-wheels petroleum consumption and emissions production. Now, Rose-Hulman is among 15 North American colleges participating in EcoCAR2: Plugging in to the Future, a three-year vehicle design challenge. The team will reduce the environmental impact of a Chevrolet Malibu without compromising performance, safety, and consumer acceptability.



HUMAN POWERED VEHICLE TEAM

Operating solely under human power, the HPVT has brought their vehicle to speeds in excess of 45 mph to become seven-time champions of collegiate American Society of Mechanical Engineers' Human Powered

Vehicle Challenges over the past four years. The team played host to the 2011 ASME HPVC at the Indianapolis Motor Speedway, and has won several awards for sportsmanship and innovative design.



EFFICIENT VEHICLE TEAM

Focusing on weight reduction, engine downsizing, and aerodynamics, the RHEV team squeezes over 1,900 mpg from their vehicle. They have competed in Shell Eco-Marathons in both the U.S. and United Kingdom, taking top-ranked places. The team has also won the SAE national collegiate supermileage competition.



GRAND PRIX ENGINEERING

Each year the team designs and builds a small open-wheeled race car to compete in the Formula SAE Collegiate Design Series. Students operate under the practical constraints of limited time, deadlines, a finite budget, a business case, and manufacturing costs as they design, analyze, build, test, and refine their design—seeking to gain as much performance as possible out of each component.



TEAM ROSE MOTORSPORTS

Bringing all-out performance front and center, TRM stables a Mustang drag car, an RX7 SCCA car, and is building an E-85 purposed Porsche 914 for road racing. Team members compete locally in both the team

cars and their personal vehicles. ■

A LOOK INSIDE THE NEW STUDENT INNOVATION CENTER

Where Creativity Never Takes a Back Seat

by Dale Long

Students exchange ideas while working on developing a human-powered vehicle in the Student Innovation Center.

The quality and variety of Rose-Hulman's co-curricular hands-on projects are on full display—in spectacular fashion—inside the new Student Innovation Center (SIC).

Opened in September, the 16,000-square-foot facility, located at the northeast end of campus, is now the hotbed of creativity and innovation for several student project groups. It provides plenty of room for team members to spread out across several well-equipped stations to work on their projects. Nearby are several machines and meeting rooms, and the Department of Mechanical Engineering's machine shop is a short walk away in Moench Hall.

Activity is happening throughout the day, night, and weekends. Nighttime supervisors have experience in manufacturing, and students get valuable insight about how to make parts or manufacture them more efficiently. This has meant that several competition teams are months ahead of last year's schedule.

"Students like how the SIC provides a convenient, clean, and comfortable space for the whole team to work together efficiently," states Dr. Daniel Kawano, co-faculty advisor of the Formula SAE race team.

Alongside that team, members of the award-winning Human Powered Vehicle (HPV) team are fabricating parts for the upcoming spring racing

season. Enhancing those efforts has been a new industrial router, with 5 foot-by-10 foot capacity, in the machine shop. It recently carved a large foam block to create the mold for a side paring for the new vehicle—a process that took just three hours, saving about 100 hours of production time.

need anything more than a table to work around. This new space was critical for the continued growth of our team."

Dr. Allen White, faculty advisor of the Rose Efficient Vehicles race team, says: "The SIC allows us to show visitors the number, breadth, and excellence of our co-curricular projects. In the past, we

"The Student Innovation Center is a natural next step in the hands-on education for which Rose-Hulman is renowned. Placing our competition teams under a common roof has enabled the sharing of knowledge and skills, engendering the co-curricular learning which will make these young men and women the advanced technology innovators for decades to come."

*Dr. Zac Chambers (ME, '94)
Advanced Transportation Systems Program Director
Co-Faculty Advisor, EcoCAR 2 Development Project*

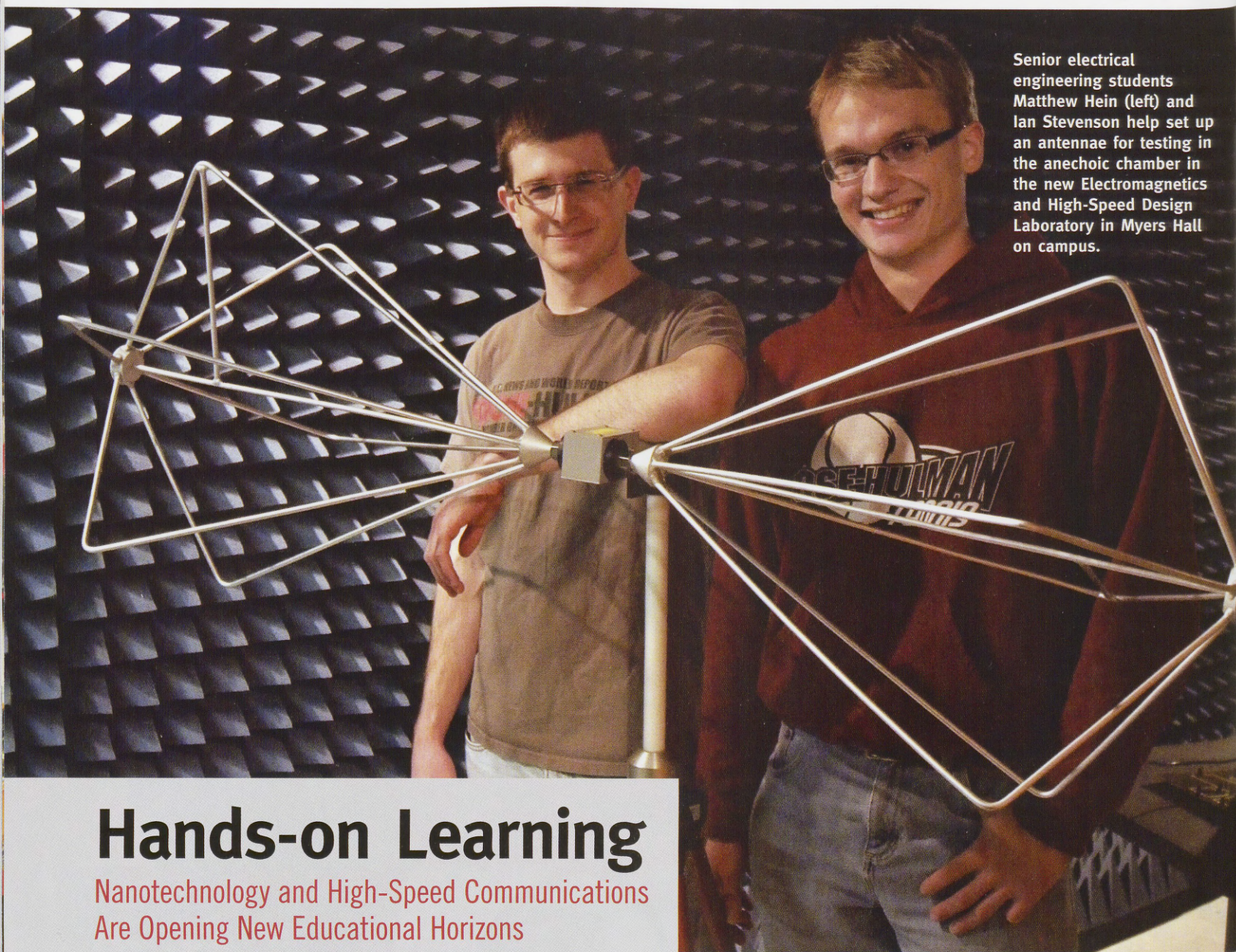
"The SIC represents a huge improvement in our team's facilities," says Dr. Michael Moorhead, the HPV team's faculty advisor. "This year, we have a record number of team members, nearly 25, that were attracted to attending Rose-Hulman because of the team's successes. It would not have been possible to accommodate all of them in our previous space (in Myers Hall). When the HPV team was created seven years ago, there were four students who didn't

could tell campus visitors about the many competition teams here. Now, we can show them and there are always students working in the center who are willing to discuss their project. All of the teams will benefit from working with each other and seeing how they tackle similar problems."

Civil engineering students are taking full advantage of the new facility this winter. They have plenty of room to create a concrete canoe for this spring's regional competition. ■



Active Learning Environment: The Student Innovation Center has lots of room for students to work on fabricating parts in the machine shop (left) and getting ready to test drive one of Team Rose Motorsports' vehicles.



Senior electrical engineering students Matthew Hein (left) and Ian Stevenson help set up an antennae for testing in the anechoic chamber in the new Electromagnetics and High-Speed Design Laboratory in Myers Hall on campus.

Hands-on Learning

Nanotechnology and High-Speed Communications
Are Opening New Educational Horizons

by Terri Hughes-Lazzell

Rose-Hulman has a long history of offering hands-on experiences to undergraduate students, developing them into leaders in their industries.

With its focus on technology, the college has created microelectromechanical systems (MEMS), microfabrication, and nanotechnology capabilities that focus on the application of the micro-nanotechnologies essential to economic growth and training future engineers and scientists.

“Innovative and high-tech engineers are needed. These are skill sets that are very rare, and available through Rose-Hulman—a major advantage to students and employers,” said Dr. Azad Siahmakounm, director of the Department of Physics and Optical Engineering’s Micro-Nanoscale Devices and Systems (MiNDS) facilities.

Rose-Hulman’s MEMS program, unique among undergraduate institutions,

was launched in 2002 through a W.M. Keck Foundation grant and enhanced by equipment donated by ON Semiconductor. A RF Photonics facility, working with the Office of Naval Research, has given students and faculty the opportunity to construct a photonics system capable of processing microwave systems into one antenna. And, the Department of Electrical and Computer Engineering’s Electromagnetic Group has

conducted projects alongside Rockwell Automation, IBM Corp. and Seagate Technologies. It has been supported by the National Science Foundation and Air Force Research Laboratory.

These opportunities have allowed students to participate in research and gain experience in their chosen fields. Graduates are able to achieve employment in their chosen industries or continue their education at leading graduate schools throughout the world.

Erin Reeves, a 2011 optical engineering master's graduate, secured a position as an electrical engineer at the National Nuclear Security Administration's Kansas City Plant, operated by Honeywell Federal Manufacturing & Technologies. Reeves has been able to work in photonics because she participated in research, made presentations at conferences, and published scholarly papers throughout her undergraduate career.

"At Rose-Hulman, the professors get you to think outside of the box," Reeves says.

Another recent graduate, Michael Gehl, earned a bachelor's degree in physics and optical engineering. He participated in research projects, wrote a paper, and presented at a conference—experiences

he attributes to his continued educational success in graduate school at the University of Arizona.

"It was unusual for an undergrad, but it prepared me well," Gehl says. "The research was probably the best experience I could have had."

He added that his personal relationships with professors not only helped him in the classroom, but also allowed him to seek out advice when considering where to attend graduate school.

These types of hands-on programs are also the premise for Rose-Hulman's pursuit to develop a High-Speed and High-Performance (HISHIP) communications laboratory. HISHIP will enhance opportunities by expanding the scope and number of industry-sponsored projects and increasing the number of students using the equipment and participating in research.

The laboratory will be a design/simulation/fabrication/measurement facility brings together students and faculty from electrical and computer engineering, physics and optical engineering, and the multidisciplinary

MEMS group. It will be used in projects with industry and collaborative applied research with other groups.

"This will permit a closer collaboration

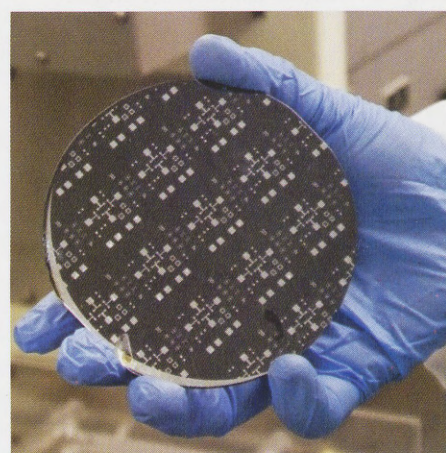
"At Rose-Hulman, the professors get you to think outside of the box."

*Erin Reeves, Engineer
National Nuclear Security Administration*

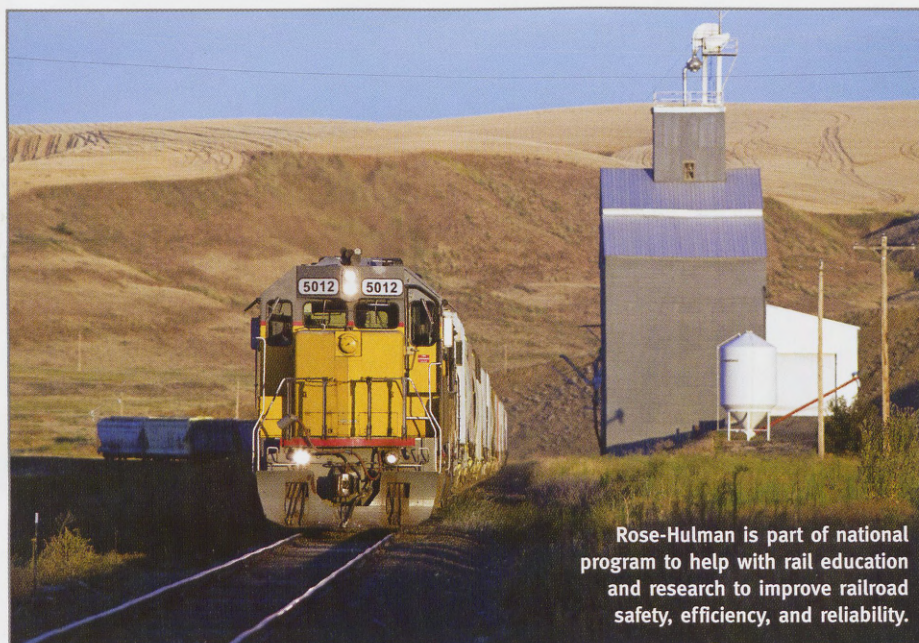
between groups, each with long-standing successful and varied activities with a variety of external collaboration," states Dr. Ed Wheeler, professor of electrical and computer engineering.

The HISHIP communications laboratory will prepare students for high-technology fields, such as high-speed design, wireless communications, optical signal processing, fiber optic communication, and high-speed photonic devices.

"Rose-Hulman education is hands-on and getting undergraduates involved in leading-edge work," says Dr. Bill Kline, interim dean of faculty. "This project fits Rose-Hulman's overall view and strategies to integrated learning." ■



Students from many academic disciplines use the new cleanrooms (left) in the larger Micro-Nanoscale Devices and Systems (MiNDS) Laboratory to learn about and create micro-nanotechnology (above). The MiNDS group has 15 faculty from six academic departments involved in various aspects of teaching and research.



Rose-Hulman is part of national program to help with rail education and research to improve railroad safety, efficiency, and reliability.

On The Right Track

Faculty, Students to be Part of National Railroad Initiative

Stepping back into its railway heritage, Rose-Hulman is addressing a need to advance the nation's transportation system by educating the next generation of railroad engineers.

Chauncey Rose, an entrepreneur and builder of railroads, established Rose Polytechnic Institute—to educate engineers to help expand the railroad industry—and commerce—in western Indiana.

Now, Rose-Hulman will be part of a multi-university consortium establishing the National University Rail (NURail) Center, based at the University of Illinois (Champaign-Urbana). The idea, funded by the U.S. Department of Transportation, will focus on rail education and research to improve railroad safety, efficiency, and reliability.

"The railroads are experiencing a comeback, and there are great opportunities for an exciting and rewarding career in railroad engineering,"

states Dr. Jim McKinney, our principal investigator to the NURail University Transportation Center (UTC).

This project will be the first UTC focused solely on rail, and the proposal received broad support from a large number of public, private sector, and international rail organizations. Joining Rose-Hulman and Illinois in the project are MIT, Michigan Tech, Illinois-Chicago, University of Kentucky, and University of Tennessee.

A new interdisciplinary railroad engineering course is being planned for the 2012-13 academic year. The course will introduce elements of electrical and mechanical engineering to railroad issues.

"Rose-Hulman's contributions to this exciting project will come from the many great minds on campus, which will produce the type of creative responses that are essential for these kinds of studies," said David Honan (CE, '05), a rail project engineer at HDR Engineering, Inc. ■

SUMMER PROGRAM CATAPULTS TEENS INTO FUTURE



Hundreds of budding engineers and scientists come to campus each summer to spend two and a half weeks discovering their future career paths through the Operation Catapult program.

In its 45th year, Operation Catapult is not a summer camp, nor is it an honors seminar. It is a once-in-a-lifetime program for rising high school seniors that goes beyond the classroom into the realms of engineering and applied science. Each student works in a team on a project that presents a challenge. They will meet students from around the world and attend special lectures by professors who are experts in their academic fields.

This summer's sessions are planned for June 12-29 and July 8-25. Find out more and register at www.rose-hulman.edu/admissions. ■



LEAVING A CAMPUS LEGACY

Students add their names and greetings to the steel beam that topped off the new residence hall, being constructed in record time on campus. Using state-of-the-art building techniques, the hall was fully enclosed within four months and will welcome students this fall. ■

Learn the latest news about Rose-Hulman at www.rose-hulman.edu

Global Programs Bridging International Experiences

The world is more flat and diverse, offering global outreach opportunities. So, it should be no surprise to see students from many countries walking on campus, and hearing foreign languages spoken in classrooms or the cafeteria.

"Our students' success now depends not only on their technical ability, but also on their global agility and leadership skills in a global context," says Dr. Luchen Li, associate dean of global programs.

Rose-Hulman has enriched the curriculum with cultural components and provides students with unprecedented opportunities and incentives for study abroad, overseas internship, and job placement with multinational corporations.



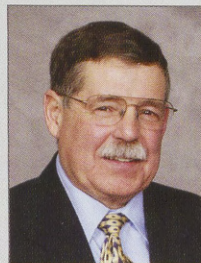
President Matt Branam and University of Ulm Rector Achim Bubenzer discuss the international education collaboration between the two institutions

Last fall, Rose-Hulman signed a dual-degree agreement with Germany's Ulm University of Applied Sciences. This program allows graduate students in electrical engineering and engineering management to do coursework at both institutes.

Exchange programs are engaging students from Japan, South Korea, Germany, Sweden, and the United Kingdom, among others. Study abroad sites are expanding to more countries. Eight Brazilian students will study on campus this spring through the Science Without Borders program.

President Matt Branam and Dr. Phil Cornwell, vice president for academic affairs, recently visited Japan's Kanazawa Institute of Technology and University of Aizu. Jim Goecker, vice president for enrollment management, visited prospective students in India. Li went to the Royal Institute of Technology in Sweden to set up a partnership for student exchange and faculty collaborative research. ■

FACULTY NEWSMAKERS



Jim McKinney

MCKINNEY IS ASPHALT ASSOCIATION HALL OF FAMER

Jim McKinney, Roland Hutchins Distinguished Professor of Civil Engineering, became the 10th inductee into the Asphalt Pavement Association of Indiana (APAI) Hall of Fame as a hallmark contributor to Indiana's transportation industry. During a 36-year career as a college instructor, he has educated thousands of civil engineering and asphalt pavement professionals.

McKinney, a faculty member since 1980 and former department chair, has coordinated the Hot Mix Asphalt Quality Assurance Certification Program in conjunction with APAI and the Indiana Department of Transportation since 1986. He has also been chief proctor of the Fundamentals of Engineering Exam for 27 years, and mentored the APAI scholarship program.

"Jim's commitment to the asphalt industry has never wavered. He is a passionate advocate for quality asphalt pavements, and above all, he has been a trusted industry friend to many of our customers, member firms and industry partners," said William I. Knopf, APAI's executive director. APAI Hall of Famer Don W. Lucas (CE, '59) introduced McKinney's induction.



Glen Livesay

LIVESAY SHARES INNOVATIONS AT FRONTIERS SYMPOSIUM

Applied Biology and Biomedical Engineering Professor Glen Livesay was among the nation's most innovative, young educators participating in the National Academy of Engineering's Frontiers of Engineering Education symposium. He was nominated by fellow engineers and deans, and chosen from a highly competitive pool of applicants.

Livesay, the first Samuel F. Hulbert Faculty Chair in Biomedical Engineering, is among early-career faculty members developing and implementing innovative educational approaches in a variety of engineering disciplines. His innovation involves embedding questions into .pdf version of current abstracts and papers that students can "uncover" as they read on their own. The idea is to provide some "guided" reflection as students learn to work with the primary literature.



Jim Hanson

HANSON ELECTED CONCRETE INSTITUTE FELLOW

Associate Professor of Civil Engineer Jim Hanson has earned one of the highest distinctions for structural engineers, being named a Fellow of the American Concrete Institute. ACI Fellows are recognized for making outstanding contributions to the production or use of concrete materials, products, and structures in the areas of education, research, development, design, construction or management. These lifetime appointments are highly respected in the concrete community.

Hanson specializes in structural design of reinforced concrete, pre-stressed concrete, and steel. He has conducted research in numerical simulation of crack propagation in concrete structures, use of fracture mechanics in analysis and design of concrete structures, and fracture toughness testing.

Bailey Challenge

By Professor Emeritus Dr. Herb Bailey

I always pose an easy warm-up problem to lure as many solvers as possible. This one is from a Rose Polytechnic Institute entrance exam in the late 1800s. (That was before my time.) The fall Super Bonus was from a recent math journal. The bonus for this issue is a problem that Will Gosnell and I proposed in the November issue of *Math Horizons*. If you have time and interest, you can find all of the problems from recent math journals at www.math.northwestern.edu/~mlema/problem/_solving/

WINTER WARM UP

Two men, A and B, shoot by turns at a target. A puts seven bullets out of 12 into the bull's eye. B puts in nine out of 12. Together, they put in 32 bullets. How many shots did each take?

WINTER PROBLEM NUMBER 1

Verify the trigonometry identity shown in the following figure:

$$\frac{\sin(b)}{\tan(b)} =$$



WINTER PROBLEM NUMBER 2

A truck has a 15-gallon fuel tank and gets 30 miles per gallon. It traveled at 45 miles per hour on a recent trip and ran out of gas after 270 miles. The fuel tank leaked gas at a constant rate. If it started the trip with a full tank, what was the leak rate?

SUPER BONUS

Do there exist isosceles triangles such that the length of each side is numerically equal to the square of the secant of the opposite angle? One example is an equilateral triangle of side length 4. Are there others?

SOLUTIONS TO THE FALL ISSUE PROBLEM: I received a few solutions to the Super Bonus, but none that could be called "elegant." The problem with two genuine and two heavy coins involves two cases: a) the heavy coins are equally heavy, and (b) the heavy coins are not equally heavy.

For Case A, you balance two of the coins. If they balance, then both are genuine or both are light. In either case, two more balances will suffice. On the other hand, if one side goes down when you balance two, then one is genuine and other is light, again, two more balances will suffice. A few sent a solution for Case B, which was more difficult. If you are not yet tired of coin problems, send me your solution.



**THREE GOLD COINS.
ONE HEAVY, FIND IT
USING BALANCE ONCE**



Send your solutions to Herb.Bailey@rose-hulman.edu or to Dr. Herb Bailey, Department of Mathematics, Rose-Hulman Institute of Technology, 5500 Wabash Ave., Terre Haute, IN 47803. If you are an alumnus, please include your class year.

Congratulations to the following solvers of the fall problems:

ALUMNI: C. Hirshfield, 1954; D. Camp, 1955; H. Brown, 1957; D. Bailey, 1959; J. Snyder, 1962; C. McCoy, 1962; J. Born, 1970; M. Marinko, 1973; P. German, 1975; M. Bailey, 1976; J. Schroeder, 1976; C. Cooper, 1976; R. Priem, 1979; M. Denzin, 1979; K. Liekhus, 1982; M. Solanki, 1985; B. Wright, 1986; J. Hoffman, 1987; C. Abdnour, 1989; M. Melton, 1990; E. Cegielski, 1990; B. Hall, 1991; J. Harris, 1991; M. Ley, 1997; M. Pilcher, 1998; K. Bartow, 1998; P. Swickard, 1998; J. Mathison, 1999; P. Mauer, 2001; C. Cole, 2001; K. Casey, 2001; S. Powell, 2002; K. Miller, 2005; D. Dominik, 2006; and P. Baker, 2006

FRIENDS: K. Bailey, M. Rosene, E. Wern and J. Ley

A Dog's Best Friend

DuPuis Takes to the Skies to Rescue Abandoned Animals

The bumper sticker that proudly adorns Ted DuPuis' Piper Aztec—"Dog Is My Co-Pilot"—says everything you need to know about the alumnus and his humanitarian flights to find new homes for abandoned animals at shelters throughout North America.

DuPuis' nonprofit organization, Cloud Nine Rescue Flights, is dedicated to providing charitable flights to transport animals more efficiently and reliably over long distances. In its first 30 months in the air, the 2006 mechanical engineering graduate has flown more than a thousand pets, mostly dogs, to safety.

"If we don't move the pets we move, they die," DuPuis recently told Boston.com. "It's that simple."

An avid animal lover, the New York native started in animal rescue by volunteering at a local shelter. Earning his pilot's certificate, DuPuis helped as a volunteer pilot to rescue animals for new homes. Seeing that larger numbers of homeless pets needed to be transported further and more reliably, he founded Cloud Nine, and now serves as its president and chief pilot.

DuPuis' mission takes dogs facing euthanasia at overcrowded shelters to homes throughout the country. Each flight saves 15 to 20 dogs.



Ted DuPuis

By day, DuPuis, 27, owns and manages DuPuis Aviation, providing engineering, flight instruction, and aircraft charter/management services. He runs his nonprofit by night and on the weekends.

"Cloud Nine absorbs all my free time but it is the most rewarding thing I do," DuPuis told The Bark.com. ■



Dr. Rick Stamper

Stamper Gets Lucas Alumni Leadership Honor

Dr. Rick Stamper received Rose-Hulman's Jess Lucas Alumni Leadership Award for career achievement, community service, and family

commitment. This award honors former leaders of the college's residence life staff.

A 1985 mechanical engineering graduate, Stamper returned to his

alma mater to serve as associate dean for professional experience and leads Rose-Hulman Ventures, where student interns have worked with more than 130 commercial clients. He has been a member of the mechanical engineering faculty since 1998, and received the Dean's Outstanding Teacher Award and Board of Trustees' Outstanding Scholar Award. The American Society of Engineering Education also presented him with the Outstanding New Mechanics Educator Award.

Stamper's industrial experience includes positions with Proctor & Gamble and General Electric. He also spent one year at the Toshiba Appliance Engineering Laboratory in Japan as part of a technical exchange between GE and Toshiba. He holds two patents for halo orthoses and is a registered patent agent at the U.S. Patent and Trademark Office.

Lucas served as vice president of student affairs and dean of students from 1976 to 2000. ■

Zuber Honored for Aerospace Achievements

Electrical engineering alumna Air Force Captain Amanda (Martin) Zuber was awarded the 2011 Women in Aerospace Achievement Award for her work with the 45th Launch Support Squadron. The 2004 graduate served as a Space-Based Infrared System (SBIRS) field program manager, overseeing the preparation and launch of defense satellite at the Cape Canaveral launch site.

Past recipients of this award have been trailblazers in their fields.

The SBIRS satellite group is one of the nation's highest-priority space programs. The group provides timely, reliable and accurate missile warning information to the President, the Secretary of Defense, military commanders and multiple intelligence agencies.

According to her nomination packet, Zuber displayed the "innate ability to logically work through problems while seeking out the win-win outcome to situations made her the perfect selection as

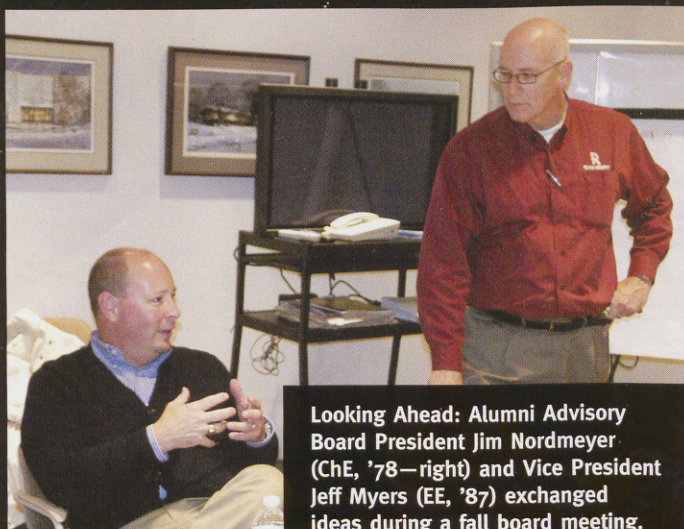
the FPM for SBIRS, resulting in the launch of a revolutionary new ballistic missile defense capability for the United States."

Zuber has been a member of the Air Force since graduating from Rose-Hulman. She previously worked in the Air Force Research Laboratory's Sensors Directorate at Wright-Patterson Air Force Base. ■

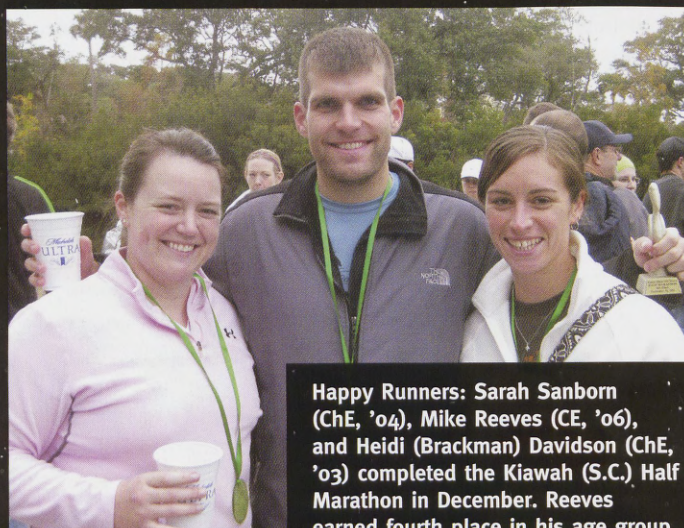


Amanda Zuber

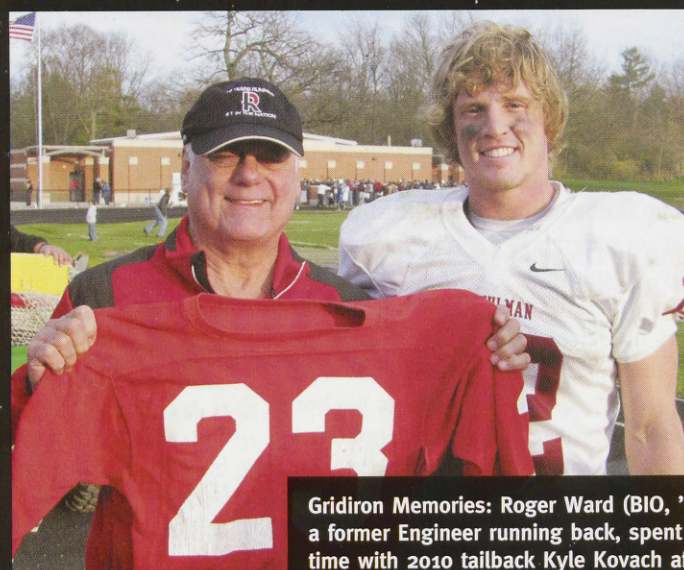
ALUMNI PHOTO ALBUM



Looking Ahead: Alumni Advisory Board President Jim Nordmeyer (ChE, '78—right) and Vice President Jeff Myers (EE, '87) exchanged ideas during a fall board meeting.



Happy Runners: Sarah Sanborn (ChE, '04), Mike Reeves (CE, '06), and Heidi (Brackman) Davidson (ChE, '03) completed the Kiawah (S.C.) Half Marathon in December. Reeves earned fourth place in his age group.



Gridiron Memories: Roger Ward (BIO, '71), a former Engineer running back, spent time with 2010 tailback Kyle Kovach after the team's victory at Earlham College. Ward joined Steve Mueller (ME, '68) and Dennis Fritz (ChE, '68) in organizing a pre-game tailgate party.



Alumni Mentor: Art McGrew (ME, '81—middle) received an award for serving as Alumni Technology Mentor for Rose-Hulman's EcoCAR and Challenge X teams.



Handy Man: Evan Harding (ME, '05) is all smiles after getting a high score from the judges during an appearance on HGTV's All-American Handyman Contest.



Lucas Award: Dr. Rick Stamper (ME, '85) is congratulated by Tom Miller, dean of student affairs, and Gwen Lucas after receiving the 2011 Jess Lucas Alumni Leadership Award.



Supporting Alma Maters: Jim Baker (EE, '71) and his wife, Mary Add, support their alma maters before the 2011 Rose-Hulman-St. Mary-of-the-Woods College Clabber Girl Trophy basketball game.

Class Notes

1970

John Bailey (ChE) retired on July 15 after more than 29 years with Continental Carbon Company, the last 19 years serving as the corporate quality systems manager. Previously, he spent more than 12 years for Allied Chemical. He has now relocated to Broken Arrow, Okla., where he has started a consulting business, OkStats, Inc. The move allows Bailey to be closer to his grandchildren and family.

1976

Gary Lee (CE) was inducted into the Lebanon (Ohio) High School Athletic Hall of Fame in December. He was earlier selected into the Rose-Hulman Athletic Hall of Fame after earning 10 varsity letters, earning honorable mention All-American honors in football, and being co-recipient of the Ruel Fox Burns Blanket as the college's top athlete in 1976.

1981

Art McGrew (ME) was honored by General Motors and the U.S. Department of Energy for serving as Alumni Technology Mentor for Rose-Hulman's EcoCAR and Challenge X teams. He is a design system engineer for GM's EV/hybrid powertrain engineering in Indianapolis. (See photo on Page 26)

1984

Ed Sammond (ChE/CM) is the North America flexible finishes business development manager for Whitford, makers of the world's largest, most complete line of fluoropolymer coatings. He is working out of the company's offices in Elverson, Pa. Sammond has more than 25 years of experience in automotive technical and business areas. He spent six years overseas, dividing his time between Japan and Europe.

1985

Rick Stamper (ME) received the 2011 Jess Lucas Alumni Leadership Award from Rose-Hulman, while also being honored as one of the outstanding mechanical engineering alumni from Purdue University's School of Mechanical Engineering, where he earned a master's degree in 1988. (See story on page 25/photo on page 26)

1988

Cary Weldy (ChE), a successful designer and builder in the Chicago area, has created an innovative reality television series, Sacred Spaces, under his production company, Om Productions. The pilot episode featured a Chicago restaurant. Weldy creates some of the most amazing homes and commercial spaces in America. His design and construction experience culminated into multiple appearances on Home and Garden Television, including hosting a 30-minute episode of My Big Amazing Renovation.

Nathan H. Wright (ME) is a partner at the San Francisco office of TPG Capital, a private equity and venture capital firm. He is also the head of the firm's field operations group. He is currently a director of Kraton Polymers LLC and its parent company, Kraton Performance Polymers Inc. Prior to joining TPG, he was a consultant at Bain & Company. Earlier in his career, Wright worked in the information systems consulting and outsourcing industry. He also founded an Atlanta-based systems strategy firm.

1991

Jeremy A. Rife (ME) is vice president of global operations at Physio-Control in Redmond, Wash. Physio-Control is the world leader in developing,

manufacturing, selling, and servicing external monitor/defibrillator products for in-hospital, pre-hospital, and public access use.

David J. Rikkens (ME) recently authored a chapter for the book *Intellectual Property Operations and Implementation in the 21st Century Corporation*, published by Wiley Publishers. He is senior intellectual property counsel for Raytheon Company's Integrated Defense Systems division.

Scott M. Simmonds (ME), has been elected partner in the Indianapolis office of Barnes & Thornburg, one of the largest law firms in the country. He is a member of the firm's intellectual property department, focusing on preparing and prosecuting patent applications through the U.S. Patent and Trademark Office, and counseling clients on the protection of intellectual property. Prior to joining Barnes & Thornburg, Simmonds spent 13 years as an engineer, working in the design and manufacture of medical devices and patient handling equipment. Simmonds received a law degree from the Indiana University School of Law in 2004.

1992

Dustin DuBois (ChE) co-presented a session on "Brewing Up New Business" at TechPoint's 2011 Innovation Summit in Indianapolis. DuBois is a partner with the Ice Miller law firm in Indianapolis. His practice concentrates on various facets of intellectual property and transactions. DuBois designs strategies for clients' intellectual property portfolios.

1999

William G. Swan III (ChE) has been working as a high



Michael R. Gambrell (ChE, 1976) executive vice president for The Dow Chemical Company, has started a two-year term on the board of directors of the National Safety Council, a nonprofit organization whose mission is to save lives by preventing injuries and deaths at work, in homes and communities, and on the road through leadership, research, education, and advocacy. Gambrell joined Dow in 1976 and has held leadership and executive leadership roles in both business portfolios and corporate functions. He serves on the board of directors and audit committee of TRW Automotive Holding Corp., and is a member of the executive committee and board of directors for the National Association of Manufacturers. He also serves on the U.S. Department of Commerce's Manufacturing Council, is a member of the University of Michigan Engineering Advisory Council, and is a distinguished director emeritus of the U.S.-India Business Council. ■

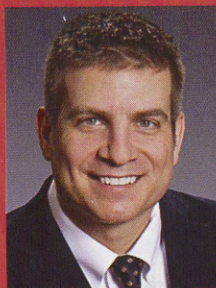
CLASS NOTES



Dustin DuBois



Alex Lo



Jeremy A. Rife



David J. Ridders



Cary Weldy

school chemistry teacher at Blue Mountain High School in Orwigsburg, Pa. for 5½ years.

Warren Timmer (EE) is the chief information officer for S2 Statistical Solutions, Inc. in Cincinnati, Ohio. He plans to build an infrastructure to streamline the company's statistical processing, allowing it to expand capacity and continue rapid growth.

2000

Wes Bolsen (EE) is now the vice president and chief marketing officer for Codexis, an industrial biotechnology company whose partners include global leaders such as Shell, Merck, and Pfizer. He is responsible for the company's corporate marketing and communications. Bolsen is a widely recognized marketing executive in the global biofuels industry, serving in senior management roles at Coskata.

2001

Tonya (Cole) Combs (ChE) has been promoted to assistant general counsel for oncology at Eli Lilly and Company. Previously, she served as lead in-house counsel in international patent litigation, and managed all aspects of patent portfolios for Lilly assets at various stages in development.

2003

Alex Lo (CS) is spending this year as a visiting professor of computer science and software engineering at Rose-Hulman. He brings a wealth of experience to the classroom, having worked for Quantitative Risk Management (Chicago), Northrop Grumman Electronic Systems (Baltimore), and Expedia (Bellevue, Wash.).

2004

Amanda (Martin) Zuber (EE) was awarded the 2011 Women In

Aerospace's Special Achievement Award in a ceremony near the Pentagon in Washington, D.C. An Air Force captain, Zuber is field program manager for the military's Space-Based Infrared System and Mobile User Objective System. (See story on page 25)

2005

Evan Harding (ME) earned high marks while showcasing his woodworking skills in HGTV's All-American Handyman Contest at The Craftsman Experience. Watch how he did at www.youtube.com/watch?v=0TrDpcwXI1s. (See photo on page 26)

2006

James Baxter (ME) is in Phase 3 of T-6 pilot training with the U.S. Air Force. He is now flying the T-1 Jayhawk, a trainer for tanker-type aircraft. He is set to earn his military wings on June 15.

Craig Kedrowski (ChE) wrote an article on enhanced energy in the December issue of *WasteAdvantage Magazine*. The title of the article was "Enhanced Energy-from-Waste Personnel Training." Read the article at www.scribd.com/doc/77641865/Enhanced-Energy. He is a senior sales and process engineer for Hitachi Zosen Inova U.S.A. in Norcross, Ga.

David Knapp (CM) and **Josh Knapp (2010 CM)** finished with respectable times in the 2011 Chicago Marathon. David is set to complete his Ph.D. in chemistry at the University of Illinois this year, and plans to begin law school this fall. Josh is currently a second-year medical student at Northwestern University's Feinberg School of Medicine.

2007

Ashley Bernal (ME) has

returned to Rose-Hulman as an assistant professor of mechanical engineering. She earned her Ph.D. at Georgia Tech, where she was a Student and Teaching Enhancement Partnership Fellow for Tech High School, along with research initiatives in MEMS.

2008

Steve Hawkins (CE) has combined his love of engineering and sports in his post-RHIT career. By day, he is a unit engineer at Marathon Petroleum's refinery in Robinson, Ill. Then, after work, Hawkins travels back to his hometown of Casey, Ill., to serve as the head boys' basketball coach at his alma mater, Casey-Westfield High School. In Hawkins' first year as head coach, the team had a 15-10 record and earned a share of a conference title. Off the court, Steve and his wife, Neeley, had their first child last year.

Justin Moore (ME) received four learning and development awards for his work at Rolls-Royce, where he serves as senior engineering associate. These honors set a record for the most L&D awards in a single year by one employee. He led a team recognized for having the best community project in the Americas region, was on the team honored for having the region's best design-and-make project, and was honored as the Graduate Trainee of the Year for both the region and globally.

2009

Sebastian Mendes (CE) has started work at a structural engineering firm in New Haven, Conn., after earning his master's degree at Worcester Polytechnic Institute. He recently started a Ph.D. program at the University of Rhode Island. ■

KEACHER MIXES HOCKEY DREAM WITH ALUMNI VISITS THROUGHOUT AMERICA

The desire of **Jeff Keacher (EE, '04)** to visit every state in his lifetime had an unusual twist, combining each stop with a side trip to play his favorite sport—hockey. He played a game in all 50 states and every Canadian province in a span of six months late in 2011.

In an adventure that was part road trip and part class reunion, the 29-year-old took to the ice in hockey games from locales as predictable as Saskatoon, Saskatchewan to the unlikely destinations of Huntsville, Alabama. He bounced from rink to rink and couch to couch, relying on the help of strangers to find the next game.

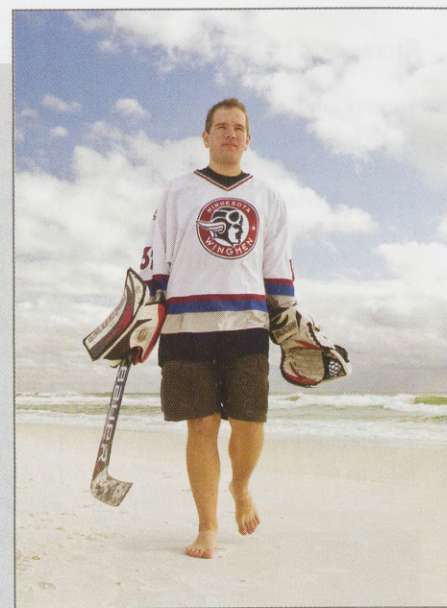
"For a while, I was concerned that I wasn't being ambitious enough with my plans, given that nobody had voiced any serious doubts about my ability to complete the trip," Keacher quipped.

The Minnesota native, who didn't start playing hockey until he was 22 years old, logged over 31,000 miles in his Subaru wagon from, June 20 until December 20 in the pursuit of hockey. A goalie, Keacher would ask to join in pick-up games at ice rinks in cities along his journey.

"The journey was a great way to reconnect with friends from Rose, Stanford (graduate school), and high school that I had not seen in a long time," Keacher notes. His travels included visits with nearly 20 fellow Rose-Hulman alumni, in addition to the friends he saw during a 2011 homecoming visit to campus.

Keacher documented his journey at www.stoppingineverystate.com, with photos and journal entries from many stops. His experiences on the road included encountering a family of grizzly bears while on a hiking excursion with Rose-Hulman alumnus Tyler Hicks-Wright (CS, '05) in the backcountry at Denali National Park in Alaska.

"The trip has been just a subplot in the adventure of life," he says. "I'm as curious and excited as anybody to see what the next page of my life holds." ■



Jeff Keacher's 50-state journey featured him playing in a hockey game in Florida.

Marriages



2003

Andy Crisman (ME) married Renee Mallory in October and reside in Shoreview, Minn. He is a doctorate student at the University of Minnesota, while she is working for Boston Scientific.

2005

Todd Wallace (CE) married Kelly Day on September 17 in Muncie, Ind. He is a civil engineer for Kova Engineering. The couple resides in Plainfield, Ind.

2006

Adam Hollman (ME) married Lindsay Bakko on December 3 in Moorhead, N.D. He is employed by Archer Daniel Midland.

2007

Devin Cook (CE) married Kristen Gunnell, a 2007 Indiana University graduate, on August 12 in Indianapolis. The couple met through Dave Yaraschewski (EE, '07). Devin is a structural engineer for Valdes Engineering. The couple resides in Chicago.



2008

Mark Ellis (BE) and **Jessica Wittig (ME, 2009)** were married on October 15 in Vincennes, Ind., and now live in Greenwood, Ind. He works for ORS, Inc. as a systems engineer in Fishers, Ind. She works as an optical engineer for Valco-Sylvania in Seymour, Ind.

Amanda Gehring (CHEM/PH) married **Ryan Smeltzer (ME,**

2010) on July 9 on the Lake Michigan beach. She is working on her Ph.D. in nuclear chemistry at Michigan State University. He is a HVAC engineer for ThermalTech Engineering.

2009

Elizabeth Ridgway (CE) married Matt Krasowski on August 27. The couple met while working at ExxonMobil.

2011

Steven Jones (ME) and **Darcie Thomas (BE, 2010)** were married on December 16. He is working in the paint and polymers division of General Motors in Detroit. She is finishing up her graduate degree at Rose-Hulman and serves as a graduate assistant in the Office of Student Affairs. ■

CLASS NOTES

Rosebuds

1996

Rob Solomon (ChE) and wife, Christine, welcomed daughter Elizabeth Marie to their family on July 19. The couple was married on May 31, 2010.

1998

Don Bales (CE) and wife, Bonnie, had their fourth child, son Ivan Ezekiel, on September 10. He joins Faith, Franklin, and Ellie to the family.



1999

Amanda (Speich) Witter (ChE) and husband, Doug, welcomed daughter Stella Samantha to their family on September 9. Stella joins a family that includes big brothers Joe, Erik, and Mike (16-year-old triplets) and sister, Harper (1). Amanda started a new job as corporate sales consultant for ExactTarget in November.

2000

Tom Shaw (ME) and his wife welcomed their third child, Griffin Shaw, in September. He joins older sister, Ava (7) and brother, Hudson (5). Tom has accepted a promotion at Caterpillar and moved back to the Peoria, Ill. area.

2002

Shilpa Lad Amato (ChE) and husband, Brian, welcomed their first child, daughter Simryn Shefali, on April 22. A proud uncle is **Ashvin Lad (CHE, '96)**.

Travis Moore (ME) and **Rebecca (Myers) Moore (ChE)** welcomed son Andrew on September 16. He joins big sister, Natalie (2 1/2). The family lives in Indianapolis, where Travis just started working as a senior cabin engineer for AAR.

Angela (Reynolds) Tien (CE) and her husband welcomed their first child, Alexa Mei-Linh, on September 23 in Boulder, Colo.

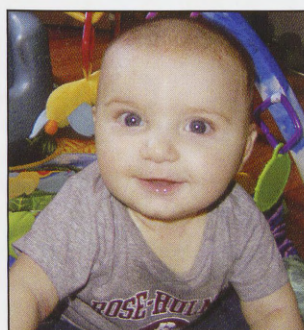
2003

Eric Beier (CE) and wife, Rachel, welcomed triplet boys (Mason Alan, Eli Eugene, and Noah Eric) on August 10.



John Lehnert (CPE) and **Liz Lehnert (EE)** announce the birth of daughter Lauren Elizabeth on June 25.

David Odle (CPE) and **Adrian (Meadows) Odle (ME)** welcomed daughter Caroline Avette on March 15.



2004

Collin Krepps (CS/MA) and **Rachel (Andre) Krepps (EE)** welcomed their first son, Wyatt Lewis, on January 27, 2011. Collin is a software engineer at Northrop Grumman, while Rachel is an electrical engineer at Baltimore Gas and Electric. The family lives in Catonsville, Md.

Mike Martin (CPE) and wife, Jennifer, are parents of their first child, son Alexander David, on August 13. Mike is a consultant at Appirio.

2005

Laura (Krause) Reese (BE) and **Bobby Reese (CE, '07)** announce that son Oliver James joined their family on April 29.

Elizabeth (Deaton) Rempala (AB) and husband, Mark, welcomed their first child, Marianne Elizabeth, on Sept. 27 in Indianapolis.

Katie (Lefler) Shonk (CHEM) and husband, Brian, had their first child, Nathan James, in August. Katie is the quality manager at Air Quality Services in Evansville, Ind. The couple bought their first house in Newburgh, Ind.



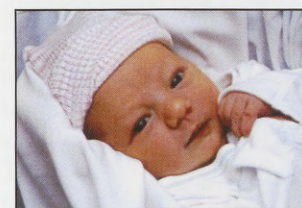
Bridget (Wiltgen) Unger (ME) and **Daniel Unger (ME)** welcomed daughter Annabel Lynn on July 16.

Kathy (Wyrzykowski) Miller (ME) and husband, Donald, had daughter Anne Bernadette on August 14. The couple was married on July 18, 2009.

2006

Matt Lovell (CE) and wife, Lindsay, welcomed their second daughter, Nora Faith, on November 29. Matt is an assistant professor of civil engineering at Rose-Hulman.

Therese (Scheibelhut) Wise (OE) and **Raymond Wise (EE)** announce the birth of son Nathan James on July 1. He is the first grandson of **Paul Scheibelhut (ME, '71)**.



2007

Adam Hirsch (ChE) and **Jennifer (Frey) Hirsch (ChE)** had their first child, Abigail Rose, on September 10. ■

We Want Your News—Promotions, Achievements, Weddings, and Birth Announcements!
Submit articles and photographs to dale.long@rose-hulman.edu

Obituaries

1932

George C. Weber, Sr. (ME), 102, died on November 25 in San Antonio, Texas. He was superintendent of power and utilities for General Motors in Indianapolis. After retirement, he moved to San Antonio. The sole survivor is his son, George Jr.

1941

Quentin Ray Jeffries (ChE), 91, died in Terre Haute on December 1. He received the Hemingway Medal at Rose Polytechnic Institute. While a graduate student at the University of Michigan, Jeffries worked on the top secret Wizard project, now known as the Polaris submarine missile. He was inducted into the Army Chemical Warfare Service in 1941 and held the rank of major in the Army during World War II service. He was a top-secret courier between Edgewood Arsenal and Washington, D.C., and also held the position of Officer-In-Charge of Night Operations at the Cryptographic Center for the European Theater of War Operations. After his military duty, Jeffries came back to serve as a lecturer in thermodynamics and unit operations courses at Rose Polytechnic and worked for Pittman-Moore until 1986. Survivors include his wife, Carolyn, two daughters, and two grandchildren.

1943

Bruce E. Powell (ChE), 89, died on November 28 in San Francisco. He worked for Chevron Research from 1946 until his retirement in 1985. At Chevron, Powell worked with the UC Radiation Laboratory on the development of the first linear accelerator. He is survived

by his wife, Charleen; and sons, Evan and Brian.

1944

George R. Butwin (CE), 88, died on November 15 in Terre Haute. He worked as a civil engineer for Texaco, Velsicol Chemical, and Commercial Solvents Corporations. Survivors include his five children, 15 grandchildren, 12 great-grandchildren, two sisters, and three sisters-in-law.

1947

Alfred M. Lawson (CE), 90, died on December 11 in Princeton, Ind. He was vice president of Koester's Construction, president of Southwind Construction and superintendent of Kings Mine. Survivors include his wife, Lois, three sons and a daughter, a brother, and several grandchildren and great-grandchildren.

1950

Jayson Russell Brentlinger (ME), 82, died on December 20 in Phoenix. His avid interest in flying was developed as a combat jet fighter pilot for the Air Force in Korea. He flew a variety of vintage and modern aircraft. Brentlinger and a friend formed a Mark Imports Volkswagen dealership and S & J Investments, which owned and operated a travel agency, commercial real estate, and several radio stations in Arizona.

Richard L. Mace (ME), 82, died on September 13 in Terre Haute. He was the President of Mace Service, Inc. Survivors include his wife, Rosemary; two sons and three daughters; three stepchildren; and 17 grandchildren.

1953

Samuel Woolley, Sr. (ME), 79, died on October 13 in Clarkson, Ky. He retired from General Electric as an engineer. Survivors include his wife, Jane; a daughter, Kathy Frazier; two grandsons; and a granddaughter.

1958

Phillip Toby Eubank (ChE), 75, of Bryan, Texas, died on August 26. He received a Ph.D. from Northwestern University, and served as a professor of chemical engineering at Texas A&M University until retiring in 2005. Eubank earned the Artie McFerrin Award for teaching, research, and service at Texas A&M, was a Fellow of the American Institute of Chemical Engineers, and was credited with six U.S. patents. Survivors include a son, Steven; a daughter, Valerie Peck; and a granddaughter.

1959

Jimmie E. Neal (ME), 73, died on August 18 in Columbus, Ind. He played football at Rose Polytechnic Institute and was a member of the Sigma Nu fraternity. He joined Cummins Engine Company in 1962 and retired in 2000 as executive director of engineering. He loved developing engines, but most enjoyed developing people. He is survived by his wife, Mary; a son, Eric; a daughter, Stacia White; a sister and brother; a half-brother; and five grandchildren.

1971

Landolin (Lanny) G. Walter (EE/CS), 62, died on December 2 in Akron, Ohio, after a long battle with multiple sclerosis. He was one of the first graduates to earn a dual electrical engineering/computer science

degree. He went on to be an announcer (under the name David Steele) and broadcast engineer for radio stations in Akron and Canton, and also started his own production business.

1993

James Rhoades (CE) died on January 3 after a lengthy illness. He specialized in remediation systems of environmental engineering, and was a licensed professional engineer. Since 1997, he was self-employed at his firm of Rhoades and Rhoades.

2005

Vernon McCarroll Jr. (CPE) died in November in Indianapolis. He is survived by his wife, Danielle, and cousin, George Evans.

Former Faculty

Donald Anderson, who taught English at Rose Polytechnic Institute from 1952-58, died on November 3 in Columbus, Ohio. He went on to teach at Butler University (1958-65) and the University of Missouri (1965-92).

Special Friends

Maxine Lorraine Giacoletto, 94, died on December 14 in Lansing, Mich. She was employed by the State of Indiana's Social Service Department before marrying Rose-Hulman alumnus Lawrence J. Giacoletto in 1941. She helped establish the Dr. Lawrence J. Giacoletto Endowed Faculty Chair for the Department of Electrical Engineering. She is survived by a daughter, Carol. ■

ALUMNI/DEVELOPMENT NEWS



Christopher K. Aimone

Christopher Aimone Joins Advancement Team as Planned Giving Director

Attorney Christopher K. Aimone has joined the Office of Institutional Advancement as the new Director of Planned Giving.

Aimone has been an attorney with the Terre Haute law firm Wilkinson, Goeller, Modesitt, Wilkinson & Drummy since 2009, where he gained experience in trusts and estate planning. He also spent nine years as a financial consultant with the Terre Haute branch of Smith Barney, and, prior to his departure, he managed approximately \$95 million in client assets.

A Peoria, Illinois native, Aimone earned a bachelor's degree in manage-

ment from Purdue University in 1991 and a law degree from Syracuse University's College of Law in 2009.

"I look forward to developing long-term relationships with alumni and friends of Rose-Hulman to help them be an important part of providing young people a first-in-class education," says Aimone.

Planned giving is a major component of institutional advancement, generating gifts to support Rose-Hulman's educational mission through bequests, trusts, annuities, and other deferred gift mechanisms. This will help expand the endowment, fund scholarships, and grow the financial base to foster continued academic excellence. ■

Alumni Can Help Their Communities on April 28

Alumni have the opportunity to give back to their communities this spring during the annual Rose-Hulman National Day of Service on April 28. This event, organized by the Young Alumni Council (YAC), will have alumni, family members, and friends working together to help community organizations such as Habitat for Humanity and People Working Cooperatively.

YAC members kicked off this year's effort by donating over 80 items to Terre Haute's 14th and Chestnut Community Center on January 14.

Cities hosting service day events are:

Bloomington, Ind.
Cedar Rapids, Iowa
Chicago
Cincinnati
Dallas
Houston
Indianapolis
Kansas City
Louisville
Minneapolis/St. Paul, Minn.
Terre Haute
Washington, D.C./Arlington, Va.

Visit <http://alumni.rose-hulman.edu/> to see details about events taking place in your city and put your name on the volunteer list. ■



SERVING COMMUNITIES: Young Alumni Council member Ashley Erffmeyer (ME, '08), left, kicked off this year's Rose-Hulman Day of Service by delivering needed items to 14th & Chestnut Community Center Volunteer/Student Shelly Hinzman. ■

ALUMNI CALENDAR

YOUNG ALUMNI HAPPY HOURS | MARCH 8-10
Throughout Country

THE 'GREAT' DEBATE | MARCH 10
Indianapolis

THE 'GREAT' DEBATE | MARCH 17
Washington, D.C./Baltimore

THE 'GREAT' DEBATE | MARCH 24
Detroit

THE 'GREAT' DEBATE | APRIL 14
Chicago

THE 'GREAT' DEBATE | APRIL 21
Indianapolis

NATIONAL DAY OF SERVICE | APRIL 28
Twelve Communities

INDIANAPOLIS ONE AMERICA | MAY 5
500 Festival Mini Marathon

BUMP DAY | MAY 20
Indianapolis Motor Speedway

SENIOR SOIREE 2012 | MAY 25
Hulbert Arena, Rose-Hulman

COMMENCEMENT, ROSE-HULMAN | MAY 26

THE 'GREAT' DEBATE | JUNE 9
San Francisco

THE 'GREAT' DEBATE | JUNE 16
New York City

INDIANAPOLIS INDIANS BASEBALL | JULY 4
Victory Field, Indianapolis

SCHOLARSHIP GOLF SCRAMBLE | JULY 19

ROSE-HULMAN HOMECOMING | SEPTEMBER 21-22

**SAVE THE DATE FOR
HOMECOMING
2012
SEPTEMBER 21 & 22**

Alumni Pave Paths for Others

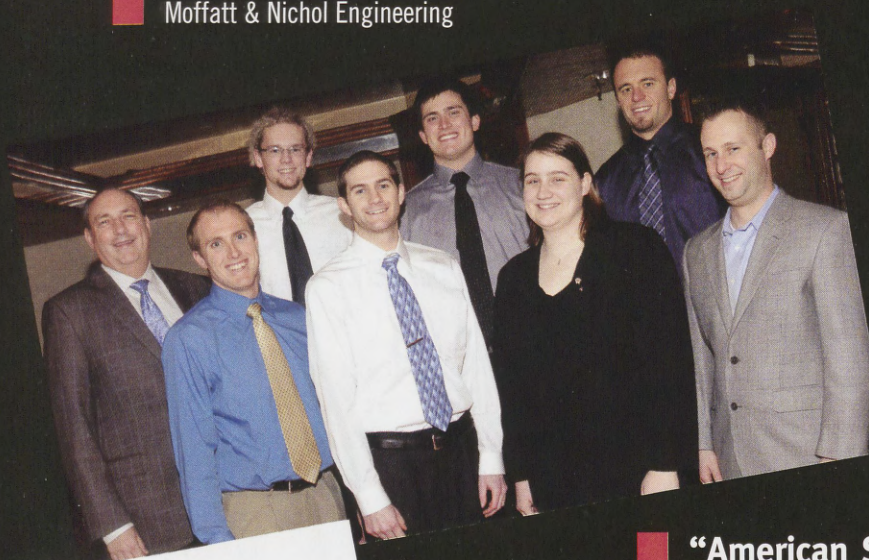
Alumni help us continue to provide the world's best education in engineering, science, and math through individual giving and corporate support.

MOFFATT & NICHOL CONSULTING ENGINEERING SCHOLARSHIP:

Started three years ago by an alumni group at the leading global infrastructure consulting firm.

"This scholarship is a great opportunity to give back to the Rose-Hulman community that gave me so much."

Matt Trowbridge, '08
Moffatt & Nichol Engineering



AMERICAN STRUCTUREPOINT SCHOLARSHIP:

Alumni are passionate about giving back and were one of the pioneers in setting up these alumni-corporate relationships.

"American Structurepoint is built on the talents and hard work of people, just like the alumni that these scholarship recipients will become."

Greg Henneke, '75
American Structurepoint

Interested in starting an alumni scholarship at your company?
CONTACT THE OFFICE OF INSTITUTIONAL ADVANCEMENT AT 812-877-8453

THANK YOU FOR YOUR GIFT!
Rose-Hulman Institute of Technology
Office of Institutional Advancement
5500 Wabash Avenue
Terre Haute, IN 47803
www.rose-hulman.edu
tollfree: 1-800-248-7448, ext. 8159



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

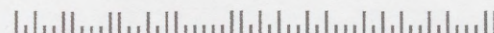
FIRST-CLASS MAIL

PERMIT NO. 562

TERRE HAUTE IN

POSTAGE WILL BE PAID BY ADDRESSEE

ROSE-HULMAN INSTITUTE OF TECHNOLOGY
OFFICE OF INSTITUTIONAL ADVANCEMENT
5500 WABASH AVENUE
TERRE HAUTE, IN 47803-9958



YES, I WANT TO SUPPORT ROSE-HULMAN. ENCLOSED IS MY GIFT.

Name _____ Class Year _____ Phone Number _____
Address _____
E-mail _____

I'm making a gift of \$ _____ by (please choose one option):

- ☐ **Check** (payable to Rose-Hulman Institute of Technology)
☐ **Credit Card** (one-time or recurring): ☐ Visa ☐ Mastercard ☐ American Express ☐ Other

_____ This is a one-time gift of \$ _____ (whole dollars only)

_____ This is a monthly recurring gift of \$ _____ (each month)

Start Date _____ Stop Date _____

Account Number _____ Exp. Date _____

Authorized signature _____

- ☐ Credit this gift equally to my spouse (spouse's name and class year, if applicable) _____

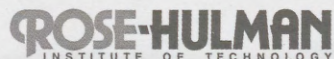
Multiply Your Dollars

If you or your spouse is affiliated with a company that has corporate gift match, please indicate:

Name of Company _____

- ☐ Form enclosed ☐ Completed form online

To make your gift online, please visit our secure Web site www.rose-hulman.edu/give.



Office of Institutional Advancement □ 812-877-8217 □ www.rose-hulman.edu

Please direct my gift to:

- ☐ The Annual Fund
☐ The Endowment
☐ Scholarships
☐ Other

For Additional Information:

- ☐ I have Rose-Hulman in my estate plan.
☐ I am interested in information regarding planned giving.
☐ I am interested in learning more about corporate and foundation giving.
☐ I would like to speak to someone regarding making a gift

Echoes

ROSE-HULMAN INSTITUTE OF TECHNOLOGY

5500 Wabash Avenue
Terre Haute, IN 47803

Address Service Requested

NON-PROFIT ORG.
U.S. POSTAGE
PAID
ROSE-HULMAN
INSTITUTE
OF TECHNOLOGY



PARTING SHOT

The Innovation Space

Members of the Formula SAE Race Team use workspace in the new Student Innovation Center (SIC) to examine improvements upon last year's vehicle for the upcoming spring racing season. Rose-Hulman participated in the national vehicle design competition for the first time in 20 years. Take a look what's happening inside the SIC on pages 18-19.