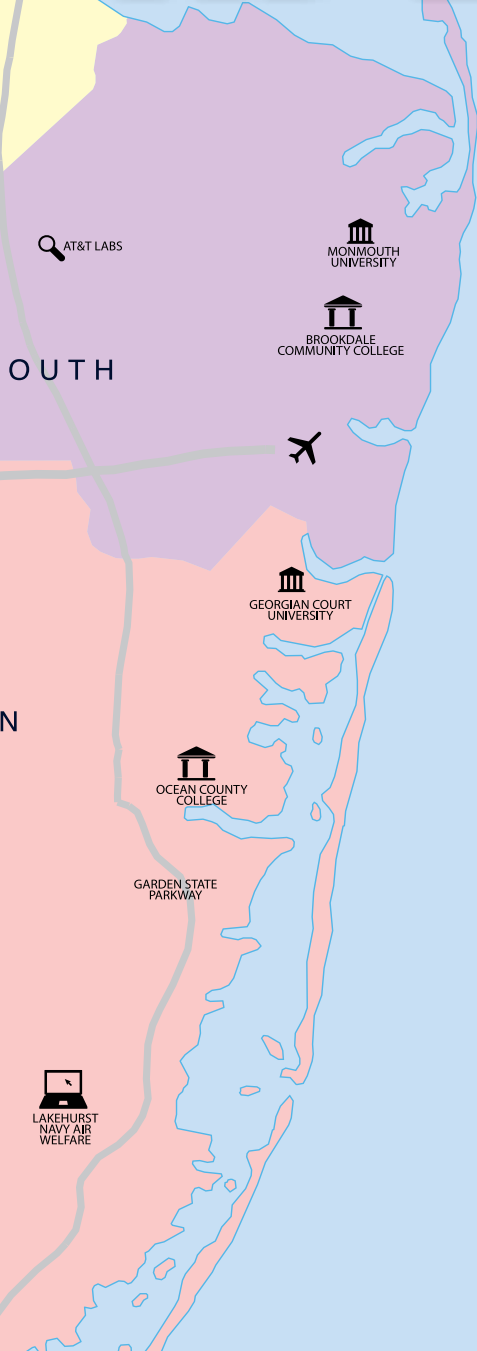


NJ Discovery

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inside

NJIT:
Catalyst for Prosperity

Rowan University:
Engineering, Science, Business

Rutgers: Pipeline of Innovation

Stevens Institute of Technology:
Ideas into Real-World Products

UMDNJ:
Bringing Science to Market

Princeton University:
Engaging in Partnerships



New Jersey:

A Home for Growth

BY LT. GOVERNOR KIM GUADAGNO

What does the anti-cancer drug Interferon, the world's first test for Hepatitis C and Band-aid sterile bandages have in common? They were all discovered in New Jersey. Along with the weather satellite and FM radio, New Jersey's rich history of scientific research and discovery has had a profound impact on our state, our nation and throughout the world.

Today, we are home to innovative, world-class companies like Johnson & Johnson, Verizon, Celgene and Sanofi-Aventis; top-notch research universities like Rutgers University, NJIT, Princeton and UMDNJ; supportive trade organizations like the HealthCare Institute of New Jersey, BioNJ and the New Jersey Technology Council; a superior incubator network; and, an active and supportive state government, led by Governor Chris Christie.

Our Administration came into office with a promise to renew our economy and change the culture of government towards fostering new technology and innovation. One of our first efforts in this endeavor was the launch of the New Jersey Partnership for Action, a public-private partnership focused on promoting the retention and attraction of businesses.

The first part of the Partnership is the Business Action Center (BAC), a team of global and domestic business advocates that will assist in permitting and regulatory efficiency, in addition to bringing a customer service approach to coordination and navigation across state and local government agencies for businesses looking to remain, expand or locate in New Jersey. Another component will be Choose New Jersey, a privately funded, not-for-profit corporation that will help position New Jersey as a world-class leader in the competitive global marketplace by effectively leveraging

our diverse resource base and utilizing our reputation for innovation. The final piece is the New Jersey Economic Development Authority (EDA) as the state's financing arm. The EDA will continue its role overseeing the various programs and incentives aimed at business retention and attraction.

Our aggressive efforts to attract businesses are already working, with major companies choosing to relocate to the Garden State. Watson Pharmaceuticals will expand into new administrative headquarters in Parsippany that will ultimately house approximately 500 employees. The expansion was supported by the state's Business Employment Incentive Program (BEIP), a powerful initiative that provides incentive grants to businesses based on the number of new jobs they have created in New Jersey. While most businesses must create at least 25 jobs within a 2-year period to qualify, emerging high technology and biotechnology companies have to create just 10 new jobs.

In addition to large businesses, New Jersey's extensive incubator network has ensured the cultivation of promising young companies. In fact, the National Business Incubation Association (NBIA) recently announced that they were formalizing their first affiliate relationship in the country with the New Jersey Business Incubation Network. This partnership will serve as a national model for the integration of global best practices in entrepreneurship, business incubation, access to capital, and job creation. One new addition to NJBIN is CGC Genetics, a Portugal-based medical genetics testing laboratory that opened its U.S. headquarters at NJIT's Enterprise Development Center in Newark this April. The state's International Trade Team, NJIT and the City of Newark were instrumental in helping this company locate in New Jersey, and a BEIP grant will support the creation of 15 new, high-paying technology jobs in the state.

The EDA's Commercialization Center for Innovative Technologies, which is part



of the Technology Centre of New Jersey in North Brunswick, is one of only 16 incubation programs in the world that have earned the Soft Landings International Incubator designation from NBIA. The designation recognizes an incubator's focus on welcoming non-domestic firms into its domestic market. To further bolster our incubator network, the EDA recently added 38,000 square feet of wet laboratory space on the Technology Centre campus to make "graduate" incubator space more readily available to thriving companies.

As we continue our efforts to make New Jersey a home for growth, the Governor and I remain steadfast in our pledge to reduce taxes and eliminate the red tape that stifles economic development. With our commitment to pro-growth, pro-business initiatives and a particular focus on growing New Jersey's innovation economy, the future is promising. ■

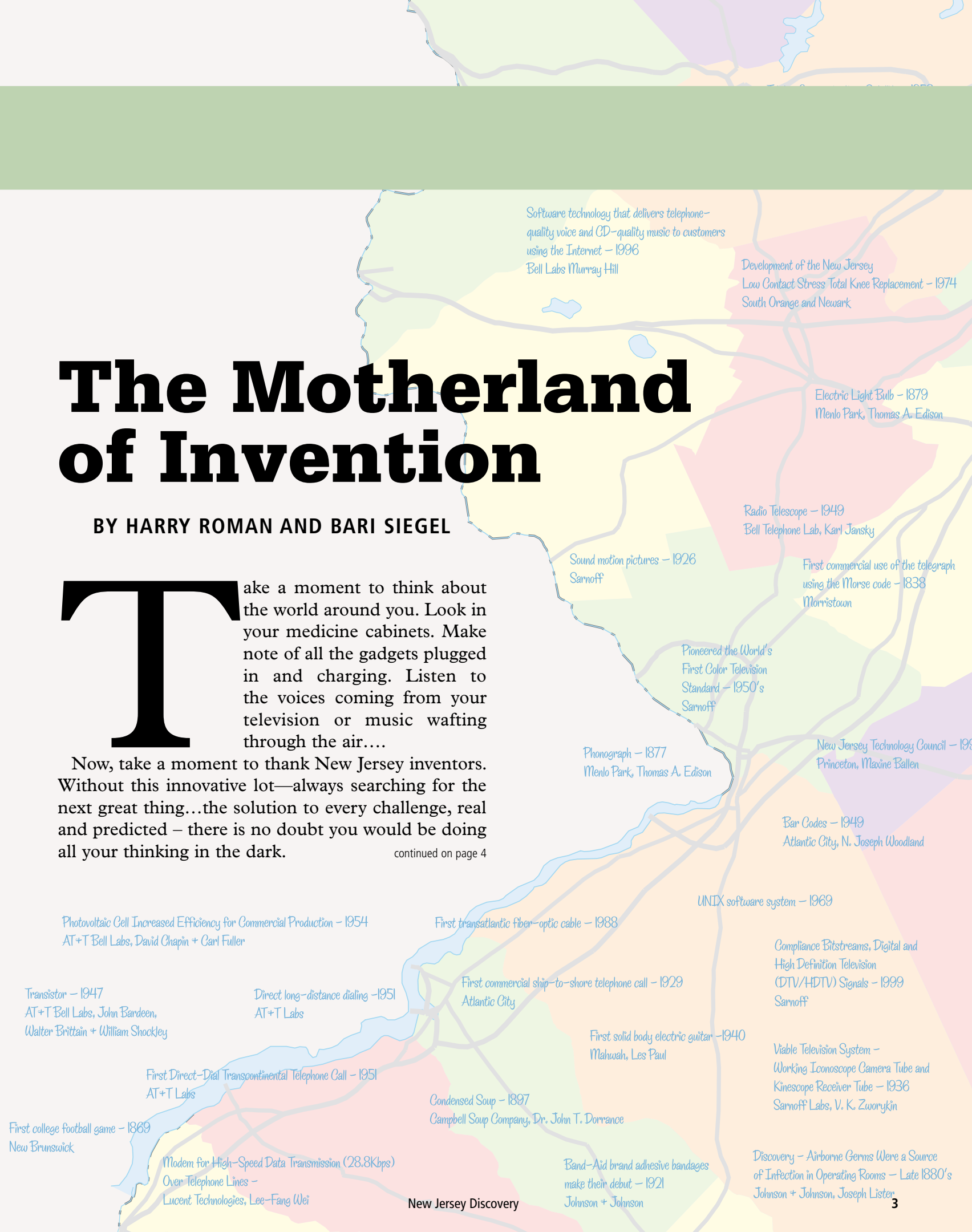
The Motherland of Invention

BY HARRY ROMAN AND BARI SIEGEL

Take a moment to think about the world around you. Look in your medicine cabinets. Make note of all the gadgets plugged in and charging. Listen to the voices coming from your television or music wafting through the air....

Now, take a moment to thank New Jersey inventors. Without this innovative lot—always searching for the next great thing...the solution to every challenge, real and predicted – there is no doubt you would be doing all your thinking in the dark.

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Software technology that delivers telephone-quality voice and CD-quality music to customers using the Internet – 1996
Bell Labs Murray Hill

Development of the New Jersey Low Contact Stress Total Knee Replacement – 1974
South Orange and Newark

Electric Light Bulb – 1879
Menlo Park, Thomas A. Edison

Radio Telescope – 1949
Bell Telephone Lab, Karl Jansky

Sound motion pictures – 1926
Sarnoff

First commercial use of the telegraph using the Morse code – 1838
Morristown

Pioneered the World's First Color Television Standard – 1950's
Sarnoff

Phonograph – 1877
Menlo Park, Thomas A. Edison

New Jersey Technology Council – 1980
Princeton, Maxine Ballen

Bar Codes – 1949
Atlantic City, N. Joseph Woodland

Photovoltaic Cell Increased Efficiency for Commercial Production – 1954
AT+T Bell Labs, David Chapin + Carl Fuller

First transatlantic fiber-optic cable – 1988

UNIX software system – 1969

Transistor – 1947
AT+T Bell Labs, John Bardeen, Walter Brittain + William Shockley

Direct long-distance dialing – 1951
AT+T Labs

First commercial ship-to-shore telephone call – 1929
Atlantic City

Compliance Bitstreams, Digital and High Definition Television (DTV/HDTV) Signals – 1999
Sarnoff

First Direct-Dial Transcontinental Telephone Call – 1951
AT+T Labs

First solid body electric guitar – 1940
Mahwah, Les Paul

Viable Television System – Working Iconoscope Camera Tube and Kinescope Receiver Tube – 1936
Sarnoff Labs, V. K. Zworykin

First college football game – 1869
New Brunswick

Modem for High-Speed Data Transmission (28.8Kbps) Over Telephone Lines –
Lucent Technologies, Lee-Fang Wei

Condensed Soup – 1897
Campbell Soup Company, Dr. John T. Dorrance

Band-Aid brand adhesive bandages make their debut – 1921
Johnson + Johnson

Discovery – Airborne Germs Were a Source of Infection in Operating Rooms – Late 1880's
Johnson + Johnson, Joseph Lister

New Jersey Discovery

New Jersey is surely one of the smallest states in the country—in size. But when it comes to research and development, the Garden State is the Motherland of Invention.

Did you know that (according to the U.S. Patent and Trademark Office) New Jersey ranks third out of 50 in total U.S. patents issued? Since 1963, New Jersey inventors have been awarded over 156,813 patents! Many of the things we see and use every day come from New Jersey inventors past and present, male and female.

New Jersey inventors represent a microcosm of the national invention scene. New Jersey is home to many of corporate America's finest research laboratories. In fact, it is the place where Thomas Edison created the first research laboratory in Menlo Park, followed later by his legendary West Orange Labs, where corporate R&D and manufacturing were joined-at-the-hip under one roof. Arguably, his laboratories may have been his most significant invention. Through them, Edison showed us how to organize our thinking and creativity so that we could profit from our innovative ideas. By codifying the process of invention, the great inventor literally gave us the keys to perpetuating the industrial revolution of that time, yielding copious benefits down to us today, with seemingly no end in sight. There is a fundamental link between the state's robust economy and its inventive spirit and output.

Thomas Edison was the most prolific and broad-based inventor of all time. He earned 1,093 patents, spread across a wide variety of inventive categories. Edison created products and whole industries that persist to today.

As the man responsible for the invention of the motion picture, recorded sound, power generation and the light bulb, and the creation of the first extensive R&D facility, he has arguably created more value than any other single human in history. It has been said that Edison is responsible for anywhere from three to five percent of the world's GNP, over \$500 billion for the U.S. alone.

Two scientific discoveries in his laboratories later led directly to radio (the Etheric Force) and modern electronics (Edison Effect), paving the way for today's telecommunications boom. His work also extended to other areas like fluoroscopy, mining, improved cement kilns, chemical production, all-cement structures, advanced

telegraphy, improved telephony, stock tickers, and many other devices including early office automation products like duplicating machines and dictation recorders.

Inventor's Lane

Every time you walk into a store to buy something, you are probably looking at products or services invented, created or produced by New Jersey inventors. New Jersey may be called the Medicine Chest of the World. And, indeed, with more than a dozen of the world's largest pharmaceutical companies headquartered here, the name is apt.

You don't have to look further than your neighborhood store to find some things first dreamed of in New Jersey:

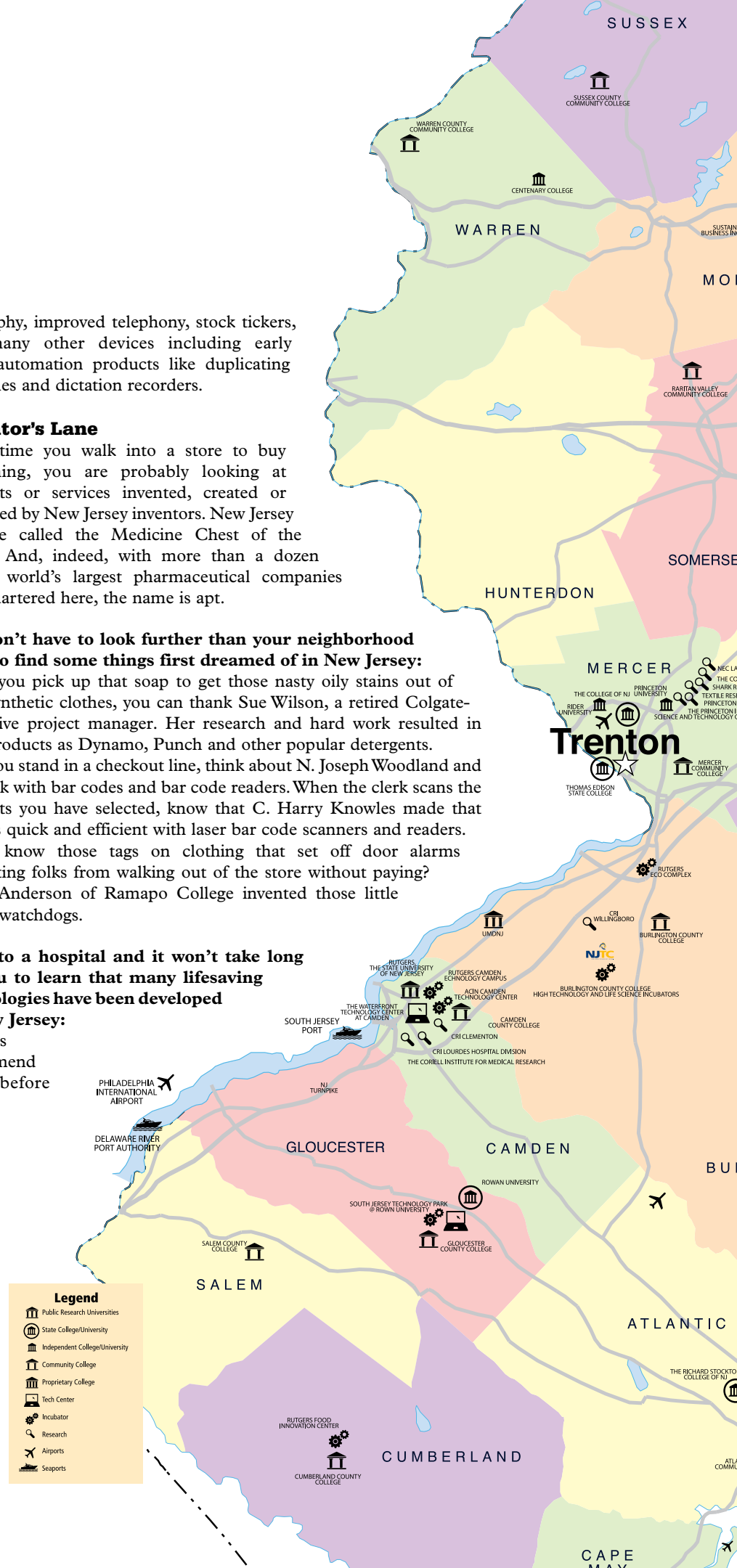
When you pick up that soap to get those nasty oily stains out of your synthetic clothes, you can thank Sue Wilson, a retired Colgate-Palmolive project manager. Her research and hard work resulted in such products as Dynamo, Punch and other popular detergents.

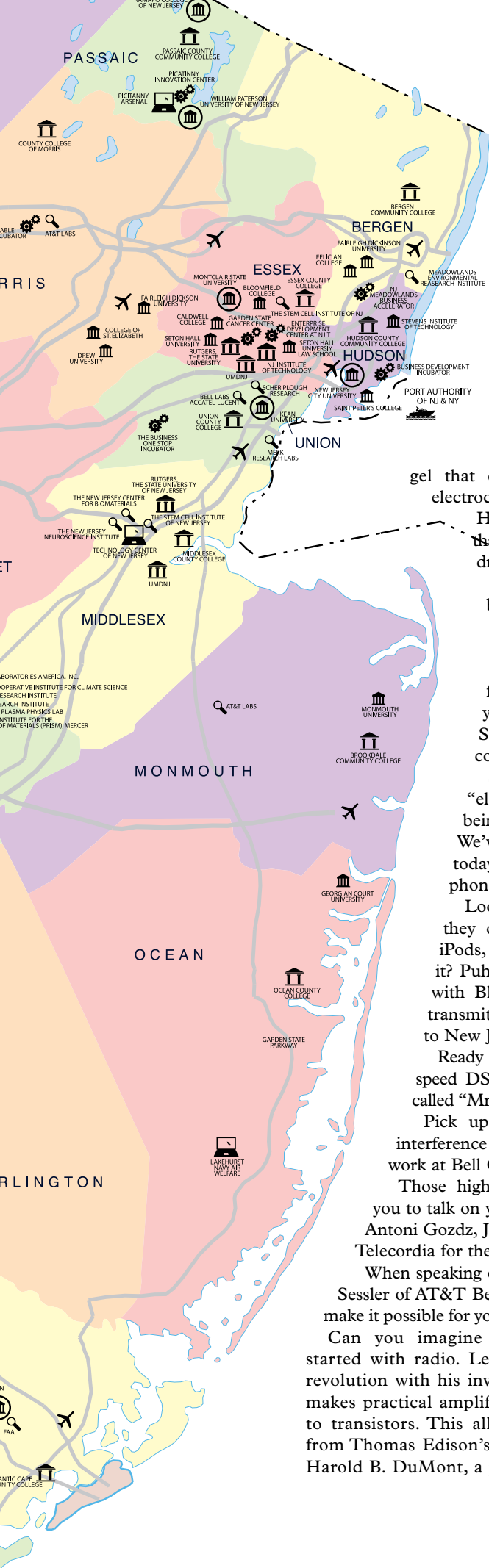
As you stand in a checkout line, think about N. Joseph Woodland and his work with bar codes and bar code readers. When the clerk scans the products you have selected, know that C. Harry Knowles made that process quick and efficient with laser bar code scanners and readers.

You know those tags on clothing that set off door alarms preventing folks from walking out of the store without paying? Philip Anderson of Ramapo College invented those little plastic watchdogs.

Head to a hospital and it won't take long for you to learn that many lifesaving technologies have been developed in New Jersey:

Doctors recommend that before





bandaging that cut on your finger, you dab on antibiotic cream to guard against infection. For that protection, you can thank Selman Waksman and Hubert Lechevalier of Rutgers University.

Gilbert Buchalter invented a reliable gel that connects electrodes to the body for electrocardiographs, and cardiac defibrillators.

High blood pressure is a serious disorder that can be treated with relatively inexpensive drugs invented by George de Stevens.

Arthur Nobile gave aging baby boomers anti-arthritis drugs. Sidney Pestka is recognized for his early work with the anti-cancer drug, Interferon.

Dominic Witkor may be responsible for one of your relatives, or perhaps even you, being alive. He invented the Witkor-Stent used to reconstruct damaged coronary arteries.

Sure, there was a time when being “electronically connected” meant, literally, being connected by wire to a phone jack. We’ve all read those lists of things that today’s 18 year olds will never understand: phones with dials, for example.

Look at it another way. Ask a teenager if they can imagine life without the Internet, iPods, smart phones. Write a letter and mail it? Puhleez! Today’s Digital Natives were born with Bluetooth headsets paired and ready to transmit first words! All that is possible thanks to New Jersey inventors.

Ready for the Internet SuperHighway? Use high speed DSL and you can thank Irwin Gerszeberg, called “Mr. DSL” by his AT&T friends.

Pick up your cell phone and make a clear, interference free call and thank Eric Addeo for his work at Bell Communications Research.

Those high capacity lithium batteries that allow you to talk on your cell phone for hours—give a nod to Antoni Gozdz, Jean-Marie Tarascon, and Paul Warren of Telecordia for their pioneering work.

When speaking on today’s phone, Jim West and Gerhard Sessler of AT&T Bell Labs and their foil-electret transducer make it possible for you to clearly hear and transmit your voice.

Can you imagine a world without television? It all started with radio. Lee de Forest kicked off the electronic revolution with his invention of the triode audion tube that makes practical amplification possible, and set us on a path to transistors. This all stemmed directly, believe it or not, from Thomas Edison’s work in New Jersey with light bulbs. Harold B. DuMont, a pioneering TV manufacturer, was also

very active in cathode ray tubes, magic eye tuners, and a host of TV improvements.

Then, in 1947, the Bell Labs team of John Bardeen, Walter Brittain and William Shockley brought it all to life! They invented the transistor, which ushered in a tremendous miniaturization of circuitry, leading to today’s computers and integrated circuits. Much of today’s integrated circuit designs lead back to Andrew Dingwall and his 100+ patents in CMOS integrated circuit technology. Cable television? We can thank Isaac Blonder and Ben Tongue for developing much of the electronics and systems for this telecommunication medium.

Music and sound recording are closely allied with radio and TV. When we talk about the sound of modern music, we must recognize Les Paul, the man responsible for our modern musical sound. A pioneer in the design of the electric guitar and early tape recorders, Les also gave us multiple sound tracks and sound mixers that allow for the making of custom music recordings. Jim Flanagan of Bell Labs gave us the basis for acoustic signal processing and modern speech synthesis. Jim made it possible for throat cancer victims with larynx damage to once again speak by using a handheld synthesizer pressed against their throats.

New Jersey is often called the Garden State because of its strong connection to agriculture, open fields and delicious Jersey tomatoes and corn. Others have called New Jersey the “Innovation State” because it is quite clear that the theory of research and development must have been invented here.

But perhaps the “Invention State” is most appropriate. New Jersey’s legacy and list of “firsts” is long and ever growing. Most that has been invented was first conceived in the halls of New Jersey’s schools and laboratories of New Jersey’s research facilities.

In New Jersey, tomorrow is not just another day. It’s another day of invention. ■

A considerable portion of this article was penned by Harry Roman, a retired PSE&G engineer and New Jersey inventor. President Emeritus of the New Jersey Inventors Hall of Fame (NJIHoF), Roman was honored by the NJIHoF as Inventor of the Year 2005.

NJIT:

New Jersey's Catalyst For Prosperity

As New Jersey's science and technology university, New Jersey Institute of Technology has a long tradition of elevating economic development to a fundamental part of its mission. And economic development, according to Donald H. Sebastian, senior vice president for research and development, means innovation rooted in science, engineering and computing.

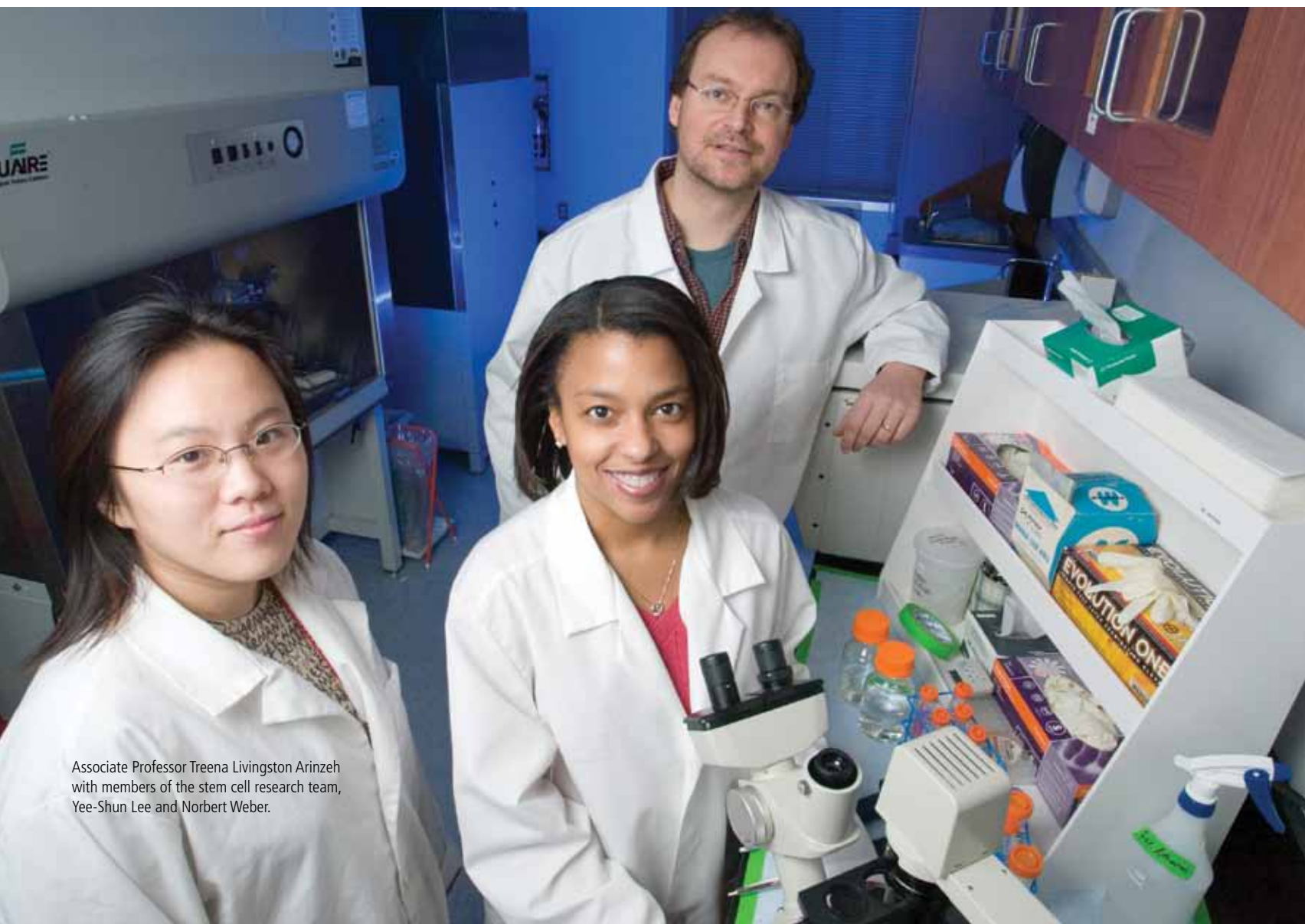
"When creativity, practical experience and scientific understanding operate together, you

have the foundation to produce disruptive technologies," he said. "Our future is not defined by the abundance of natural resources nor by the availability of a skilled workforce. Prosperity comes from solutions that use new understanding and new technology to shed the limits imposed by the current way of doing things, and produce new business concepts that are faster, cheaper and better. Universities have an opportunity to assume new roles that facilitate engaging the private and public sectors to work toward the common goal of reasserting our region as a leading producer in a global economy."

Sebastian said NJIT is strongly focused on applied research, often in partnership with local companies, to develop new knowledge and applications that improve industrial processes and products. He said the goals are both a thriving economy for New Jersey and an enhanced quality of life for its citizens, as demonstrated by the university's growing life sciences research efforts.

Applied Life Sciences

NJIT's Biomedical Engineering department, founded in 2002, has led the way in establishing a program of life sciences research:



Associate Professor Treena Livingston Arinze with members of the stem cell research team, Yee-Shun Lee and Norbert Weber.

Treana Livingston Arinze won a prestigious Presidential Early Career Award for Scientists and Engineers for her work to create therapies from stem cells for repairing and regrowing bone tissue.

Richard Foulds, director of the Rehabilitation Engineering Research Center, is developing technologies to help children with orthopedic disabilities through therapeutic video games.

Sergei Adamovich has developed a virtual reality-based training program for rehabilitation of stroke victims.

Bryan J. Pfister studies rapid axon stretch growth, a technique for regenerating damaged or diseased nerve cells. He hopes to develop a nerve-tissue interface for a thought-controlled prosthesis that would behave like a natural limb.

Mesut Sahin received grant support from the Eunice Kennedy Shriver National Institute of Child Health and Human Development to develop technologies for interfacing with the central nervous system to learn more about its natural function and to develop treatments for neurological disorders. The interface will assist patients with spinal cord injuries in gaining mobility.

Tara Alvarez studies the learning strategies used by the brain to control eye movement to gain insight into the general problem of motor learning. She is working to develop special techniques and equipment to diagnose and treat traumatic brain injury.

But beyond biomedical engineering, life sciences research has become ubiquitous at NJIT. Examples include:

Timothy Chang, electrical and computer engineering, developed a low transient pulse (LTP) technique for ultrasound that provides better resolution medical imaging.

Jason Wang, computer science, is creating a search engine to simplify—by analysis and classification—huge amounts of biological data. Wang's team is developing and testing a search tool for processing queries about information patterns in large databases.

Yehoshua Perl, computer science, works to simplify and refine medical terms used in patient records, decision-support systems and healthcare administrative systems. The goal is to eliminate errors and redundancies in large,

complex clinical databases, thereby reducing healthcare costs.

Gordon Thomas, physics, has developed a new tonometer that enables thru-the-eyelid measurement of intra-ocular pressure to diagnose glaucoma, and a “smart shunt” for hydrocephalus and brain injury patients.

Information Technology and Wireless Telecommunications

One of the nation's most computing intense campuses, NJIT also has a major research focus in information technology:

Yeveskel Bar-Ness and Alex Haimovich, electrical and computer engineering, lead a team of researchers working to develop the infrastructure needed to support the burgeoning demand for wireless services. The group addresses issues such as privacy and security, interference and jamming, ever heavier user traffic, and rapid transmission of data through wireless networks.

Leonid Tsybeskov, electrical and computer engineering, works with nanotechnology to increase computer-processing speed. He received two NSF grants and support from Intel for his work with three-dimensional silicon-germanium nanostructures.

Nirwan Ansari, electrical and computer engineering, is collaborating with experts in Japan on security in next-generation networks. They are looking at security not only in fixed and cellular networks, but in sensor networks and satellite networks.

Cristian Borcea, computer science, studies mobile and ubiquitous computing. His projects have focused on large-scale mobile networks with applications for social networking, and inter-vehicle networking with smart vehicles exchanging data for safe driving, traffic condition monitoring, emergency message dissemination, and dynamic route planning over hybrid wireless networks.

Michael Chumer, information systems, studies preparedness and emergency response management information systems, specifically, identifying and integrating the design components specifically command and control into a cohesive and useable technology.

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EDC: Nurturing New Businesses

When NJIT alumnus Al Limaye decided to expand his business, he knew it was time to relocate to NJIT's Enterprise Development Center (EDC). His company, AC Birox, manufactures a unique portable detector for biological and chemical warfare agents, explosives and narcotics. Limaye could see potential applications in pharmaceutical manufacturing, biomedical research, and for detecting and differentiating among pathogens in the hospital emergency room. But in order to enhance the detector's capabilities for industrial and medical application, he would need the edge that EDC could give him.

“I knew about the EDC as an NJIT graduate,” Limaye says. “I also knew that there would be many advantages in moving there. Some are those needed by any new business, including affordable office and lab space, and being able to network with interested investors. But there are also the resources that you'll find only at a research university such as NJIT.”

Expert faculty advisors, skilled student workers, and access to sophisticated facilities and equipment are among the pluses, he said. Limaye is now coordinating NJIT faculty and students in enhancing his detector's capacity for fast and accurate verification of pathogens such as E. coli and staph bacteria, mold, and even the H1N1 flu virus.

Opened in 1988, EDC is the state's oldest and largest incubator for technology-based and life-science companies. Participation is open to early-stage companies that have a proprietary technology as a significant source of revenue.

EDC provides office and lab space, financial assistance, business and technical services, and the shared business acumen of the Center's management staff. The center has graduated more than 85 successful businesses. Nearly 95 companies now at the EDC employ over 300 people full-time, along with some 100 student interns.

“The mission of the EDC is to provide the best possible environment that allows early stage startup companies to grow and accelerate commercialization of their technologies,” says Judith Sheft, NJIT associate vice president for technology development. “Part of the interface role that NJIT's Office of Research and Development plays is to facilitate connections with the rich set of resources available. We help companies navigate what can at times be a daunting path, often by opening doors and making introductions to begin what, hopefully, will be very fruitful conversations.” ■

Aiding North Jersey Entrepreneurs

The New Jersey Center for Innovation Acceleration at NJIT is designed to help innovators and entrepreneurs access the resources of New Jersey's science and technology university and its Enterprise Development Center (EDC), the state's oldest and largest high tech business incubator. Connecting start-up businesses in the science and technology industries with capital, academic resources, support organizations, professional service providers, volunteers, workforce talent, business partners and knowledge, the Center outfits entrepreneurs to create successful, sustainable businesses and thriving industry clusters.

"Helping ventures accelerate growth in achieving time-to-market and time-to-profitability milestones will be a hallmark of the Center," says Judith Sheft, associate vice president of technology development and director of the center. She emphasizes that the Center leverages the successful EDC programs and facilities along with other university and local resources to support nascent and early stage entrepreneurs. The new NJIT Student Innovation Acceleration Club, which seeks to assist students in their new business endeavors, has adopted the Center as its home base. Student innovators also have access to the Capital One Entrepreneurial Learning Lab at the EDC where they learn to make their business plans a reality.

The Center also serves as a clearinghouse for ideas for entrepreneurs from throughout New Jersey. Earlier this year the center co-sponsored presentations by noted authors Clayton Christensen who wrote, *The Innovator's Dilemma* and Chester Elton, author of *The 24 Carrot Manager*. Another key goal is to intensify connections between the academic and entrepreneurial communities. For the many years, professors from the NJIT School of Management have been working with EDC companies, sponsoring both experiential learning courses with incubator firms and programs for EDC-based entrepreneurs such as a venture acceleration workshop. Through the Center for Innovation Acceleration, these services are now available to start up companies throughout NJ. ■

For more information, please contact Michael Ehrlich (Ehrlich@adm.njit.edu) or Judith Sheft (Judith.Sheft@njit.edu).

Materials and

Materials Process Engineering

Novel materials, particularly at the micro- and nanoscale level, are another important research focus at NJIT.

The research of Reginald Farrow, physics, lies at the interface between nanotechnology and biotechnology, and may lead to ways of listening (and talking) to individual cells. It may also lead to power sources that use blood sugar as fuel and are so small that they can power nano-computers that could circulate through the body in the blood and provide medical diagnostics as they pass through critical organs.

Rajesh Dave, chemical engineering, is lead investigator in the NSF-supported Engineering Research Center for Structured Organic Compounds, investigating techniques for mixing nanocomposites to improve the performance of drugs, biomaterials and catalysts.

Zafar Iqbal, chemistry, applies the principles and materials of nanotechnology to a novel biofuel cell that converts the body's own glucose to power devices like pacemakers and glucose biosensors for diabetics. The device uses highly conductive nanomaterials to guide the electrons. Iqbal and Somenath Mitra, also chemistry, have developed proprietary techniques for producing, purifying and changing the chemical characteristics of carbon nanotubes for a wide variety of applications.

Kamalesh K. Sirkar, chemical engineering, is develops membrane separation technologies for water desalination, protein purification, removing carbon dioxide and other gases from air, and the removal of toxins from water.

John Federici, physics, uses terahertz (THz) electromagnetic radiation to detect and identify explosives and biological agents. A terahertz imaging system could be used in airports to detect potentially harmful materials even if they are concealed in clothing, sealed packages, or suitcases.

Michael Jaffe, biomedical engineering, collaborates with the Iowa Corn Promotion Board (ICPB), and University of Sao Paulo to find polymer applications for corn sugar derivatives. His team developed a corn-based epoxy, which can be used as an adhesive, paint, or a coating to protect food in cans.

Edgardo Farinas, chemistry, has an NSF CAREER grant supporting his work in the development of methodologies and "rules" for enzyme design, and the application of these methods to create novel and practical biocatalysts.

Sustainable Systems and Infrastructure

Architecture students Robert Pietrocchia and Joseph DiNapoli worked with Darius Sollohub, architecture, to study the feasibility of bus rapid transit (BRT) in the city of

Newark. They found that BRT, with its inherent economy, efficiency and speed of deployment, is especially suited to Newark not only because the City's urban pattern evolved around the streetcar network of the last century, but also that Newark's residents already use buses extensively. Sollohub also offered a studio that challenged students to work on designs for a new generation of Habitat for Humanity townhouses. One of his students, Alex Merlucci, won the competition with a modern, cost-effective design with customizable exterior and interior elements.

Ala Saadeghvaziri researches structural and earthquake engineering. His team developed an improved design for concrete bridges that will lessen stresses as the concrete shrinks and eliminate cracking on the decks of the bridges.

Richard Garber, and student Brian Novello designed a network of modular floating docks to harness clean energy for New York City. These docking stations would plug into conventional piers in New York City with vertical turbines fastened to their underside to harness river currents to generate clean energy while increasing public green space and tidal pools for wildlife. Garber, Nicole Robertson, and colleagues at their firm GRO Architects also recently completed a residence in Jersey City, a prototype for an energy efficient, pre-fabricated housing alternative for urban neighborhoods 21st century solution for urban housing.

Ken Chin, physics, has a grant from the Chinese firm, Apollo Solar Energy, Inc., to establish a solar research center for improving the applications of Cadmium telluride semiconductor materials for use in thin-film solar cells, reducing the cost per watt of solar power and making it a viable alternative to fossil fuels.

Management Research

Michael Ehrlich, assistant professor of management, focuses on financial markets and institutions, with an emphasis on market failures. His current interest has been the unintended consequences of financial market innovation with special attention to structured investment vehicles

William V. Rapp, Henry J. Leir Professor of International Trade and Business, researches international business, strategy, and financial institutions, especially using technology to gain competitive advantage.

Katia Passerini, Hurlburt Professor of Management of Information Systems, researches computer-supported learning, knowledge management and mobile communications services evolution. ■

RESEARCH CENTERS

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Solar Cell Research Center

Kenneth Chin, PhD, Director
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Smart Campus

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Structural Analysis of Biomedical Ontologies Center

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James Geller, PhD, Co-Director
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OUTREACH CENTERS

Center for Information Age Technology

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Defense Procurement Technical Assistance Center

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Enterprise Development Center

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Innovation Acceleration Center

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Judith Sheft, co-Director
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New Jersey Health Information Technology Extension Center

William O'Byrne, Executive Director
856-229-3831

Polymer Processing Institute

Ming Young, PhD, President
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www.polymers-ppi.org

Real World Connections

Osama Eljabiri, Director
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realworldconnections.net/default.aspx

Small Business Institute

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York Center

Helen Gramcko, Director of Operations
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Materials Characterization Laboratory

Larisa G. Krishtopa, PhD, Director
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EDUCATIONAL RESOURCES

Continuing Professional Education

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Collaborative Doctorate Program

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Rowan University:

Engineering, science, business and other programs contribute to New Jersey and beyond

In labs and classrooms at Rowan University, Glassboro, hundreds of professors and students are conducting research that makes a difference to local and regional businesses, non-profit organizations and government offices and to the economy. They study and work in the Colleges of Engineering, Liberal Arts & Sciences and Business, the South Jersey Technology Park and beyond.

At Rowan, a selective, medium-sized public university, on any given day it's possible to see:

- An engineering team working to develop a catheter that will cool heart and brain tissue after a heart attack or stroke 10 times more quickly than current technology.
- Business students competing to develop the most effective website for an area non-profit.
- Science students conducting cancer research with a nationally recognized professor.

During state fiscal year 2009, Rowan professors received \$7.3 million in grants from such organizations as the National Science Foundation,

National Academies of Engineering and National Geographic. Those grants join others from organizations such as the National Institutes of Health, U.S. Navy and Exxon. The \$5.1 million the University has garnered so far in FY 2010 is a highly competitive figure for a University that is primarily an undergraduate educational institution. It's only part of the picture: equally important are the interdisciplinary collaborations that outside groups can tap into.

External organizations fund multiple projects

Professors have been working with undergraduate and graduate students on more than 100 externally funded projects in technical and business areas. For their work, they have received numerous local, regional, national and international honors. Rowan also has been recognized by many organizations.

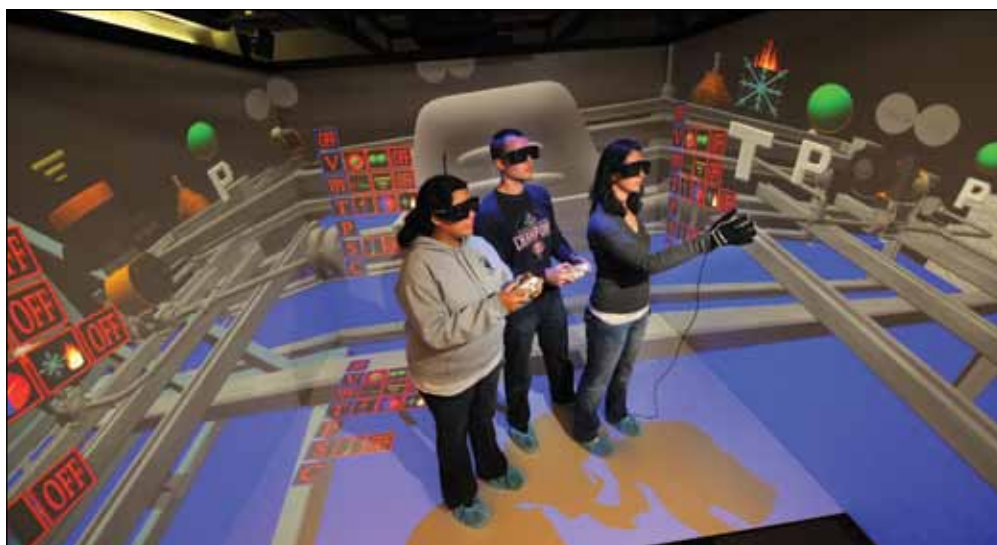
- U.S. News & World Report ranks Rowan 22nd in Northern Regional Universities. Rowan's College of Engineering is ranked 15th, and three of its four programs are in the top 10.
- The Princeton Review included Rowan in "The Best Northeastern Colleges," "The Best 366 Colleges" and "The Best 301 Business Schools."

Rowan was selected for the Colleges of Distinction and was named one of "America's 100 Best College Buys" by Institutional Research and Evaluation, Inc.

The projects faculty and students undertake — and their funding — are a huge plus for Rowan's professors, many of whom are building research programs. The projects also are important for Rowan's students, who often are enjoying opportunities available at the graduate level in larger institutions.

The projects are critical for others, too. Rowan teams' work supports small businesses, supplements the research being conducted at larger companies and provides non-profit groups and government offices with the kinds of skills that would be difficult to otherwise afford.

"We have ideas that we would like trialed; however, we do not have the resources here to put engineers or chemists on them other than in a consulting type of capacity," said Rich



INTO THE CAVE . . . Rowan students under the direction of electrical and computer engineering professor Dr. Shreekanth Mandayam are conducting several research projects in the Cave Automatic Virtual Environment, known as a CAVE®, located at the South Jersey Technology Park. Last year, they worked on projects for NASA; the U.S. Navy; and Cooper's Ferry Development Association, Camden.



Gutowski, manufacturing manager, Chemicals and Catalysts, at the West Deptford branch of London-based specialty chemicals company Johnson Matthey. “We’ll negotiate with Rowan and decide on one to two projects they and we are interested in working on . . .”

BUSINESS IS BLOOMING . . . Dr. Darren Nicholson (left) and MIS majors Erin Donegan (second from right) and Marlon Farlow (right) consulted with Colleen Henry on updates to her floral shop’s website, which Nicholson’s students designed.

Rowan boasts resources, recognition, results

All of Rowan’s six academic colleges (Business, Communication, Education, Engineering, Fine & Performing Arts, and Liberal Arts & Sciences) and the College of Graduate and Continuing Education have strong ties to the community. The Colleges of Business and Engineering and the science departments in the College of Liberal Arts & Sciences work virtually daily with industry partners, small businesses, government offices and non-profits.

Rowan Engineering — which offers programs in chemical, civil and environmental, electrical and computer, and mechanical engineering — offers bachelor’s and master’s degrees and is accredited by ABET, the organization that evaluates all engineering programs.

Within the College of Liberal Arts & Sciences are the Departments of Biological Sciences, Chemistry and Biochemistry, Physics and Astronomy, and Computer Science. The programs are accredited by various relevant organizations, such as the American Chemical Society.

The Rohrer College of Business, accredited by AACSB International — The Association to Advance Collegiate Schools of Business and by ABET, emphasizes project-based learning, with students collaborating on real-world projects for various organizations. The College offers majors in accounting, entrepreneurship, human resource management, finance, management information systems and marketing and an M.B.A. program.

South Jersey Technology Park opens doors to expanded research

The 12 College of Engineering labs that almost fill the first floor of the South Jersey Technology Park about two miles from the University in Mantua Township are dedicated to research, much of which is funded by and supports outside organizations.

That’s where their similarity ends, though. The students and professors who work in those labs explore diverse topics. Among the spaces housed at the Tech Park are the:

Process Research Lab, which conducts research in the areas of advanced materials, bioprocessing, green engineering, food technology, multiphase transport, particle technology, pharmaceutical engineering, petroleum refining, renewable fuels/alternate energy and specialty chemical manufacture.

Sustainable Design Lab, which focuses on clean energy, smart growth, energy efficiency, waste management, transportation and experiments in new energy paradigms. Currently funded research is in photovoltaics, energy audits, wind resource assessment and novel energy processes.

Automotive Lab, which researches a broad range of topics related to advanced technology vehicles, including emissions measurement, hybrid-electric power train design, electric vehicles and fuel cells.

Virtual Reality Lab, which houses a fully immersive, navigable and interactive virtual reality system, known as a CAVE®, for providing advanced scientific visualization.

The Tech Park, about a half-hour from Philadelphia, opened its first building, the Samuel H. Jones Innovation Center, in 2008. In addition to labs, the building houses offices and the Center for Innovation and Entrepreneurship, the Rohrer College of Business Incubator and the Educational Information and Resource Center, Inc. That and future buildings provide/will provide competitively priced facilities for start-up and established companies and for researchers, inventors, entrepreneurs, professors and students. All tenants have access to the research, development and commercialization expertise of Rowan’s engineering, science and business faculty, among others.

The Tech Park is a public/private partnership supported by the New Jersey Economic Development Authority, the New Jersey Commission on Science and Technology, South Jersey businessman Samuel H. Jones, the Rowan University Foundation, the U.S. Small Business Administration and the New Jersey Department of Community Affairs.

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BRAIN/COMPUTER CONNECTIONS . . . Dr. Robi Polikar (right), of Rowan's Electrical & Computer Engineering program, is working with students on brain/computer interfaces, exploring ways that people can use their minds to power a computer and other technology to complete a variety of actions.

Center for Innovation and Entrepreneurship supports local and regional businesses

Major corporations like Lockheed Martin, Cherry Hill; small businesses like Flowers by Design, Glassboro; and nonprofits like Elwyn New Jersey, a human services organization located in Vineland, have benefited from work conducted under the auspices of the Center for Innovation and Entrepreneurship (CIE). Based in Rowan's Rohrer College of Business, the seven-year-old CIE focuses on fostering an environment that encourages entrepreneurial thinking and activity under professors and others who have created, managed, consulted or conducted research related to entrepreneurial endeavors. By combining practitioners and researchers from multiple disciplines in developing entrepreneurial activities, Rowan has built a support system that enhances the ability of students and other key stakeholders to turn ideas into successful growth ventures.

The CIE manages programs and projects that influence Rowan and the surrounding area, including numerous project-based learning efforts that team Rohrer College of Business undergraduate and M.B.A. students. For Lockheed, students analyzed pay scales. For Flowers by Design, teams worked on an interactive website and a business plan. For Elwyn, they created a business plan to open and operate a thrift shop.

Center offers big results, no cost

"Time and again what we hear from our clients — who receive these services at no cost — is that our faculty and students provide professional services that directly impact their organizations' futures — and often their bottom line," said CIE Interim Director Sarah Piddington.

A Rowan team conducted a case study for Brian Wolfson, partner in Tricon Development Group, which is exploring renovating the G.G. Green Building, Woodbury, into a playhouse. "As a Community Development Project there are limitations on the financial capacity to fund every aspect of analysis," Wolfson said. "Still, the need for accurate, comprehensive analysis exists. The challenge — How to get expert analysis, without the cost. The answer — Rowan M.B.A. students under the leadership of

At-A-Glance

Rowan University
 201 Mullica Hill Road
 Glassboro, N.J. 08028
 (856) 256-4000
 www.rowan.edu

The South Jersey Technology Park

107 Gilbreth Parkway
 Mullica Hill, N.J. 08062-4446
 (856) 256-4099
 www.sjtechpark.org

the Center for Innovation & Entrepreneurship. What a terrific job these students did! They listened, asked questions, devised approaches and (presented) a deliverable that easily rivaled the final product of what the project would have had to pay lots of money for."

Business Incubator home for young firms and more

An integral part of the CIE is the Rohrer College of Business Incubator, which provides tenant and virtual tenant facilities and services for emerging, high-growth technology businesses. Located in the Tech Park, the Incubator provides entrepreneurs with access to Class A commercial space, fully equipped laboratories and a rich network of business resources invaluable to their development and success.

An engine for economic growth, the Incubator assists companies with their business plans, strategic plans and go-to-market plans by providing access to broad networks of professionals throughout the region, connection to Rowan faculty and students, office and reception services, research opportunities, and training and mentoring programs.

Support is wide ranging

Tenants can access support to develop business and technology plans and can exhibit at conferences and venture capital showcases. They can tap into an extensive network of business resources: legal, venture capital, governmental, scientific, licensing, patent, grant funding, marketing and e-commerce. CIE is home to five young and developing businesses as well as one established firm:

- Provonix, a contract research organization that provides individualized clinical trial solutions for pharmaceutical, biotechnology and medical device companies.
- FocalCool, L.L.C., a medical device startup company developing technology to reduce tissue damage from heart attacks and strokes under a grant from the National Institutes of Health.
- French & Parrello Associates, P.A., a full-service engineering firm with corporate headquarters in Wall.
- Strategic Billing Enterprises, which performs account-receivable services as an insurance billing contractor for medical, dental and other offices.
- Sure ID, which provides services to reduce theft, minimize errors, improve inventory control and increase staff efficiencies.
- SRW Personnel, a financial resource and software development company.

SocialReach, an ad network for social networking websites, recently graduated from the Incubator.

Said Brian Ruiz of Strategic Billing, "The incubator eliminates challenges and creates an environment that is the catalyst for success." ■

Through Grant, Engineering Firm Funds High-Tech Research

Mission Solutions Engineering (MSE), of Arlington, Va., and Moorestown, understands the value of research conducted at Rowan University and recently awarded \$100,000 to the school's Computer Science Department to tap into that research.

Under a one-year contract, Rowan University will help the firm improve the capabilities of a software system called Advanced Display Infrastructure (ADI).

ADI is an application that provides situational awareness to military users and others through a display of the Earth, using the World Geodetic System 1984, in part to show the location of military units. Similar to Google Earth, ADI allows users to navigate a globe to view those units and potential targets.

Dr. Adrian Rusu, an associate professor of computer science, is heading Rowan's team of four undergraduate and graduate students on the project titled "Visualization and Software Engineering Strategies for Tactical Decisions Advances."

The project focuses in part on developing software for new decision

aids, tools that will help the ADI users more quickly determine and act upon courses of action. The students will develop features that help improve the navigation around the globe and calculations that help determine potential collisions between two objects. The students' computer code will be used as an external support for ADI in what is called an "independent library" and will enable users to employ portable devices similar to a handheld Global Positioning System or GPS. Ultimately, MSE — a full-service systems and software engineering provider with nearly 40 years' experience in delivering mission systems — will use the Rowan work to promote its ADI product and to cultivate more business from military service branches.

In addition to this project, the MSE/Rowan collaboration will include establishing a co-op program and offering master-level courses at MSE facilities.

"We are very excited to expand our partnership with Rowan University," said MSE President Tim Caswell. "Through the ADI effort and co-op program, MSE is able to bring innovative perspectives to our offerings, and students will interact with and learn from industry leaders. We hope that the success of this program will lead to future collaboration efforts in other areas." ■

HOW IT WORKS . . . Rowan computer science student Spence DiNicolantonio shows (left to right) MSE's Alan Marsh, computer science professor and lab director Dr. Adrian Rusu and MSE's Kimberly Davis some of the research a Rowan team is conducting for the Arlington, Va. and Moorestown-based firm.



Rutgers: Pipeline of Innovation

Rutgers, The State University of New Jersey, is a leading national public research university and the state's preeminent, comprehensive public institution of higher education. Rutgers provides outstanding educational opportunities to 40,500 undergraduates and 14,100 graduate students at its Camden, Newark, and New Brunswick campuses. The university offers more than 100 distinct bachelors, 100 masters, and 80 doctoral and professional degree.

In 2009, Rutgers received more than \$300 million in federal-funding to support research and education programs. Most of this federal funding supports research on a broad range of topics in life sciences, pharmacy, physical sciences, engineering, agriculture, social science, computer science, and the humanities.

Rutgers is home to many large federally-funded research centers. The Protein Data Bank (PDB) led by Dr. Helen Berman, provides researchers around the world with information for studying the structures of 50,000 biological macromolecules and their relationships to genomic sequence, function, and disease.

The Center of Excellence for Command, Control and Interoperability, led by Dr. Fred Roberts, is funded by the United States Department of Homeland Security (DHS) to conduct research and develop technologies, tools, and advanced methods for information analysis, situational awareness, decision support, information sharing, and cyber infrastructure protection.

The Armed Forces Institute of Regenerative Medicine led by Dr. Joachim Kohn, conducts research and develops new products and therapies for the repair of battlefield injuries through the use of regenerative medicine. This innovative approach employs biological therapies (including stem cells and growth factors), tissue and biomaterials engineering, and advanced transplantation methods that limit rejection, and enable the body to repair, replace, restore, and regenerate damaged tissues and organs.

The Northeast Structural Genomics Consortium led by Dr. Gaetano T. Montelione, is developing integrated technologies for high-throughput protein production and 3D structure determination.

The Rutgers University Cell and DNA Repository (RUCDR) led by Dr. Jay Tischfield, plays a key role in research aimed at understanding the genetic causes of common, complex diseases. RUCDR activities enable gene discoveries leading to diagnoses, treatments, and eventually cures for these diseases. RUCDR assists researchers throughout the world by providing the highest quality biomaterials, technical consultation, and logistical support.

The Federal Highway Administration's Long-Term Bridge Performance (LTBP) Program is led by Dr. Ali Maher, Director of

Rutgers' Center for Advanced Infrastructure and Transportation (CAIT). The LTBP program is envisioned as a 20-year research study to expand quality information available on bridge performance in order to help bridge and highway transportation managers make better, data-driven decisions. This study will be the first to collect uniform bridge performance data at the national level.

A significant portion of the research at Rutgers is conducted on basic problems which may serve as the foundation for applied commercial developments. An ideal example is the research led by Dr. Joachim Kohn, Director of the New Jersey Center for Biomaterials. Scientific knowledge of biomaterials, with direct support of \$4.5M from the National Institutes of Health, is being translated into medically useful products, services, and new

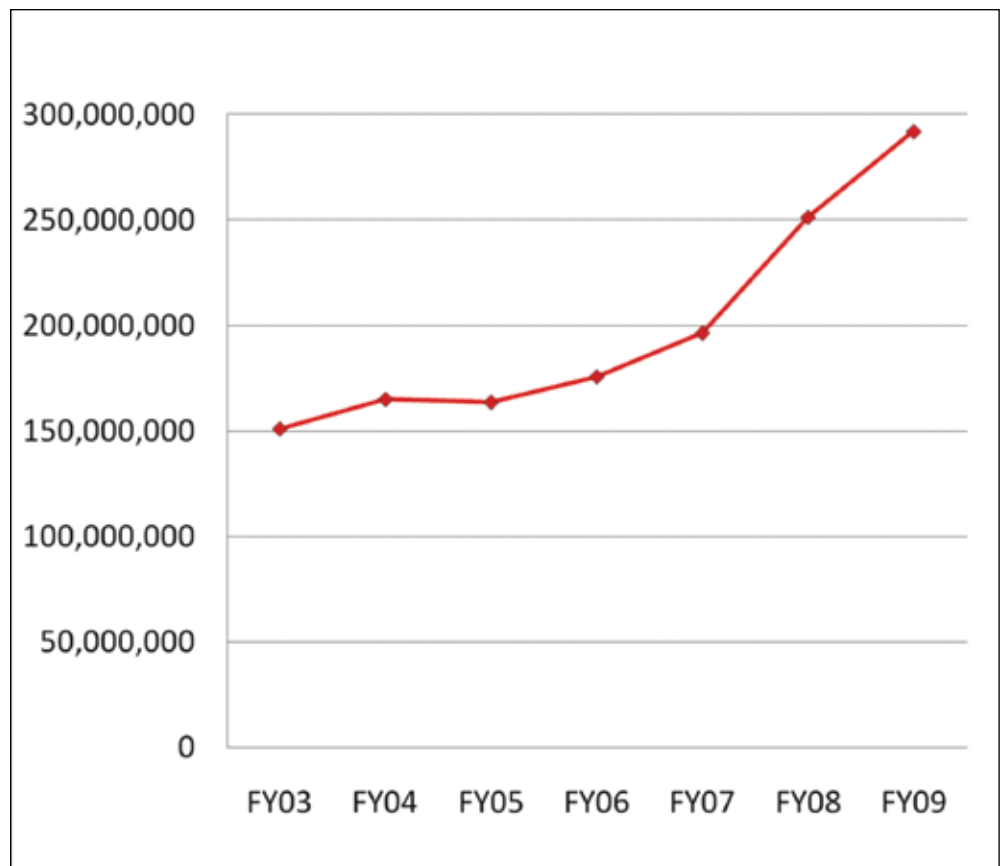


Figure 1. Federal Funding for Research at Rutgers

therapies, including a hernia repair device, an antimicrobial sleeve for prevention of infection of cardiac devices, and a cardiovascular stent. Four start-up companies (REVA Medical, TyRx Pharma, Lux Biosciences, and Renova) have licensed these technologies and have attracted more than \$120 million in private equity funding, creating more than 100 high-salary jobs.

Some federal funding is specifically intended to encourage collaborations between research universities and industry. The largest of such projects at Rutgers, The National Science Foundation Engineering Research Center for Structured Organic Particulate Systems, is a \$1.5M project led by Dr. Fernando Muzzio. This center brings together faculty researchers and industry leaders to improve the way pharmaceuticals, foods, and agriculture products are manufactured. This center, and many others at Rutgers, invite industry representatives to guide the directions of and benefit from the centers' discoveries. Rutgers is also the home to five NSF-funded Industry & University Cooperative Research Centers. These centers encourage collaborations between faculty and industry.

The Center for Dynamic Data Analytics led by Dr. Dimitris Metaxas, develops algorithms and solutions to analyze and visualize massive, complex, multidimensional, and multi-scale data.

The Ceramic, Composite and Optical Materials Center led by Dr. Richard Haber, is conducting research on ceramic materials and processing, nanoparticulates and processes, opaque and transparent armor ceramics, optical material synthesis and processing, and materials for energy conversion.

The Center for the Integration of Composites into Infrastructure led by Dr. Perumalsa Balaguru, focuses on innovation and mass-production of advanced polymer composites to create new products such as pre-cast composite bridge decks and pavement panels, and protection systems to increase the service life of infrastructure damaged by natural and man-made disasters such as earthquakes and terror attacks.

The Center for Autonomic Computing, led by Dr. Manish Parashar, focuses on improving

the design and engineering of computing systems that are capable of tuning themselves, adapting their resources and operations to current workloads, and anticipating the needs of their users. This center conducts research and development focused on improving hardware, networks and storage, middleware, service, and information layers used by modern industry.

WINLAB (Wireless Information Network Laboratory) is an industry-university cooperative research center focused on wireless technology, and is led by Dr. Dipankar Raychaudhuri. Its mission is to advance the development of wireless networking technology by combining the resources of government, industry, and academia.

Rutgers is also involved in collaborations with businesses that result in federal grants made to both the business and university. Some of these grants are made under the Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs. In addition to these types of grants, which provide up to \$1 million, larger collaborative grants are also made. For example, a recent grant made by the National Institute of Standards and Technology (NIST) under its Technology Innovation Program for The Automated Nondestructive Evaluation and Rehabilitation System (ANDERS) for bridge decks, involves Rutgers and partners from several companies. Other examples include numerous projects with companies funded by grants from the Department of Defense (e.g., DARPA, ONR, AFOSR, ARO) the Department of Energy (ARPA-E), and the Department of Homeland Security.

Businesses Partnering with Rutgers

Rutgers is a source of well-educated employees for many corporations. New Jersey's pre-eminent public university, Rutgers graduates more than 12,000 students a year. The majority of these students seek permanent employment immediately after graduation. Furthermore, many students take internships or part-time jobs with New Jersey businesses while pursuing their degrees.

Rutgers conducts more than 200 research

projects a year sponsored by corporations on problems selected by mutual agreement between the business and a faculty researcher. Sponsored projects at Rutgers can be a less expensive means of conducting research for businesses, particularly when the research requires specialized equipment or expertise. As many corporations downsize their internal R&D, research at universities such as Rutgers can help maintain a pipeline of innovation. Many sponsored projects involve students who are closely mentored by faculty researchers.

Rutgers licenses the discoveries of its inventors to a wide range of businesses including large multi-national corporations and small start-up companies. Some licensees sponsor additional projects to adapt the technology for a particular application or product. The patenting of Rutgers technology, marketing and licensing of technology to companies, and negotiation of corporate-sponsored research projects is handled by the Rutgers Office of Technology Commercialization (OTC).

Rutgers's Successes in Technology Commercialization

In 2007, Rutgers ranked 35th of all universities and 5th of all universities without a medical school in technology transfer income, according to data released by the Association of University Technology Managers (AUTM). The income is derived from licenses to both existing and start-up companies. In the past few years, Rutgers faculty researchers have been starting 7-10 companies a year to commercialize their inventions. At least three publicly traded companies have spun out of Rutgers in recent years. Ask.com is based on technology originally developed at Rutgers under the leadership of Dr. Apostolos Gerasoulis, a professor of computer science. Gerasoulis started a company, Teoma, that was purchased by Ask Jeeves, and which was later renamed Ask.com. Professor of Neuroscience, Dr. Paula Tallal, co-founded the Scientific Learning Corporation, producer of the educational software Fast ForWord, based on her research in strengthening the skills of memory, attention, processing rate, and

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sequencing for children. Axion International, Inc., designs, develops, and manufactures a new generation of eco-friendly structural building materials. Axion's technologies, developed at Rutgers University, transform recycled consumer and industrial plastics into a myriad of structured products, including railroad ties and bridge supports.

The breadth of Rutgers research is reflected in the breadth of its corporate licenses. For example, in pharmaceuticals, Professor Edmond Lavoie's discoveries have been licensed to both a start-up and an established company. In August 2009, a start-up company, TAXIS Pharmaceuticals Inc., was founded and signed an exclusive licensing agreement with Rutgers for worldwide rights to develop and commercialize one area of Dr. Lavoie's research, a novel antimicrobial technology addressing multidrug-resistant (MDR) bacterial infections. Genzyme Inc., licensed patents relating to novel compounds that inhibit Topoisomerase I, that were invented by Dr. Lavoie and others. In the area of agricultural research, Rutgers faculty member Dr. Nicholi Vorsa created a cranberry variety, the Crimson Queen, that offers earlier ripening and harvesting and large fruit size and superior vine vigor for rapid cranberry bed establishment, enabling growers to achieve full production up to two years earlier and with less need for chemical and pesticide intervention than standard varieties. This variety has been licensed to Ocean Spray Cranberries, Inc., and other growers. In the engineering space, Nuance Corporation has licensed technology invented by Professor Richard Mammone for speech recognition applications.

Rutgers Outreach to Small Companies

Rutgers has a variety of programs designed to assist small businesses.

The Rutgers-Newark Small Business Development Centers helps entrepreneurs and business owners start and grow sustainable, successful small businesses through the delivery of appropriate training and technical assistance services and programs.

The Center for Urban Entrepreneurship & Economic Development (CUEED) at Rutgers Business School integrates venture capital and municipal resources with university research

to study and promote economic development and entrepreneurship. CUEED concentrates on building strong corporate and community partnerships to support the revitalization of Newark and other urban areas in New Jersey, educating students by providing real world experience in urban entrepreneurship and economic development, and taking a multidisciplinary approach to research that will aid economic policy and decision making.

The Rutgers-Camden Technology Campus is a science and technology incubator/accelerator established to support early-stage companies in Camden as they create economic wealth through commercialization of science and technology, development of new business ideas, attraction of capital investment, and creation of new jobs. The incubator supports its early-stage client companies by providing an array of strategic business development services, operational guidance, and infrastructure support.

Rutgers' EcoComplex in Bordentown, New Jersey, helps green companies commercialize and market their ideas. The center offers access to applied research and demonstration capabilities and facilitates the commercialization of new technologies that address pressing environmental and energy issues.

The Food Innovation Center in Bridgeton, New Jersey, provides business and technology expertise to small and midsized food and agricultural businesses in New Jersey and nationwide.

Taking Courses at Rutgers

Rutgers has several educational opportunities designed specifically for employees in technology companies.

Rutgers Advanced Technology Extension (RATE) is the continuing education arm of the School of Engineering. RATE allows enrollment in single courses on select topics or certificate programs with groups of related courses. Courses and certificate programs are in areas such as professional engineering review, green energy and corporate sustainability, information technology, user experience design, and web technologies. Many of these programs lead to national certifications. Courses are offered at six locations throughout New Jersey, and

competitively priced custom courses can be offered at individual company locations.

The Center for Management Development offers the Mini-MBA™ that provides an overview of the key concepts, tools, and techniques that are required to succeed in today's challenging business environment. The program features focused learning experiences and case studies in 10-12 three hour sessions.

The Master of Business and Science (MBS) degree is a new degree program at Rutgers that brings together master's level study in science, mathematics, and engineering with courses in business and policy. The goal of this new degree program is to train the next generation of individuals to assume key integrator and leadership roles in science-intensive industries and to help translate research into commercialization to fuel innovation and economic growth in New Jersey and the U.S. A final capstone course covers technology valuation, entrepreneurship, and business case development. The science concentrations include Biotechnology and Genomics, Drug Discovery and Development, Biomedical Engineering, Personal Care Chemistry, Food Sciences, International Agriculture, Sustainability, Urban Environmental Sciences and Management, Information Technology, User Experience Design, Electrical and Computer Engineering, Actuarial Sciences, and Industrial Mathematics.

Rutgers and Technology Commercialization Ecosystem

Rutgers is a vital part of the technology commercialization ecosystem in New Jersey. Rutgers serves as an important source of talent and ideas to create the next generation of technology and innovation. However, universities cannot operate alone, and they require partners in economic development. These partners include businesses that hire Rutgers graduates and offer internship opportunities, companies with problems that can be addressed by a top-tier comprehensive research institution, companies that license technology from Rutgers, angel and venture capital investors interested in investing in early stage technologies, and experienced entrepreneurs willing to lead early stage companies. ■

Office of Technology Commercialization

Dipanjan Nag
Corporate Sponsored Research
and Technology Licensing Contracts
<http://otc.rutgers.edu>

Master of Business and Science Degree

Deborah Silver
Professional Science
Masters Degree
<http://psm.rutgers.edu/>

Rutgers Advanced Technology Education

Deborah Silver
Technology Courses and Certificates
<http://rate.rutgers.edu/>

Center for Management Development

Abe Weiss Mini-MBA
Center for Management Development
www.cmd.rutgers.edu

Protein Data Bank

Helen Berman
Structure and Function of Bioactive Molecules
www.pdb.org

Center for Discrete Mathematics and Theoretical Computer Science

Fred Roberts
Information Analytics, Computational Analysis
<http://dimacs.rutgers.edu/>

New Jersey Center for Biomaterials

Joachim Kohn
Biomaterials
www.njbiomaterials.org/

Northeast Structural Genomics Consortium

Gaetano Montelione
Structural Genomics
www.nesg.org/

Rutgers University Cell and DNA Repository

Jay Tischfield
Genetic causes of common, complex diseases
www.rucdr.org/

Center for Advanced Infrastructure and Transportation

Ali Maher
Transportation Infrastructure
<http://cait.rutgers.edu/>

Center for Structured Organic Particulate Systems

Fernando Muzzio
Pharmaceutical Manufacturing
<http://ercforsops.org/>

Center for Computational Biomedicine

Imaging and Modeling
Dimitris Metaxas
Data Analytics, Computational Biomedicine,
Computer Vision
www.cbim.rutgers.edu/

Ceramic and Composite Materials Center

Richard Haber
Ceramic Materials
[tp://ccmc.rutgers.edu/](http://ccmc.rutgers.edu/)

Center for the Integration of Composites into Infrastructure

Perumalsa Balaguru
Advanced Polymer Composites

Center for Autonomic Computing

Manish Parashar
Autonomic Computing Systems
www.nsfcac.org/

Wireless Information Network Laboratory

Dipankar Raychaudhuri
Wireless Technology
www.winlab.rutgers.edu/

Rutgers-Newark Small Business Development Center

Tendai Ndoro
Small Business Development
<http://rnsbdc.newark.rutgers.edu/>

Rutgers-Camden Small Business Development Center

Gary Rago
Small Business Development
<http://crab.rutgers.edu/~rsbdc/>

Center for Urban Entrepreneurship & Economic Development

dt ogilvie
Urban Entrepreneurship

Rutgers' EcoComplex

David Specca
Incubation of Green Companies
<http://ecocomplex.rutgers.edu/>

Food Innovation Center

Lou Cooperhouse
Incubation of Food Companies
www.foodinnovation.rutgers.edu/

Rutgers Energy Institute

Paul Falkowski
Alternative Energy Research
<http://ruei.rutgers.edu/>

Center for Human Resource Strategy

Paula Caligiuri
Human Resource Strategy
www.chrs.rutgers.edu/

Environmental and Occupational Health Sciences Institute

Kenneth Reuhl
Environmental and Occupational Health
<http://eohsi.rutgers.edu/>

Institute for Advanced Materials, Devices and Nanotechnology

Leonard C. Feldman
Nanotechnology & Devices
<http://iamdn.rutgers.edu/>

John J. Heldrich Center for Workforce Development

Carl Van Horn
Workforce development
www.heldrich.rutgers.edu/

Stevens

Turns Ideas Into Real-World Products

For 140 years, Stevens Institute of Technology has been on the forefront of innovation, educating the leaders and entrepreneurs of the future. From our founding family's engineering breakthroughs in steamship and locomotive engineering to environmental startup companies like Plasmasol and Hydroglobe, Stevens provides undergraduate and graduate programs that prepare students to develop the groundbreaking technologies of tomorrow.

Research

The Research Enterprise at Stevens features three National Research Centers of Excellence: the Center for Secure & Resilient (CSR) Maritime Commerce; Systems Engineering Research Center (SERC); and the Atlantic Center for the Innovative Design & Control of Small Ships (ACCESS). Stevens also features the Center for the Advancement of Secure Systems & Information Assurance (CASSIA); a nexus for research advancements

in cybersecurity in addition to a wide range of research centers and facilities.

Research at Stevens is structured into three overarching areas that are based on the needs of our society and a determination of how the world class assets of the university can be utilized by industry and entrepreneurs.

Nanotechnology & Multi-scale Systems

- Develops and implements nanotechnology-enabled solutions spanning a broad spectrum of engineering and science disciplines. Rooted in nanoscale science, yet, focused on real-world problems, these emerging technologies will have transformative value in the areas of national and global interest including energy, health, electronics, communications, the environment and national security.

Secure Systems - Is a cross-disciplinary research area focused on developing transitional breakthroughs in national security technology. The Maritime Security Laboratory established in partnership with the U.S. Navy focuses on emerging maritime threats while researchers in the departments of Mathematics, Computer Science, Computer Engineering and Physics work on a wide variety of cybersecurity issues.

Systems Engineering & Enterprise

Management - Addresses questions that are related to the nature of sociotechnologic systems within the context of global competitiveness in their process to create economic value. Research efforts create unique knowledge about the functionality of socioeconomic systems and focus on developing practical methods, tools and heuristics that leaders can apply to increase the productivity of sociotechnical systems and improve their economic value.

Dr. Joseph Mitola III is the Vice President of the Research Enterprise.

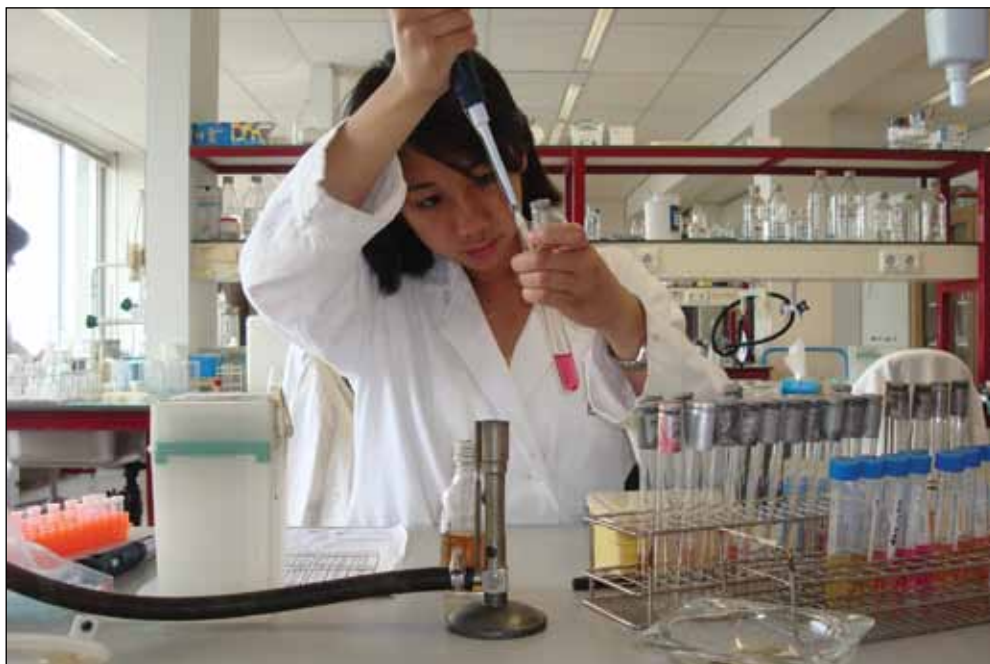
Entrepreneurship

Technogenesis® is an environment where research innovation connects with business development. At Stevens, this ensures that entrepreneurial activities are initiated at the faculty level and supported throughout the development process by the academic administration.

The Office of Academic Entrepreneurship, led by Associate Provost Dr. Christos Christodoulatos, provides abundant tools and support for students, faculty and research scientists to ensure that ideas are successfully transitioned into the marketplace.

HydroGlobe is an outstanding example of a Stevens company having gone through the entire lifecycle development process. A Technogenesis® environmental company, HydroGlobe produced patented products for the removal of heavy metals from water – including lead and arsenic. Originally founded by three Stevens professors, their research has since been acquired by Graver Technologies, a leading manufacturer of filtration and separation products.

PlasmaSol, another Stevens spinout, was named Environmental Company of the Year in 2000 by the New Jersey Technology Council (NJTC). PlasmaSol is exclusively licensed by Stevens to use its new patented plasma technology, "Capillary Discharge Non-Thermal Plasma," for environmental applications.



Stevens Innovations and Enterprise Development

The resounding success of our entrepreneurial ventures has been taken to the next level with the introduction of Stevens Innovations (SI) LLC, a virtual incubator led by Vice President, Malcolm Khan.

Based on a strong pipeline of technology coming from its expert researchers and from relationships the University is developing with other organizations, SI is an investment vehicle that helps researchers and entrepreneurs turn their ideas into real-world products. SI offers a full range of services from office support and business development, to assistance in raising capital and is in the process of raising its own investment fund to help early stage companies

get started. This is a major commitment that Stevens has made to its faculty, researchers and partners.

“Stevens dual focus on entrepreneurship and enterprise development is a key differentiator for the University. Our understanding of what it takes to develop completely engineered, commercially viable products and turn them into professionally run businesses is well documented,” said Malcolm Khan.

The process of innovation and entrepreneurship provides lucrative opportunities for businesses, venture capitalists and entrepreneurs while our academic programs are built in collaboration with professional societies and corporations to ensure that our graduates are perfectly aligned with the skills

required to succeed in today’s marketplace. The world-class centers of excellence, research facilities and laboratories are home to many groundbreaking innovations and patents.

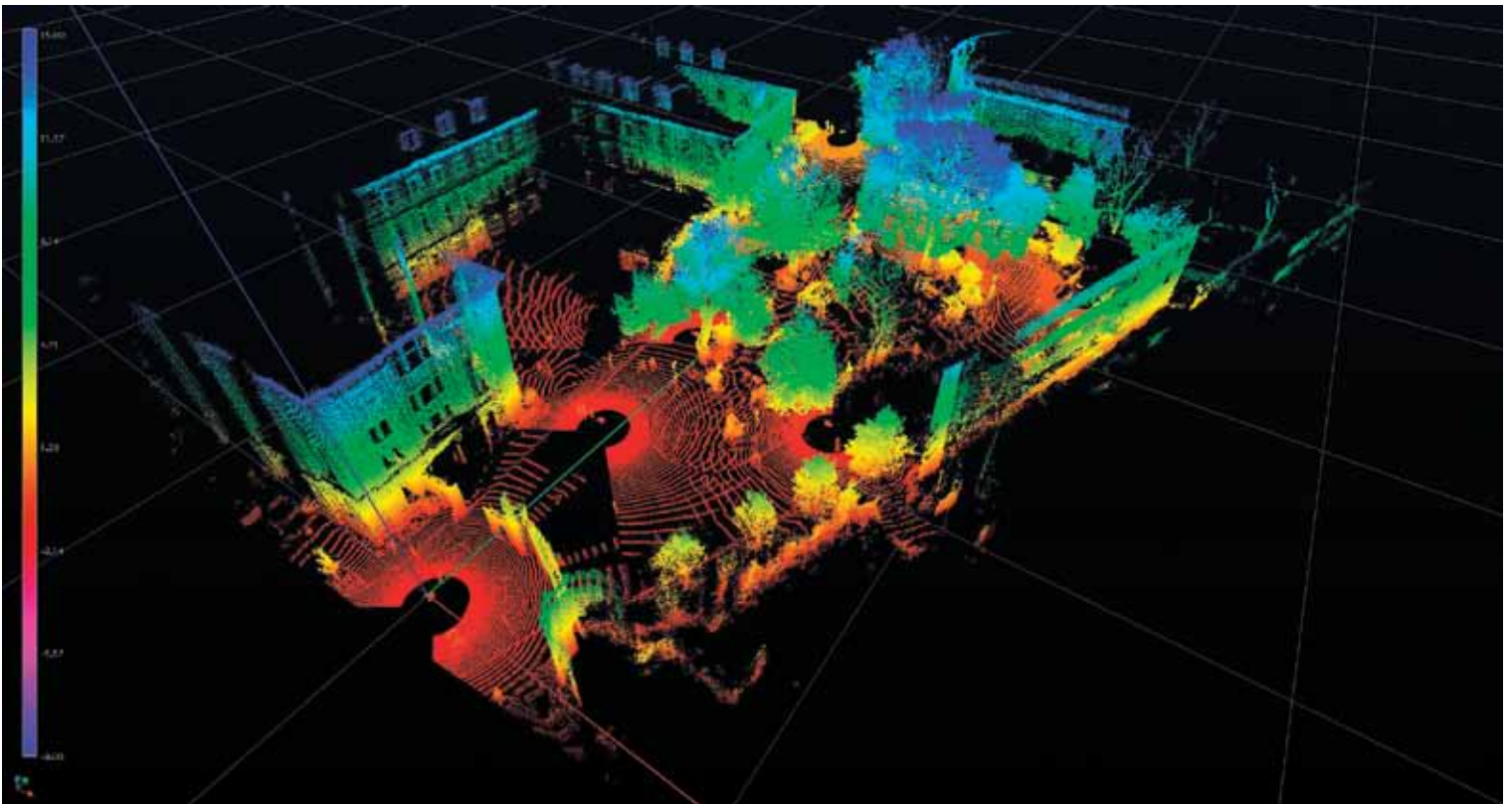
Please contact us to learn how 140 years of innovation and entrepreneurship can assist your business needs. Also, stay up-to-date on the latest Research & Entrepreneurship news by joining us on Facebook and Twitter or by visiting our news and research portals! ■

<http://www.facebook.com/StevensRE>

<http://buzz.stevens.edu>

http://www.twitter.com/RE_Stevens

<http://research.stevens.edu>



CADEYES, a new Stevens Spin-out company, has developed a mobile 3D scanning device capable of producing dimensionally accurate CAD-ready drawings of buildings and landscapes in a fraction of the time of conventional methods. The 15 acre scan above was done in less than 1 hour and provides architects and engineers with a high level of detail, including texture information through a combination of LIDAR lasers and high-definition cameras.



At-A-Glance

Stevens Institute of Technology

Castle Point on Hudson, Hoboken NJ 07030-5991
www.stevens.edu/sit/
Phone: 201.216.5000

Enterprise Development & Licensing

www.stevens.edu/startups/
Malcolm Kahn, Vice President
malcolm.kahn@stevens.edu
Phone: 201.216.8780

Research Enterprise

www.stevens.edu/research/
Dr. Joseph Mitola III, Vice President
joe.mitola@stevens.edu
Phone: 201.216.5263

Academic Entrepreneurship

www.stevens.edu/entrepreneurship/
Dr. Christos Christodoulatos, Associate Provost
christod@stevens.edu
Phone: 201.216.5675

Centers of Excellence

Center for Secure & Resilient

Maritime Commerce

www.stevens.edu/csr/
Dr. Hady R. Salloum
hsalloum@stevens.edu
Phone: 201.216.8575

Systems Engineering Research Center

www.sercuarc.org/
Dr. Arthur Pyster
arthur.pyster@stevens.edu
Phone: 703.717.8110

Atlantic Center for the Innovative Design & Control of Small Ships

www.stevens.edu/access
Dr. Raju V. Datla
rdatla@stevens.edu
Phone: 201.216.5568

Research Trusts

Nanotechnology & Multiscale Systems

www.stevens.edu/multiscale

Secure Systems

www.stevens.edu/secsys

Systems Engineering & Enterprise Management

www.stevens.edu/sem

Research Centers & Labs

Center for Environmental Systems

www.ces.stevens.edu/
Dr. Christos Christodoulatos christod@stevens.edu
Phone: 201.216.5675

Highly Filled Materials Institute

www.hfmi.stevens.edu/
Dr. Dilhan M. Kalyon dkalyon@stevens.edu
Phone: 201.216.8225

Design & Manufacturing Institute

www.dmi.stevens.edu/
Dr. Kishore Pochiraju kpochira@stevens.edu
Phone: 201.216.8053

Micro Devices Laboratory

www.stevens.edu/mdl
Dr. Eui-Hyeok Yang
eyang@stevens.edu
Phone: 201.216.5574

Laboratory for Multiscale Imaging

www.stevens.edu/lmsi/
Dr. Matthew Libera
mlibera@stevens.edu
Phone: 201.216.5259

Center for Maritime Systems

www.stevens.edu/cms/
Dr. Alan F. Blumberg ablumber@stevens.edu
Phone: 201.216.5289

Center for the Advancement of Secure Systems & Information Assurance

www.stevens.edu/cassia
Dr. Susanne Wetzel
susanne.wetzel@stevens.edu
Phone: 201.216.5610

Center for Intelligent Networked Systems

www.stevens.edu/inets/
Dr. Victor Lawrence
vlawrenc@stevens.edu
Phone: 201.216.5636

Maritime Security Laboratory

www.stevens.edu/msl/
Dr. Julie Pullen
julie.pullen@stevens.edu
Phone: 650.269.9394

Business Process Innovation

www.stevens.edu/bpmresearch
Dr. Michael zur Muehlen
michael.zurmuehlen@stevens.edu
Phone: 201.216.8293

Center for Complex Adaptive

Sociotechnological Systems
<http://socio-technical.org/>
Ali Mostashari
amostash@stevens.edu
Phone: 201.216.8723

Center for Decision Technologies

<http://howe.stevens.edu/cdt>
Dr. Jeffrey V. Nickerson
jnickers@stevens.edu
Phone: 201.216.8124

Systemics Laboratory

<http://systemicslab.com/>
Dr. Brian Sauser
bsauser@stevens.edu
Phone: 201.216.8589





Princeton University

Engages in Partnerships to Further Research and Innovation

BY HILARY PARKER

As a research institution, Princeton University seeks to achieve the highest levels of distinction in the advancement, preservation and dissemination of knowledge. The University's leaders hold the core belief that the knowledge generated at Princeton should serve the public interest and welfare, whether by deepening the understanding of the world, addressing pressing societal problems or strengthening the economy.

Entrepreneurs and businesses often play a valuable role in helping the University achieve this goal by helping to enable path-breaking research efforts at Princeton and serving as a conduit for discovery from Princeton labs into the marketplace. These collaborations bring together leading minds in fields across the intellectual spectrum from academia and industry, and often provide industry partners with access to intellectual property and state-of-the-art research facilities at the University.

The Office of the Dean for Research -- which encompasses the offices of technology licensing, corporate and foundation relations, and research and project administration -- fosters the development of a wide range of partnerships between the University and external sponsors and partners.

"The discoveries made by world-class Princeton scientists and engineers on a quest for fundamental new knowledge lay the crucial groundwork for applications that improve human wellbeing and bolster the economy," said Princeton Dean for Research A.J. Stewart Smith. "Vital collaborations with investors and corporations allow these benefits to be tapped to the fullest potential."

Several of Princeton's research centers, such as the Mid-Infrared Technologies for Health and the Environment (MIRTHE) Center, and academic departments, including chemistry and computer science, have established industry memberships and corporate affiliate programs. These confer a range of opportunities to entrepreneurs and businesses in the full array of technology and industry sectors. These ongoing and regular interactions between Princeton researchers and industry partners enable joint research projects, facilitate the technology transfer process, and establish relationships between industry members and Princeton students, many of whom will become invaluable members of tomorrow's work force.

Beyond formalized partnership programs, there are a number of avenues through which businesses may connect with the Princeton research

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Photo Credits:

Princeton University, Office of Communications, Denise Applewhite (top 4 images)
David Hunsinger (bottom)

community. Events such as the Celebrate Princeton Invention reception, sponsored by the Office of the Dean for Research, and the annual Innovation Forum, sponsored by the University's Keller Center for Innovation in Engineering Education, provide introductions to some of the commercially available technologies at Princeton. Each year such events feature a host of colloquia, lectures and panels on a multitude of research efforts underway at Princeton.

When businesses or Princeton researchers identify a potential opportunity for collaboration, the Office of Corporate and Foundation Relations customizes a partnership that is well aligned with both industry needs and Princeton research priorities. Efforts range from establishing joint research projects and co-managed funds, to sponsoring an individual faculty member's research and supporting or endowing graduate fellowships or professorships.

Businesses also harness the potential of Princeton research by licensing discoveries made in University labs. In the 2009 fiscal year alone, more than 300 faculty members, research professionals and students participated in research and technology transfer activities. The discoveries currently available for licensing cover the technological spectrum, including computer software and hardware, optoelectronics, materials science and biotechnology.

"Collaboration with investors, entrepreneurs and businesses helps transform basic research into applications and technologies that will make the world a better place, and we recognize that these partnerships are crucial drivers of the innovation process," said John Ritter, director of Princeton's Office of Technology Licensing.

Perhaps one of the greatest technology transfer success stories is Alimta, the blockbuster anti-cancer drug that developed out of discoveries made in the lab of Edward Taylor, Princeton's A. Barton Hepburn Professor of Organic Chemistry Emeritus, in partnership with Eli Lilly and Co. scientists. Approved for the treatment of malignant pleural mesothelioma by the U.S. Food and Drug Administration in 2004, the drug has since received three additional FDA approvals, most recently in July when the compound became the first chemotherapy approved for use as a maintenance therapy to extend survival for patients with locally advanced

or metastatic nonsquamous non-small cell lung cancer. Although no drugs exist to cure lung cancer, Alimta has been successful in treating the disease, improving the quality of life and extending the lifespan of millions of cancer patients in nearly 100 countries, and with fewer side effects than many other chemotherapeutic agents.

Speaking at the 2009 Celebrate Princeton Invention reception, Princeton President Shirley M. Tilghman said of the collaboration, "There is no better example of how this kind of partnership plays out for the benefit of humankind." ■



Photo Credit: Princeton University, Office of Communications, Denise Applewhite



Princeton University Research Centers, Institutes and Labs

Princeton's many institutes, centers and research programs work across traditional academic boundaries to promote research and teaching that is interdisciplinary, collaborative and groundbreaking. These include:

Mid-Infrared Technologies for Health and the Environment Center (MIRTHE)

www.mirthecenter.org

Specialty: Mid-infrared trace gas sensing systems
Contact: Joseph Montemarano, managing director and Princeton Institute for the Science and Technology of Materials entrepreneurial liaison
609.258.2267

jmonte@princeton.edu

Princeton Center for Complex Materials (PCCM)

www.princeton.edu/~pccm/

Specialty: Materials science
Contact: Anthony Novembre, associate director
609.258.6855
novembre@princeton.edu

Princeton Institute for the Science and Technology of Materials (PRISM)

<http://www.princeton.edu/prism/>

Specialty: Materials science, optics and sensors
Contact: Anthony Novembre, associate director
609.258.6855
novembre@princeton.edu

Lewis-Sigler Institute for Integrative Genomics

www.genomics.princeton.edu/

Specialty: Genomics, quantitative biology
Contact: Kara Dolinski, assistant director
609.258.8306
dolinski@princeton.edu

Princeton Neuroscience Institute

www.princeton.edu/neuroscience/

Specialty: Neuroscience
Contact: Patricia Gensel, assistant director
609.258.4113
pgensel@princeton.edu

Combustion Energy Frontier Research Center

<http://cefr.princeton.edu/>

Specialty: Combustion science
Contact: Chung K. Law, director and the Robert H. Goddard Professor of Mechanical and Aerospace Engineering
609.258.5271
cklaw@princeton.edu

Center for Networks Science and Applications

www.princeton.edu/cnsa/

Specialty: Network science
Contact: Paul Prucnal, director and professor of electrical engineering
609.258.5549
prucnal@princeton.edu

Princeton Physical Sciences-Oncology Center

http://physics.cancer.gov/centers/adv_princeton.asp?p=home

Specialty: The evolution of cancer under stress
Contact: Sally Waltman, associate director
609.258.2602
swaltman@princeton.edu

Princeton Environmental Institute (PEI)

<http://web.princeton.edu/sites/pei/index.html>

Specialty: Environmental research, education and outreach
Contact: Holly Welles, manager of PEI communications and outreach
609.258.6456
hwelles@princeton.edu

Princeton Plasma Physics Laboratory (PPPL)

www.pppl.gov/index.cfm

Specialty: Plasma science and fusion energy
Contact: John DeLooper, P.E., PPPL head, best practices and outreach
609.243.3047
jdelooper@pppl.gov

Research Administration

Office of Corporate and Foundation Relations

<http://cfr.princeton.edu/cfr/>

Contact: David Langiulli, director
609.258.5954
davidfl@princeton.edu

Office of Technology Licensing

www.princeton.edu/patents/index.htm

Contact: John Ritter, director
609.258.1570
jritter@princeton.edu

Office of Research and Project Administration

www.princeton.edu/~orpa1/

Contact: Jeff Friedland, director
609.258.3090
jfried@princeton.edu

Office of the Dean for Research

www.princeton.edu/main/research/dean/

Contact: A. J. Stewart Smith, dean for research
609.258.5500
dfr@princeton.edu

University of Medicine and Dentistry of NJ

Bringing Science to Market

BY EVE JACOBS

Not even a feverish flu can keep “the patent guy” down for long. His mile-high schedule sends him moving north to south, east to west along New Jersey’s highways and zipping along the electronic global thruways. Perhaps his arrival at UMDNJ five years ago created this need, or maybe he appeared in exactly the right place at the right time for a job that sorely needed his attention.

Lucky that the patent guy — also known as Vince Smeraglia — has big energy and a big personality to meet his position’s growing demands. Think of him in terms of a major bridge — connecting the University’s researchers with a world of commercial potential and intricacy that many had once perceived as foreign, and somewhat sinister, territory. A scientist by training and first career, as well as an attorney with the right background to protect intellectual property, he straddles these worlds with relative ease, speaking the specialized languages of both, inhibited by the boundaries of neither.

With a BS in biochemistry from Rutgers in hand, Smeraglia landed a first job at Cytogen Corporation in Princeton in 1989, where he did lab research in cancer diagnostics for seven years. The young scientist found a lunchtime lecture by a patent attorney so compelling that he boldly decided to take the giant step from

“bench” to law school — so he could prepare for a career in “tech transfer.”

With the necessary background in science, he was accepted into the Franklin Pierce Law Center in Concord, NH, repeatedly ranked among the country’s top 10 in intellectual property law by U.S. News and World Report. After graduating, he worked for McCarter and English for one year and Rutgers’ Office of Technology Commercialization for six years before landing at UMDNJ, where he managed to double the number of license agreements signed in his very first year.

As Federal grant monies dwindle, income from the commercialization of intellectual property becomes ever more important to universities. “There is a lot of compelling, innovative research going on here,” says Smeraglia, but little of it traveled into the marketplace before the patent guy came onboard to teach, encourage and handhold through the complex, often tedious and always expensive process called technology transfer.

“Filing patent applications is time-consuming and resource-intensive,” he explains. The review process can stretch to several years, and the “inventor will have to spend a lot of time with a lawyer properly describing the invention and helping to refute patent examiners’ legal arguments of why the inventor should not get the patent.”

But this is a road that Smeraglia has walked down many times. He knows his way and doesn’t lose heart; and University inventors

know they have a skilled, determined advocate to see them through the process. “As the review is going on, we are also aggressively marketing to pharma, diagnostic, medical device and biotechnology firms,” Smeraglia states.

“Success means a licensing agreement,” giving the licensee permission to use the invention to make a product, he says. The company will have to demonstrate safety and efficacy of the product to the FDA, which usually takes three to five years, but sometimes up to eight years. “We get a royalty — a percentage of the sale of the product,” he states, which is divided, according to a formula, among the University, the school, the department, the inventor and the Office of Patents and Licensing, which uses its small fraction of the pie to underwrite its operations.

“A licensed technology, if successful, can provide a terrific monetary benefit to UMDNJ and a solution to an unmet medical need for the public,” he says.

“Our University is an upstart, but we’re coming along rapidly,” states Smeraglia with pride. With 75 to 80 inventions submitted to his office annually for review, and ongoing relationships with more than 100 UMDNJ faculty members, the patent guy’s schedule won’t be slowing down anytime soon. In fact, his work-life will likely become even more hectic.

But he’s not worried. “I love this job,” he says. “It’s thrilling and it is an important and growing part of UMDNJ’s success.” ■



Fast Facts

<http://www.umdj.edu/research/>

4 Main Campuses:

- Newark
- Stratford,
- Camden
- Piscataway/New Brunswick
- Branch Campus: Scotch Plains

Largest Institution of its Kind in the Nation with 8 Schools:

- New Jersey Medical School
- Robert Wood Johnson, Medical School
- School of Osteopathic Medicine
- New Jersey Dental School
- Graduate School of Biomedical Sciences
- School of Health Related Professions
- School of Nursing
- School of Public Health

4 Principal Teaching Hospitals:

- UMDNJ-University Hospital
- Robert Wood Johnson University Hospital
- Cooper Hospital/University Medical Center
- Kennedy Memorial Hospital
- University Medical Center

3 University Hospitals:

- Hackensack University Medical Center
- Meridian Hospitals Corporation/Jersey Shore University Medical Center
- University Medical Center at Princeton

(l-r) Laura M. Schepps, MBA, Director of Finance & Administration; Barbara V. Maurer, Esq, Patent Counsel; Vincent A. Smeraglia, Esq, Director; Tatiana Litvin-Vechnyak, PhD, Assistant Director, all from the UMDNJ Office of Patents & Licensing
Photo: Andrew Hanenberg.

UMDNJ Major Centers and Institutes

- The Cancer Institute of New Jersey
- The New Jersey Medical School
- University Hospital Cancer Center
- Center for Advanced Biotechnology and Medicine
- Center for Biodefense
- Center for Public Health Preparedness
- Center for Tobacco Surveillance and Evaluation Research (CTSER)
- Child Health Institute of New Jersey
- Clinical Research Organization (CRO)
- Division of AIDS Education, The Center for Continuing and Outreach Education
- Environmental and Occupational Health Sciences Institute
- Eric B. Chandler Health Center
- François-Xavier Bagnoud Center
- New Jersey Institute for Successful Aging
- The Informatics Institute of UMDNJ
- Institute for Complementary and Alternative Medicine
- The Institute for the Elimination of Health Disparities
- The New Jersey Medical School
- Global Tuberculosis Center at UMDNJ University
- New Jersey Medical School and University Hospital
- Robert Wood Johnson Medical School
- New Jersey Dental School
- School of Osteopathic Medicine
- School of Health Related Professions
- School of Nursing
- School of Public Health
- University Behavioral Healthcare

New Jersey Public and Private Colleges and Universities – Research Sites/Capabilities

Drew University

www.drew.edu

The Charles A. Dana Research Institute for Scientists Emeriti (RISE) at Drew University offers undergraduates a unique opportunity to engage in research under the supervision of retired industrial scientists. Since 1981 Institute fellows have guided the research efforts of nearly two hundred students majoring in biology, chemistry, mathematics, and physics. The program is believed to be the only one of its kind in the nation and in 1989 received the prestigious Merck Innovation Award for Undergraduate Science Education “for fresh thinking and imaginative use of resources.”

Fairleigh Dickinson University

www.fdu.edu

The Silberman College of Business sponsors a series of business research studies that involve faculty and students. The College publishes several working paper series and *The Journal of Pharmaceutical Chemical Business*. Faculty also are developing a unique research strength in entrepreneurship.

The faculty are also engaged in research in the areas of economics, management, marketing, human resources, health care, entrepreneurship, management information systems, accounting, finance, business law, taxation, quantitative analysis, production management and operations management. Finally, research also is an integral component of activities at Anthony J. Petrocelli College of Continuing Studies. Faculty pursue scholarly inquiry in areas that include 19th-century European history, the history of the Bronx, medieval French and English literature, classical philosophy and ethical issues in the late 20th century.

Kean University

www.kean.edu

The Office of Research and Sponsored Programs (ORSP) provides leadership and assistance in all areas of external grant funding to the Kean University community. ORSP provides information, services and support to assist faculty and staff to compete successfully for external funding to conduct research and scholarship; engage in creative work; develop curriculum; advance student learning, aid recruitment and retention; support campus programming and community outreach. We aid faculty and staff from the pre-award prospect research, planning and submission phases through the post-award management processing and reporting stages. In addition to grants and contracts administration, our responsibilities encompass management of internal research awards, oversight for sponsored programs, and compliance with applicable Federal, State, and University policies and regulations including research involving human subjects and care and use of laboratory animals.

The Kean Autism Research and Education Center

www.kean.edu/~kare

The Kean Autism Research and Education Center’s (KARE) mission is to advance research in autism spectrum disorders (ASD); to educate professionals to work in an interdisciplinary manner to improve the lives of individuals with ASD; and to provide information, training, and a lifetime of support to individuals and their families. The KARE Center is located on the campus of Kean University in Union, New Jersey. The KARE Center research program supports multi-disciplinary clinical and applied research focused on developing effective intervention and treatment methods that improve the lives of individuals and families affected by autism spectrum disorders. The KARE Center interdisciplinary autism education program supports evidence-based education to prepare highly trained professionals from many separate disciplines to work with individuals and families that are affected by autism spectrum disorders. The KARE interdisciplinary education program serves teachers, school-based professionals and community-based professionals. The program offers an 18 credit, graduate-level certificate for teachers and professionals as well as specialized workshops and conferences.

Monmouth University

www.monmouth.edu

The mission of The Urban Coast is to serve Monmouth University and the public interest as a forum for research, education, and collaboration in the development and implementation of science-based policies and programs that support stewardship of healthy, productive, and resilient coastal ecosystems and communities. The UCI maintains a principal focus on the interactions between humans and the coastal and ocean environment, and sustainable coastal development along New Jersey’s coasts and watersheds. Monmouth County and the New Jersey-New York region is an ideal “laboratory” for study of these issues. The UCI has a unique focus on how good science can inform public policy and the “human dimensions” of coastal ecosystem-based management, including the impacts of human use and development on coasts.

Montclair State University

www.montclair.edu

Institutes: African American Studies, The Coccia Institute for the Italian Experience in America, Institute for the Advancement of Philosophy for Children, Institute for the Humanities, The Margaret and Herman Sokol Institute for Pharmaceutical Life Sciences, Passaic River Institute

Centers: ADP Center for Teacher Preparation and Learning Technologies, Center for Academic Development and Assessment, Center for Academic Advising and Adult Learning, Center for Archaeological Studies, Center for Child Advocacy, Center for Community-based Learning, Center of Pedagogy, Center for Economic Research on Africa (CERAF), Center for International Business (CIB), Community Outreach Partnership Center (COPC), DuMont TV Center, Global Education Center, International Trade Counseling Center (ITCC), Research Academy for University Learning, Student Academic Services, Women’s Center.

Ramapo College of New Jersey

www.ramapo.edu

The School of Theoretical and Applied Science has been a distinct and incorporate part of Ramapo College since it admitted its first class in 1971. Since its inception, the School of TAS has been committed to excellence in teaching, research, and public service in the sciences and mathematics, and has sought to prepare its graduates not only for professional and academic careers but to be scientifically literate citizens and lifetime learners in an increasing complex and ever changing technological culture. The School of TAS places a strong emphasis on teaching, practice, and public service. It encourages faculty/student collaborative research as a continuing course of study. Its faculty and graduates continue to serve as rich resources to governmental agencies, academic institutions, and private research facilities to promote the public good and educational excellence.

Rider University

www.rider.edu

The Psychology Department encourages students to become involved in research projects. Research programs span all major areas in the curriculum. Many of the projects have been funded by outside sources including the Federal Government and the State of New Jersey. A significant level of funding is provided by Rider itself in recognition of the Department's proven track-record of integrating undergraduates into faculty research programs. Students can assist faculty in their research by taking Directed Study in Psychology (Psy-295), as well as work on their own project by taking Independent Research and Study (Psy-490) under the supervision of a faculty member. Areas include: Research in Developmental Psychology, Applied Developmental Research / Community-Based Program for Individuals with Special Needs, Research on the Psychology of Cyberspace, Research in Community Health Psychology.

Saint Peter's College

www.spc.edu

The Center for Microplasma Science & Technology (CMST) at Saint Peter's College (SPC) is a designated Center of Excellence (CoE) and the National laboratory for advanced research and development in microplasmas. The CMST was founded in 2009 through Department of Defense (DoD) funding from the Air Force Office of Scientific Research (AFOSR) to serve as the United States of America's first and only scientific and educational center devoted entirely to the emerging field of microplasmas. CMST engages in sponsored research programs dedicated to improving our Nation's scientific and technological capabilities. As an affiliated entity of SPC's Department of Applied Science and Technology (DAST), CMST supports the three core Institutional missions of Research, Education, and Public Service. The current nature of the research spans the spectrum from fundamental inquiries into the basic plasma physics and chemistry of microplasmas to the work on potential microplasma technological applications. CMST maintains five active research laboratories on the Jersey City campus of Saint Peter's College that support the various research projects. Undergraduate and local high school students have the opportunity to work with six full-time CMST staff members on various projects.

Seton Hall University

www.shu.edu

The Center for Community Research and Engagement (CCRE) was created in 1997 to coordinate the activities of Seton Hall University as it implements service learning and community-based research on campus. The mission of the Center for Community Research and Engagement is to develop partnerships that integrate Seton Hall University faculty, students, staff and our neighboring communities through applied research, active learning, and action projects, aimed at enhancing both the learning environment and community capacity.

The College of New Jersey

www.tcnj.edu

Centers: Bonner Center for Civic and Community Engagement, Center for Assistive Technology and Inclusive Educational Studies — CATIES, Center for Youth Relationship Development, The Institute for Educational Design, Evaluation, and Assessment (IeDEA), Municipal Land Use Center, Small Business Development Center

The Richard Stockton College of New Jersey

www.stockton.edu

The Coastal Conservation Research Program (CCRP) is the outgrowth of a research program initiated in 1989 at the Wetlands Institute on the Cape May Peninsula of southernmost New Jersey. Located on 6,000 acres of coastal salt marsh, the Wetlands Institute promotes research, education, and conservation through a variety of methods including classes, field research, and local community involvement. The CCRP is a partnership between the Wetlands Institute, Richard Stockton College of New Jersey (RSC), and other public and private partners. The CCRP focuses its research and conservation efforts on issues related to our close proximity to the dense human population of the northeastern United States. Over the past 20 years, nearly 200 college and university students from over 100 academic institutions throughout the United States and abroad have participated in our program. The CCRP now annually involves approximately 10-15 student researchers working closely with research scientists on a wide variety of projects.

William Paterson University of New Jersey

www.wpunj.edu

Students are encouraged to join faculty in conducting research. Financial support for students is often available through grants awarded to members of our faculty. In addition, the recently established WPUNJ Student Undergraduate Research Program, supported by the Office of the Provost, provides monetary support and recognition to students pursuing independent research. Students are also encouraged to conduct independent research projects under the supervision of a member of our biology faculty.

BioNJ

With more than 275 member companies, BioNJ focuses on the growth and prosperity of New Jersey's biotechnology cluster. Founded in 1994 by NJ industry CEOs, BioNJ serves as the voice of the State's biotechnology industry, seeks to advance our members' economic development and works to encourage new and established companies from around the world to locate to New Jersey. BioNJ represents companies engaged in biopharmaceutical, biomedical, bioagricultural and bioremedial endeavors.

Debbie Hart, President, BioNJ
609-890-3185
DHart@BioNJ.org
www.BioNJ.org

HealthCare Institute of New Jersey

The HealthCare Institute of New Jersey is a trade association for the research-based biopharmaceutical and medical technology industry in New Jersey. Founded in 1997, the Institute serves as a unified voice for the industry and seeks to build awareness of this industry's impact on New Jersey's quality of life and economic well-being. There are currently 34 members of the HealthCare Institute of New Jersey.

908-212-0333
www.hinj.org

New Jersey Business Incubation Network

The New Jersey Business Incubation Network (NJBIN) is a collaborative state-wide community of business experts, resources and facilities dedicated to enhancing the commercial success of early-stage entrepreneurial companies, growing higher paying jobs in New Jersey and supporting the Economic Growth Strategy for the State. NJBIN incubators provide early-stage companies critical support services in a professional business environment including coaching, access to capital, technical and business resources, networking opportunities, and flexible office or laboratory space.

973-242-3515
www.njbin.com

New Jersey

Economic Development Authority (EDA)

The EDA is a financing and development agency that serves as New Jersey's "bank for business" by providing support to the Partnership for Action through its financing and incentive resources. With its large portfolio of varied programs and services, the EDA's mission is to strengthen New Jersey's economy by retaining and growing businesses through financial assistance, by renewing communities, and by promoting the State's strategic advantages to attract businesses.

If you are interested in hearing about what the EDA can do for your business, contact the State's Business Service Center at (866) 534-7789 or Email CustomerCare@njeda.com.

866-534-7789
CustomerCare@njeda.com
www.njeda.com

New Jersey Technology Council

The NJTC was founded 14 years ago by business leaders who saw a need for one central support organization to foster growth within the fastest growing business sectors in the region – IT/Software, Environment/Energy, Life Sciences, Telecommunications, Advanced Materials and Electronics. These are the foundation pillars of New Jersey's vibrant technology community. New trends catch on—clean tech, green tech and nano tech, for example—and programs designed to help companies succeed at every stage of the business growth cycle evolve.

Maxine Ballen, CEO & President, NJTC
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