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RSVP welcomes 242 new graduates to the Rensselaer Alumni Association.
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EDUCATION EVOLUTION

Innovative interactive education prepares students to change the world

LAST MONTH WE LAUNCHED THE CLASS OF 2002 AT OUR 196TH COMMENCEMENT EXERCISES HERE ON CAMPUS. IT WAS A WONDERFUL DAY FULL OF CELEBRATION AND HOPE, AS WE SENT INTO THE WORLD GRADUATES WHO HAVE BEEN PREPARED BY THE INSTITUTE TO PROSPER, TO FACE THE INEVITABLE CHALLENGES OF LIFE, AND TO MAKE THE WORLD A BETTER, SAFER, MORE HUMAN PLACE.

A KEY COMPONENT OF THEIR EDUCATION EXPERIENCE AT RENSSELAER HAS BEEN INTERACTIVE LEARNING—AN INNOVATIVE AND CREATIVE APPROACH TO INSTRUCTION THAT READIES STUDENTS TO BECOME THE DISCOVERERS, INVENTORS, AND GROUNDBREAKING RESEARCHERS OF TOMORROW.

THE 21ST CENTURY, WITH ITS ONLINE, REAL-TIME, HIGH-SPEED ECONOMY, PRESENTS AN UNPRECEDENTED DEMAND FOR STUDENTS WITH THE RIGHT TECHNOLOGICAL SKILLS: THE ABILITY TO COLLABORATE, COMMUNICATE, AND WORK EFFECTIVELY IN TEAMS; AND THE CAPABILITY TO APPLY KNOWLEDGE AND THINK INDEPENDENTLY. IN THIS RESPECT, RENSSELAER IS A PIONEER IN THE EDUCATION OF THE FUTURE. OUR STUDENTS LEARN THROUGH STUDIO-BASED CLASSROOM EXPERIENCES AND HANDS-ON DESIGN AND RESEARCH OPPORTUNITIES—ALL AVAILABLE AT THE UNDERGRADUATE LEVEL.

AT RENSSELAER, CLASSES OF 35 TO 60 STUDENTS ARE ENGAGED AT WIRED WORKSTATIONS—USING CUTTING-EDGE TOOLS LIKE WEB-BASED TECHNOLOGIES, FULL-MOTION VIDEO, COMPUTER SIMULATION, AND OTHER LABORATORY RESOURCES. AN INSTRUCTOR AND A TEACHING ASSISTANT MOVE FROM WORKSTATION TO WORKSTATION, OBSERVING AND COACHING. STUDENTS DOWNLOAD COURSE MATERIALS ONTO THEIR LAPTOPS, AND COMMUNICATE WITH OTHER STUDENTS AND FACULTY MEMBERS THROUGH ELECTRONIC DISCUSSION GROUPS. IT IS AN INNOVATIVE BLEND OF DISCUSSION AND SKILL-BUILDING, HIGH-TECH INQUIRY AND PROBLEM SOLVING—PREPARING SCHOLARS TO SUCCEED IN THE NEW BUSINESS WORLD.

INTERACTIVE LEARNING HAS BEEN INFUSED THROUGHOUT ALL OF OUR UNDERGRADUATE DISCIPLINES IN MORE THAN 35 STUDIO CLASSROOMS, WITH MORE BEING BUILT ALL THE TIME. IN THESE CLASSROOMS, KNOWLEDGE AND APPLICATION ARE INTERTWINED SEAMLESSLY. FOR EXAMPLE, IN THE LITEC (LABORATORY FOR INTRODUCTION TO EMBEDDED CONTROLS) STUDIO CLASSROOM, STUDENTS BUILD REMOTE-CONTROLLED CARS IN A PROJECT-BASED, TEAM ENVIRONMENT. IN THE CIRCUITS STUDIO, STUDENTS DEVELOP AND TEST THEIR OWN CIRCUITS. IN THE O.T. SWANSON MULTIDISCIPLINARY DESIGN STUDIO, STUDENTS WORK TOGETHER IN A STATE-OF-THE-ART FACILITY TO TACKLE CHALLENGING "REAL-WORLD" PROBLEMS, OFTEN PROVIDED BY CORPORATE SPONSORS, FROM CONCEPTION THROUGH PROTOTYPE FABRICATION. ALL OF THESE LABS OFFER STUDENTS THE OPPORTUNITY TO GAIN EXPERIENCE IN THE WAY INDUSTRY WORKS TODAY.

OUR INNOVATIVE MODEL FOR EDUCATION—WHICH EARNED THE FIRST PEW CHARITABLE TRUST AWARD FOR THE RENEWAL OF UNDERGRADUATE EDUCATION AND THE FIRST BOEING OUTSTANDING EDUCATOR AWARD, AMONG OTHERS—HAS BEEN TALKED ABOUT, HONORED, AND EMULATED. RENSSELAER ALSO WAS NAMED TO ADMINISTER A PEP FOUNDATION PROGRAM, THE CENTER FOR ACADEMIC TRANSFORMATION, TO FUND COST-EFFECTIVE EDUCATIONAL INNOVATION AT OTHER UNIVERSITIES IN THE UNITED STATES.

OF COURSE, THE VERY THINKING THAT ENABLED RENSSELAER TO INITIATE INTERACTIVE LEARNING IS THE SAME MINDSET THAT KEEPS THE INSTITUTE PRESSING FORWARD WITH THE RENSSELAER PLAN. RENSSELAER'S ANDERSON CENTER FOR INNOVATION IN UNDERGRADUATE EDUCATION WAS FOUNDED 11 YEARS AGO WITH THE CONTINUING MISSION OF MAKING RENSSELAER A LEADER IN INNOVATIVE PEDAGOGY. MORE RECENTLY, THE RENSSELAER ACADEMY OF ELECTRONIC MEDIA HAS BECOME THE SPawning GROUND FOR HIGHLY CREATIVE VISUALIZATION SOFTWARE THAT ENABLES STUDENTS TO LEARN SCIENTIFIC AND ENGINEERING PRINCIPLES IN WAYS NEVER BEFORE POSSIBLE. WITH A GRANT FROM THE GE FUND AND SUPPORT FROM THE AT&T FUNDATION, EDUCATIONAL TECHNOLOGY AND NEW COURSE STRUCTURES AND MATERIALS ARE BEING DEVELOPED TO ACCOMMODATE DIFFERENT STUDENT LEARNING STYLES. AT THE END OF THE TWO-YEAR PROJECT, A MODEL WILL BE PROPOSED THAT WILL COMBINE MODERN EDUCATIONAL TECHNOLOGY WITH ENHANCED CLASSROOM EXPERIENCES.

RENSSELAER CONTINUES TO LOOK FOR NEW AND BETTER METHODS TO EVOLVE EDUCATION—MEETING THE PRESENT AND FUTURE NEEDS OF OUR STUDENTS, FACULTY, AND GLOBAL BUSINESSES.

OUR STUDENTS ARE THE LEADERS OF TOMORROW. THEY EXPECT—and they deserve—a compelling education experience, grounded in the strong fundamentals for which Rensselaer is known. We continue to breathe life into Amos Eaton's vision for hands-on education, a vision that takes on greater importance and urgency in this uncertain world.

I am very pleased to announce that, as this issue went to press, we selected a new dean for the Lally School of Management and Technology. Denis Fred Simon, who currently is president of Monitor China Ltd. in Beijing and who led the China Strategy Group at Andersen Consulting, will bring his accumulated leadership and expertise in global technological business development to the Institute beginning Aug. 1.
LOVE AND RENSSELAER!

First-Year Experience

In response to your article on freshman orientation (“Welcome Aboard,” December 2001): In June 1949 I graduated from Troy High. My choice of colleges was either RPI or Russell Sage. I chose Rensselaer. At that time there was no orientation camp for women. There were four of us in a class of about 800 men.

My first introduction to Rensselaer was three days of testing to see what our aptitudes were. Then we were given a schedule and was off to the races. I was fortunate to be in a section of veterans who treated me as a buddy. I went to lunch with them, studied with them in Tin Town, and in general was looked at as a buddy. I never wore a beanie.

Since I lived at home, I did not need to worry about dorms. There was a house on a street off Pawling Avenue for the women students. This lasted my freshman year, then women had to find their own housing. The whole attitude was just to jump in and swim.

I married Norman Pedersen ’53 in ’51 and moved to the ’Wyck. We graduated in ’53 with a B.S. in physics and went on to earn Ph.D.s from Rensselaer in the 60’s. In total I spent 11 years at Rensselaer, four as an undergraduate and seven in graduate school. While in graduate school I was a teaching assistant and a lab assistant. When my husband and I graduated in ’53, we were on the cover of a Rensselaer alumni magazine as the first husband and wife couple to graduate together.

I loved being at Rensselaer and never regretted choosing it.

JEANNE CASSAVANT PEDERSEN ’53
Newburyport, Mass.

GM Partnership Extends to Alumni

After reading the article “A Working Partnership” in the March issue, I had occasion to visit the General Motors Tech Center in Warren, Mich., as part of an alumni admissions volunteer training program hosted by GM. I was struck by both the superb facilities made available to us and by the degree of technological excellence and commitment evidenced by the GM team members.

It was obvious, as President Jackson observed in the March issue of Rensselaer magazine, that “strategic partnerships in education and research are absolutely essential to the future of Rensselaer, to the future of corporations like General Motors, and indeed, to the global economy.”

We were pleased that 13 of our Detroit-area alumni were able to participate in such a unique event. The goal is to expand the admissions pipeline into Rensselaer from southeastern Michigan... who better to do that than our own graduates?

Thank you to Dudley Smith ’88 for creating this opportunity and to General Motors for hosting the event. And, if anybody missed it but would like to participate, e-mail me at longks@rpi.edu.

KAREN LONG
DIRECTOR OF ENROLLMENT PROGRAMS, RENSSELAER
Troy, N.Y.

Beautiful Person

I want to thank you for printing the letters from other alumni remembering Dr. Jeanne Lynch. It brought me great joy to read how others expressed their love for this wonderful lady.

I, too, hold a special place in my heart for Jeanne, as she was my favorite RPI teacher, mentor, friend, and fan. Behind her “tough-as-nails” business persona, Jeanne was a beautiful person who wanted all of us to succeed. Those who dared to get to know here better received from her gifts that will last a lifetime.

RICK SALES ’85
Exeter, N.H.

Value Added?

I was very interested in the article on the distinguished alum Jackson Tai ’72, and the career he has made for himself (“Global Vision,” March 2002). A true story of growth through globalization and not the least is that an RPI education can form the foundation. What surprised me was in the small box at the end, “Family Values,” wherein Mr. Tai is quoted as saying, “Life doesn’t value processors. Life rewards leaders and entrepreneurs.”

Yes, leaders and entrepreneurs receive life’s value, I guess, according to one’s own sense of values. What about the other approximately 5,999,000,000 lives on Earth—are they somehow devalued? I prefer to think that if Mr. Tai were to reconsider his statement, he might word it in a different manner.

NORM ZELVIN ’51
Eastchester, N.Y.

We’d love to hear from you! To provide space for as many letters as possible, we often must edit them for length. Please address correspondence to: Rensselaer Magazine, Office of Marketing and Media Relations, Rensselaer Polytechnic Institute, Troy, NY 12180, or e-mail to alum.mag@rpi.edu, or call (518) 276-6531.
NEW FOCUS ON EXPERIMENTAL ARTS

Rensselaer has chosen Johannes Goebel, a respected curator and renowned composer of electronic music, to lead the university’s experimental media and performing arts center. He will begin his appointment July 1.

"Johannes Goebel’s impressive resume mirrors exactly what we are looking for in an artistic director," says President Shirley Ann Jackson. "He will bring scholarship and innovation to our program of experimental media and performing arts. With other faculty, he will create a center that is unprecedented as a site of new knowledge in disciplines that range from art and architecture to physics and information technology."

Goebel is the founding director of Germany’s Institute for Music and Acoustics (IMA) at the Zentrum für Kunst und Medientechnologie (ZKM) in Karlsruhe. A center for art and media, the ZKM is a forum for international exchange that combines art with research in science, art, politics, and finance.

At Rensselaer, Goebel will conceive, implement, and manage the artistic programming for the new arts facility.

He will relate advanced technology to the arts, and work with Rensselaer’s artists in electronic media and with faculty in traditional academic disciplines who are interested in research and scholarly collaborations with artists. Goebel also is expected to be influential in the latter stages of the performing arts center’s design.

Construction on the 160,000-square-foot experimental media and performing arts center is expected to begin in 2003.
**MICROELECTRONICS**

**RENSSELAER AWARDED MICROELECTRONICS CENTER**

Rensselaer has been awarded a Center for Advanced Interconnect Systems Technologies (CAIST) by the Semiconductor Research Corporation (SRC) to support research in microelectronic interconnect technologies, the backbone of the next generation of computer technology. The new center will continue and advance the work of the Center for Advanced Interconnect Science and Technology created in 1996.

The three-year program is valued at more than $9 million, which includes $500,000 per year from New York state. The SRC will provide $1.5 million per year, and IBM will provide a minimum of $1 million per year in cash, scholarships, and equipment. Rensselaer will provide $250,000 per year in administrative costs and technical support.

Toh-Ming Lu, the Ray Palmer Baker Distinguished Professor at Rensselaer, will direct the CAIST. David Duquette, chair of materials science and engineering at Rensselaer, and Paul Ho, director of the Laboratory for Interconnect and Packaging at the University of Texas-Austin, will serve as associate directors.

The CAIST will draw on the expertise of New York researchers from Rensselaer, Columbia, Rochester, Cornell, and the University at Albany. It will combine that expertise with that of researchers from Georgia Institute of Technology, University of Texas-Austin, MIT, UC Berkeley, University of Maryland, North Texas University, and Texas Tech.

"The CAIST will assist the nation's microelectronics, telecommunication, and supplier industries. It will determine their technological needs, identify areas of long-term technological relationship, and build partnerships that will advance economic growth here in New York state," says Rensselaer President Shirley Ann Jackson.

"The challenges facing the semiconductor industry in the interconnect area require the depth of experience and great expertise that Rensselaer and its partners in CAIST have built over the years," says John Kelly, senior vice president and group executive of the IBM Technology Group.

CAIST research will focus on increasing the performance of interconnects on microelectronic chips through the use of advanced materials and 3-D chip stacking. Present interconnection technology is unable to keep pace with devices that can switch on or off in less than a billionth of a second.

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**MANAGEMENT**

**ONLINE BUYERS: LET'S GET PHYSICAL**

The key to e-commerce success is in finding ways to use information technology to mimic the physical interactions consumers are already used to in most brick-and-mortar shops, says Junglooo Jahng, assistant professor of management.

In other words, customers want to feel and look at a product at all angles, and have immediate face-to-face contact with someone to answer questions—services that are not prevalent in today's e-commerce world.

"Although e-commerce has been growing in recent years, it has fallen short of what forecasters have predicted," says Jahng. "In virtual stores, people cannot touch the product or immediately track down the seller if they have a concern."

Jahng tested his theory using 400 participants in a study in which he simulated several e-commerce sites to sell a digital camera. The Web site viewed by the first group showed a static picture of a camera that participants could only look at. The site also offered an e-mail address for product questions.

A second group viewed another site using interactive technologies. Viewers in this group could use the mouse to get a 360-degree view of the camera and to "try out" different features of the camera.

The site also provided the viewer with a live representative to answer immediate questions through video conferencing available from a window on the bottom of the virtual page.

According to the study, 79 percent of the group using multimedia interactive technologies purchased the digital camera, which was a 32 percent increase over members of the first group who bought the product.
The connection between Rensselaer and the United States Navy has been well established since the earliest days of the Institute. Through the years, many Rensselaer alumni have gone on to become top servicemen who made major contributions in both military and civilian life.

Mordecai T. Endicott, Class of 1868, began a tradition of Institute graduates who became leaders of civil engineering in the Navy. Known as the “Father of the Civil Engineer Corps of the United States Navy,” Endicott was the first to head that Navy unit. Later, he would become the first engineer to be named chief of the Bureau of Yards and Docks.

Endicott, a 1999 Rensselaer Alumni Hall of Fame inductee, was commissioned as a civil engineer in the U.S. Navy in 1874. By 1890, he was posted to Washington, D.C., and given control of all civil engineering projects.

During this period, the Navy yards were undergoing extensive modernization and Endicott introduced electronic appliances, and steel and concrete dry docks. He designed the Dewey, which was at the time the world's largest floating dry dock. The 16,000-ton vessel, stationed in Subic Bay in the Philippine Islands, handled ships up to 20,000 tons, including the largest American ships at that time.

In 1898, shortly before the Spanish-American War, President William McKinley appointed Endicott chief of the Bureau of Yards and Docks, making him the first individual to be named both chief of the Civil Engineer Corps and chief of the Bureau of Yards and Docks. Later, Endicott was given the rank of rear admiral, the first of more than 50 Rensselaer graduates to attain the rank of admiral.

In 1895, Endicott served as a member of the Nicaragua Canal Commission. The commission's report led Congress to delay taking action on furthering the Nicaragua Canal project, which was eventually abandoned in favor of the Panama Canal route. In 1905, Endicott was appointed a member of the Panama Canal Commission.

Endicott retired in 1909, but then returned to work at age 73 to serve in World War I as president of the Naval Examining Boards and Special Boards of Investigation. In 1920, he permanently retired and received a letter of commendation for his war services from the secretary of the Navy.
LIGHTING RESEARCH CENTER

A BRIGHTER FUTURE FOR LEDS

Researchers at Rensselaer’s Lighting Research Center (LRC) are developing advanced LEDs and other solid-state lighting technologies that could ultimately replace today’s conventional bulbs for illuminating everything from homes and businesses to government complexes and airports.

Solid-state lighting systems, such as LEDs (light-emitting diodes), are made from semiconductors. They use far less energy and last longer than conventional lighting in certain applications and are being used increasingly in traffic signals, automotive lighting, and exit signs. But they aren’t yet bright enough to replace fluorescent and incandescent lights.

The LRC, in collaboration with the University of California-Santa Barbara, recently received a $3 million, three-year grant from the U.S. Department of Energy (DOE) to develop LEDs and other solid-state lighting devices that emit high-quality white light while maintaining energy efficiency, longevity, and low production costs.

“The demand for lighting is increasing every year,” says Nadarajah Narendran, director of research at the Lighting Research Center. “As we know, California couldn’t meet energy demand last year. LED systems could be one way to prevent this from happening again.”

Solid-state lighting has the potential to more than double the efficiency of today’s lighting systems and could save more than $98 billion in energy costs over the next two decades, according to the DOE.

UC-Santa Barbara will work on developing the semiconducting elements while Rensselaer will work on integrating these semiconducting devices with optics and electronic controls, and then evaluate them for general lighting applications.

Founded in 1988 as part of Rensselaer’s School of Architecture, the LRC is the leading university-based research center devoted to lighting.

MAKING A DIFFERENCE

SURPRISING SUPPORT!

In January of last year, Elbert Childs made Rensselaer an offer. He would contribute $50,000 if another individual matched his gift. What was most extraordinary about his gesture was the fact that Elbert Childs never attended Rensselaer.

“I was intrigued by President Shirley Ann Jackson’s efforts to advance Rensselaer,” Childs says. “I felt that the best way for me to support those efforts was through a challenge to alumni and friends of the university.”

Elbert Childs was accepted to Rensselaer in 1929, but chose to go to Yale. A native of Spencerport, N.Y., Childs taught chemistry and math at Chapman High School in New London, Conn., and had at least one student go on to attend Rensselaer. He later served as staff engineer at Mobil Oil Company and retired from that position in 1972. A dedicated professional, Childs has been a member of the American Chemical Society for more than 60 years.

Rising to Childs’ challenge was a former Mobil Oil Company executive (and dedicated Rensselaer supporter), Robert O. Swan son ‘58. “Mr. Childs’ challenge encouraged me to double my gift to the Rensselaer Annual Fund, and therefore enhance support for Rensselaer’s students. In addition, it allowed me to honor his successful career at Mobil Oil,” Swanson says.

In order to have the greatest impact on Rensselaer students, the resulting $100,000 would provide unrestricted support through the Rensselaer Annual Fund, which supports the experience and success of Rensselaer students—through student activities, research and innovation, scholarship, and entrepreneurship. The Annual Fund helps to bridge the yearly gap between tuition and the full cost of a high-quality technological education. For more information, contact Lisa McGrath’89, director of annual giving, at mcgrath@rpl.edu or (518) 276-2737.
TWO RENSSELAER RESEARCHERS HAVE MADE groundbreaking developments in growing and discovering new properties of carbon nanotubes. Their unprecedented research has been highlighted in some of the most noted scientific periodicals in the nation, including Nature and Science magazines.

Pulickel Ajayan, professor, and Ganapathiraman Ramanath, assistant professor, both of materials science, have learned how to grow carbon nanotubes in near-limitless ways. They also have discovered that the nanoscopic cylinders will ignite under certain circumstances.

GROWING NANOTUBES EVERY WHICH WAY

Next-generation computer chips, integrated circuits, and the microelectro-mechanical (MEMS) devices that power them depend upon carbon nanotubes that can be grown up, down, sideways, and in all three dimensions. Ajayan (above) and Ramanath (right) are the first to achieve this unprecedented, specific, and controlled nanotube growth.

Their research, reported in the April 4 issue of the journal Nature, paves the way for Lilliputian devices that depend on tiny networks and architectures.

The method is based on a selective growth process that allows the nanotubes to grow perpendicular to the silica-coated substrate. By chiseling the silica into predetermined shapes, Ajayan and Ramanath are able to precisely control and direct the nanotube growth. Their use of gas phase delivery of a metal catalyst, essential for nanotube growth, makes their growth process more flexible and more easily scalable than conventional methods.

This simple process for controlled nanotube growth could be brought to market in a matter of months, the researchers say.

“The impact of our work is well beyond nanotubes,” Ramanath says. “This is the first step toward making complex networks comprised of molecular units. By manipulating the topography of the silica blocks, and utilizing the selective and directional growth process, we have been able to force nanotubes to grow in predetermined, multiple directions, with a very fine degree of control. No one else has done this.”

The researchers’ work is funded by the Office of Naval Research and the Interconnect Focus Center.

CARBON NANOTUBES IGNITE

Ramanath and Ajayan also have discovered a surprising new property of single-walled carbon nanotubes. When exposed to a conventional photographic flash, the nanotubes emit a loud pop and then ignite. The discovery, reported in the April 26 issue of the journal Science, could mean that the nanotubes might be used in light sensors or to remotely trigger explosives and combustion reactions, although researchers say that more testing needs to be done to realize these possibilities.

The researchers explain that the loud popping sound heard after the flash is a well-known phenomenon, called the photoacoustic effect. It occurs when porous black objects, such as carbon nanotubes, absorb a large amount of light, which results in the expansion and contraction of the gas surrounding them, releasing sound.

What surprised the researchers, however, was that the nanotubes then spontaneously ignited.

“The single-walled carbon nanotube samples in this situation were just a jumble of tubes. They were not laid out in any pattern, and because of that, the heat generated from the flash could not dissipate, so the nanotubes just burned,” Ajayan says.

The discovery was initially noted by Andres de la Guardia when he took flash photographs of the nanotubes. De la Guardia is a graduate student in operations research and statistics.

Since the discovery, the researchers have found that while the tubes burned only when oxygen is present, their atomic structure was altered even in inert gas environments.

“From an applications perspective, our work opens up exciting possibilities of using low-power light sources to create new forms of nanomaterials, and will serve as a starting point for developing nanotube-based actuators and sensors that rely on remote activation and triggering,” says Ramanath.

The research is a collaborative effort between Rensselaer, a French group headed by T.W. Ebbesen, and researchers in France, Mexico, and Germany.
HAWK TALK
CALL OF THE WILD

MARC CAVOSIE HAS THE DESIRE—AND ABILITY—to prove he can play with the best.
In April, the 6-foot, 180-pound, 20-year-old Rensselaer hockey standout signed a professional contract with the Minnesota Wild of the National Hockey League. Cavosie, who was named this year’s ECAC (Eastern College Athletic Conference) Player of the Year, also was chosen as a finalist for the prestigious Hobey Baker Memorial Award, presented annually to the best Division I player in the country.
“I’ve had a tremendous experience at RPI and I’m going to miss my teammates, coaches, and fans,” Cavosie says. “It’s always been a dream of mine to play professional hockey, so to get this opportunity is amazing,” says the Cohoes, N.Y., native, who was selected by the Minnesota Wild in the fourth round (99th overall) of the 2000 NHL Entry Draft.
“We believe this is the best time for Marc to become a professional and continue his development as a player,” says Doug Risebrough, Minnesota Wild executive vice president and general manager. As per club policy, terms of the contract were not released.

Cavosie, a forward, turned heads as he led the ECAC and ranked among the leaders in the nation in numerous offensive categories this season. In 36 games, he tallied 23 goals and 27 assists for 50 points. Nine of his goals came on the power play, two were short-handed, and four were game-winners. In 21 league games, he tallied 13 goals, including five power-play markers, and 17 assists. He also enjoyed a 17-game scoring streak in which he tallied 12 goals and 15 assists.
The American Hockey Coaches Association chose Cavosie and teammate Matt Murley as JOFA Division I Men’s Hockey National All-Americans.

“Marc is a talented hockey player who has worked hard at developing his skills. Over the course of his career, he has become the kind of team player that others would follow,” says Dan Fridgen, Engineers head coach.

Cavosie, a management major, began playing hockey as a young child with his brother, Eric, also a member of Rensselaer’s squad.
Part of Marc’s summer schedule last year included a trip to Sweden, where he worked to improve his skating and leg strength. He also added about 15 pounds of muscle. The rigorous training obviously has paid off.
The production and a that took part of an by tracking the motion of the performers. "Library of Maps: An Opera in Many Parts," that took place on the Rensselaer campus in April. The performance was the culmination of Oliveros' graduate course, Arts Practicum. The production included video installations and a specialized camera that produces sound by tracking the motion of the performers.

**Making a Difference**

**Reunion Reflections**

In this, their 50th Reunion year, the Class of 1952 has been doing a good bit of reflecting—on their Rensselaer experience, and on how they can benefit future generations of students. However, the members of the class, led by Reunion Gift Committee Co-Chairs Jack Feininger '52 and Al Krause '52, did not stop there. They set an ambitious goal for their 50th Reunion fund-raising campaign of $1.5 million in gifts and pledges, a goal designed to have the greatest impact on the future of Rensselaer and its students.

According to Feininger, "RPI gave me the breadth and knowledge (both in engineering and in business) to learn how to solve problems, which in turn equipped me well in business and in my personal life. I am so proud to be a graduate of this great educational institution." He and his wife, Marilyn, feel that they "should give back so our colleges can continue to provide the same high-quality education we received."

Krause has spoken with and corresponded with numerous individuals in the Class of 1952 in the course of the Reunion gift campaign. While motivations for giving vary, there are some common themes—to commemorate the 50 years since graduation, to give something back to the institution that contributed to their success in life, and finally, to do something profound for society. In his view, Rensselaer distinguishes itself for its comprehensive view of a technological education.

"The future of this country rests in today's and tomorrow's students. In this complex world, we need people who not only have a body of knowledge, but also an understanding of the ethical and moral aspects of technology and science," says Krause.

The class has exceeded their goal, raising more than $1.5 million in gifts and pledges (including planned gifts) to support a diverse array of programs and initiatives at Rensselaer—the Rensselaer Annual Fund, the O.T. Swanson Multidisciplinary Design Laboratory, the Chapel & Cultural Center, Rensselaer libraries, scholarships, and the Rensselaer endowment, as well as individual schools and departments.

A signature feature of this effort was a commitment to the Rensselaer Annual Fund. The co-chairs established a guideline of securing 10 percent of each gift as a commitment to the Rensselaer Annual Fund. They used this strategy to maximize the impact of the campaign by providing unrestricted annual support to the university.

The Class of 1952 reflected back to their student experiences and designed a campaign that would have the maximum benefit for today's students. To learn more about gift opportunities at Rensselaer, visit AlumServ at www.alumnirpi.edu or contact Stu Stabley, director of development, at (518) 276-8215 or stabley@rpi.edu.
THE CAUSE OF LOU GEHRIG'S DISEASE (amyotrophic lateral sclerosis, or ALS) has remained elusive since it brought down one of baseball's greatest players 60 years ago.

ALS starts "when good proteins go bad," says Wilfredo "Freddie" Colón, assistant professor of chemistry. Understanding just why they go bad is a necessary first step toward developing medicines that will help ALS patients live with a manageable disease instead of a death sentence.

"If we know what the pathological mechanism is, we could devise drugs to block it," Colón says. "Just knowing which protein is different is not enough. We need to do the biochemistry at the molecular level to understand what these mutations are doing to the protein."

The Rensselaer biochemist recently earned a $1 million, four-year grant from the National Institutes of Health (NIH) to support his study of the hereditary version of the disease, called familial ALS (FALS). He is attempting to understand why mutants of the enzyme superoxide dismutase (SOD1) fail and misfunction in FALS.

On average, FALS strikes people at around 47 years of age, says Colón. Most patients die within two to five years. But some patients, whose proteins exhibit a different kind of mutation, experience a very slow progression and can survive for as long as 18 years, he says.

The existence of the enzyme mutants associated with this "milder" form of FALS makes it an intriguing biophysical and biochemical marker. Unlocking the mystery of the pathogenic causes for familial ALS could also play an important role in better understanding other neurogenerative diseases, such as Parkinson's and Alzheimer's.

According to the NIH, ALS is one of the most common neuromuscular diseases worldwide. There is no known cure for the disease that eventually paralyzes and kills its victims.
FOCUS ON... MARK SMITH

To many students, Dean of Students Mark Smith is their connection to Rensselaer and success.

With the mission to ensure that every Rensselaer student graduates, Smith has made his top priority to create an environment that eliminates as many obstacles as possible for students to complete their degrees. He also hopes that, along with their diplomas, they'll take with them positive memories of Rensselaer.

That mission requires Smith to wear many hats. He serves as counselor, problem solver, miracle worker, financial-aid officer, grant writer, and friend—to name just a few.

"Mark Smith is the quintessential student-focused administrator. Anyone who has worked with Mark or even just had the pleasure to talk with him knows he is sincere and compassionate and truly cares about students," says Gil Valadez '02, who served as the 2001-2002 Grand Marshal. "I have personally seen him give up evenings on a weekly basis to work with students."

In addition to his role as student supporter, Smith also is the chief disciplinary figure on campus.

"Rensselaer's goal is to graduate students with a positive educational experience and some loyalty to the university," he says.

"To accomplish this, we have to address myriad issues that pertain to the college transition, financial difficulties, and behavior not consistent with the mission of an academic institution—whatever the problem is at hand. Each case is different. No two students are the same. My job is never boring."

Smith, who has served in higher education for more than 20 years, was appointed dean of students in February. He joined Rensselaer in 1986 as assistant dean of students and director of academic support programs. In 1995, he was named director of the Office of Minority Student Affairs (OMSA) after a nationwide search.

Since then, Smith has established many corporate and professional contacts for students seeking internships, co-ops, and job placement. He has been at the forefront of Rensselaer's curriculum development for pre-college and pipeline initiatives to attract talented high school students to Rensselaer.

Smith received a bachelor's degree from Northwestern University. He earned his master's degree at the University at Albany and became certified as a biology and chemistry teacher. He earned a certificate of advanced study in educational administration and supervision at SUNY Cortland.

As the dean of students, Smith oversees OMSA, International Services for Students and Scholars, Greek Life, Judicial Affairs, and Disabled Student Services.

In addition to counseling up to a dozen students a day in one-on-one sessions, Smith also meets regularly with various student groups and clubs across campus. He's known to show up at cultural events long after typical work hours are over.

"I have stayed at Rensselaer for more than 15 years because of the opportunities to learn, to teach, and to change lives of those who become so important to our future—young men and women who cross Rensselaer's threshold," Smith says. "Most of them are Rensselaer students, undergraduate and graduate. Some are high schoolers, and the rest are parents, teachers, or community members who have an interest in keeping the pipeline open and flowing freely into and out from Rensselaer. This is the joy and excitement that Rensselaer holds now and for the future."

CINZIA ABBATE, adjunct associate professor of architecture and director of the Roman Studies program, was honored at the Energy Globe Award gala dinner, celebrating the best international projects that used renewable energies. Abbate's innovative photovoltaic roof for the Children's Museum of Rome was one of the best 10 selected among 1,300 projects from 98 countries.

CAREN CANIER, associate professor of arts, received the Distinguished Alumni Award for 2002 from the College of Fine Arts at Boston University. Her paintings were on exhibit at the university's Sherman Gallery through April.

LUCIANO CASTILLO, assistant professor of mechanical, aerospace, and nuclear engineering, won the Robert T. Knapp Award from the Fluids Engineering Division of the American Society of Mechanical Engineers. Castillo's paper, "Characterizing Turbulent Boundary Layers Subject to Strong Adverse Pressure Gradient With Eventual Separation," was recognized as an "outstanding original paper resulting directly from analytical or laboratory research." The award will be presented at the Summer Fluids Engineering Conference in Montreal.

DANIEL FREEDMAN, assistant professor of computer science, has been awarded a Faculty Early Career Development (CAREER) Award from the National Science Foundation. The CAREER Award is the NSF's most prestigious honor for faculty...
MILESTONES

members who are at the beginning of their academic careers. Freedman’s $350,000 five-year grant will enable him to develop a new automated visual tracking system that can improve surveillance and MRI technology. He will develop algorithms that would be able to track people for surveillance purposes using conventional cameras as they move through buildings.

LESTER GERHARDT, professor and associate dean of engineering, was selected by the ASEE (American Society for Engineering Education) Research Council as the first recipient of the Research Administration Award, given for administration, development, and innovation in research. This includes achievement in developing and supporting programs that lead to substantial research success of colleagues; achievement in the development and implementation of a major research initiative that has a substantial positive impact on research; promotion of research and development excellence; and major innovations in the administration of research excellence.

PRABHAT HAJELA, professor of mechanical, aerospace, and nuclear engineering, has been named a fellow of the Aeronautical Society of India. Hajela was recognized for his distinguished record of teaching and research in structural and multidisciplinary optimization of aerospace systems. He is internationally recognized for seminal contributions in the adaptation of evolutionary algorithms, neural networks, and fuzzy logic in problems of large-scale multidisciplinary design.

MARK HOLMES, chair and professor of mathematical sciences, received a 2002 Award for Innovative Excellence in Teaching, Learning and Technology during the 13th annual International Conference on College Teaching and Learning. The award is given to recipients "based on their highly creative contributions to teaching, learning, and technology at their respective colleges and universities."

WILLIAM PEARLMAN, professor of electrical, computer, and systems engineering (ECSE), has been named director of the Center for Image Processing Research (CIPR). Pearlman will lead the center in its mission to conduct research in the various aspects of image processing encountered in many fields, such as telecommunications, optical information processing, medicine and biology, and computer graphics. CIPR was formed in 1978 as an expansion of the ECSE’s Image Processing Laboratory.

DAVID RAINNEY ’77 has been appointed acting vice president for Rensselaer at Hartford. Rainey, clinical associate professor and chair of the Hartford Department of the Lally School of Management and Technology, will work closely with Virginia Gregg, vice president for finance, Curtis Powell, vice president for human resources, and Bud Peterson, provost, on the day-to-day operation of Rensselaer at Hartford. Rainey also will finalize the performance plan and budget.

ZVI RUSAK, professor of mechanical, aerospace, and nuclear engineering, has been named associate fellow of the American Institute of Aeronautics and Astronautics. Rusak, recognized for his pioneering research in vortex flows and transonic aerodynamics, provided the first relatively complete theory of the vortex breakdown phenomenon, a problem that had remained unsolved for more than 40 years. His work has applications in the aerodynamics of high-performance fighters and large transport airplanes, helicopters, the design of modern combustion systems, hydrocyclon separators, chemical mixers, and meteorology.

KIRSTEN VOLPI has been named assistant vice president for finance and controller at Rensselaer. Volpi is Rensselaer’s chief accounting officer. Volpi will have overall responsibility for managing financial reporting, systems, and operations. Her work will include establishing accounting policies and procedures to ensure Rensselaer’s financial resources and operations are utilized prudently and in compliance with all external financial regulations.
“[Science] urges on us a delicate balance between no-holds-barred openness to new ideas, however heretical, and the most rigorous skeptical scrutiny of everything—new ideas and established wisdom.” —Carl Sagan, from his book *The Demon-Haunted World*

**The fuss over fusion**

Richard Lahey ’64, the Edward E. Hood Professor of Engineering at Rensselaer, was on the phone for about five hours on March 4 to answer questions from reporters about “bubble fusion,” a possible new technique for creating fusion that was reported in the March 8 issue of *Science* magazine. The announcement sparked an explosion of debate in the international scientific community and generated widespread media attention.

Lahey and Rusi Taleyarkhan ’78 are part of a team of researchers who reported the observation of phenomena that could point to the possibility of nuclear fusion using a novel technique for plasma confinement. Ultrasonic waves were used to implode small cavitation bubbles of deuterated-acetone vapor. The team said that, during bubble implosion, evidence pointing to nuclear emissions and sonoluminescence light flashes was observed. They also observed evidence of tritium, which could suggest the fusion of deuterium atoms in the highly compressed bubbles.

The experiments were conducted at Oak Ridge National Laboratory by a team led by Taleyarkhan, who earned his doctorate in nuclear science under Lahey’s tutelage. Lahey and Robert Nigmatulin, a visiting scholar at Rensselaer and a member of the Russian Academy of Sciences, performed the theoretical analysis of the bubble dynamics and the shock-induced pressures, temperatures, and densities in the imploping bubbles. Robert Block, professor emeritus of nuclear engineering at Rensselaer, helped to set up and calibrate a neutron and gamma detection system.

Attempts to confirm the researchers’ results by looking for the telltale neutron signature of the deuterium fusion reaction have yielded mixed results. Additional experiments still are needed to verify neutron emission.


Donald Kennedy, editor-in-chief of *Science*, wrote, “Our mission is to put interesting, potentially important science into public view after ensuring its quality as best as we possibly can. After that, efforts at repetition and reinterpretation can take place out in the open. That’s where it belongs, not in an alternative universe in which anonymity prevails, rumor leaks out, and facts stay inside.

“It goes without saying that we cannot publish papers with a guarantee that every result is right,” Kennedy wrote. “We’re not that smart. That is why we are prepared for occasional disappointment when our internal judgments and our processes of external review turn out to be wrong, and a provocative result is not fully confirmed. What we ARE very sure of is that publication is the right option, even—and perhaps especially—when there is some controversy.”

The March 18 issue of *Business Week* magazine examined the controversy in the article “Is It Really Fusion This Time?” which follows here:
Fusion on a tabletop? Shades of 1989, when reports about cold fusion sparked headlines and wide-eyed fantasizing about cheap, clean, and unlimited power. Cold fusion fizzled, leaving scientists bitterly cheap, clean, and unlimited power. Commercialized, the technology would end the world's dependence on oil and eliminate the production of radioactive byproducts at today's nuclear power plants, which release energy by splitting atoms, not fusing them.

To date, the main—and ghastly—use of fusion has been in hydrogen bombs. No existing technology can both control and sustain such a fusion reaction in a way that could be used to generate electricity. Nuclear physicists have been trying ever since the first hydrogen bomb exploded in 1952. So imagine their surprise when a team of engineers asserts that they have developed a new method that may produce sustained nuclear fusion. The technique is called sonofusion—sound-triggered fusion—because it supposedly works by pumping ultrasound waves and a beam of neutrons into a modified form of acetone, a common solvent that's used in fingernail polish remover, for example.

Even though the new claim is already provoking a heated debate similar to the furor that engulfed cold fusion, this time the official announcement comes with the imprimatur of Science—and more than a year of peer reviews by leading scientists. While not all of the sonofusion reviewers voted in favor of publication, the report of tabletop fusion does come from an outfit well versed in nuclear physics: Oak Ridge National Laboratory. However, the team consists mainly of engineers, not nuclear physicists, hence much of the initial skepticism. In fact, even Oak Ridge management had second thoughts and asked two of its nuclear physicists to verify the work. They failed. The sonofusion team insists that the double-check effort was flawed. Claims and counterclaims have been flying across the Internet. "These guys are almost to the point of calling each other liars," says Seth J. Puttermann, a University of California at Los Angeles physicist and a reviewer for Science.

Clearly, getting published in Science doesn't guarantee acceptance. Claims of fundamental scientific breakthroughs, says William C. Moss, a reviewer and a physicist at Lawrence Livermore National Laboratory, must be held to the highest standards. Tabletop fusion would be potential Nobel Prize work, he explains, "so it's easy for people to lose their objectivity." But Moss isn't writing off sonofusion altogether. "In fact, I wrote a paper a few years ago saying that it might be possible."

The Oak Ridge team that took up that challenge is led by senior scientist Rusi Pesi Taleyarkhan. It consists of two other Oak Ridge researchers, plus Richard T. Lahey Jr., an engineering professor at Rensselaer Polytechnic Institute, and Robert I. Nigmatulin of the Russian Academy of Sciences. To generate the immense heat needed to fuse nuclei, they turned to an obscure phenomenon called sonoluminescence.

Sonoluminescence uses ultrasound energy to create little bubbles in a liquid—bubbles that grow to many times their original size, then swiftly collapse and disappear with a wink of light. It all happens in a tiny fraction of a second, so determining what goes on is extraordinarily difficult. Even after studying sonoluminescence for two decades, Puttermann can't say precisely how much heat is released by the imploding bubbles, but temperatures may reach as high as those in the sun.

Harnessing the sun's source of power would be the ultimate energy technology. In a world where fusion is possible, seawater could be fuel. A cubic kilometer of seawater contains as much energy as all the world's oil—in the form of deuterium, a "heavy" variant of hydrogen that has a neutron as well as a proton in its nucleus. And the oceans have millions of cubic kilometers of water.

However, five decades of painstaking fusion research have failed to tap the energy locked up in seawater. The two orthodox roads to forcing deuterium to fuse are expensive and confoundingly complex. Magnetic confinement, the leading candidate, would create an artificial sun suspended in a magnetic field, since no material can withstand temperatures of 100 million C. The other would use a football-stadium-size array of powerful lasers to zap little glassy spheres of deuterium. Both can achieve fusion, but only briefly, and they consume much more energy than they produce.

The latest hope for magnetic confinement is ITER, short for International Thermonuclear Experimental Reactor. The U.S., Canada, Europe, Japan, and Russia began designing it in the late 1980s. But when the price tag hit $10 billion, the U.S. had second thoughts and yanked its support in 1999. Since then, a redesign has trimmed the size of ITER and slashed the projected investment to $4.5 billion. Early this year, the U.S. began to think about rejoining the program. Groundbreaking for ITER is expected around 2003 or 2004.

ITER would cap a 50-year quest—but wouldn't end it. Fusionists have always said commercialization is at least 20 years in the future, and it probably still is. ITER is just one more stepping-stone to harnessing fusion energy. And despite fusion-research budgets in the U.S. of upwards of $250 million a year, scientists say they could use even more.
Even though the new claim is already provoking a heated debate similar to the furor that engulfed cold fusion, this time the official announcement comes with the imprimatur of Science—and more than a year of peer reviews by leading scientists.

So when a small group from outside the fusion Establishment claims it can produce fusion on a shoestring, researchers working on the big-bucks programs tend to worry about the future of their pet schemes. Rensselaer’s Lahey hints that this might have affected the replication effort by Oak Ridge nuclear physicists Dan Shapiro and Michael J. Saltmarsh. But Puterman points out that Shapiro and Saltmarsh measured something not in the Taleyrkhan team’s paper: correlating the detection of neutrons, which are one of the telltale signs of fusion, with when bubbles imploded; no meaningful relationship was found. Lahey retorts that Shapiro and Saltmarsh didn’t set up their instruments properly.

The first order of business is to end the bickering, says Lawrence A. Crum, a researcher at the University of Washington’s Applied Physics Laboratory in Seattle and a reviewer. “What matters now is to confirm whether there really is fusion going on. If this really is confirmed, there’ll be a bunch of companies started,” he predicts, to build bubble-fusion power sources.

Lahey is cautiously optimistic that his group’s design could turn into a big source of future energy. “The first step would be to increase the neutron yield by replacing the deuterium with tritium,” an even heavier form of hydrogen with two neutrons. Adds Taleyrkhan: “We’ve already filed patents on lots of ideas for scaling up.”

Even small units could find immediate markets. Applications would include sterilizing food, boosting the production of chemicals by raising the temperature of reactions, and producing the streams of neutrons needed for small, inexpensive detectors for sniffing out explosives at airports and remotely peering into cargo containers at sea-ports.

Actually, the entrepreneurial phase has already begun. Three years ago, engineer Ross Tessien founded Impulse Devices Inc. His Grass Valley (Calif.) startup has hired a leading sonoluminescence researcher—D. Felipe Gaitan, a protege of Crum’s—and is working on simulations of sonofusion reactors up to 20 feet in diameter that would create giant bubbles. Tessian is now negotiating with Los Alamos National Laboratory to verify his computer models.

Among the original sonofusion pioneers is Roger S. Stringham, a former researcher at SRI International. He co-founded First Gate Energies in the mid-1990s, and the Woodside (Calif.) company has recently built several demonstration sonofusion devices. He [discussed] his latest efforts on Mar. 22, during a final-day cold-fusion session at the American Physical Society’s Annual March Meeting in Indianapolis.

Session moderator Scott R. Chubb, head of Research Systems Inc. in Arlington, Va., predicts that researchers will eventually uncover “some very exotic reactions” that explain how tabletop fusion works. For instance, he suggests the physical dynamics of sonofusion “become deeply intertwined with electromagnetism,” causing deuterium to behave somewhat like electrons. “This is something you’d never expect to see in conventional fusion reactions,” he adds. As more physicists get intrigued by sonofusion in coming months, he anticipates many other surprises.

THE BEST DEFENSE

Anthony Tether '64, who holds one of the nation's most important high-tech leadership positions as director of DARPA, puts technology to work for our protection.

BY ALAN MOORSE

Anthony J. (Tony) Tether '64 was a reluctant presidential appointee. In early 2001, as President George W. Bush's transition team was working to fill myriad government positions with new appointees, a member of the team asked Tether to submit his resume.

Tether, who was operating a consulting firm in Newport Beach, Calif., ignored the request. Today, relating the story from his new office, that of director of the Defense Advanced Research Projects Agency (DARPA), he chuckles at his cavalier attitude.

"He called me back a week later and said 'Where's your resume?' I said, 'Oh yeah, I'll send it,' and again I ignored him," he says. "He called back the third week and said, 'Now, send in your resume today.' Well, I did. I figured I'd better. I thought maybe I'd get a consulting job out of it or something."

Next thing he knew he was deep in the appointment process for one of the nation's most important high-tech leadership positions. When the job was offered, he says, "I took it, and I haven't had any regrets."
DARPA is the central research and development organization for the Department of Defense (DoD). It manages and directs selected basic and applied research and development projects for DoD, and pursues research and technology where risk and payoff are both very high and in which success may provide dramatic advances for traditional military roles and missions.

According to Tether's predecessor, the job of managing the $2 billion-a-year agency isn't for everyone. In the 2000 Prime Book, a guide to top jobs in the federal government, former DARPA boss Frank Fernandez comments that the breadth of the agency's work would make any incoming director feel "like a post-doc, learning from scratch," even with a strong technical background and experience in defense-related research and development.

Add to that a directive from Secretary of Defense Donald Rumsfeld that the new director must make DARPA an entrepreneurial hotbed that will give the U.S. military the tools it will need to maintain the nation's access to space and to protect satellites in orbit from attack—and the job might seem downright intimidating.

But with years of experience in government and business, Tether has proved to be more than equal to the challenge.

Tether served four years as DoD's director of national intelligence (1978-1982) and was director of DARPA's Strategic Technology Office from 1982 to 1986. In that role, he managed projects to develop new surveillance techniques; satellite technology such as power sources, optics, and radio transmitters; stealth aircraft; and tools for antisubmarine warfare. Tether first went to Washington in 1978 from Systems Control Inc., a consulting firm he'd helped found in 1969.

The Teal Amber program, launched early in Tether's first stint with DARPA, was the technique used to clean up the Hart Senate Office Building. In many cases, DARPA funds research on a technology for years, then waits a decade or longer to see it in use, Tether says. For instance, the Global Hawk remote-operated, high-altitude reconnaissance plane, which can spend a day or more at a stretch aloft to bring commanders on the ground a clear view of the terrain and action around them, resulted from a project begun around 1978.

Its close-in cousin, the Predator, grew out of the Teal Amber program, launched early in Tether's first stint with DARPA.

Fortunately, DARPA usually works far in advance of current defense needs.

"We never wait for [military commanders] to tell us what they need," Tether says. "We basically develop technology capabilities based on a more long-range perspective of what threats could exist and what could happen if we had the technology."
transition team found him when they needed a new boss for DARPA.

RENSSELAER TO THE RESCUE

Tether’s rise to national prominence almost was cut short when he ran out of money as an undergraduate at Stanford. He credits Rensselaer for taking a chance on admitting him as a transfer student who initially did not have the funds to pay tuition.

A native of Middletown, N.Y., Tether earned an associate’s degree at Orange County Community College, then transferred to Stanford University, where he eventually earned a Ph.D. in electrical engineering, to study applied mathematics. By mid-year, however, he was out of money and headed homeward to find a school within New York state where he could complete his degree, since attending an in-state school would qualify him for state loans.

Classmates from Orange County had transferred to Rensselaer and gave it good reviews, so he drove to Troy to look the campus over and while there stopped by the admissions office.

Some of the admissions staff were incredulous at a walk-in transfer applicant from Stanford, he says, but they went out of their way to help him. In less than two weeks, he was in.

Soon after, he found himself in the registration line, signing up for classes and dreading the last stop: the bursar’s table. His state loans hadn’t come through yet. He had no way to pay.

Luckily, he recognized among the registration staff one of the helpful admissions officers. When he explained his situation, the man—whose name he wishes he could remember—confessed with other officials and arranged to let him attend on credit until his loans cleared.

Without that combination of kindness and coincidence, Tether says, “I don’t know where I’d be today.”

Where Tether is today, 40 years later, is in a position to make the nation more secure and, perhaps, to change the world.

A TECHNOPHILE’S DREAM JOB

The DARPA director’s job description reads like a technophile’s dream: oversee a lean agency, staffed with exceptionally talented people who look to the future, especially the far future, envision technologies that could be, and make them happen, all with minimal bureaucratic overhead. The agency’s specialty is investment in high-risk research that yields, in some cases, revolutionary technologies. Often, it provides the impetus to get a new technology off the ground.

“It’s a neat job to have because you see many, many things, and you have the brightest of the brightest constantly briefing you,” Tether says. “We have projects in almost anything you can imagine.”

DARPA has played a role in the development of myriad technologies, from the Saturn launch vehicles for the Gemini and Apollo programs in the 1960s and 1970s, to more recent innovations such as packet switching, stealth aircraft, high-power lasers, and the semiconductors in the heart of cell phones.

But the agency doesn’t do R&D, it funds and manages it, relying on university and industry teams to make the advances it envisions. And when projects succeed, DARPA hands off the new developments to the armed services or the companies and universities that did the work.

“If I could get somebody to make an edict that anything that had DARPA technology in it had to have a sticker put on it called ‘DARPA Inside,’ there wouldn’t be anything in the Department of Defense that wouldn’t have a sticker,” Tether says. “And I would say there’s probably a large percentage, if not even more than 50 percent, of all things out in the commercial world that also would have a ‘DARPA Inside’ sticker put on them.”

Others share his opinion. In a column published last fall in Technology Review, Michael Dertouzos, former director of the MIT Laboratory for Computer Science, wrote, “DARPA has been responsible for about one-half of the major innovations that have made information technology what it is today.”

The agency has been a veritable treasure chest of new military technologies, including the Tomahawk cruise missiles used in Operation Desert Storm a decade ago, which were propelled by engines DARPA helped develop, and the stealth aircraft and precision weapons that first saw battle against Iraq.

PREPARING FOR THE WAR ON TERRORISM

DARPA has been on the front lines of the war on terrorism since the early 1990s, when it began developing tools for detecting, understanding, and countering terrorist networks. It launched projects in evidence extraction and link discovery, creating systems to detect and track terrorist networks, and in behavioral analysis and group dynamics, working toward systems that potentially could predict what such groups will do. It also convened projects to counter biological threats, developing systems to detect bio-warfare agents and searching for vaccines to protect against them and medicines and decontamination techniques to neutralize them.

Bucking trends in the pharmaceutical industry, where drugs are increasingly specialized, DARPA has led a search for a single drug that could be used to fight multiple “bugs,” Tether says. Its team has found a promising characteristic among the exotic pathogens under study—a few shared segments of genetic code that don’t occur in humans. If it can find a drug that will attack those segments, DARPA may have the key to a “one drug, many bugs” defense against biological attack.

Tether accelerated these long-term efforts following Sept. 11 and last fall’s anthrax attacks.

He created a new Information Awareness Office, which is building a prototype information awareness system to see whether such technology really can recognize terrorist organizations. He also is pressing ahead a program called “War-gaming the Asymmetric Environment,” designed to predict terrorist behavior well enough that forces fighting them can pre-empt future attacks.

Tether describes the systems as an information-age version of the DEW Line, the string of radar emplacements that watched Arctic skies for signs of attack during the Cold
War. The difference, he says, is "we're not looking for bombers. We're not looking for missiles. We're looking for groups of people who seem to be gathering to do something evil to the United States."

Tether leads 220 DARPA employees in three mission areas: finding technical solutions to national-level problems, providing technologies necessary to give our armed forces operational dominance, and developing and exploiting high-risk, high-payoff core technologies for military use.

Link discovery falls under operational dominance, along with projects to create affordable, precision systems for finding and striking elusive targets such as mobile anti-aircraft missile systems; technologies for repelling attacks by large numbers of simple cruise missiles; devices for identifying people from a distance; and a clandestine communication system for soldiers working in buildings, jungles, tunnels, or mountains.

Other projects under this heading are devoted to producing pilotless airplanes for the Air Force and Navy that will be supervised by a human pilot on the ground but will work without constant human control (see "Airborne Robot"); a pilotless helicopter for the Army; miniature air-robots to serve as combat scouts; and tools to help ship designers create faster, more efficient vessels.

Core technology projects may produce software to enable computer systems to learn so future robotic vehicles can navigate on their own; computer systems that monitor themselves and can "heal," that use less energy, and that can adapt their operations to meet changing needs; microsensors that when scattered on a battlefield could organize themselves into an ad-hoc network and send surveillance information back to headquarters; and non-silicon-based semiconductors that take advantage of quantum effects.

DARPA researchers also are working on projects that could yield shoebox-size, legged robots; exoskeletons to be worn by soldiers; methods for printing electronic circuitry onto the fibers of clothing or other surfaces; aircraft able to change the shapes of their wings in flight; ways of allowing soldiers to stay awake and alert for up to a week at a stretch without ill effects; and fast-healing technologies.

Tether often qualifies descriptions of these potential new technologies with "if we can do this" and "if this works."

MONKEY BUSINESS

Of course, in its 44 years, DARPA has turned countless "ifs" into reality, and in doing so has helped change the world.

Tether says he does see a revolution in one project now under way: the Brain Machine Interface program.

In this program researchers appear to have found a way to tap a monkey's thoughts to control a robot arm. The monkey, in a North Carolina laboratory, was trained to move a joystick when it saw a signal. Electrical impulses in its brain were used to control a robotic arm and move a joystick in a lab at MIT. When the monkey's joystick was taken away and the signal given, the monkey didn't move, but the robot arm did.

The researchers thought they had tapped into the motor signal that controlled the monkey's muscles, Tether says, "but they actually had tapped into the thought signal. The monkey was thinking about moving the joystick, and that is what was transmitted and moved the joystick up at MIT."

DARPA has launched a major program in this area in an effort to determine the mental codes and how feedback can be delivered, he says. If that can be done, it would open the door to mental control of computers and other systems, plus the possibility of brain-to-brain communication. In civilian life, it could mean thought-controlled prostheses that move as though they are flesh and blood.

"I don't know how long it's going to be, but I do know that this is going to happen," Tether says. "This one, if we can do it, will truly be revolutionary."

Alan Morse is a freelance writer living in East Greenbush, N.Y.
RENSSELAER’S DARPA-FUNDED RESEARCH

DARPA’s mission under the leadership of alumnus Tony Tether ‘64 resonates with the Institute’s priorities as stated in The Rensselaer Plan. The research DARPA supports at Rensselaer aligns to the university’s strategic initiatives in information technology (projects in networking, pervasive computing, and new types of micro- and nanoscale devices) and in biotechnology (sensors and other technologies at the intersection of biology, information technology, and the physical sciences), says Arthur Sanderson, vice president for research.

Although DARPA contracts account for less than 10 percent of research activity on campus, the agency is a valuable partner, Sanderson says. DARPA, with the armed services’ R&D organizations, is “one of those important agencies that work with universities on basic research and continue that support through development of applications,” he says.

In other words, the agency identifies a need, and then supports work to satisfy it.

Following is a rundown of some of Rensselaer’s current DARPA-funded research projects:

PAUL CHOW ’82, professor of electrical, computer, and systems engineering (ECSE), leads a team of Rensselaer researchers developing efficient electronic switches for high-power applications.

Modern combat vehicles, such as tanks and reconnaissance vehicles, use hybrid diesel-electric drives, which are energy efficient and easier to control, as well as less vulnerable, than purely mechanical drive systems, Chow says. They do, however, require semiconductor switches that can handle hundred-kilowatt to megawatt-scale loads.

Chow’s team is developing power switches based on silicon carbide, a specialty semiconductor that is under study within Rensselaer’s Center for Power Electronics Systems. These switches will, he says, be more efficient than today’s silicon-based switches and able to operate at higher temperatures, reducing the need for equipment cooling. Besides land vehicles, these SiC devices also have a big impact on power electronics systems in naval ships and airplanes.

SHIVKUMAR KALYANARAMAN, assistant professor of ECSE, has participated in several DARPA-funded projects at Rensselaer related to computer networking, and recently received funding for a new one.

The new project, titled “Measurement Driven Overlay Quality of Service Control Using Closed-Loop Techniques,” unites his earlier work in two areas: quality of service, which means providing different levels of service to different user segments, and solving problems of network congestion.

The new techniques he is developing will allow quality-of-service controls to be overlaid onto existing networks.

He also has a vision for networks of embedded systems, the computing systems built into military hardware, which may become still another project for DARPA.

JOHN MCDONALD, professor of ECSE, began working on DARPA projects to develop faster computer chips more than a decade ago.

In several projects, he says, the focus was on designing circuits using DARPA-sponsored advanced fabrication processes, first for gallium arsenide semiconductors, and more recently for silicon germanium.

Now, his team is working on high-speed, field-programmable circuits, what he calls “soft hardware.” Such circuits, he says, will be generic gate arrays that can be reconfigured dynamically to serve different functions. Made with SiGe, the circuits will be able to “change personalities on a dime,” he says.

McDonald also is working with Ronald Gutmann, professor of ECSE, on another DARPA project exploring techniques for assembling multi-level chips, including those with different types of layers, providing electronic and photonic circuits on a single chip.

MICHAEL SHUR’s first DARPA project expanded a system he and three colleagues had developed.

The system, called AIM- spice, is used to model sub-micron electronic circuits. DARPA funding allowed the team to add photonic systems to the simulator.

Shur, the Patricia W. and C. Sheldon Roberts 48 Professor of Solid State Electronics, currently is working on plasma wave electronics, circuits that would function not on the flow of electrons, as current systems do, but on waves traveling through the electrons. Such circuits, which would operate at exceedingly high frequencies, would be useful for detectors and for short-range communication, he says.

Shur also is a subcontractor on three other projects. One project is related to printing nanostructures onto surfaces. The second focuses on building high-power amplifiers using nitride semiconductors, and the third deals with ultraviolet light-emitting diodes for detection of biological hazardous agents.

BOLESLAW SZYMANSKI, professor of computer science, leads a current DARPA project and has been involved in a series of others in the area of computer networks. In the first project, he and two colleagues worked with Lucent Technologies on distributed measurements of network performance and prediction of network problems. The technology developed in this project became a basis for the company, Premonitia Inc., started last year with the help of Rensselaer alumni.

A second project focused on use of simulation to evaluate and choose the best available set of parameters for the current network operating point. Another project focuses on the scalability of network simulation and modeling of network traffic. The Genesis simulation system developed by Szymanski’s team enables online, collaborative simulation of wired and wireless networks in support of automated network management.
Marshall Brain '83 has created an industry around telling people "how stuff works".

SULTAN

Marshall Brain '83 is a self-described "curious guy." From a young age, Brain (yes, it is his real name) has wondered about the inner workings of everything from a car engine to his father's electronic garage door opener. Brain has turned that boundless curiosity into a successful, award-winning media company called HowStuffWorks Inc. The Web site "HowStuffWorks.com" is the flagship of the operation and was named by Time magazine as one of the "50 Best Websites" for 2002. The site features more than 650 articles that explain the inner workings of everything from diamonds to chocolate to a rotary engine, as well as hypnosis, cell phones, home appliances, audio electronics, holiday traditions—you name it and Brain or one of his staff members is researching and writing about that topic right now. Visitors even can learn how the site itself works. Brain's Raleigh, N.C.-based company also offers: HowStuffWorks Express, a magazine designed to bring science, technology, and the Internet into classrooms that reaches almost 1 million students and teachers. Two books published last year: Marshall Brain's How Stuff Works and How Much Does the Earth Weigh? Two new books, More How Stuff Works and What If?, will be published in the fall. TV and radio spots syndicated to stations around the country. Articles syndicated to newspapers, magazines, and Web sites including The Los Angeles Times and USA Today. Consulting services to help companies communicate their products to consumers, train internal sales teams, and produce training materials. "Our company's core competency is explaining things clearly," Brain says.  

OF STUFF
FROM "HOW SINGING FISH WORK"

You've probably seen one at a store in the mall, at the flea market or on television. Looking deceptively like a normal stuffed fish mounted on a plaque, it is actually a robot that begins to sing and move when someone walks up to it. As the fish swings his head out from the plaque, he lip-syncs to a prerecorded 30-second clip of a popular song or spits out a savvy one-liner.

The singing fish is actually a very simple robot. It has its own power supply, it senses its environment and acts autonomously on what it senses, it moves in fairly complex patterns, and it vocalizes—in other words, it meets all of the qualifications of a robot!

The fish's skeleton has three moving parts: The tail, which flaps back and forth; the body, which swings out and away from the plaque; and the mouth, which moves up and down to simulate singing.

When power is supplied to the motor, the lower jaw opens. As soon as the motor stops, a spring causes the jaw to close. By starting and stopping the motor repeatedly, the jaw opens and shuts, making it appear as if the fish is singing. All three of the motors work in this way—applying power to them moves the associated body part in one direction, and the spring moves it back.

With about 3 million unique visitors each month, the Web site is the backbone of the company, which was founded two years ago. Brain says investors were drawn to the site because it initially attracted 100,000 visitors a month with zero dollars spent on advertising. In contrast, Brain says, there were online companies—now defunct—that "burned through $100 million in advertising just to get the same traffic as HowStuffWorks."

Brain's talent for explaining a wide range of topics in clear, easy-to-read-and-digest prose has earned him praise from the media and a thriving business amid the burst of the Internet bubble. Forbes cited HowStuffWorks as "a great reference tool for parents and inquisitive children," while CNN warns "Pack a lunch, you'll be at this site for hours."


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The site's advertisers also are banking on its addictive nature—a process explained in the article "How Web Advertising Works."

Brain created a page on his personal Web site where he would post his articles on topics targeted toward teenagers. His first entry was "How Car Engines Work."

"I would sit down and think about what I'm curious about" and what interested him as a teenager, says Brain, who also describes his teenage self as a "geek." Brain quickly found kindred spirits intrigued by the same topics, and the site grew by word of mouth—and the click of the mouse—from just two visitors a day to 3 million a month today, ranking it among the top 400 U.S. sites on the Web. Six months after posting his first article, the site had enough traffic to warrant its own domain, and...
Attention from the cyber and media worlds followed. "The first mention was on Netscape Netscenter 'site of the day,' and then it appeared on Yahoo!, USA Today, and other places," says Brain, who is still mystified by all the acclaim his site has garnered. A breakthrough, he says, was winning the Cool Site of the Day's annual "Cool Site of the Year Award" for 1998. "At the time it was the biggest award on the Web, and winning it got my attention.

"I'm a guy working at my kitchen table, on weekends, by myself, and there were 60 sites nominated with millions of dollars and staffs of 100. That told me there was something here that might be developed."

Brain realized he had tapped into a large market of Internet users: the chronically curious. "If you're a curious person, you look at this site and you love it," he says.

With a full-time staff of 20 writers, editors, and artists at HowStuffWorks Inc., the Web site is updated daily with feature articles often on topics related to current events. When the Russian nuclear submarine Kursk sank in August 2000, the site posted an article on how subs work within 24 hours. Following Sept. 11, visitors to the site have expressed a lot of interest in information about military hardware, terrorism, and why the World Trade Center towers collapsed, so articles on those topics were produced. More than 6,000 e-mail requests a month from users and discussions on the site's forums also generate topics for articles.

Brain is the quintessential life-long learner who is driven to teach others, especially young people. In fact, in 1997 he self-published The Teenager's Guide to the Real World, a book, Brain says, "I wish someone had handed me when I was a teenager." It was named by the New York Public Library as one of the top 50 books for teens. The book offers advice to teens on how to get adults to take them seriously, how to improve confidence and self-esteem, how to make smart choices about sex, and how to manage money and plan for success, among many other topics. "I wondered why didn't someone tell me all this stuff as a teenager," Brain says. "Being rejected, for example, is devastating to everyone except perhaps the captain of the football team. When you're older, you understand it better, but I didn't think anyone was giving teenagers that perspective now."

Brain says he had a particularly tough time in high school, an experience made worse by the loss of his father before his 15th birthday. David Brain was an aeronautical engineer for McDonnell Douglas and worked on the Apollo missions in the 1960s. Brain remembers his father as a "tinkerer" who always "took apart and put stuff together and created serious and goofy stuff." He constructed the family's stereo system from scratch and made a bubble machine and built radios with his son. Unfortunately, Brain says, just when "my brain was getting to a point where I could understand what my father does in his work, he passes away." But he believes his fascination with the intricacies of machines and systems may be hardwired into his brain. It certainly was a major influence in his early years growing up in California.

Brain arrived at Rensselaer as an electrical engineering major who intended to design and build computers. His need to learn broadly—and quickly—led him to take junior- and senior-level courses as a freshman. "I learned what I really wanted to learn amazingly early at RPI." He also spent a lot of time at the School of Architecture. "They were cool people, had a great library, and lots of project demonstrations on the lawn that I attended," he says. Brain adds that the small campus and interconnected disciplines were perfect for his hungry mind. In fact, his favorite professor was the late Douglas Washburn, a member of the language, literature, and communication faculty in the School of Humanities and Social Sciences from 1949 to 1986. "I was not a writer in college," Brain says. "Now, of course, it's a big part of what I do." He remembers Washburn's writing exercises to help students describe what they were seeing in ways that would
FROM “HOW BREAD WORKS”

Bread is a bio-chemical technology for turning wheat flour into something tasty!

If you pick up a slice of bread and examine it closely, you can see that it is full of air holes. This makes it spongy and soft. You will also see that bread is moist. If you let a slice of bread sit out on the counter for a day you will realize just how moist fresh bread is!

Bakers use two simple facts of life to create soft, spongy, moist bread:

First, they use the fact that yeast (a single-cell fungus) will eat sugar, and from the sugar create alcohol and carbon dioxide gas as waste products. The carbon dioxide gas created by yeast is what gives bread its airy texture (and the alcohol, which burns off during baking, leaves behind an important component of bread’s flavor).

Second, wheat flour, if mixed with water and kneaded, becomes very elastic. The flour and water mixture in bread becomes stretchy like a balloon is stretchy because of a protein in wheat known as gluten. Gluten gives bread dough the ability to capture the carbon dioxide produced by yeast in tiny flour balloons.

be compelling to readers—very much like his writing assignments today. “One day for class we sat looking at the [Voorhees Computing Center] to think about how we would describe it,” Brain says.

Brain’s off-campus adventures were educational as well. He was fascinated by the 19th-century industrial history of the Capital Region—“it was the Silicon Valley of the mid 1800s”—and he and a friend would often explore the old mill and factory sites in Troy and Cohoes. “This was the place to be technologically,” Brain says. “The history is unbelievable.” He was fascinated especially by the remnants of the old Erie Canal—the engineering feat of its day—that had been abandoned when a newer canal was built in the early 20th century to carry larger vessels. To Brain, attending Rensselaer brought him closer to how things worked a century and a half before he arrived in Troy.

From “How E-mail Works”…

The first e-mail message was sent in 1971 by an engineer named Ray Tomlinson. Prior to this, you could only send messages to users on a single machine. Tomlinson’s breakthrough was the ability to send messages to other machines on the Internet, using the @ sign to designate the receiving machine.

An e-mail message has always been nothing more than a simple text message—a piece of text sent to a recipient. In the beginning and even today, e-mail messages tend to be short pieces of text, although the ability to add attachments now makes many e-mail messages quite long. Even with attachments, however, e-mail messages continue to be text messages.

These days, Brain is doing real-life research into “How Twins Work.” In early April his wife gave birth to twin boys, who join the Brains’ other two children ages 4 and 2. “I haven’t gotten a lot of sleep lately,” says the proud but overwhelmed father.

“How Twins Work” seems like a logical article to be working on but now I’m just trying to get over the shock,” he says with a chuckle. “The twins have strong lungs and good endurance at night.”

Meanwhile Brain continues to expand the HowStuffWorks franchise. This fall, he will host “HowStuffWorks at the Movies” on TBS Superstation. Based on the network’s popular “Dinner and a Movie” feature, the show will wrap a movie in hosted segments that demonstrate how things work. Brain will explain everything from common items such as an alarm clock to how Hollywood creates special effects. He’ll appear during the broadcast of about 40 movies on the network over the course of a year. Brain is excited about this newest deal with the cable network and the opportunity to explain how stuff works to an even larger audience.

For Brain, the evolution and growth of his company keeps confounding his expectations. “It’s amazing to me how well the whole idea of ‘how stuff works’ works in all these different mediums.”

For Brain, the evolution and growth of his company keeps confounding his expectations. “It’s amazing to me how well the whole idea of ‘how stuff works’ works in all these different mediums,” he says. A series of home videos on topics such as “How engines work,” for example, is yet another project under way. While he prefers not to speculate on the future of the company—“you never know what will happen down the road”—he continues to explore other possibilities for TV, radio, and even for large arena events, anywhere the “how stuff works” concept might take hold.

“One bit of advice I wish I had gotten in college is to take business classes. I should have gotten an MBA or minored in business,” Brain says. “You often end up doing something with your life you didn’t train for.” But Brain seems to know how business works just fine.
Class Notes

Class Notes Deleted for Privacy Concerns
I JUST CALLED TO SAY “THANK YOU”

THE OFFICE OF ALUMNI RELATIONS AND THE Red and White Student Alumni organization recently conducted the first alumni volunteer “Thankathon.” In March, student members of Red and White—a group of student volunteers who serve as ambassadors for Rensselaer and represent the university to alumni, campus, and the community—contacted nearly one thousand alumni volunteers to offer a simple “thank you” for their service and commitment to Rensselaer.

Each year, the student group engages in a special project to help the Rensselaer community, and in particular the RAA. “We decided the Thankathon would be a great project for us this year,” said Cosmo Marfone ’00, co-president of Red and White. “Our members were excited to talk to alumni volunteers.”

Over the course of six days, 925 alumni—or 80 percent of the list of volunteers—were contacted. The students reached enrollment managers, mentors, board members, chapter leaders, and Reunion volunteers. New and former volunteers were called to recognize their many contributions and the important roles they have played in moving Rensselaer forward.

“The call I received from the Rensselaer student thanking me for my volunteer efforts was a really nice surprise,” says Sandeep Nandy ’94. “I was not home the first time they tried to reach me, but the individual was persistent and called me a second time. In life, we don’t get a lot of compliments for completion of our daily tasks. It was a really nice gesture and made me feel appreciated and that my work matters.”

The program’s concept is simple: the best student volunteers contact the best alumni volunteers. According to David Bohan ’82, director of alumni relations, “The Thankathon was a big success, from both the alumni and student viewpoints.”

“I had to convince some of the alumni I spoke to that this was simply a call to say thanks—nothing more than that,” says Audra Baroni ’04. “It was a treat to make those thank you calls to our alumni.”

ALUMNI TRAVEL TOURS 2003

The RAA sponsors tours to exciting destinations around the world at a great price. Alumni of all ages can travel with a group of people who are sure to share their interests—fellow Rensselaer alumni. For more information, contact program coordinator John Buckley ’49 at (518) 274-6562 or write to him c/o Alumni Relations, 1301 Peoples Ave., Troy, NY 12180.

NEW CAREER TOOLS FOR ALUMNI

Rensselaer alumni have free access to CareerTools, a comprehensive job search and career management site that includes resume templates, a job site index, research resources, a career wizard, networking resources, and more. CareerTools is offered through Rensselaer’s partnership with ExecuPlanet and Lee Hecht Harrison LLC. Go to www.alumni.rpi.edu/career.html for more information.

E-MAIL FOR LIFE

All alumni as well as current seniors, juniors, and graduate students are eligible for a free “@alum.rpi.edu” e-mail account. The easy-to-establish browser-based account can be used from any computer with Internet access. Additional features include the ability to forward mail to and from another e-mail address, create folders, set up a vacation reply, send and receive messages with attachments, and change user passwords. Yahoo Mail users take note: Yahoo will soon be charging for its mail-forwarding feature. To sign up, visit AlumServ at www.alumni.rpi.edu and click on the “E-mail for Life” tab.

SHOP FROM HOME!

The Rensselaer Union Bookstore’s online catalog offers T-shirts, hats, baby clothing, hockey souvenirs, glassware, decals, and much more. Now you can shop online for your favorite Rensselaer logo merchandise.

Visit http://bookstore.rpi.edu/
PROFESSIONAL CONNECTIONS

WORKING THE RENSSELAER NETWORK!

John Bogdan '86, senior scientist at Baxter BioScience in Columbia, Md., decided to attend a recent regional alumni event because the subject area was of interest, and because he hoped to make new connections in his field. His success in making those connections confirms once again that the Rensselaer alumni network is a potent tool for professional growth.

The event, “Rensselaer at the Cutting Edge: The Human Genome Project and Beyond,” was held in March in Rockville, Md. Focused on biotechnology, it featured a joint presentation by Claire Fraser '77, president of The Institute for Genomic Research, and Jonathan Dordick, Rensselaer’s Howard P. Isermann '42 Professor of Chemical Engineering. Fraser and Dordick discussed leading-edge genomics research from the perspectives of industry and academia.

Bogdan met alumni from all facets of the biotechnology field, representatives from the National Institutes of Health, as well as Shreefal Mehta, research assistant professor of management at Rensselaer. This connection brought Bogdan back to campus as a representative of his company, where he met with students who have formed a biotechnology group. He’s also developed new ties in the field for his own professional growth.

His is just one of many stories that continue to come out of Rensselaer alumni affinity and networking activities. The Office of Alumni Relations, in partnership with local alumni chapters and alumni affinity groups throughout the U.S., will continue to sponsor events like this to support the clear demand from Rensselaer alumni to learn about cutting-edge research and to grow the thriving alumni network. Affinity areas of particular interest for growth are biotechnology, information technology, entrepreneurship, intellectual property/commercialization, and building technologies/trades. If you are interested in getting involved, contact Kathy Kinsey at (518) 276-2832 or kinsek@rpi.edu.

ALUMNI DATEBOOK

AUGUST 2002
NEW STUDENT WELCOME BARBECUE

The RAA, in conjunction with the Office of the First Year Experience, sponsors a barbecue to welcome students to the Troy campus. Alumni who will be in the area are invited to join us for the barbecue, and to welcome the newest members of the Rensselaer community. Contact Alumni Relations at ALUMNI@RPI.EDU or (518) 276-6205 for more information.

JUNE 12-15, 2003
REUNION 2003

If your class year ends in a 3 or 8, make plans now to join the rest of your classmates for next year’s milestone Reunion. Volunteers are being sought to help with the planning.

For more information or to lend a hand, contact Kathy Kinsey at Kinsek@RPI.EDU or (518) 276-2832.
Help Unlock the MYSTERY

ALS (Lou Gehrig's disease) starts "when good proteins go bad," says Rensselaer biochemist Wilfredo "Freddie" Colón. He and Ph.D. student Sarah Hobart '99 are researching how proteins fold and misfold. Understanding why proteins misfold could help unlock the mystery of the pathogenic causes of ALS and could play an important role in understanding other neurogenerative diseases, such as Parkinson's and Alzheimer's.

Leave your mark on Rensselaer

Contribute to advances at the cutting edge of biotechnology. With your support, Rensselaer researchers are changing the world (and our lives).

Make a gift today at www.alumni.rpi.edu/mad/howtogive.html or contact Stu Stabile, director of development, at stabls@rpi.edu or (518) 276-8215.
Rensselaer professor Xi-Cheng Zhang has developed the world's first real-time sensor for terahertz, or T-rays—a next-generation imaging technology with tremendous potential.

From detecting breast cancer more accurately to locating toxins underground to creating new advances in information technology, the applications are endless.

Learn more.

Xi-Cheng Zhang
Professor
Center for THz Science and Technology

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