



Howard Kimmel, NJIT's assistant vice president for academic affairs, (standing) works with Jose Marti Middle School teachers Michael Ruiz, Laura Kushnir and Cesar Figueroa in the Medibotics program. The program helps teachers to develop a new science curriculum in which students will build robots and solve biomedical engineering problems.

*Preparing the*

# NEXT GENERATION

AS THE NEED FOR TECHNOLOGY

*The Pre-college  
Connection*

**“D**espite our best efforts over the last two decades to place computers in elementary and high schools and to establish curricular standards, we continue to lose ground in attracting students to technology careers.

*We’ve given our youngsters the tools to succeed in science and technology, but not the motivation. We need to show them the excitement and relevance of a career at the very edge in knowledge.”*

— Fadi Deek, dean of the College of Science and Liberal Arts

PROFESSIONALS INCREASES — NASA PREDICTS A SHORTFALL OF TWO MILLION SCIENCE AND ENGINEERING WORKERS, AND THE U.S. DEPARTMENT OF EDUCATION ESTIMATES A NEED FOR NEARLY 300,000 NEW MATH AND SCIENCE SECONDARY SCHOOL TEACHERS — NJIT HAS LAUNCHED A NEW UNIVERSITY-WIDE INITIATIVE TO ENRICH AND STRENGTHEN HIGH SCHOOL CURRICULA IN SCIENCE, MATHEMATICS AND ENGINEERING, PARTICULARLY IN THE STATE’S URBAN CENTERS. AT THE CORE OF THE PROGRAM ARE THREE GRANTS FROM THE NATIONAL SCIENCE FOUNDATION TOTALING NEARLY \$5 MILLION, ALL AIMED AT BRINGING THE KNOWLEDGE AND SKILLS OF NJIT’S SCIENCE AND ENGINEERING STUDENTS INTO THE CLASSROOM.

**C**2PRISM (Computation and Communication: Promoting Research Integration in Science and Mathematics), led by **Fadi Deek**, dean of the College of Science and Liberal Arts, places NJIT doctoral students in Newark high schools. The students, who use computational techniques for cutting-edge research in mathematics or the physical sciences, team with high school teachers to develop curricula in mathematics, physics, chemistry and biology designed to teach students how to formulate significant questions, think analytically, and offer creative solutions. Deek, and co-PIs **Robert Friedman**, associate professor of humanities and **Bruce Bukiet**, associate dean of CSLA and associate professor of mathematical sciences, hope that exposure to real cutting-edge researchers will spark the interest of teens.

“Outside of the scientific community, few people have had the opportunity to learn how computing has transformed research,” points out Deek. “Today, mathematicians are using realistic mathematical and computational models for research that ranges from blood circulation and how small vessels supply tissues with oxygen to ocean acoustics to help the Navy detect submarines. We hope we can inspire others to consider careers in science and technology.”

The second project, Medibotics: The Merging of Medicine, Robotics and IT, directed by Ronald Rockland, associate dean of Newark College of Engineering, will help teachers launch a new program in which students design and build robots to perform procedures modeled on biomedical applications. **Howard Kimmel** and **John Carpinelli**, directors of NJIT’s Center for Pre-college Programs, are co-PIs. The program brings science teachers from high and middle schools in Jersey City, Newark, Orange, Perth Amboy and Union City, and the Benedictine Academy in Elizabeth to NJIT for help in developing lesson plans around the LEGO robotics kit that students can use to build a medical robot in class.

The third grant will provide nearly \$500,000 over four years for scholarships to NJIT and Rutgers-Newark students who earn a teaching certificate along with their undergraduate degree in science or mathematics and agree to teach in New Jersey’s high-needs schools after graduation. TECHS-NJ, Teacher Education Collaboration of High-Need Schools – New Jersey, supported through the NSF’s Robert Noyce Scholarship program, is also directed by Bruce Bukiet. The program will train students to become effective science and math teachers in high-needs districts such as Newark.

## In Other Projects...



NJIT was named as one of 19 universities in the nation to host the 2007 ExxonMobil Bernard Harris Summer Science Camps, a two-week residential summer camp experience offering innovative programs to enhance middle-school students’ knowledge in science, technology, engineering and mathematics. Above, former NASA astronaut Bernard Harris and Christine Ella of ExxonMobil visit with **Suzanne Berliner** of NJIT’s Pre-college Programs, and Newark students Yusef Williams, Tikeyah Thornton, Damilola Ojoye, Xavier Taylor and Nicholas Drinkard. ■

wooden bats to see which is safer for children. The project is part of a collaboration between NJIT and Liberty Science Center designed to improve science and technology literacy. ■

Twelve-year-old Jada Hoyle-Gardner, a 7th grader at Hillside Catholic Academy, demonstrates Newton’s Three Laws of Motion by simulating an amusement park swing ride.



She was a participant in the Pre-Engineering Program (PrEP), a five-week program designed to provide academically talented post-sixth grade students with an introduction to Mechanical Engineering. ■



NJIT partnered with the Newark Public Schools to prepare nine teams of students to compete in the annual FIRST (For Inspiration and Recognition in Science and Technology) competitions, the LEGO League tournament for middle schoolers and the FIRST Robotics Competition for high school teens. Thirty-three NJIT students served as technical advisors and robotics mentors to 200 Newark youngsters. ■

NJIT hosted more than 500 students from high schools and



middle schools statewide competing in the New Jersey Science Olympiad, co-sponsored by the Research and Development Council of New Jersey. NJIT faculty and staff supervised and judged the day-long series of competitions designed in the formats of popular board games and TV shows. The Olympiad’s individual and team contests challenge knowledge and hands-on skill in biology, chemistry, computing, Earth science, and physics. ■



Highlander power hitters **Derrick McCain** (left) and **Kwesi Mitchell** are helping physics professor **Nuggenalli M. Ravindra** test aluminum and