The Rensselaer Solar Car Racing Team has been invited to compete in Shell's North American Eco-Marathon in Houston, Texas, in April. This will be the third year the team competes with hundreds of other students from the United States, Canada, Mexico, and Brazil to build the most energy-efficient car possible.
The Molecularium Project has unveiled its latest offering, an online “molecular theme park.” Page 10.

FEATURES

20 The Sporting Mind
Love of the game inspires success on and off the field for Rensselaer scholar-athletes.

28 Best of Class
Expanded academic and research offerings, outstanding new facilities, and a broad admissions process are attracting ever-stronger students to Rensselaer.

36 Return to the Forest
Sivaporn Dardarananda ’68 is helping to save an endangered species one elephant at a time.

DEPARTMENTS

4 President’s View
Data, crowds, clouds, and jams.

5 Mail
LRC spotlight opens doors.

6 At Rensselaer
Recent Breakthroughs 14
Milestones 19

42 Staying Connected

44 Class Notes
In Memoriam 63

64 One Last Thing
Of Science and Curiosity.
President Participates in World Economic Forum

President Shirley Ann Jackson participated in the 2012 World Economic Forum’s (WEF) “Summer Davos,” held in September in Tianjin, China. Considered by WEF officials “the foremost global business gathering in Asia,” the Sixth Annual Meeting of the New Champions engaged more than 1,000 participants from 90 countries in forums designed to share strategies and solutions and to discuss global issues and risks. The meeting of global leaders in government, business, academe, media, the arts, and civil society focused on “Creating the Future Economy.”

“Successful innovation—essential to strengthen the global economy and to meet the grand challenges of our time—will be driven by creative collaboration among the business, government, and academic sectors. This gathering provides an invaluable opportunity to enhance the interconnections that can help strengthen our various institutions as we work to meet the challenges and tap the opportunities before us,” says President Jackson.

President Jackson was a panellist in two forums. The first, titled “The 7 Billion Challenge,” focused on innovations required to meet the basic needs of a growing population; the second was a discussion on “The Future of Innovation,” focusing on how leading innovators are reshaping models of research and development.
Data, Crowds, Clouds, and Jams

Leadership in the face of new technologies

Often, new technologies force leaders to rethink their approaches. The essentials of leadership—strategic thinking and planning, organization, managing talent, developing human capital, ensuring execution—remain important over time. But technology can have both positive and negative impacts on traditional approaches to leadership.

We live in a world where “big data” is coming to the fore. Social networking leaves behind “digital crumbs” for us to follow and study. The Internet is the new library—with more information than anyone can think of really ingesting. Sensors and networks are embedded in everything from buildings to automobiles to cameras to satellites, and are creating what often is referred to as “the Internet of Things.” The ability to process this deluge of new data in an efficient and relatively inexpensive way provides us with new bases for decision-making.

One of the more intriguing possibilities for the emerging role of big data is illustrated by the ability to “mash up” data from different sources in ways that create compelling new insights. A simple example of this is the pairing of real estate data with crime data to create maps that can be used to reveal problems and suggest possible solutions.

We also see this phenomenon of crowdsourcing. Crowds can help to identify problems, suggest ideas, and assist in the execution of solutions.

Wikipedia provides a good illustration of the pluses and minuses of crowdsourcing. On one hand, this online encyclopedia is a rich resource, providing a powerful starting point for research. On the other hand, Wikipedia, despite the efforts of many people who take it upon themselves to make corrections, is riddled with errors. Some may be added in good faith, while others are added maliciously. However, no matter how they got there and how long they persist, they can mislead and misinform. Nonetheless, crowdsourcing serves the useful purpose of bringing multiple viewpoints to bear in a given area.

We also have the emergence of cloud computing. Cloud computing makes complex applications and massive amounts of data and information available for a wide array of people across an organization—and, sometimes, those in the general public who may have an interest in an endeavor.

In spite of these concerns, with the advent of new tools come new ways to address big questions and challenges. In this vein is the idea of the jam. IBM has been a leader in facilitating these online sessions, which bring together interested participants from around the globe to concentrate on a selected challenge over a short period of time. Working from shared data sets, propositions, and questions—within a carefully designed framework—experts and interested parties use online collaborative tools to come together to share knowledge, express concerns, and brainstorm projects and solutions that can have high impacts.

I expect these technologies—big data, crowdsourcing, cloud computing, and jams—to reshape leadership. For instance, in many of these cases, you have participants who, in previous times, would not have had a voice. These days many people who are essential to achieving goals, which may be strategic, are participating on a volunteer basis. Anyone can tell you that managing an organization of volunteers differs in a substantial way from managing people who are required to accept direction.

We also must address concerns about trust. Are the sources of data reliable? Are the combinations, the mash-ups, fair and reasonable? Are the people involved really who they say they are, and do they have credentials that give them authority?

But let us not just look at the participants. The leaders themselves must be trusted and must manage differently in this new space. Traditionally, their positions give them authority, and trust comes from their reputations. But, when part of the team is formed on an ad hoc basis, will their authority be recognized? Will key participants even know who they are?

Do the leaders’ finely honed skills of persuasion translate into online communications? How do they build trust—especially for endeavors that include risk or important consequences—when they may never get to look people in the eye or shake their hands?

Clearly, as the world of such virtual leadership evolves, indeed, even when there is a blended approach that includes both face-to-face and electronic interactions, the challenge of trust is large. But, if leaders can solve the trust problem, they will have access to a wider variety of perspectives, and more talent than ever before.

Online tools can better enable education, and remote mentoring of both employees and those who represent stakeholders, as we face important challenges. Leaders will need to hone their abilities and find approaches to persuasion that work in this new context.

Those who wish to lead, to work to make a difference in this technologically transformed world, must assess the pros and cons of the new technologies.

Those who wish to lead, to work to make a difference in this technologically transformed world, must assess the pros and cons of the new technologies. These tools will have enormous impact on what we can do, but also on how we work together to achieve our goals.

This is the new leadership.
Lighting Research Center Spotlight Opened Doors

I read “Lighting Up the Aviation Industry” with great interest. Credit this magazine for initiating contact with the Federal Aviation Administration. I first read an article on RPI’s Lighting Research Center (LRC) in the early 2000s as manager (now retired) of FAA’s Airport Engineering Division. Our engineers were very experienced with incandescent lighting on airfields, for which brightness steps are achieved by controlling the amperage in a constant current circuit, and for which, as noted in the current article, colors are determined by the lens placed over the bulb. LEDs work nothing like incandescent bulbs, and we were struggling with developing specifications for new LED lighting fixtures.

An email to Dr. Narendran soon resulted in a visit to the LRC by me and researchers from the FAA Technical Center. He and his colleagues impressed us not only with their extensive knowledge of LED technology and the perception of light by the human eye, but also their focus on practical applications.

Considering the thousands of lighting fixtures at a typical airport, the savings in power consumption, labor costs, and runway downtime through the use of energy-efficient, long-life LED fixtures is immense.

The advances in technology that make these savings possible are a direct result of work by the LRC.

RICK MARINELLI, P.E. ’77
Stafford, Va.

Bravo!

OOLAH!” These are the words that are inscribed in my wife’s and my wedding rings based on the Laurie Anderson film Home of the Brave, which we saw over 26 years ago while we were engaged. Living back then (1986) in Sacramento, my wife and I and fellow RPI grad school friend Dr. John Bossard ’86 went to see this film. We walked out so blown away by the originality and uniqueness of the music that John was quoted as saying, “I want to have Laurie Anderson’s baby!”

So impressed by the entire production, my wife Tamara and I engraved our wedding rings with her one-word exclamation “OOLAH!” as an expression of the wonderment we saw in each other and the movie. This past October, in a flea market in Cannes, France, my wife and I were rummaging through a myriad of French treasures: she at the antiques, I at the CDs. I came across the very Laurie Anderson CD, Mister Heartbreak, that contained the music from that movie. While it was not the complete soundtrack, it had the author William S. Burroughs speaking on “Sharkey’s Night.”

We return and there is a pile of mail including the alumni magazine, and there is this article about Laurie Anderson (“Laurie Anderson Named Distinguished Artist-in-Residence”). I’ve been watching the film. Movie, wedding rings, flea market, alumni magazine, Ms. Anderson—you have enriched our lives like some guardian angel appearing when one least expects it.

When we were students, RPI always brought in excellent musicians whom we got to watch in the McNeil Room. We were treated to the likes of the Heath Brothers, Jeff Lorber Fusion, Larry Coryell, Koko Taylor, and other bands which provided a great experience for us back in the late ’70s and early ’80s.

With Rensselaer bringing Ms. Anderson to EMPAC for the next three years, RPI appears to continue providing a rich and stimulating environment beyond the rigor of science and engineering, which I hope the current students will take advantage of. Please let us know when she will be performing at EMPAC. We would make the trek from Virginia to see her in her new “home,” OOLAH!

MICHAEL “MIKI” FEDUN ’81, ’84
Fredericksburg, Va.

From Russia, With Love

I was reading the alumni pages in the Fall issue when I ran across Jack Regula ’70’s mention (Class Notes, 1971) of playing against the Russian “Traktor” hockey team last year.

I worked in Russia in 2005 and 2006 on a chemical weapons destruction facility, which is now being used by the Russian military to destroy their stockpile of chemical weapons. When we first arrived in Russia, we commuted to the project site from the city of Chelyabinsk, Russia. Chelyabinsk is famous in Russia as the home of the Chelyabinsk Tractor Company, the original sponsor of the Chelyabinsk Traktor hockey team, which still plays in the top Russian Professional Hockey League.

About a month after arriving in Russia, we relocated to a camp about five miles from our project so we stopped making the 55-mile commute from and to Chelyabinsk. Since Chelyabinsk was the nearest big city, our camp ran buses to the city on the weekends so you could spend the weekend in Chelyabinsk. Some of the ex-pats would attend the Chelyabinsk Traktor hockey games and many of us came home from Russia with Traktor hockey jerseys and knit scarves with Chelyabinsk Traktor on them. Thanks for reminding me of the time we spent in Russia. Most of the ex-pats on the project enjoyed their time in Russia.

SAMUEL KALAT ’69
Fort Worth, Texas

We’d love to hear from you! To provide space for as many letters as possible, we often must edit them for length. Address correspondence to: Rensselaer Magazine, Strategic Communications and External Relations, Rensselaer Polytechnic Institute, Troy, NY 12180; email to alum.mag@rpi.edu; or call (518) 276-6531.
MIRIAM KATZ, ASSISTANT PROFESSOR OF EARTH AND ENVIRONMENTAL SCIENCES, is one of six scientists nationwide to be named a 2012-2013 Ocean Leadership Distinguished Lecturer.

The Distinguished Lecturer Series brings the discoveries of the international Integrated Ocean Drilling Program (IODP) to undergraduate and graduate students and to the geoscience community.

Now through spring, Katz will travel across the country, presenting her research and serving as an ambassador for geoscience and IODP.

Katz’s research focuses on ocean circulation and sea level changes that have occurred over millions of years. She analyzes marine microfossils and sediment obtained via deep ocean drilling to reconstruct past ocean and climate conditions and understand the causal relationships among system components of climate change. Her research on the Antarctic Circumpolar Current (ACC) provided the first evidence that the ACC played a key role in the formation of the modern ocean structure, which contributed to the major global climate shift that began about 38 million years ago.

“Dr. Katz’s pioneering work provides important insights into how Earth’s climate has changed through time,” says Laurie Leshin, dean of the School of Science. “Her appointment as a distinguished lecturer is a fitting honor for Dr. Katz and reflects the high quality of earth science research taking place at Rensselaer.”

“The series typically targets research universities and smaller institutions that don’t have a history of conducting research in oceanography and earth science,” Katz says. “We want to get students excited about the science, to share the experience of traveling around the world with international teams of scientists who are engaged in high-profile research.”

Researchers and other members of the scientific community will hear about Katz’s findings on the progressive deepening of the ACC and the evolution of modern ocean currents. All audiences will get a sense of life aboard a research vessel, where 30 scientists from around the globe analyze samples unearthed from hundreds of meters beneath the ocean floor.
**Center for Cognition, Communication, and Culture**

**New Center Explores the Intersections of Cognitive, Cyber, and Physical Worlds**

Rensselaer launched the Center for Cognition, Communication, and Culture (CCC Center) in November, with a ribbon-cutting, multimedia presentations on the initial core research areas—cross-modal displays, mixed reality, and synthetic characters—and an open house. Jonas Braasch, associate professor of architecture, has been named center director.

The CCC focuses on the intersections and interdependency of cognition, communication, and culture in the context of contemporary research, technology, and society. Interdisciplinary research activities will draw on the arts, design, engineering, humanities, science, and social science.

“The Rensselaer Plan is bringing a continued expansion of interdisciplinary research, and the launch of the Rensselaer Center for Cognition, Communication, and Culture is an important milestone in support of that priority,” says President Shirley Ann Jackson. “This new center represents a new frontier of both research and pedagogy, and their intersection. The center will bring together researchers from such seemingly diverse arenas as the arts, computer science, cognitive science, and game design to forge new tools at the intersections of the cognitive, cyber, and physical worlds. By making it possible for us to interact with and manipulate vast quantities of data on a human scale, their work will help us to meet our social and technological challenges.”

The initial core research areas are:

- **Cross-modal Displays**—which seek to employ all human sense in understanding and exploring data; Mixed Reality—in which data overlaid on the real world enriches learning and research environments; and Synthetic Characters—computer programs intended to simulate an independent individual.

“Through the CCC we hope to tackle some of the emerging challenges and opportunities that life in our growing parallel digital universe has brought up,” says Braasch. “Initially, the center will focus on virtual reality-based narrative and game playing to develop better ways to learn languages in a more natural and entertaining way, work on the design of next-generation synthetic intelligent characters that can interact with us and enrich our social life, and on cross-modal scientific displays that take into account how humans integrate all their senses to explore and understand big data sets produced by the supercomputers like the CCNI, our supercomputing center.”

**Economic Development**

**Governor Cuomo Tours Economic Development Projects**

New York State Governor Andrew Cuomo visited the Rensselaer campus Oct. 23 as part of his statewide Regional Economic Development Council Progress Tour. President Jackson and Albany Medical Center CEO James Barba, co-chairs of the Capital Region Economic Development Council, joined the governor at an event reviewing some of the Council’s work of the past year.

The governor also toured a laboratory in the Rensselaer Center for Biotechnology and Interdisciplinary Studies to highlight the work being done by the NYCAP Research Alliance, a partnership between Rensselaer, Albany Medical Center, and the University at Albany. The Alliance was awarded $950,000 to establish a regional initiative to leverage world-class intellectual capital and an unparalleled biomedical research and development infrastructure to attract both private sector investment and federal sponsored funding. The Alliance announced its first grants—10 awards totaling $745,000 in seed funding—in early October.

After departing the campus, the co-chairs led the governor on a tour to view the progress made on projects throughout the Capital Region. In Green Island, they met with Eben Bayer ’07 and toured Ecovative Design, a bio-based materials manufacturer co-founded by Bayer and Gavin McIntyre ’07 and launched in the Rensselaer incubator program. Ecovative was awarded $250,000 for the purchase of machinery and equipment as part of an expansion project that increased efficiency to meet customer demand. It has created 10 new full-time jobs and has helped leverage $2 million in private investment.

“Through this regional economic development process, we are successfully collaborating across sectors and regions to strengthen the Capital Region economic ecosystem, thereby maintaining and creating jobs, preparing and retaining the workforce, and celebrating and strengthening our communities,” said President Jackson.
BIOMEDICAL ENGINEERING

Nanoglue Boosts Heat Transfer

A TEAM OF INTERDISCIPLINARY RESEARCHERS HAS DEVELOPED a new method for significantly increasing the heat transfer rate across two different materials. Results of the team’s study could enable new advances in cooling computer chips and light-emitting diode (LED) devices, collecting solar power, harvesting waste heat, and other applications.

By sandwiching a layer of ultrathin “nanoglue” between copper and silica, the research team demonstrated a four-fold increase in thermal conductance at the interface between the two materials. Less than a nanometer—or one billionth of a meter—thick, the nanoglue is a layer of molecules that form strong links with the copper (a metal) and the silica (a ceramic), which otherwise would not stick together well. This kind of nanomolecular locking improves adhesion, and also helps to sync up the vibrations of atoms that make up the two materials which, in turn, facilitates more efficient transport of heat particles called phonons.

Heat transfer is a critical aspect of many different technologies. As computer chips grow smaller and more complex, manufacturers are constantly in search of new and better means for removing excess heat from semiconductor devices to boost reliability and performance. Ganpati Ramanath, professor in the Department of Materials Science and Engineering, who led the new study, says the ability to enhance and optimize interfacial thermal conductance should lead to new innovations.

“Interfaces between different materials are often heat-flow bottlenecks due to stifled phonon transport. Inserting a third material usually only makes things worse because of an additional interface created,” Ramanath says. “However, our method of introducing an ultrathin nanolayer of organic molecules that strongly bond with both materials at the interface gives rise to multifold increases in interfacial thermal conductance, contrary to poor heat conduction seen at inorganic-organic interfaces. This method to tune thermal conductance by controlling adhesion using an organic nanolayer works for multiple materials systems, and offers a new means for atomic- and molecular-level manipulation of multiple properties at different types of materials interfaces. Also, it’s cool to be able to do this rather unobtrusively by the simple method of self-assembly of a single layer of molecules.”

CIVIL ENGINEERING

Engineers Help Destroy Test Levee in Netherlands

CIVIL ENGINEERS FROM RENSSLEAER WERE part of an international research team that collapsed a full-scale dike in the Netherlands. The test dike was embedded with advanced sensors and traditional measurement instruments, and results of the study are expected to help validate powerful new technologies for monitoring the health of aging flood-control infrastructure.

The dike was situated in a specially constructed basin, which the researchers filled with water. The slow addition of water into the basin increased the pressure on the dike. Water forced its way into the dike, and eventually softened the bottom of the dike and shifted the earth underneath, prompting the overall structure to collapse.

The study was led by Dutch researchers and optimizes interfacial thermal conductance should lead to new innovations.

Civil engineers working on flood-control infrastructure are always on the lookout for ways to improve the structural integrity of levees and other flood-control systems. The collapse of a levee can lead to catastrophic flooding as we unfortunately witnessed in 2005 during Hurricane Katrina,” says Tarek Abdoun, the Judith and Thomas Iovino ’73 Career Development Professor in the Department of Civil and Environmental Engineering. “A large-scale test like this can help supply us with invaluable data to inform and validate our efforts to create a long-term, real-time monitoring system that can assess the health of levees and help identify the vulnerability of levee or dam sections before they fail.”

The collapsed dike was fitted with a large number of different sensors, including SAPP (shape-acceleration-pore pressure) arrays that were developed through a partnership between Rensselaer and industrial collaborator Measurand. SAPP sensor arrays are designed to be installed into the ground, beneath and around levees and dams. The cost-effective arrays accurately measure soil deformation, vibration, and pore pressure at critical points of a flood-control system.

In the United States, the national flood-control infrastructure is aging and its structural health is deteriorating, Abdoun says. The system is comprised of more than 5,600 km of levees, and 43 percent of the U.S. population lives in counties with levees designed to provide some level of protection from flooding. Some of these levees are as old as 150 years. In 2009, the American Society of Civil Engineers Report Card for America’s Infrastructure gave the condition of the nation’s dams a grade of D, and levees a grade of D-minus.
ADVANCED MANUFACTURING

High School Students Visit for National Manufacturing Day

As part of its ongoing mission to educate and inspire the next generation of technology leaders, Rensselaer hosted local high school students for a morning and afternoon of activities to celebrate national Manufacturing Day.

More than 100 students from Capital Region high schools visited campus in October for manufacturing-related activities and workshops. The School of Engineering partnered with Hudson Valley Community College to host Manufacturing Day, in collaboration with the Chief Executives Network for Manufacturing of the Capital Region, and the Center for Economic Growth, as well as Haas-HFO Allendale Machinery, the Rensselaer and Capital Region chapters of the Society of Manufacturing Engineers, Ecovative Design, and the Empire State Development Division for Science, Technology, and Innovation.

“Advanced manufacturing is essential for reinvigorating American innovation and for creating high-paying jobs across all technology sectors—around the country and right here at home in the Capital Region,” says David Rosowsky, dean of the School of Engineering. “Manufacturing Day is a powerful tool to excite young people about manufacturing, to challenge them to think critically about it, and to inspire them to study and pursue a career in science, technology, engineering, and math.”

Manufacturing Day activities at Rensselaer ranged from learning how a fuel cell works and interacting with the university’s full-scale Motoman industrial robot, to a Lego-based demonstration of additive manufacturing and donning a “bunny suit” for a tour of the clean room facilities. Participating labs and centers included the Center for Automation Technologies and Systems, the Manufacturing Innovation Learning Lab, and the Micro and Nano Fabrication Clean Room, which is operated by the Center for Integrated Electronics.

Nationally, Manufacturing Day is organized by the Fabricators and Manufacturers Association, the Hollings Manufacturing Extension Partnership of the U.S. Commerce Department’s National Institute of Standards and Technology, the National Association of Manufacturers, and the Manufacturing Institute. The program aims to highlight the importance of manufacturing to the nation’s economy and draw attention to the many rewarding high-skill jobs available in manufacturing fields.

RENSSELAER INNOVATION

Luncheon Celebrates Patents

At Rensselaer, innovation is a way of life for many faculty and budding student inventors. To honor their contributions to science, engineering, and research, the Office of Technology Commercialization (OTC) recognized and awarded patent plaques to members of the Rensselaer community during the annual Innovation Luncheon in October.

Founded in the 1990s, the OTC helps the Institute protect intellectual property and forges relationships with industry to bring discoveries to the marketplace.

The luncheon featured remarks from OTC Executive Director Ron Kudla and Patent Manager Sherri Dente. Special guest speaker was Nadarajah Narendran, director of research and professor at the Lighting Research Center.

On October 17, 16 patent plaques were awarded to 20 Rensselaer inventors. “The Office of Technology Commercialization hosts the Innovation Luncheon each year to provide recognition of its inventors for their innovations,” says Ron Kudla, executive director of the office of intellectual property, technology transfer, and new ventures. “We look forward to licensing these technologies to companies that will develop, market, and sell products protected by these patents. The event also provides our office with the opportunity to provide the statistics on its activities, an update on the new America Invents Act of 2012, and an outstanding presentation by Professor Nadarajah Narendran from the Lighting Research Center on the patenting process. His talk provided the audience with a true representation of what it takes to be a successful innovator of new technology.”

Patent plaques were distributed to current Rensselaer inventors who had United States patents issued between September 2011 and August 2012, and other Divisional and Continuation United States patents.
“NanoSpace” Answers Call To Improve Science Literacy

Rensselaer has unveiled NanoSpace, an online “molecular theme park” populated with more than 25 games, activities, and animations to educate and excite young students about the world of atoms and molecules. Visit NanoSpace at www.molecularium.com.

NanoSpace is the latest platform from the Molecularium Project, which is the flagship outreach and education effort of the Rensselaer Nanotechnology Center. Many NanoSpace games and activities feature the characters Oxy, Hydra, and Mel from the Molecularium animated movies Molecules to the MAX! and Riding Snowflakes.

The mission of the Molecularium Project is to expand science literacy and awareness, and to excite audiences of all ages to explore and understand the molecular nature of the world around them. Funded by the National Science Foundation (NSF) and others, the project is a direct response to the challenge of inspiring more young people to pursue careers in science, technology, engineering, and mathematics (STEM). This is a significant workforce development issue, as the NSF estimates 80 percent of jobs created in the next decade will require some mastery of STEM subjects.

“Science literacy—in every capacity—has never before been so important to our nation,” says Richard Siegel, the Robert W. Hunt Professor of Materials Science and Engineering and director of the Rensselaer Nanotechnology Center. “We realize that not every kid wants to be a scientist, but learning the basics of science—involving molecules and atoms—is critical to the careers that will be available in the next decade, especially as the U.S. continues to fall behind. When learning is fun, it increases a child’s capacity to absorb and retain knowledge. That’s why we are excited to unveil NanoSpace. Kids are interacting, exploring, and having a great time while learning about atoms and molecules, and they are not even realizing they’re learning.”

This concept of “stealth education” runs through every aspect of the Molecularium Project. Executive producers of the project are Linda Schadler, the Russell Sage Professor and associate dean for academic affairs for the School of Engineering; Shekhar Garde, the Elaine and Jack S. Parker Professor and head of the Department of Chemical and Biological Engineering; and Siegel.

To bring NanoSpace and the Molecularium Project animated movies to life, Schadler, Garde, and Siegel partnered closely with a highly recognized team of artists, animators, programmers, and Web designers.

The Molecularium Project and its NanoSpace program are helping to fill this gap by supplementing scarce school-based curricula and teaching children through enjoyable interactions. The activities in NanoSpace teach and reinforce the National Science Education Standards, just as do all other Molecularium Project programs. In addition to the Teachers Guides, which outline measurable goals related to these standards, free educator resources for the Molecularium Project include lesson plans for grades K-4 and 5-8, crossword puzzles, songs, quizzes, and posters.

Research has shown that students retain more thorough knowledge of a concept through interactive learning. Independent analysts quizzed students before and after seeing Molecularium animations, and found that the core concepts were firmly grasped by young audiences. The percentage of correct answers for younger audiences more than doubled.

“Stealth education works!” Siegel says.
LALLY SCHOOL OF MANAGEMENT AND TECHNOLOGY

Students Launch Mandarin Club

Two Lally School of Management and Technology students from China—Hui Li of Harbin, who is pursuing a master’s degree in management, and MBA candidate Ying Xia of Wuhan—have established a Mandarin Club on campus. Their goal is to teach conversational, everyday language skills—and to develop a network of relationships.

“Many people want to do business in China and need the language skills we can help them with,” says Li. “We are now teaching between 20 and 30 people on campus,” Xia reports, “and we have high school students who come to us biweekly as well.”

Both women have found Lally to be a school that promotes leadership. “There are personal development workshops you can take, with alumni who come back to share their experiences as leaders,” says Xia.

“The Lally School is proud of the leadership and initiative of Hui and Ying in creating the Mandarin Club for the benefit and learning of other students,” says Tom Begley, dean of the Lally School. “They reflect the mission of our school to create sophisticated, global business leaders, and I am sure this success will be one of many in their careers after graduation.”

The Mandarin Club itself has proven to be an excellent opportunity for developing leadership skills. “Leaders need to train future leaders, and since we want to make sure that the club will continue, we are training people to be tutors,” says Xia. “I want to become a leader who uses more aspects of myself and my personality and who I really am,” adds Li. “The Mandarin Club is helping me become that kind of leader.”

LIGHTING RESEARCH CENTER

Self-Luminous Devices Can Delay Sleep

A new study from the Lighting Research Center (LRC) shows that a two-hour exposure to electronic devices with self-luminous “backlit” displays causes melatonin suppression, which might lead to delayed bedtimes, especially in teens.

The research team, led by Mariana Figueiro, associate professor and director of the LRC’s Light and Health Program, tested the effects of self-luminous tablets on melatonin suppression. In order to simulate typical usage of these devices, 13 individuals used self-luminous tablets to read, play games, and watch movies.

“Our study shows that a two-hour exposure to light from self-luminous electronic displays can suppress melatonin by about 22 percent. Stimulating the human circadian system to this level may affect sleep in those using the devices prior to bedtime,” says Figueiro.

The actual melatonin suppression values after 60 minutes were very similar to those estimated using a predictive model of human circadian phototransduction for one-hour light exposures. “Based on these results, display manufacturers can use our model to determine how their products could affect circadian system regulation,” says Figueiro.

The results of this study, together with the LRC predictive model of human circadian phototransduction, could urge manufacturers to design more “circadian-friendly” electronic devices that could either increase or decrease circadian stimulation depending on the time of day—reducing circadian stimulation in the evening for a better night’s sleep, and increasing in the morning to encourage alertness. In the future, manufacturers might be able to use data and predictive models to design tablets for tailored daytime light exposures that minimize symptoms of seasonal affective disorder, and sleep disorders in seniors.

Melatonin is a hormone produced by the pineal gland at night and under conditions of darkness in both diurnal and nocturnal species. It is a “timing messenger,” signaling nighttime information throughout the body. Exposure to light at night, especially short-wavelength light, can slow or even cease nocturnal melatonin production.

“We recommend dimming these devices at night as much as possible in order to minimize melatonin suppression, and limiting the amount of time spent using these devices prior to bedtime,” Figueiro says.
LALLY SCHOOL OF MANAGEMENT AND TECHNOLOGY

Shedding Light on Evolving Securities and Markets

FROM THE AMERICAN STOCK EXCHANGE TO THE CLASSROOM, John Teall, Jackson Tai ’72 Professor of Practice at the Lally School of Management and Technology, has established a career introducing trading and financial markets to upper-division undergraduates and graduate students who are planning to work with or as financial traders.

Published in Academic Press (an imprint of Elsevier), a leader in scientific and technical works, Teall’s new book, Financial Trading and Investing, presents concepts, tools, and market details that traders need to succeed in today’s increasingly competitive, international, and technologically oriented markets. The book covers a broad array of topics, including auctions, market microstructure, the roles of information and inventories, behavioral finance, market efficiency, trading algorithms, risk management and arbitrage, and electronic communication networks.

“This book provides an updated discussion of securities markets and concepts in a field that has been evolving dramatically over the past decade,” says Teall. “Trading has taken on increased significance in our economy and commands more resources and technical expertise than ever before, while also representing an ever-increasing source of economic risk.”

At the Lally School, Teall teaches degree candidates in the M.S. in Financial Engineering and Risk Analytics program, which offers a balance between an overall understanding of finance and an opportunity to focus on specialized interests. The program provides students with the knowledge and skills to respond to changes and challenges that characterize the fast-moving world of quantitative finance.

Teall is also the author of Financial Market Analytics published by the Quorum Press and Governance and the Market for Corporate Control published by Routledge Press. He is coauthor of Quantitative Methods for Finance and Investments published by Blackwell.
MAKING A DIFFERENCE
Changing Lives, Student by Student

HUGO FERGUSON ’56 IS QUIETLY EFFECTING change on the Rensselaer campus. While you won’t see his name on a plaque outside a new building, his support of students is instrumental in allowing top students in science and engineering the opportunity to thrive on campus.

Five students thus far have been fortunate enough to receive scholarships as a result of Ferguson’s generosity, thanks to his recent gift of $1 million to the Institute in 2011 and past gifts used to fund two Patroon Scholarships. His recent gift established a graduate student fellowship and a scholarship in Rensselaer’s Department of Materials Science and Engineering. In addition, he established a scholarship in the School of Science’s Department of Physics, Applied Physics, and Astronomy.

After growing up on a small dairy farm with no money available for college, Ferguson joined the Navy, and as a result of the G.I. Bill, a small scholarship, and a job, he was able to put himself through Rensselaer, graduating without any debt.

“Students just out of high school have a difficult time paying for college, unless they are from a wealthy family,” Ferguson reflects, “Borrowing large sums to attend college makes starting out in life difficult. Giving is one way of directing wealth to a worthy cause—education. There is considerable satisfaction in seeing others move ahead in life.”

It is his Rensselaer education that he credits with the success in life that has allowed him to give back. In 1957, Ferguson, along with fellow Rensselaer graduates Warren Savage ’43 and Ernest Nipples ’38, founded Dynamic Systems Inc., which invented the Gleeble thermal-mechanical system and pioneered the field of physical simulation of metallurgical processes.

While Ferguson’s work has had a global impact, his legacy at Rensselaer also endures. Not only did three of his sons graduate from Rensselaer, one of his granddaughters is currently pursuing her MBA in the Lally School of Management and Technology.

Through his philanthropy, today’s students, who are tomorrow’s innovators, reap the reward and are inspired to follow his lead. “Dr. Ferguson is a great role model for me,” says Torrin Bechtel ’12, Dr. Hillard B. Huntington School of Science Scholarship recipient. “He’s made so many contributions to science and research and it’s really something I would like to live up to one day and eventually give back the same way he has.”

CHEMICAL AND BIOLOGICAL ENGINEERING
New Weapon in Fight Against Disease

ANTIBODIES DEVELOPED BY RESEARCHERS AT RENSSLEAER are unusually effective at preventing the formation of toxic protein particles linked to Alzheimer’s disease and Parkinson’s disease, as well as type 2 diabetes, according to a new study.

The onset of these devastating diseases is associated with the inappropriate clumping of proteins into particles that are harmful to cells in the brain (Alzheimer’s disease and Parkinson’s disease) and pancreas (type 2 diabetes). Antibodies, which are commonly used by the immune system to target foreign invaders such as bacteria and viruses, are promising weapons for preventing the formation of toxic protein particles.

A limitation of conventional antibodies, however, is that high concentrations are required to completely inhibit the formation of toxic protein particles in Alzheimer’s, Parkinson’s, and other disorders.

To address this limitation, a team of researchers led by Rensselaer Professor Peter Tessier has developed a new process for creating antibodies that potentlly inhibit formation of toxic protein particles. Conventional antibodies typically bind to one or two target proteins per antibody. Antibodies created using Tessier’s method, however, bind to 10 proteins per antibody. This increased potency enables the novel antibodies to prevent the formation of toxic protein particles at unusually low concentrations. This is an important step toward creating new therapeutic molecules for preventing disorders such as Alzheimer’s and Parkinson’s.

“It is extremely difficult to get antibodies into the brain. Less than 5 percent of an injection of antibodies into a patient’s bloodstream will enter the brain. Therefore, we need to make antibodies as potent as possible so the small fraction that does enter the brain will completely prevent formation of toxic protein particles linked to Alzheimer’s and Parkinson’s disease,” says Tessier, assistant professor in the Howard P. Isermann Department of Chemical and Biological Engineering at Rensselaer. “Our strategy for designing antibody inhibitors exploits the same molecular interactions that cause toxic particle formation, and the resulting antibodies are more potent inhibitors than antibodies generated by the immune system.”
Head men’s soccer coach Adam Clinton has been named the National Soccer Coaches Association of America Division III East Regional Coach of the Year for the 2012 season.

Clinton, who is assisted by Nick Bochette and Cassidy Jones, led the Engineers to a first-place tie in the Liberty League regular season standings, the Liberty League Tournament Championship, and into the second round of the NCAA Tournament. Rensselaer finished 10-6-6 overall and 5-1-2 in the league.

During the season, Rensselaer had an eight-game unbeaten streak (5-0-3) in which it posted seven shutouts. The string came to an end with a 1-0 loss at nationally ranked Williams College, which went on to play in the national semifinals.

In the Liberty League Tournament, the Engineers advanced past nationally ranked St. Lawrence University on penalty kicks in the semifinals and Vassar College on penalty kicks in the finals. Rensselaer defeated Christopher Newport University, 2-0, in the first round of the NCAA Tournament—Rensselaer’s third national tournament appearance in the last five years—before losing at nationally ranked Swarthmore College.

Clinton’s team finished with 11 shutouts, holding the opposition to 0.82 goals per game. The Engineers scored 1.09 goals per game and saw five student-athletes earn All-Liberty League recognition. Rensselaer also placed five on the Academic All-District First Team and two were named Capital One Academic All-America.

Clinton, who recently finished his 11th season, has a record of 101-70-30 all-time at Rensselaer. Overall as a head coach he is 117-98-33.

Clinton has also been a head coach on the professional level, having led the Capital District AlleyCats. On the field, Clinton played at both Hudson Valley Community College and Keene State University as a midfielder and back. While at Hudson Valley, he was the team’s Most Valuable Player and named All-Region before moving on to Keene, a nationally ranked Division II program, where he was a captain. Clinton also played professionally for the New York Kick.

Under Coach Clinton’s tutelage, the Rensselaer men’s soccer team qualified for the NCAA Division III Tournament in three of the last five seasons.
Wireless Technology Concept Chosen “Best of Best”

THE CHANGE THE WORLD CHALLENGE IS A twice yearly competition open to all current Rensselaer students. The challenge, sponsored by the Office of Entrepreneurship, encourages the development of innovative ideas with the potential of achieving the Rensselaer goal of changing the world. Individual students and teams submit ideas focused on addressing energy, water, trust, safety, or security areas.

Each semester, up to 10 ideas that can improve the human condition are recognized as winners and share in a prize pool of $10,000. In 2010, an added $5,000 “Best of” award was specially created to accelerate the progress of a fall or spring team that demonstrated a strong commitment and clear momentum in pursuing the commercialization of its idea.

The 2012 Best-of-the-Best award was presented to graduate students Jonathan Ashdown ’06, Ph.D. ’12 (electrical engineering), Kyle Wilt ’06, Ph.D. ’12 (mechanical engineering), and Anthony DeMaio ’12 (MBA) for their breakthrough technology UltraSoniComm™.

The innovation overcomes the limitations of conventional wireless capabilities by using ultrasound to transmit data and deliver power wirelessly through solid metal walls for a variety of critical potential applications in hard-to-reach environments.

“Selecting a ‘Best of’ winner from the submissions of several 2011-2012 Change the World Challenge winners was made difficult by the quality, potential, progress, and inventiveness of a dozen well-developed entries,” says Rob Chernow, vice provost for entrepreneurship and chair of the competition. “In addition to the creativity in our students’ ideas, we are impressed with how many are continuing to evolve and expand their innovations.”

For anyone who has ever lost a cell phone signal in a tunnel, subway, or elevator, the concept of the “Best of” wireless technology is obvious. However, its potential applications go much further in helping to solve important challenges. Among three of the uses proposed by the inventors are: a sensor for monitoring incoming torpedoes on the outside of a ship or submarine by detecting its approach through the hull; efficiently monitoring oil rig equipment on the ocean floor, a pipeline, or a refinery to prevent or fix dangerous leaks similar to the Deepwater Horizon disaster; or the ability to monitor the interior of nuclear reactor vessels to preclude meltdown threats created by natural disasters like the recent tsunami in Japan.

The technology’s capability to power, collect, and store data with through-wall signal processing techniques and communication is revolutionary in comparison to current methodologies.

New Method for Lighting Roundabouts

ROUNDABOUTS, ALSO KNOWN AS TRAFFIC CIRCLES, ARE increasing in number across the United States. These intersections generally increase traffic throughput while reducing the severity of automobile accidents. However, as relatively new traffic features, modern roundabouts are sometimes described as confusing for drivers.

One difference between roundabouts and conventional cross-type intersections is the location of pedestrian crosswalks. Drivers may be less familiar with the location of crosswalks when driving through a roundabout.

The Lighting Research Center (LRC) at Rensselaer has developed a concept for roadway illumination called “ecoluminance” that incorporates roadside vegetation with low-level pedestrian and landscape lighting, retroreflective markers, and light-emitting diode (LED) road and walkway illumination. In a study sponsored jointly by the New York State Energy Research and Development Authority and by the New York State Department of Transportation, the LRC designed, installed and evaluated new lighting approaches in real-world conditions. Senior Research Scientist John Bullough and LRC Director Mark Rea were the principal investigators for the study.

“Ecoluminance uses a combination of lighting and vegetation to provide visual delineation, illumination for important safety hazards and concerns, and cues about road geometry,” says Bullough.

Traditional lighting for roundabouts consists of a relatively large number of pole-mounted overhead luminaires, which are relatively expensive to operate because they are energy intensive. The LRC estimates that the initial cost of the ecoluminance system is similar to that of conventional lighting, but the energy use is only about a fourth, resulting in substantially lower energy costs as well as substantially lower light pollution impacts. “The ecoluminance concept could allow transportation agencies to integrate vegetation and lighting while reducing costs and environmental impacts,” says Rea.
BIOMEDICAL ENGINEERING

Battling Brittle Bones

A NEW STUDY FROM ENGINEERING researchers at Rensselaer shows, for the first time, how the little-understood protein osteocalcin plays a significant role in the strength of our bones. The findings could lead to new strategies and therapeutics for fighting osteoporosis and lowering the risk of bone fracture.

Funded by the U.S. National Institutes of Health, the study details how fractures in healthy bones begin with the creation of incredibly tiny holes, each measuring only about 500 atoms in diameter, within the bone’s mineral structure. In the case of a slip, trip, or fall, the force of the impact on a bone physically deforms a pair of joined proteins, osteopontin and osteocalcin, and results in the formation of nanoscale holes. These holes, called dilatational bands, function as a natural defense mechanism, and help to prevent further damage to the surrounding bone. However, if the force of the impact is too great—or if the bone is lacking osteopontin, osteocalcin, or both—the bone will crack and fracture.

The multi-university study, led by Deepak Vashishth, head of the Department of Biomedical Engineering, is the first to give evidence of fracture at the level of bone’s nanostructure.

“This study is important because it implicates, for the first time, the role of osteocalcin in giving bone the ability to resist fracture,” Vashishth says. “Since osteocalcin is always the point of fracture, we believe that strengthening it could lead to a strengthening of the overall bone.”

Long known but little understood, the protein osteocalcin has been produced by and present in animal bones since before the dawn of humanity. Recently, abnormalities in osteocalcin production have been associated with type 2 diabetes as well as problems in reproductive health. Vashishth’s new study, however, is the first to explain the structural and mechanical importance of osteocalcin in bone.

Now that osteocalcin is known to participate in bone fracture, new strategies for strengthening the bond between osteocalcin and osteopontin can be investigated, Vashishth says. Augmenting the body’s natural supply of osteocalcin, for example, could be one possible strategy for treating osteoporosis and other conditions leading to increased fracture risk, he says. Osteocalcin must be in its carboxylated form to get absorbed into bone, and the protein is carboxylated by vitamin K. Vashishth says future studies could investigate the relation between vitamin K intake, osteocalcin, and bone strength.

“Currently, all of the advice for treating osteoporosis is related to calcium. We believe there’s more to the story than just...”

NUCLEAR ENGINEERING

Calculating Radiation Exposure

VIDEO GAMERS ARE GENERALLY THE BIGGEST CONSUMERS OF computer graphics cards, using the devices to boost the speed and resolution of their digital quests to fend off invading extraterrestrials or outwit hostile dragons. But researchers at Rensselaer seek to harness the power of these computer graphics cards to solve one of the world’s most pressing health-care technology challenges: radiation exposure from X-ray and CT imaging scans.

Rensselaer nuclear engineering expert X. George Xu is leading an interdisciplinary team of academic, medical, and industrial researchers to develop new techniques for quickly calculating the radiation dose a patient will receive from a CT scan. Funded by a $2.6 million grant from the National Institute of Biomedical Imaging and Bioengineering, the research team aims to use NVIDIA video cards and leading-edge parallel processing techniques to help reduce radiation dose calculations from 10 hours to less than 60 seconds.

“With this new study, we hope to bring massively parallel computing power—currently available only to national laboratories and major research universities such as Rensselaer—to busy and resource-limited hospitals,” says Xu, professor in the Department of Mechanical, Aerospace, and Nuclear Engineering (MANE) and the Department of Biomedical Engineering. “There is a high level of interest at the national level to quantify and reduce the amount of ionizing radiation involved in medical imaging. Our parallel computing method has the potential to be used...”

Three Rensselaer faculty members are partnering with Xu on this study: Wei Ji, assistant professor in MANE; Christopher Carothers, professor in the Department of Computer Science; and Mark Shephard, the Samuel A. Johnson ’37 and Elisabeth C. Johnson Professor of Engineering and director of the university’s Scientific Computation Research Center.

As part of the study, the research team will perform calculations using the Rensselaer supercomputing center, the Computational Center for Nanotechnology Innovations.
COMMUNICATION AND MEDIA

New Book Explores Impact of Reality Television

LOVE IT OR HATE IT, REALITY TELEVISION has changed the face of the entertainment industry and our culture. In Consuming Reality, June Deery, associate professor of communication and media, examines how this now-dominant media form has altered conceptions of entertainment, privacy, and commercialization. In other words, she is interested in how it “consumes” reality.

“You can snicker at its trivial nature, but there is no doubt that reality TV has become an enduring phenomenon,” says Deery. “It is worth asking what it reflects or amplifies about current trends in our society and economy; and that’s what I did with this book.”

Published by Palgrave Macmillan, the book can be divided into two conversations, Deery says: an “internal discussion” about how reality TV has affected the business of television entertainment (experimenting with lower production costs and amateur actors, joining it with newer media, and commercializing content) and an “external discussion” about how reality TV is affecting our culture.

As part of the “internal discussion,” Deery says that reality television, which was born of efforts to control costs, has been a pioneer in several aspects of the entertainment industry.

“Reality TV has experimented a great deal with budget cutting and with making use of so-called ‘real’ or ‘ordinary’ or non-professional actors,” Deery says. “That’s the ultimate selling point of this programming.”

“They were among the first to say ‘we want people who view our programming to also go online, to be part of a blog, part of a website, to interact with us,’” Deery says. “Reality TV articulates, or joins, with other media.”

Reality TV has also expanded the entertainment industry’s ability to make money from content. “Television used to work on the model of the ‘commercial break,’ making money only in the time between content. It was like a Trojan horse—the show was only there to make you watch the advertising,” Deery says. “TiVo and the DVR sent the industry into a crisis, by making it possible for people to access content without viewing advertising. Reality TV’s solution is to commercialize the content through post-advertising strategies such as product placement, branded interactivity, and corporate donorship.”

The genre has also made inroads into daily culture, changes which Deery details in the “external discussion” of the book. In one example, Deery says that, by exposing the private lives of individuals for profit, reality TV has re-written concepts of privacy and intimacy.

“What’s supposed to be shared? What’s public? What does it mean to sell your persona on a media platform?” Deery says. “You are commodifying your experience, and these questions become controversial.”

RESEARCH DATA ALLIANCE

NSF Grant Focuses on Data Sharing

THE NATIONAL SCIENCE FOUNDATION HAS AWARDED A $2.5 million grant to Rensselaer to enable its participation in a new international organization that will accelerate research data sharing among scientists around the globe.

The grant will be used to develop a Research Data Alliance (RDA) that will allow researchers to collaboratively use scientific data to speed up innovation.

To date, more than 120 U.S. and international participants are helping conceptualize the organization and populate its first efforts. Along with scientific and data leaders from the United States, members from Australia and the European Union are part of the new alliance’s organizational steering committee. U.S. participation will be led by Rensselaer Computer Science Professor Francine Berman.

“The Research Data Alliance addresses a worldwide need for efforts that accelerate data-driven innovation,” Berman says. “The National Science Foundation, with U.S. and international partners, is expanding the global conversation on data-driven research. Community development of the RDA will contribute to the global infrastructure needed for new discovery and insights.”

As an example of gains that can be expected from the RDA, Berman says that researchers sharing open-access data sets about a particular disease would increase the pool of information, and therefore, the potential for insights that can only be gained at large scale.

She adds that the coordination of economic data sets, geographic data sets, and census data to create urban data sets can be used to make strategic predictions about programs and initiatives that can improve the quality of life in cities. “All of us use digital information every day to augment our lives in innovative ways,” Berman says. “The goal of the Research Data Alliance is to help researchers work with a world of useful digital information more innovatively and at scale.”

Although the RDA has broad scope, it is being loosely modeled on a number of successful community organizations, including the Internet Engineering Task Force, which focuses on Internet standards, and the Message Passing Interface Forum, which focused on communication protocols for parallel computers.
A CROWD OF MORE THAN 3,000 ALUMNI AND guests returned to campus to enjoy Reunion & Homecoming in October.

A wide variety of alumni groups participated in the celebration. Class years ending in 2 or 7 celebrated their five-year milestone Reunions, and the Class of 1962, with over 100 alumni returning, was welcomed into the 50 Year Club.

Twenty-one Greek organizations hosted events, partnering with the alumni office for planning and marketing, including Lambda Chi Alpha, which celebrated its 75th anniversary, and Phi Kappa Tau, which celebrated its 90th anniversary at Rensselaer and 50th at 19 Sherry Road. The popular Greek ChowderFest allowed current students and alumni from all Greek organizations to meet and mingle.

Athletic teams also hosted events including breakfasts, tailgates, and athletic competitions with students. Retiring head athletic trainer Anthony Ortolano was honored with a reception, and the Athletic Hall of Fame induction ceremony was held on Sunday. The football team beat St. Lawrence, and the game featured a special halftime show that included recognition of the 50th Reunion Class of 1962, and a ceremonial "Farewell to the 'Tute Screw."

Special interest groups included a variety of student groups such as Phalanx, Air Force and Navy ROTC, and the Society of Women Engineers. The School of Humanities, Arts, and Social Sciences celebrated the 40th anniversary of the Department of the Arts and 30th anniversary of the Department of Science and Technology Studies, while the Model Railroad celebrated the 65th anniversary of the club and the 40th anniversary of the Davison Hall display with an open house.

"Reunion & Homecoming continues to grow each year. More and more alumni are taking part in the tradition, and we thank them for their participation."

President Jackson and a panel of Institute leaders presented to a packed house at the EMPAC Concert Hall on "Rensselaer at 200: Refreshing The Rensselaer Plan," and alumni were given the opportunity to provide their feedback. FanFest, a carnival midway held at ECAV, drew a large crowd to enjoy free food, performances by student a cappella groups, face painting, and much more. FanFest also featured the return of the Physics Magic Show, with Aidyl Gonzalez-Serricchio '94 presenting outlandish and visually stunning physics and chemistry demonstrations with audience participation.

Nearly 1,000 people attended the Mars Rover Curiosity Program to learn about the science behind the Mars Rover and the study of its findings with alumni members of the team: Kobie Boykins '96, staff mechanical engineer, Jet Propulsion Laboratory; Michael Meyer '74, lead scientist, NASA's Mars Exploration Program; and Fred Serricchio '94, senior staff engineer, NASA. The program was moderated by Dean of Science Laurie Leshin, who is also a member of the Curiosity Rover Science Team.

"Reunion & Homecoming continues to grow each year," says assistant vice president for alumni relations Jeff Schanz. "More and more alumni are taking part in the tradition, and we thank them for their participation."
JONATHAN DORDICK, the Howard P. Isermann Professor of Chemical and Biological Engineering and director of the Center for Biotechnology and Interdisciplinary Studies, has been appointed vice president for research. Dordick will be responsible for advancing the research enterprise across the full range of academic disciplines and interdisciplinary activities. He will work closely with the president and provost in the development and implementation of policies and practices relating to all aspects of the university’s research mission. As a leading researcher, Dordick has established a large, long-standing, and internationally recognized program, in which he has published 300 peer-reviewed papers and nearly 40 patents and patent applications. In support of his research program, he has received nearly $30 million in research support, the vast majority from peer-reviewed federal sources.

JACKIE ELLSWORTH, bursar in the Department of Capital Finance and Banking in the Division of Finance, has received the 2012 Pillar of Rensselaer Award, the highest honor Rensselaer gives to a staff member. The Pillar Award is presented annually to a staff member who understands the institute’s mission and history, has been a role model for other employees, and who has shown concern for students and their welfare, has added to the human dimension of the school, and who has played an active role in his or her home community.

STEVEN CRAMER, the William Weightman Walker Professor of Polymer Engineering, has been elected a fellow of the American Chemical Society (ACS) for excellence in leadership, volunteer service, and for “outstanding achievements in and contributions to science, the profession, and the society.” Cramer is a recognized global leader for chromatographic bioprocessing.

YURI GORBY, a geomicrobiology expert, has been named the Howard N. Blitman ’50 P.E. Career Development Professor in Engineering. Gorby’s interdisciplinary research is at the nexus of environmental engineering and biology. He is an accomplished microbial physiologist and bioprocess engineer who, in his work, embraces the use of controlled cultivation to understand the fundamental properties of bacteria for a range of applications. He joins Rensselaer from the Department of Marine and Environmental Biology at the University of Southern California, after spending six years at the J. Craig Venter Institute, a nonprofit genomics institute in San Diego.

PETER FOX has been named the new director of the Information Technology and Web Science (ITWS) program. Fox is a Tetherless World Research Constellation Chair and professor of Earth and Environmental Sciences and Computer Science. He joined Rensselaer in 2008 after 17 years at the High Altitude Observatory of the National Center for Atmospheric Research, where he served as chief computational scientist. Fox is principal investigator for the Semantic eScience Framework, Deep Carbon Observatory Data Science, Integrated Ecosystem Assessment Interoperability Initiative, and Semantic Provenance Capture in Data Ingest Systems projects.

FARHAN GANDHI, a rotorcraft and adaptive structures expert, has been named the Rosalind and John J. Redfern Jr. ’33 Professor of Engineering. An innovative researcher in the field of rotary-wing aircraft, he is recognized internationally as a leader in morphing and active rotors, and adaptive cellular structures. He is a prolific researcher, and is the author of more than 170 technical papers in refereed journals and proceedings. Gandhi joins Rensselaer from Pennsylvania State University, where he served as professor of aerospace engineering and deputy director of the Penn State Vertical Lift Research Center of Excellence.

JOHN KILLINGS has been appointed assistant director of student activities and multicultural programs. In the newly created position, Killings will advise all student organizations and multicultural programs. In his work, embraces the use of controlled cultivation to understand the fundamental properties of bacteria for a range of applications. He joins Rensselaer from the Department of Marine and Environmental Biology at the University of Southern California, after spending six years at the J. Craig Venter Institute, a nonprofit genomics institute in San Diego.

BRIGITTE ARDUINI has been named director of the New York state-funded Stem Cell Research Core Facility, within the Center for Biotechnology and Interdisciplinary Studies. Arduini previously served as director of the Rockefeller Human Pluripotent Stem Cell Core Facility in New York City. The facility will be available to stem cell researchers throughout upstate New York. Arduini holds a B.S. from Cornell in biology and a Ph.D. from Ohio State University in molecular genetics. The research core is part of the Rensselaer Center for Stem Cell Research, which launched in June 2012 with funding from a $2.45 million grant from the New York State Stem Cell Science Program.

T. RAVICHANDRAN, professor of management and an information systems and supply chain management expert, has been named associate dean for research for the Lally School of Management and Technology. Ravichandran started at Rensselaer as an assistant professor in 1996, was named associate professor in 2003, and professor in 2009. He served in several academic leadership roles in the Lally School including as the area coordinator for the marketing, information systems, and operations management group and chair of the AACSB Accreditation Committee.

GINA O’CONNOR, professor of marketing and director of the Severino Center for Technological Entrepreneurship, has been named associate dean for academic affairs for the Lally School of Management and Technology. O’Connor, who started at Rensselaer in 1989, has published 15 books and book chapters and over 80 papers. She has been named one of the top 25 scholars in the field of innovation in a study published in the Journal of Product Innovation Management.
The Sporting Mind

Love of the game inspires success on and off the field for Rensselaer scholar-athletes.

By Mark Marchand
C.J. LEE
MEN'S HOCKEY, FORWARD
MECHANICAL ENGINEERING

CHERYL TRAN
TRACK & FIELD/HIGH JUMPER/HURDLER
INDUSTRIAL AND MANAGEMENT ENGINEERING

BROOKE VAN BAUSH
WOMEN'S SOCCER/MIDFIELDER
ARCHITECTURE

JACOB MEYERS
FOOTBALL/DEFENSIVE LINE
BIOMEDICAL ENGINEERING

CARLIE NEWCOMB
WOMEN'S FIELD HOCKEY/ATTACKER
BIOMEDICAL ENGINEERING

C.J. LIE
MEN'S HOCKEY, FORWARD
MECHANICAL ENGINEERING

C.H. TAYLOR
MEN'S HOCKEY, FORWARD
INDUSTRIAL AND MANAGEMENT ENGINEERING
Lee is not only a talented left winger on a nationally known and competitive Division I hockey team, he also is a mechanical engineering major who is fascinated by heating, ventilation, and air conditioning systems. In fact, he first applied to Rensselaer to study engineering before a post-high school stint in amateur hockey drew notice from recruiters at the Institute and elsewhere.

At a time when the governing body of college athletics is implementing tough new academic rules—and penalties—for Division I athletic programs, the muscular, smooth-skating Lee and others bring to life the academically rigorous challenge of being a student-athlete and excelling at both while at Rensselaer. Lee and the 550 other students who join him in pursuit of intercollegiate athletic excellence each semester achieve at such high academic levels that the new NCAA rules are almost an afterthought in Troy. Their collective GPA is, in fact, higher than the general student body at Rensselaer: 3.19 overall for men and women athletes vs. 3.13.

“I’ve always been interested in figuring out how things work, since I was pretty young,” says Lee, who was named captain of this year’s team in October. “When I first got here, I started in civil engineering but I migrated over to mechanical engineering because I’m fascinated by HVAC systems in large buildings that essentially make the whole building functional. One of my favorite areas of study is thermals—especially the flow of air through building systems.”

Playing on a respected Division I hockey program that just two years ago went to the national tournament, Lee is quick to say he hopes to give his professional hockey career a try. He was third on the team in scoring last year and is well-known throughout ECAC Hockey for a brand of play that doesn’t leave any physical moves in the locker room. He spent 73 minutes in the penalty box last year. But his focus never strays from the class and lab challenges, and what might become his life’s work.

“I did struggle a bit with class work during the first semester,” Lee admits. “But Coach [Seth] Appert and my older teammates understood what I was going through and they really helped me. I also got a lot of great help and tutoring from our academic adviser in athletics, Bob Conway. This has been a very supportive environment.”

The backdrop against which Lee and his fellow Rensselaer athletes excel is a strong push from the NCAA to implement new rules that require colleges and universities to achieve higher results in the classroom. One new rule, for example, requires Division I schools to have graduation rates of 50 percent or better before they are allowed to participate in post-season playoff tournaments. This already has cost some powerful college basketball programs the opportunity to play in the popular March Madness college hoops tournament in 2013. That might be a tough standard to meet for many schools across the nation but it is not at Rensselaer.

The approach Lee brings to his classroom work prevails throughout an athletic program—played at the Division III level except for the men’s and women’s ice hockey teams at Rensselaer—that drew a West Point graduate and administrator named Jim Knowlton to come to Troy as athletics director in 2007. “When I began to look at where else I might go after West Point, I knew I wanted to be in a place where the term ‘student-athlete’ actually meant something,” Knowlton says. “I was impressed by the programs and the excellent academic reputation of Rensselaer, so it was a pretty easy decision.”

Since then, Knowlton has worked hard to instill in freshman student-athletes the absolute requirement of class work first. “From the moment they get here, freshmen know academics come first. The culture on each of the intercollegiate teams is that you work hard in the classroom so you can play hard on the fields of friendly strife,” says Knowlton. “Being a student-athlete at Rensselaer is a privilege and they know that they are expected to live up to very high standards—and they do!”
From the moment they get here, freshmen know academics come first. The culture on each of the intercollegiate teams is that you work hard in the classroom so you can play hard on the fields of friendly strife. Being a student-athlete at Rensselaer is a privilege and they know that they are expected to live up to very high standards—and they do!

—JIM KNOWLTON, ATHLETICS DIRECTOR

“ From the moment they get here, freshmen know academics come first. The culture on each of the intercollegiate teams is that you work hard in the classroom so you can play hard on the fields of friendly strife. Being a student-athlete at Rensselaer is a privilege and they know that they are expected to live up to very high standards—and they do! ”
A native of Loganville, Ga., Brooke Van Baush meets Knowlton’s challenge as she contributes what she feels is an ability to “make things happen” for her teammates on the women’s soccer team. The junior midfielder takes pride in her passing ability when she’s not hard at work earning an architecture degree in Rensselaer’s challenging five-year program.

“I had this dream from a very young age that I wanted to play soccer at the college level, but the desire to study architecture was strong as well,” Van Baush says. “As I started to look around at colleges, I discovered that many schools didn’t want architecture majors on their soccer team because of the time demands of the academic program. That was not the case here. This is a great, tough architecture program and my coaches and teammates on the soccer team welcome that and they go out of their way to accommodate me and the labs and classes I have to attend.”

Van Baush’s dream differs from what most might consider the holy grail of architecture: designing a city or company’s landmark tower or large headquarters.

“I’m interested in designing houses; it’s a much more personal side of this area of study. I would love to help others design their own homes so that their living environment not only reflects their personality but also gives them a space that will suit their specific needs.”

When she talks about her life off the soccer field, Van Baush says her athletic pursuits actually help her manage her overall schedule and help her achieve success in the classroom—a theme echoed by many Rensselaer student-athletes when they talk about the challenges of balancing athletic practices and contests with class and lab work.

“Because of the sport I play, I have actually become much better at time management,” says Milton, Mass., native and junior high jumper/hurdler Cheryl Tran. “It didn’t take long for me to figure out that I couldn’t sit around and waste time when I wasn’t practicing with the track team. I needed to find the best way to achieve balance and get both done in limited time. And once I left the classroom and study hall, my sport has been a great stress reliever that helped me forget about schoolwork for a while.”

Tran is working toward a degree in industrial and management engineering. She says she found math and science “just more interesting” than other subjects in high school, leading to a search for a college program that would allow her to play track and field.”

Lee and the 550 other students who join him in pursuit of intercollegiate athletic excellence are almost an afterthought in Troy. Their collective GPA is, in fact, higher than the general...
for a school where she could study engineering and continue her successful high school track and field career. On a visit to Rensselaer, she says that the new East Campus Athletic Village helped convince her that the Institute was serious about providing the best facilities for both athletics and academics.

For senior field hockey attacker and Southwick, Mass., native Carlie Newcomb, it was all in the family when it came time to decide where to attend college and play field hockey at a competitive level. Her older sister, Audrey Newcomb ’11, is a Rensselaer alumna who starred in the same sport.

“From talking to my sister, I already knew this place was a great fit for me academically,” Newcomb says. “I became interested in science and math when I attended a summer program at Worcester Polytechnic Institute—which ultimately led to me choosing to study biomedical engineering here.

“I have a particular focus on bio-imaging and I’m hoping to work in the medical device industry when I graduate.”

Newcomb says her favorite class thus far has been Cell Biology with Professor George Plopper.

“He really makes himself available off hours and he records his lectures and makes them available as a podcast, allowing you to review them as you study,” she says.

One of Lee’s teammates on the men’s hockey team, junior Brock Higgs from Kingston, Ontario, doesn’t mince words when asked how he feels about his class work. “I know what the upperclassmen before us accomplished in the way of GPA and overall academic achievement. I don’t want to be the one who comes in and lowers the overall GPA for our team and the other teams.”

Higgs is involved in a challenging program at the Lally School of Management and Technology, where he is studying in a co-terminal program that will result in both a bachelor’s degree and a master’s degree in business and finance when he is finished.

“I’m hopeful that my hockey career might continue after Rensselaer, but because my parents always pushed to convince me to consider academics first, I ended up coming here after playing junior hockey in Canada,” he says. “No matter what happens with my hockey career, I will now have this tremendous degree upon which I can build a career for the rest of my life.”

each semester achieve at such high academic levels that the new NCAA rules student body at Rensselaer: 3.19 overall for men and women athletes vs. 3.13.
DEMANDING REQUIREMENTS

Students who take the field for Rensselaer athletics hail from all five schools: Architecture; Engineering; the Lally School of Management and Technology; Humanities, Arts, and Social Sciences; and Science. According to Kevin Beattie, who serves the dual role of leading athletic communications as well as compliance, one of the more challenging differences between Rensselaer and other schools is the requirement for all students—regardless of their major—to complete a core program in science (24 credits), which includes a minimum of eight credit hours of math. For most that means at least one semester of calculus.

“The core credits are an absolute requirement, so you know the young men and women who choose to come here are serious about academics,” Beattie says.

When he reflects on the ongoing discussion about reinforcing the message on academics, Knowlton loves to tell the story of his annual ice cream social where he asks each team with a GPA above 3.0 to stand and be recognized.

“There was a year when one of our teams was one of the few (last year 21 of 23 teams had GPAs above 3.0) that did not have the opportunity to stand up and be recognized,” Knowlton says. “It meant so much to that team that they spent the entire following year focusing on achieving the grades that allowed them to stand up the next time the athletic director recognized high academic achievement. It was a great accomplishment for them.”

LEADING THE WAY

In many ways, the story of Tim Sams’ decision to come to Rensselaer as vice president for student life two years ago is deeply intertwined with athletics. While he was involved in interviews and research following the retirement of longtime Student Life Vice President Eddie Knowlton, Sams was walking through ECAV one day when he had a chance meeting with now graduated student Alisa Harrison ’12, a former captain of the women’s hockey team.

“She asked me what I was doing, and I told her the job for which I was interviewing,” Sams says. “We ended up sitting down for a while and, without asking, she volunteered this terrific ‘inside-out’ look at Rensselaer from a student and athlete’s perspective. From where she sat, she explained, Rensselaer was the best of both worlds. She posed the simple question: Where else could you find such a high level of intellectual pursuit while experiencing such a competitive experience in athletics?

“After talking to her for a while, especially discussing the family atmosphere here, I asked her what she thought I should do,” Sams adds. “She didn’t hesitate to talk about how student-athletes here take pride first in being among the brightest students they can be, and she of course said I should come here. I’m not saying that was the absolute primary factor that put me over the edge, but it played a big role. How do you not want to work at a place with students like her?”

Sams considers athletics, which resides in his department, part of what illustrates the intricacy of a student who attends Rensselaer. He finds little disagreement with that assessment, but where he goes in a slightly different direction is the nomenclature. He doesn’t think the term “student-athlete” goes far enough. He prefers “scholar-athlete.”

“That term speaks in a very simple way to the seriousness of coming to school here and playing sports,” Sams explains. “Every one of these athletes who plays intercollegiate sports for us is a scholar in the making.”

For Sams, the athletic experience at Rensselaer is a key component of the CLASS (Clustered Learning, Advocacy, and Support for Students) program—a new model of residence life at the forefront of transformational change in the Rensselaer student experience.

“Being an athlete here is a part of the robustness of student life—it helps bring a sense of connectedness and helps build excitement about just being here,” he says. “It’s a big part of how we help these students develop personally, and they are proud of it. It’s also something they see when they visit other campuses for athletic contests. There is a big difference in being a scholar-athlete here.”

In the final analysis, Sams says the athletic experience at Rensselaer helps students learn ways to strike a balance between competing and often difficult life challenges, and the experience goes a long way toward developing “the whole person.”
**FINDING INSPIRATION ON THE WORLD STAGE**

For junior football player Jacob Meyers, inspiration to study biomedical engineering at Rensselaer started with his mother at home in Burnt Hills, N.Y. A critical care nurse at nearby Ellis Hospital, she instilled in Meyers a deep desire to study engineering and science to find a way to help people. Meyers, who played in the statewide football “Super Bowl” at the Carrier Dome at Syracuse University during his high school football career, also felt he could continue his football career at a school like Rensselaer. 

“I visited campus on an overnight trip and was very impressed with everything from the athletic facilities to the labs and classes, and I was also amazed after meeting some of the football players at that time,” Meyers, an outside linebacker, says. “From there it was an easy decision. For me, coming here basically was a way I could use tough, challenging academics as one way to continue to play football.”

Meyers says he finds the course work challenging but has worked with advisers, tutors, and others to apply himself to his class and lab work successfully.

"I actually feel like I'm not just a number in the classroom here; the professors are willing to work with you to help you gain an understanding of a topic," he says.

During his time at Rensselaer, Meyers has worked hard to expose himself to opportunities that could help him plot out his future career. He has already completed an internship at a pharmaceutical company.

“Between football and his classes, Meyers tries to keep a long-range view on where his studies might take him. As he watched the Summer Olympics in London last summer, one athlete illustrated the potential for biomedical engineering. South African sprinter Oscar Pistorius captured the imagination of the world when the double-amputee who ran on two prosthetic legs fashioned from advanced materials advanced to the 400-meter semifinals. He also competed in the 4x400-meter relay.

“He was an inspiration for me because he proved that through biomedical engineering, things that were limitations in the past won’t be roadblocks in the future,” Meyers says.
Expanded academic and research offerings, outstanding new facilities, and a broad admissions process are attracting ever-stronger students to Rensselaer. BY JANE GOTTLEIB

Graham Ramsey always enjoyed tinkering with computers and exploring the unlimited ways that they can make things better. That fascination led him to develop an app for Apple’s online store, devise software doctors in Ghana use to track patient medical records, and help launch a technology startup.

And then he turned 16 and graduated from high school. “I guess everyone is unique in different ways,” says Graham, now 17 and studying computer science at Rensselaer. “I think
I'm definitely different from a lot of the people I went to high school with. They weren't really into technology or engineering.”

Rensselaer’s freshman class is loaded with such talent of the off-trail variety. Among its 1,339 members are licensed software designers, young humanitarians who have launched organizations for the poor, and slick and business-savvy entrepreneurs with patents under their belts. One young woman founded an organization that raises money to donate caps to local hospitals for cancer patients. Then there are those who make serious work of building sandcastles or flying on a trapeze. And solving Rubik’s Cube puzzles.

“T’m teaching people in my dorm,” says Matt DiPalma, an aerospace and mechanical engineering major who is Connecticut Rubik’s Cube champion, capable of solving the vexing puzzle in seven seconds. “They like it, except for the clacking noise it makes when you do it really fast. It gets annoying but people seem to want to learn.”

The rather unconventional brilliance of the Class of 2016
reflected in part the rising competitiveness among the nation’s top-tier schools, as more and more gifted high school students face off for precious few spots. As the Institute expands academic and research offerings, internships, and overseas study, and as it boasts of a top-flight athletic complex, supercomputing facility, and its Curtis R. Priem Experimental Media and Performing Arts Center, it is drawing an ever-larger pool of applicants.

This year, Rensselaer received more than 100,000 inquiries and 15,223 applications, up more than 4 percent from the previous year—and the seventh consecutive year a record was set. Consequently, the students are arriving with ever-stronger credentials.

“We have always been known as one of the best engineering and technological schools. Why shouldn’t we be attracting the best and brightest students?” asks Vice President for Enrollment Paul Marthers, who oversees undergraduate and graduate admissions. “As we get the name out nationally, the quality of the applicant pool rises. The question then becomes, ‘Does this give us a better presence with other students?’ The answer is yes, and then we attract more of the best students.”

“I guess everyone is unique in different ways. I think I’m definitely different from a lot of the people I went to high school with.” GRAHAM RAMSEY ’16

Average freshman SAT scores have risen 80 points in a decade, to 1366. More than 100 of the 1,339 freshmen earned a perfect 800 in critical reading or math, and 90 graduated as valedictorian or salutatorian. And 200 received the Rensselaer Medal, a scholarship recognizing achievement in high school math and science.

Another sign of the times: While many new arrivals also applied to traditional science and engineering institutions, a rising number were admitted to more comprehensive selective universities, says Jack Mahoney, Rensselaer’s director of institutional research. U.S. News & World Report consistently ranks Rensselaer among the top 50 national universities, with its engineering and business programs rated higher.

On top of all the measurable benchmarks, administrators see maturity and enthusiasm in the newest crop of students.

“One thing I saw at orientation is that they hit campus and jumped right in,” says Janelle Fayette, dean of the First-Year Experience, which provides social and academic guidance. “We are seeing more students coming here after having experiences in other countries. They are traveling or doing an internship or working in businesses or were selected for science camps. This type of thing has been increasing in the last couple of years. These students are just really self-motivated.”

Like Alex LeBon. The southern California native, an avid math and science student, graduated from high school with a 4.2 GPA, a perfect score on the physics SAT, and a 35 out of 36 on the ACT exam. He has long gravitated toward engineering with an eye toward designing Formula One race cars. Before college, he coached Little League in New Zealand, traveled solo in Australia, and took part in the family business—building sandcastles.

From childhood, he and his father, Greg, an architect, have built elaborate sand sculptures that are often uncanny replicas of actual buildings or inventive fantasy designs. Alex specializes in the detailed work, carving out bricks or adding the shingles. Their business, Archisand, builds their creations for parties, professional meetings, and weddings.

It also takes part in timed competitions that can draw tens of thousands of spectators. LeBon is even a national champion, having helped Archisand earn two of its numerous U.S. Open titles.

For college, he was anxious to try out a different part of the country—even if that meant leaving the sandcastles behind. At a Rensselaer admissions event in Los Angeles, LeBon was impressed by the individuals he met with off-beat interests. Now, as a freshman, he has not been disappointed.

“They are like me. They did well in school and had an interest in different aspects of technology,” he says before heading into a meeting of the campus Society of Automotive Engineers.

“One person was already writing his own Android apps, another knew five languages, and another already had his pilot’s license. They are intensely interested in whatever they are doing.”

For classmate Graham Ramsey, that intense interest is in computers, what his childhood hero Steve Jobs called the “bicycles for our minds.”

At 11, Ramsey was pulling them apart to see how they worked. At 13, he was building operating systems and designing websites. At 15 he got an iPhone and set out to create an app. After six months of teaching himself how, he developed iSearch, which pulls results from Google and Wikipedia and other sites and bookmarks them. He submitted it to Apple and on the way home from a family vacation got the call saying their engineers had approved his creation, which has been downloaded around the world.

“That’s when I decided I really wanted to make things that people would use,” says Ramsey, who is from Allendale, N.J.

The following summer he traveled to Ghana with the Grameen Foundation, to contribute his technical skills. He saw that doctors and nurses in the field had difficulty accessing patient records with their out-of-date cell phones and developed a way to install Android in smart phones, which made retrieving the records simple at little cost. Ramsey returned to the West African country for a second summer, volunteering with Women in Progress to work on the system used to sell women-owned goods over the Internet.
iSearch, which culls results from Google and Wikipedia and other sites and bookmarks them, an app created by Graham Ramsey, was launched by Apple in 2010 when Graham was 15.
By then, Ramsey, who had already skipped a grade, decided to graduate high school a year early. And, at an age when many students are taking their first computer science class, he joined Knote, a tech startup.

Ramsey might have continued working and innovating without college. But he had firm reasons for pursuing higher education: a desire to expand his skills in order to help those in need.

“How can we apply technology to health care, apply it to making more efficient systems in transportation, or in biology? I don’t see myself working in a cubicle,” says Ramsey, who balances his full course load at Rensselaer with his tech job. “I’ve always been self-taught. RPI has such a great computer science department. Professors have experience in the field, in the business world. And I like that it’s very much based on ‘Why not change the world?’”

Andrea Collins came to Rensselaer from Florida, where she had started a foundation called Caps4Cancer to help cancer patients. “I’ve had a lot of family members who passed away or fought cancer,” says Collins. “It’s a project that is near to my heart. One of the major side effects I noticed when my grandmother went through chemo was hair loss. I noticed that a lot of women wear bandanas and wigs, but not a lot of people think about the men. So I started collecting baseball caps and got involved in Relay for Life with the American Cancer Society. The cancer society had a local office in a hospital in Miami and they said women are the ones who take hats and wigs the quickest. I started collecting baseball caps and donating my hats to the cancer society there.”

Collins has been recognized by the local chapter of the American Cancer Society for her efforts. “The cancer society told me men are the ones who really need the stuff the most. But people don’t think of it.”

Her background made Rensselaer an ideal choice. “In high school, I really liked math and science and that’s what interested me,” she says. “I like the small campus here. I was pretty much a straight-A student through high school. Everyone I spoke to said for engineering, go straight to RPI.”

Rensselaer—the nation’s oldest engineering school—has always loomed large based on its rigorous academics, record of cultivating students for powerful careers, and legacy of innovation by its faculty and graduates. In recent years, the Institute has done more to introduce itself to younger students, now hosting a full calendar of events that invite young people to experience college life years ahead of college.

High school students take part in national Manufacturing Day to learn how high-tech products are made. Middle school students involved with the ExxonMobil Bernard Harris Summer Science Camp design high-tech solutions to global problems. Some programs are geared for girls, African-Americans, and Hispanics, who are underrepresented in science and technological fields.

These opportunities are primarily focused on attracting the next generation of leaders to fill the well-known void of American innovators coming through the ranks. But the pre-college campus events also get the Rensselaer name out, and a number of participants each year eventually attend Rensselaer, says Director of Undergraduate Admissions Karen Long.

Another goal of the effort to draw more applicants and select the strongest: Retain them through graduation. Marthers notes that science and engineering schools are particularly sensitive to seeing students return after freshman year because the courses are so rigorous.

“We don’t want to just see them get in. We want them to thrive. To thrive they have to be able to handle the work,” says Long, who has worked at Rensselaer for 25 years. “We are proud to say we are attracting amazing students with fantastic accomplishments. But our success cannot be just a one-year success.”

She is well aware of the need to keep students themselves in mind as college admission grows increasingly competitive, and rising levels of institutional selectivity contribute to a kind of anxiety...
in current applicants that their parents doubtless did not experience.

“One thing that is very different today is the level of coaching that takes place,” says Alan Gelb, a consultant who helps high school students write successful college application essays and who devoted a book, Conquering the College Admissions Essay in Ten Steps, to the topic.

“In some private schools kids are coached all the way through school,” he says. “They have SAT tutors and college admissions coaches and essay coaches. I was written up in the Wall Street Journal and as soon as the article came out I had clients two years ahead.”

Alex LeBon brought his eclectic qualifications from California to his application to Rensselaer. He visited, was taken by the campus and students, and accepted a spot in the Class of 2016.

“I’m really glad I ended up at RPI and I cannot see myself anywhere else,” he wrote in an email two months into the semester. “The only negative thing I can think of is that there are so many interesting things for me to do that I barely have much free time.”

From his vantage point in the admissions office, Paul Marthers is thrilled that Alex LeBon has joined the Rensselaer community, along with the Rubik’s Cube champion and classmate who invented medical software for smart phones.

He sees promise in the growing number of talented students who might not have known about Rensselaer until recently. But Marthers also believes that Rensselaer avoids some of the liabilities of this high-stakes college admissions environment by remaining open to a wider array of talents.

“We are selective. We want you to be able to do the work. But we want you to come here and be passionate and thrive here and shape the future. We are not looking for reasons to say no to you.”

“"We have always been known as one of the best engineering and technological schools. Why shouldn’t we be attracting the best and brightest students? As we get the name out nationally, the quality of the applicant pool rises. The question then becomes, 'Does this give us a better presence with other students?' The answer is yes, and then we attract more of the best students.”

PAUL MARTHERS, VICE PRESIDENT FOR ENROLLMENT
College Admissions: No More Waiting for the Mailman

Many people reading this applied to a handful of colleges—a few in their academic range, a so-called “reach,” and a “safety” school—put all that information in an envelope and sent it through what is now called snail mail. How does that process translate to 2012?

Long: The Common Application (CA) has made the admissions process more streamlined for many students. Students can complete the CA and the one- or two-page supplement for each participating school. Most students now complete the electronic version of the application, so it is much easier to apply to more schools. My son applied to five schools last year, which is definitely on the low end of application numbers. I see many students who apply to 10 or more schools. The month of April can be very challenging for these students if they are admitted to all 10 (or more) schools—how do they narrow down their choice in a month?

Marthers: Another major change is the increased emphasis on name brands as defined by results of college rankings. But the “reach” and “safety” approach holds today, even as students apply to more and more colleges per capita. More applications being submitted per student has tended to result in applicants adding more “reach” schools to their list—perhaps because the ease of applying has encouraged applicants to take a “playing the lottery to win the big prize” approach to college admissions.

With students hitting “enter” to apply to schools across the country, we take it the once-mighty college interview is a thing of the past? How does a motivated student get your attention?

Long: The interview is an important component of the application for many schools. Given our application numbers of 15,200-plus, we can’t interview everyone. We do take notice of a student’s interest in us. With so many competitive students, we want to admit students who we believe will say yes to us. Knowing someone has visited campus helps us to know a student is interested in and understands us.

Marthers: Many colleges moved to waive interview requirements or not offer them at all once it became widely recognized that interviews
focus on acquiring the knowledge and skills that will lead to future accomplishment wherever they go to college. In other words, do you want to spend your time becoming really good at something lasting or do you want to spend it figuring out how to game the admissions system? The latter type of applicant is usually not hard to recognize and, when spotted, is usually judged as unappealing.

What sets Rensselaer’s process apart?

Marthers: Rensselaer prizes academic excellence above all else. Getting an education at a technological university is a rigorous undertaking. The key question the admissions committee seeks to answer is, can the applicant thrive here? As a result, Rensselaer focuses first and foremost on the applicant’s academic ability (as demonstrated by the high school transcript—especially courses and grades in science and math and standardized test scores) as a proxy indicating his or her potential for success at RPI. More than many of our highly selective peers, we attract an academically strong, self-selecting applicant pool. There are very few applicants who have no prayer of admission.

RPI students err on the side of being smarter and more talented than they think they are, rather than the opposite. And I suspect employers find that an appealing quality, perhaps even a breath of fresh air in comparison to some other universities.

Another factor working against interviews is the limited time each family has to devote to a campus visit. When interviews are offered, families feel that it is a “must do” during a campus visit, sometimes at the exclusion of other potentially more beneficial ways to spend that hour. Many institutions believe, like we do, that prospective students will get more out of a group information session, campus tour, and personal interactions with Rensselaer students and faculty. Having conducted thousands of interviews over my career, I would say that at most 1 percent became the deciding factor during the subsequent application review.

Applicants, of course, used to get their replies in the mail. A fat envelope was usually a good sign while the skinny envelope, not. Please tell us how you notify applicants, successful and otherwise.

Long: Students who are admitted receive the news online on a Saturday with the RPI fight song playing as they view their acceptance letters. We’ve had great messages from students about how their parents (usually mothers) play the fight song over and over again. They then receive the fat envelope in the mail with all of the details. Students who are not admitted or who are placed on the wait list also receive the news online. Our director of operations monitors the site over the weekend and reports the numbers of students who have checked their decisions and the great notes of thanks we receive.

The once straightforward process of applying to college has escalated into a complex system that often mystifies students and their parents. What do you say to students coming through the ranks who are really anxious about the process?

Marthers: Too much emphasis on trying to figure out how to get in can lead applicants astray. For applicants, it is far better to...
Sivaporn Dardarananda ’68 is helping to save an endangered species one elephant at a time.

By Elisa Gallaro
For millions of years, elephants were the caretakers of Thailand’s forests, pruning plants and trees, scattering seeds, and creating a refuge for other species. Then humanity intervened. Elephants were removed from their native habitat to transport armies into battle, help build roads and bridges, and even log the lands that previously were their homes.

Now, most of the forests are gone, and Thailand’s elephant population has dwindled from some 200,000 a century ago to 4,000 today. Like their African counterparts, many Thai elephants have been slaughtered for their ivory tusks. Of the Thai elephants that remain, almost three-quarters live in captivity.

Sivaporn Dardarananda ’68 and other members of Thailand’s Elephant Reintroduction Foundation are determined to reverse that trend by returning captive elephants to the wild. They’re also spreading the word about the foundation’s successes—and its need for support—through a stunning 30-minute documentary, Return to the Forest. Sivaporn is one of four executive producers of the film, which is narrated by William Shatner. It premiered August 12 on World Elephant Day and can be viewed online at worldelephantday.org/galleries/.

Sivaporn became aware of the elephants’ plight back in 2002, when he was asked to join the board of directors of the foundation and serve as its secretary-general. The retired president of Thai Investment and Securities Co. Ltd. (TISCO) accepted, in part, because “Who else was going to do it? There are hundreds and hundreds of MBAs like me who would be happy to work in finance,” he says. “But none are willing to do this kind of work.”

Sivaporn admits that, at the time, he knew very little about the elephants, their singular role in taking care of the forest, and the difficulty of returning them to their natural habitat.

“My first thought was, ‘How hard could this be,’ ” he recalls, “especially compared to heading a financial institution or restructuring non-performing assets after a crash?”

Sivaporn’s work with the Elephant Reintroduction Foundation is a departure from his previous experience. After receiving his bachelor’s in mechanical engineering from Rensselaer, Sivaporn earned an MBA in international business and finance from the University of Pennsylvania’s Wharton School. At TISCO, Thailand’s first investment bank, he rose through the ranks to the top position.

Since retiring, Sivaporn has dedicated himself to public service. He is chairman of the TISCO Foundation, which funds scholarships and medical care for those in need and provides startup funds to help the underprivileged become self-employed. At Rensselaer, he established the TISCO Endowed Scholarship Fund to support Thai graduate and undergraduate students. Sivaporn also is a major supporter of the Thomas Phelan Chair in Humanities and Social Sciences. In 2006, he was honored with the Rensselaer Alumni Association Fellows Award from the School of Humanities and Social Sciences. This distinction is reserved for alumni or friends of the Institute who set an example for others from Rensselaer to emulate.

At the Elephant Reintroduction Foundation, Sivaporn has tackled his responsibilities with his customary passion and resolve. He immersed himself in research on the history of the Asian elephant from its glory days to its current status as an endangered species and has emerged as an expert. In Return to the Forest, it is Sivaporn who explains, on screen, the Asian elephant’s role as a “keystone species” that literally shapes the forest and maintains it as the ideal habitat for countless varieties of plants and animals.

“The reason Asia has these lovely tropical forests,” he says, “is because the elephants worked on them for 20 million years.”

An engineering marvel

Sivaporn’s research gave him what he calls “an RPI perspective. I realized that the elephants are the civil engineers of the forest,” he says. “If I asked engineers to build me a machine that could take
care of the forest, they would come up with the equivalent of a steel elephant. But their machine wouldn’t be able to swim, and to compete with live elephants, it would have to be equipped with the best night-vision goggles.”

Asian elephants are seldom still. They roam through the forest, consuming up to 50 gallons of water and 300 pounds of roots, grasses, fruit, and bark every day. In the process, elephants clear land for vegetation and create trails for other creatures. Some of the food that elephants shake loose from trees is spilled and left behind for smaller animals to eat. Elephants also fertilize and restock the forest by dispersing seeds that are wrapped in nutrient-rich dung. The seeds are deposited miles away from the parent plant, strengthening the forest by contributing to biodiversity. After the seeds sprout, the elephants help create favorable growing conditions by trimming the surrounding grass so the new plants can receive the necessary sunlight.

“The elephants cut the grass and leave the young trees untouched,” Sivaporn says. “Then, they turn the grass into fertilizer by doing what comes naturally.”

Most of Thailand’s elephants have little or no knowledge of the forest. Instead, they’ve been working as “street elephants” natural habitat. In January 1997, the queen released the first three elephants on protected lands, a practice that she repeated time and time again. In 2002, the Elephant Reintroduction Foundation was established to continue the queen’s work. Today, 96 reintroduced elephants roam freely on 450,000 acres in three Thai sanctuaries. One of them, the Sublangka Wildlife Sanctuary, is home to what may be the foundation’s greatest success: a baby elephant born in April 2012 to two formerly captive elephants that mated naturally in the wild.

“Setting an elephant free is the highest form of making merit, and it often brings good luck or at least prevents misfortunes from besetting a person.”
Even so, the birth was no accident. “We don’t just set the elephants free in the forest,” Sivaporn says. “We manage everything very carefully.”

Before an elephant is reintroduced to the forest, the animal undergoes a thorough exam by a veterinarian. The elephant is tagged with an ID chip, and DNA and hormone samples are collected and analyzed. This information is entered into a database to help map the genetic diversity of the reintroduced elephants. Because not all former captives can make the transition to the wild, newly released elephants are observed closely while a decision is made about their ability to be rehabilitated. After that, their progress is monitored by trained field staff, who track the elephants to make sure they remain healthy and are adapting well.

It’s a difficult task. Although ideal for elephants, the environment is challenging for humans, and the elephants can be hard to spot. In their natural surroundings, the elephants are easily camouflaged. Despite their size, they move very quietly. Those that can make the adjustment tend to do so fairly quickly. Although they’ve never foraged for food before, their instincts are awakened, and they “remember” how to use their trunks, how to select foods that are safe to eat, and how to take cover during the rain. Instead of identifying with humans, the elephants begin to take their place in the herd.

A FERTILE ENVIRONMENT

Reintroduction is critical, but it’s not enough. If Thai elephants are to survive, they must reproduce in their natural habitat. To achieve this objective, the Elephant Reintroduction Foundation distributes younger males and females among the three sanctuaries to give the bulls and cows ample opportunity to mate. Veterinarians have brought some pairs together for artificial insemination, to no avail.

“In the end, success came from the elephants that mated on their own, in the forest,” Sivaporn says.

The mother is 15-year-old Jarunee, who worked in the tourism industry before Sublangka became her home. At the foundation’s insistence, the delivery proceeded naturally. “We did not allow...
our field staff or anybody else to be present during the birth. Many places will bring in cameras and lots of people, and the baby ends up dying due to complications,” Sivaporn says. “Our baby was born healthy.”

Without a doubt, the calf is cause for celebration. But Sivaporn cautions that it’s only the first step. “The number of elephants dying off each year is still much greater than the number of births,” he says. “We must find a way to make those numbers equivalent.”

The task is especially challenging because elephants give birth to relatively few babies in a lifetime. The typical elephant pregnancy lasts 22 months and yields just one calf. After the calf is born, the mother will nurse the baby for three years. During that time, the mother will not mate.

“There are many years in between pregnancies, and 40 percent of them will result in males,” Sivaporn says. “A male baby is of no use in the propagation business.” Factor in elephant mortality rates, disease, and other life-threatening events, and it becomes clear why the foundation is focused on reintroducing elephants—especially females—to an environment where they and their calves will remain protected.

Public support is critical because it’s expensive to buy and release elephants. One of the Elephant Reintroduction Foundation’s more successful fundraising efforts is in keeping with the Thai tradition of earning “merit” by releasing an animal into the wild to mark a birthday. Donors provide the funding, and the foundation purchases a captive elephant and arranges a release ceremony.

“Most people release fish or birds as a good deed on their birthday, with hopes of receiving good fortune in return,” Sivaporn says. “We tell them that releasing an elephant is the biggest good deed you can perform because the elephant is the biggest animal.

“Setting an elephant free is the highest form of making merit,” he adds, “and it often brings good luck or at least prevents misfortunes from besetting a person.”

If that’s the case, Sivaporn and his colleagues at the Elephant Reintroduction Foundation could end up among the luckiest people on earth.
JOIN ALUMNI AROUND THE WORLD TO show your Rensselaer pride on Friday, Feb. 1, 2013, at the second annual RPI Spirit Day.

Participating is easy—simply wear or display your Rensselaer gear at work, at grad school, at the mall, at home, or wherever you may find yourself on Feb. 1, and put your pride in your alma mater on display for everyone to see.

Put on your Phalanx pin! Wear your freshman beanie! How about an old jersey? Line up your GM Week mug collection on your desk, or hang an RPI pennant on your office door. It can be as simple as wearing red. “We encourage you to do something to show the world that you are a proud graduate of the oldest technological institute in the nation,” says Jeff Schanz, assistant vice president for alumni relations.

You may also show your pride virtually by changing your profile pic or avatar to a Rensselaer-related image—several are available on the website at alumni.rpi.edu/spirit, including the Rensselaer flag and seal, the “RPI” sports logo, and Stephen Van Rensselaer sporting a class button and freshman beanie.

Last year’s Spirit Day included a photo competition. More than 60 photos were received—from individuals, large groups, co-workers, babies, pets…even a Zamboni got into the act. Watch for details on social media and in your email about how to enter this year’s #RPISpiritDay contest.

Don’t forget that Spirit Day is also the day before Big Red Freakout. Return to campus for the RPI vs. Dartmouth game on Saturday and the pre-game Ice House buffet dinner and pep rally as part of your Spirit Day celebration. (See calendar item below for more information.)

Join fellow alumni to tout your connection to the ‘Tute on RPI Spirit Day on Feb. 1! If you have questions about Spirit Day, contact Mike O’Neill at oneilm2@rpi.edu or (518) 276-8719.

Watch for details on social media and in your email about how to enter this year’s #RPISpiritDay contest.

STAYING CONNECTED

Second Annual Spirit Day
Show your Rensselaer pride on Feb. 1

JOEY JOSEPH

EVENTS CALENDAR

FEBRUARY

2 Big Red Freakout Ice House. This annual hockey tradition takes place at the Heffner Alumni House. Enjoy a delicious buffet dinner with other RPI hockey fans, get into the spirit with face painting by the Red & White Student Organization, and take a convenient shuttle to and from the Houston Field House. After the game, return for dessert and a reception with the team and coaching staff. For more information, contact Peter Pedone at pedonp@rpi.edu or (518) 276-6061.

2 Alumni Hockey Game. Men’s ice hockey alumni are invited to return to the Houston Field House for the alumni game at 11:30 a.m. The public is welcome to watch as your favorite players lace up for this fun annual event. Contact Peter Pedone at pedonp@rpi.edu or (518) 276-6061.

14 HASS Alumni Reception at the 101st Annual Conference of the College Art Association, New York Hilton, New York City. Special guest will be Mary Simoni, dean of the School of Humanities, Arts, and Social Sciences. Contact Susan Haight at haighs@rpi.edu or (518) 276-6042.
GREEK NEWS

Delta Tau Delta Goes Green

WHEN DELTA TAU DELTA began to address the major renovation needs at their aging house, they did so with a desire to reduce operating costs while being mindful of their impact on the environment. The result is a program called “Delts initiate Green at Rensselaer” or DiG@RPI.

The project is a partnership between the fraternity and the Institute, with current fraternity members, the house corporation, alumni, and administrative staff all lending a hand. “Through the DiG program, we aim to establish the Delta Tau Delta Upsilon Chapter as a 'Center of Excellence for Sustainable Living' for the Rensselaer community,” explains Brett Farbstein '95, Delta Tau Delta housing corporation board member. “We plan to be the first LEED Certified Existing Building at Rensselaer and the first fraternity house in the country.”

A team of alumni is working with the students to put forward ideas for improvements and best practices, as well as to provide pro bono architectural design, engineering, construction, and project management services. More than 200 alumni have already made contributions totaling over $250,000, and Rensselaer has also committed to supporting the project, which is estimated at $1.2 million.

Renovations include low-flow shower and sink fixtures and energy-efficient lighting and appliances. An 18.5 kwh photovoltaic system and a 44.4 MBtu solar thermal (hot water) system will be installed in the fall.

“We look to connect with the Institute’s ongoing academic programs and grant funding opportunities to incorporate technology demonstration and research projects, ultimately making the residence hall a living laboratory,” says Farbstein. “We intend to be a model for other Greek organizations and student life residences to become more sustainable.”

RENSELAER RED & WHITE

RENSSELAER’S RED & WHITE STUDENT ORGANIZATION was honored by the Council for the Advancement and Support of Education with the Affiliated Student Advancement Program National Award as the 2012 Outstanding Student-Alumni Organization.

The Red & White Student Organization is a group of students who serve as ambassadors of Rensselaer, representing the Institute to its constituencies—the alumni, the campus, and the community. They partner with the Rensselaer Alumni Association and the Office of Alumni Relations to provide programs and services to alumni.

MARCH

26 Alumni Reception at the Game Developers Conference. Marriott Marquis, San Francisco. Take part in this annual reception to meet other alumni in the game developers industry. Guest speakers will be Ben Chang and Lee Sheldon, co-directors of Rensselaer’s Games and Simulation Arts and Sciences program. Contact Kathy Kinsey at kinsek@rpi.edu or (518) 276-2832.

30 Science Dean Laurie Leshin at the Boston Science Museum. Join Boston area alumni for a fascinating talk by Dean of Science Laurie Leshin. Contact Kathy Kinsey at kinsek@rpi.edu or (518) 276-2832.

APRIL

2 Nano 2013. The 11th annual one-day conference exploring the global opportunities in nanobiotechnology and related science and engineering fields. There is no charge to attend Rensselaer campus. Contact Kathy Kinsey at kinsek@rpi.edu or (518) 276-2832.

MARS ROVER PRESENTATION ON YOUTUBE

If you missed the Reunion & Homecoming presentation on the science behind the Mars rover, visit YouTube.com/RPIAlumni to watch.
Please contact me so I can finally fulfill my request.

...and still going strong. If you know anyone older did consulting work.

George retired from Florida Power & Light and then mostly due to aging and illness, including

business in Hollywood please contact me again!

...times this. My bragging about the Class of '39 is that

...out that in 1939 RPI handed out only 185 bachelor's

...relative to the VIPs who were in our class. Just found

vertical.

Eustace Hetzel

...able to communicate. I guess this is the new normal

...there are some, who I have not spoken to directly for

...using walkers, and some using canes. Of course

...several classmates, some are in wheelchairs, some

...a setback with medication interaction. I hear from

...tions and treatments.

...that this will give him a better handle on medica-

...inventing, morals, truth!

...helping, giving, freedom, ethics, loving, networking,

...oughness) and it starts with believing, teaching,

...The experience was great (Knowledge and Thor-

...77 years ago. Or that I graduated from high school

...Difficult for me to believe that I graduated from RPI

...many years when I met him at my 65th Reunion.)

...away a few months ago. (He was a good friend for

...words of wisdom from

...Byron Forster '41

...This is the first time

...Mac enjoyed a career

...class correspondent

...Robert "Mac" Mac

...passed away Aug. 20. Mac enjoyed a career

...list a few classmates.

...in aerodynamics testing, with General Dynamics

...passed away Aug. 5, 2012. He was a

...of Daystrom, passed away Aug. 5, 2012. He was a

...of Schlumberger and the Transicoil division

...at SUNY-Binghamton. He also was a returning

...Muriel Williams

...who was in those days

...Cleo Theodorsen. Her interest in things aeronau-

...SUNY-Binghamton. She later got a B.S. in electrical engineer-

......Cadette, who was in those days

......who was in those days

...Muriel Williams

...Cleo Theodorsen. Her interest in things aeronau-

...at NACA, the precursor of NASA. Like all of us, she

...of Strategic

...Ed McCarthy, P.E. '68

...Dick Schwartz

...Patroon of Rensselaer and a WWII veteran who

...loushormick.com

...Send news to: Lou Shornick '39, Director of Development,

...Send news to: Ed Koenig, P.E. '42, Officemate

...Send news to: Class Notes, Office of Strategic

...Muriel recalls the snows of Troy and the trek up the

......Muriel Williams

...Muriel Williams

...Muriel recalls the snows of Troy and the trek up the

...approach; she later got a B.S. in electrical engineer-

......Muriel Williams

...Muriel Williams

...Muriel recalls the snows of Troy and the trek up the

...approach; she later got a B.S. in electrical engineer-

......Muriel Williams

...Muriel recalls the snows of Troy and the trek up the

...approach; she later got a B.S. in electrical engineer-

......Muriel Williams
a pedestrian promenade along the north side of '86 Field lined with elm trees, and enhanced by 11 benches, a gift of the Class of 2011.
Of Science and Curiosity

New discoveries will sow seeds for future generations of scientists and engineers | BY LAURIE LESHIN

On August 6, the NASA rover Curiosity raced toward the surface of Mars, and, during a truly terrific “seven minutes of terror,” the rover went from skimming the top of the Martian atmosphere at 13,000 mph to an ideal landing on the floor of Gale Crater. It was an extraordinary moment filled with excitement, smiles, and tears. But, for those of us in the Curiosity science team, it didn’t last long. Within minutes of landing, I and the other members of the team at the Jet Propulsion Laboratory buckled down to work, evaluating the first images to be returned from the Martian surface.

A successful landing and science mission after a journey of more than 300 million miles is a reward for nearly a decade of work on the part of thousands of engineers and scientists. I was part of that effort, serving on the team of scientists who defined Curiosity’s science goals, and helping build two of the 10 instruments that Curiosity carries to analyze Martian rocks, soils, and atmosphere.

Curiosity is a technological marvel, and it is already providing us with fascinating insights into our planetary neighbor that could finally settle the question of whether life can or has existed on Mars. Our landing site at the base of Mount Sharp, with its many layers visible from space, offers the promise of a geological timeline as clear as the record found in the Grand Canyon.

With Curiosity, we will drive up the mountain and read the history of Mars in the rock layers. With the sophisticated instruments on board we will determine the chemical composition of the rocks and soil we pass—even ingesting samples into an onboard lab for study. Of these, rocks and minerals that form only in the presence of water would be the most rewarding find, proving that a time existed when water flowed on Mars.

The rover can also detect preserved organic materials and the mission could settle the question of life on Mars in one of two extremes: either life has or could have existed on Mars at some point; or the environment on the surface of Mars is too hostile for life. This is perhaps the most compelling question Curiosity will seek to answer.

We are true explorers in this realm, and I have no doubt we will be amazed by our discoveries. In a way, this is full circle for me. I remember the amazement I felt when, as a 10-year-old girl in my mother’s kitchen, I saw the first photos of Mars taken by the 1976 Viking lander in Time magazine. That moment has never left me, and it’s certainly one of my earliest memories of being riveted by and drawn to scientific discovery.

I know I’m not alone in having had a moment like this, and in the background of every scientist or engineer who has served on this mission, there is the hope that something we find will inspire a school kid, maybe a child in your own hometown, to learn more about rocks and rockets, and follow in our footsteps; the hope that this moment of inspiration will serve as a motivation for the hard work of learning science, technology, engineering, or math, the so-called STEM fields.

After six years with NASA, I am now dean of the School of Science at Rensselaer. Since I arrived, I have learned that quite a few of the scientists and engineers who worked on the mission graduated from Rensselaer.

In October, during our annual Reunion & Homecoming, we hosted a discussion with a group of four Rensselaer alumni who worked on this mission, including Michael Meyer ’74, who serves as lead scientist of NASA’s Mars Exploration Program.

Each of us had inspiration and an introduction to the STEM fields that made it possible for us to complete a technical education. Right now, in our midst, are students with the same capacity for amazement, and the aptitude for the rigors of science and math. It is important that we support them, and, perhaps even more than the general public, those of us who have experience in the STEM fields are in a position to help them navigate the route we once charted for ourselves.

As I help to analyze data from the Martian landscape we will explore with Curiosity, I am constantly reminded of how what we accomplish today sows seeds for future generations of scientists and engineers. If, together, we can get them to a place like Rensselaer, we will get them to Mars.

Laurie Leshin, dean of the School of Science at Rensselaer, was previously deputy associate administrator of exploration systems for NASA. You can follow her tweets about Curiosity’s mission at @RPISciDean.
“Our intent was to have Rensselaer emerge re-energized, re-awakened, refocused. It meant that we had to imagine a different, bolder future for the Institute. We needed to recognize that, while building on its legacy and existing strengths, Rensselaer had to change.”

President Shirley Ann Jackson

Renaissance at Rensselaer: A President, A Plan, A University Transformed

Written by national higher education writer Stephen G. Pelletier for the Institute, with a foreword by Dr. Paul Gray, Professor and President Emeritus, Massachusetts Institute of Technology, this book chronicles the extraordinary transformation of Rensselaer Polytechnic Institute that has occurred under the leadership of President Jackson under The Rensselaer Plan.

Available in hardcover and e-book format. Go to www.rpi.edu/transformed for details on downloading.
EMPAC is Rensselaer’s international hub for contemporary art, performance, science, and technology. This dynamic center offers adventurous public events and performances in dance, theater, music, and the visual arts throughout the year. EMPAC is also a space where artists and researchers engage in new creative practice through its residency program.

For information on these and other upcoming events, visit empac.rpi.edu.