



Research Professor Zohar Ophir with Quentin Harris, an East Orange Campus High student who worked with the research team during a 10-week internship through Project Seed, a national program sponsored by the American Chemical Society to encourage economically disadvantaged high school juniors and seniors to pursue careers in the chemical sciences. Students work on research projects under a faculty mentor and receive a salary during the internship.

FUELING THE ECONOMY THE DEVELOPMENT OF *Partnerships with Industry*

“As virtually all industries have curtailed R and D activity in the past decade, they have come to view universities as strong partners in their development programs and valuable sources of concepts for innovative products and services. This new relationship between industry and the academic community can stimulate research that is at the leading edge of science and exceedingly relevant to real-world problems.”

— Judith Sheft, associate vice president for technology development

NEW OR IMPROVED SYNTHETIC MATERIALS FROM CORN DERIVATIVES IS THE GOAL OF A PARTNERSHIP AMONG NJIT RESEARCHERS, THE IOWA CORN PROMOTION BOARD AND THE MID-ATLANTIC TECHNOLOGY, RESEARCH AND INNOVATION CENTER (MATRIC). THE TEAM HAS A GRANT FROM THE U.S. DEPARTMENT OF AGRICULTURE TO DEVELOP COST-EFFECTIVE CORN-BASED CHEMISTRIES AND PROCESSES RELEVANT TO THE COMMERCIAL POLYMER INDUSTRY. THE STUDY FOCUSES ON ISOSORBIDE, A SUBSTANCE DERIVED FROM CORN SUGAR, THAT IS CURRENTLY USED IN PHARMACEUTICALS BUT COULD REPLACE OTHER CHEMICALS IN THE PRODUCTION OF PLASTICS.



Research Professor Anthony East (photo at left), Michael Jaffe, research professor of biomedical engineering and director of the Medical Device Concept Lab (below, left), and Research Professor George Collins (below right) are part of the isosorbide research team.

corn-derived chemistries to replace existing commercial polymer additives, such as plasticizers, anti-oxidants, and UV stabilizers.

“For these compounds to be attractive for commercial production, stable markets based on cost-performance must be identified,” Jaffe said. “The new applications we’ve identified could consume 30 to 40 million bushels of corn annually. These large vol-

umes of materials will diversify the market for corn and for wet-mill biorefineries.”

Jaffe said that the work will have a positive impact on the feasibility of fuel production in an existing processing facility by creating applications for high-value chemical



building block derivatives co-produced with liquid fuels.

In addition to Jaffe, the NJIT research team includes **George Collins, Anthony East, Willis Hammond** and **Zohar Ophir**, all research professors of biomedical engineering.

According to **Michael Jaffe**, research professor of biomedical engineering who heads the NJIT part of the study, isosorbide is a polymer component or additive that can significantly improve the performance characteristics of plastics.”

“One advantage of isosorbide is that it can raise the use temperature and performance for moldable plastics,” said Jaffe, who directs NJIT’s Medical Device Concept Laboratory. “We are looking into new applications for the substance, some that would make use of its ability to raise use temperature and others that take advantage of its biodegradable and non-toxic nature.”

NJIT’s role in the partnership is to identify and assess potential polymer applications, while MATRIC’s role is to scale up the isosorbide production process. University researchers have already identified several attractive opportunities including new polymer compositions, monomers for existing polymer modifications and

In Other Projects...

NCE alumnus **Harry Roman** (right) collaborated with physics professor **Ken Chin** and a team of MEMS specialists at NJIT to develop sensor technology designed to boost the reliability and security of the nation’s electric power supply.



Roman, who recently retired as a senior technology consultant at PSE&G, received a patent for a device that can detect small electric discharges in the power grid before they become large enough to shut down a transformer. ■

Networking, mentoring and access to the resources of NJIT’s Enterprise Development Centers are some of the benefits of the **NJIT Incubator Without Walls (WOW)** program launched



recently with funding from the New Jersey Commission on Science and Technology. The program is geared to provide support to high-potential entrepreneurs who prefer to participate as a virtual EDC company. ■

Judith Sheft, associate vice president for technology development, received nearly \$500,000 in grant support from the New Jersey Commission on Science and Technology to assist faculty researchers in obtaining patents for their discoveries, a first step toward commercialization of new technologies. In 2006, university researchers gained nine new patents. ■



A new **BS in Concrete Industry Management of Technology**, established at NCE in partnership with industry to meet a specific need for managers in the field, had six students enrolled during its first year and projects 18 for fall 2007.



A national coalition of concrete-related businesses and trade groups is providing internships, speakers, research support and networking as well as scholarship funding. The program, directed by Adjunct Professor **James Brown**, emphasizes management, communications and problem-solving skills as well as technologies used in the concrete industry. ■

NJIT’s Division of Continuing Professional Education conducted brownfield job training for Newark residents with grant support from New Jersey Department of Labor and Workforce



Development New Jersey Youth Corps. The program, aimed at inner-city young adults, opens the way to jobs in the state’s initiatives to recover contaminated properties. ■