

# innovative

○ —————▶  
For more than 125 years NJIT has been an active leader in developing real-world solutions.


# entrepreneurial

○ —————▶  
The university is a catalyst for economic growth, cultivating high-tech talent and thinking.

# engaged

○ —————▶  
NJIT is actively engaged in public service — locally, nationally and internationally.

# innovative



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NJIT is a research university with an emphasis on applied, interdisciplinary efforts encompassing engineering, architecture, the sciences (including health sciences), mathematics, transportation and infrastructure systems, and information and communications technologies.


# entrepreneurial



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NJIT is contributing to New Jersey's economic development through the creation of intellectual property, leadership of the state's largest business incubator system, and joint ventures with government and the business community.

# engaged



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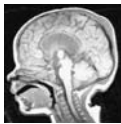
NJIT is actively engaged in making education opportunities widely available, initiating and leading community-building projects, and conducting public policy studies that benefit both our own urban community as well as the broader society. Learn about several of our efforts inside.

NJIT devotes almost \$90 million annually to interdisciplinary applied research supported by public and private funding. Here are a few current initiatives.

### Health/Medicine

- Research at NJIT is transforming adult stem cells into tissue and organ replacements for a wide range of therapies.
- Two NJIT professors have developed a concept for a fuel cell that draws its energy from sugars in the bloodstream and could power implanted medical devices such as pacemakers and defibrillators.
- The university's new Rehabilitation Engineering Research Center, funded by a \$4.75 million grant from the National Institute on Disability and Rehabilitation Research, is developing technologies to help children with orthopedic disabilities linked to cerebral palsy, brain injuries and other conditions.

- With \$1 million in funding from the State of New Jersey, NJIT researchers are working to improve treatments for hydrocephalus, a buildup of excess fluid within the brain that leads to brain damage and loss of mental and physical abilities.



Ranked nationally by *U.S. News & World Report*, NJIT is one of the country's top ten technological research universities, based on research expenditures.

- NJIT researchers are part of a new NSF-funded engineering research center developing technologies for production of nanopharmaceuticals with increased potency and better control and targeting of release.

### Homeland Security

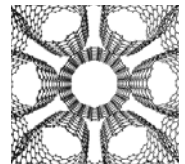
- A "smart camera" surveillance system developed at NJIT as a national prototype is aimed at safeguarding schools and shopping malls. Faculty researchers are developing active facial recognition capabilities to enhance these systems.
- University researchers received a patent for an imaging system for use in airports to detect explosives and biological agents concealed in clothing, sealed packages or suitcases.
- Researchers at the university are working to apply NJIT's revolutionary "smart gun" technology to cockpit controls to prevent aircraft skyjacking.

### Wireless Communications and Networking

- Supported by the National Science Foundation and Hewlett-Packard, NJIT is set to become a "SmartCampus" and a national prototype for a People-to-People-to-Places network that can enhance personal interaction and build community.
- At NJIT's Center for Communications and Signal Processing, a team of researchers is developing the next-generation technology for high-speed wireless digital devices. This includes improving wireless base station performance to help meet the world's growing demand for "anytime, anywhere" information and entertainment.

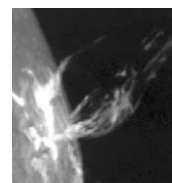
### Nanotechnology

- A team of researchers is working with silicon nanostructures — molecule-sized crystals of silicon — in pursuit of a new generation of computer chips measuring just a few atoms in width.
- A ground-breaking method of modifying carbon nanotubes — cylindrical carbon molecules — could lead to better food processing, cleaner gasoline, and faster and cheaper ways to clean air.



### Sustainable Systems and Technology

- Researchers at NJIT are working on a breakthrough method of desalination to extract fresh water from seawater and brackish groundwater.
- A project focusing on microscopic sensors will alert utility companies of irregularities in the power grid and prevent electrical outages.
- An NJIT researcher has been awarded a patent for a way to detect miniscule amounts of airborne pollutants including potentially lethal amounts of carcinogens.



- An NJIT researcher at the world's largest ground-based optical solar observatory is working to capture high-resolution images of the sun's corona which may help predict the timing and severity of solar flares that sometimes damage satellites and interfere with cellphones and other wireless devices.

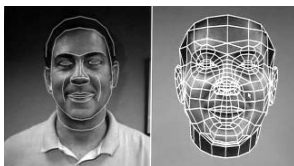
NJIT is an economic engine for Newark, the state of New Jersey and the nation.

## Enterprise Development Center

NJIT operates the state's oldest and largest business incubator system, the Enterprise Development Center (EDC). The EDC accelerates successful development of high-tech entrepreneurial companies by providing office and lab space, support services, mentoring and professional advice. Located adjacent to the NJIT campus, the EDC hosts 80 companies with combined revenues in 2006 surpassing \$44 million and employing over 300 people. The incubator has graduated 79 companies since its founding in 1988. The EDC programs were recently highlighted by the Council on Competitiveness as an example of a best practice in leveraging university capabilities to advance regional economic development. Some recent success stories include:



- **CyberExtruder.** The company's proprietary software creates an accurate 3-D model of a subject's head from a standard 2-D photo.



The technology has potential applications in security, computer and video games, wireless communications and

even facial reconstruction. CEO Larry Gardner: "As a tenant of the NJIT incubator, we tap into all kinds of resources — from teams of seniors and MBA students willing to put their training into real-world practice to consultants and faculty who listen and share their advice for free."

- **Menssana Research, Inc.** The company has developed a portable breath collection apparatus (BCA) for detection and diagnosis of diseases. The BCA, which can collect breath samples virtually anywhere, is being used in clinical research studies at hospitals in the U.S. and Europe. With support from the National Institutes of Health, Menssana is performing its own clinical studies to evaluate breath testing for diseases like lung and breast cancer, heart transplant rejection, ischemic heart disease, kidney disease and diabetes.
- **Chembrane Research & Engineering.** Founded in 2002, the company specializes in the design and development of innovative membranes and related processes for various industrial applications such as petroleum and natural gas manufacturing,

pharmaceutical production, pollutant prevention, wastewater treatment and water purification. Currently Chembrane is working with NJIT and NASA on a demonstration project for the use of technology for the removal of volatile organic compounds (VOCs).

Last year, NJIT received nine new patents from research or discoveries by faculty members in fields such as biomedicine and wireless communications.

## Intellectual Property Development

One of just three public research universities in New Jersey, NJIT seeks to capitalize on successful public/private/academic collaborations. The aim is to create commercial opportunities for new products, serve as a basis for start-up companies, and generate new jobs to keep the economy strong.



- NJIT has 137 new patent applications in process.
- In the last two years NJIT received 11 new patents from research or discoveries by faculty members, including:
  - > Somenath Mitra, professor and chair of NJIT's Department of Chemistry and Environmental Sciences, for a method of concentrating and identifying miniscule amounts of airborne pollutants.
  - > Kamalesh Sirkar, professor of chemical engineering, for a means of removing impurities from biomolecules important in pharmaceutical production.
  - > Alexander Haimovich, professor of electrical and computer engineering, for a device to reduce distortion in broadband wireless communications.
- The New Jersey Commission on Science and Technology through its University Intellectual Property Program recently awarded \$463,938 to NJIT to accelerate the transfer of innovations from lab to marketplace by enabling researchers to further develop their inventions and make them more commercially valuable to outside companies and/or venture capitalists.

**NJIT is fully and actively engaged at all levels in the world beyond its campus.**

**Improving Educational Opportunities**

To create the workforce needed for a knowledge-based economy and to compete in the global arena, NJIT works with schools, teachers and students throughout the state to improve education in science, technology, engineering and mathematics.

- Each year, NJIT’s long-established Center for Pre-College Programs serves approximately 4,500 teachers and students in elementary through high school, providing:
  - > academic enrichment programs on campus and in the classroom;
  - > afterschool, weekend, and summer classes and workshops for top-performing students;
  - > lesson plans, pre-engineering curriculum and professional development for K-12 teachers;
  - > workshops for guidance counselors advising students on careers in science, technology, engineering and math.



- NJIT’s Science and Technology Enrichment Program offers motivated high school students hands-on exposure to computer science, mathematics, physics, chemistry, environmental science and engineering specialties.

**Strengthening Skills in the Workplace**

NJIT supports those already in the workforce with flexible opportunities to take learning to the next level.

- NJIT provides full-time working adults access to the university’s academic programs through the Division of Continuing Professional Education, which offers advanced and undergraduate degrees, graduate and undergraduate certificates, customized corporate training programs, and a special Weekend University program for professional advancement.
- An early leader in eLearning, NJIT researchers coined and registered the phrase “Virtual Classroom” in the 1980s. Today, NJIT is ranked sixth in the nation by *U.S. News and World Report* for enrollment in online graduate computing and engineering programs.

**A five-year \$3 million National Science Foundation grant to NJIT is funding math, science and technology education initiatives in Newark.**

- A five-year \$3 million National Science Foundation grant to NJIT is funding math, science and technology education initiatives in Newark. The grant:
  - > places 24 NJIT doctoral students (in computer science or math) in four Newark high schools;
  - > benefits 3,000 students and their teachers;
  - > teaches both students and educators about tools and techniques for cutting-edge research in mathematics and the physical sciences;
  - > supports teams in developing math, physics, chemistry and biology curricula to ignite students’ curiosity and shape analytical skills.



NJIT’s Educational Opportunity Program has grown from 19 students to over 550 currently enrolled. The program provides educational access and improves outcomes for students traditionally underrepresented in the disciplines offered at NJIT.

**Community Building and Service Projects**

- NJIT is a leader in the planning phase of The Campus Gateway Project, a major urban redevelopment effort designed to enhance and expand amenities available in and near Newark’s University Heights section.
- Students at NJIT’s New Jersey School of Architecture helped New Orleans residents by cleaning up flood-ravaged properties and surveying and assessing the damage sustained by many of the 1,600 houses in the New Orleans East neighborhood. In the classroom, their work continues with designs for retrofitting existing houses and prototypes for flood-resistant homes.
- NJIT students, alumni, faculty and staff volunteer with public and nonprofit organizations in Newark and throughout New Jersey. Over the past five years, NJIT students donated 70,000 hours of community service. Volunteers have:
  - > developed a renovation plan for a senior citizen day-care facility;
  - > coordinated the computer database for a department at the Newark Museum;
  - > tutored kids in reading at a local elementary school;
  - > collected clothing for the homeless, and;
  - > helped serve food at soup kitchens.



**NJIT**<sup>™</sup>

New Jersey's Science &  
Technology University

*THE EDGE IN KNOWLEDGE*

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The NJIT logo with sweeping arc, the university descriptor and "The Edge in Knowledge" tagline are service marks of the New Jersey Institute of Technology