



FROM CAMPUS TO COMMERCE

AN INTERVIEW WITH JUDITH A. SHEFT,
NJIT ASSOCIATE VICE PRESIDENT FOR
TECHNOLOGY DEVELOPMENT

“Half a century ago, when the Soviets beat us into space with the launch of a satellite called Sputnik, we had no idea how we’d beat them to the moon. The science wasn’t there yet. NASA didn’t even exist. But after investing in better research and education, we didn’t just surpass the Soviets; we unleashed a wave of innovation that created new industries and millions of new jobs.

This is our generation’s Sputnik moment. Two years ago, I said that we needed to reach a level of research and development we haven’t seen since the height of the Space Race.... We’ll invest in biomedical research, information technology, and especially clean energy technology – an investment that will strengthen our security, protect our planet, and create countless new jobs for our people.”

President Barack Obama
State of the Union Address
January 2011

As New Jersey’s science and technology university, NJIT is helping to meet the challenges of America’s new “Sputnik moment” through increased emphasis on translating innovative scientific and technological concepts into marketplace realities. Associate Vice President **Judith A. Sheft** is working to build essential bridges between academia and economic progress. Sheft manages the university’s Office of Technology Development, which is focused on patent creation, intellectual property (IP) valuation and the strategic use and protection of IP assets. Her responsibilities also include promoting entrepreneurship and economic development in the Newark Innovation Zone through the Enterprise Development Center (EDC), NJIT’s high-technology business incubator, and the Procurement Technical Assistance Center.

How would you describe your role at NJIT?

Making connections between the technological creativity of NJIT faculty and industry is at the heart of my work. My office – Technology Development – strongly encourages faculty members to come to us with innovations that we will evaluate for commercial potential. If we determine that a concept does have real potential, we then work out the best way to commercialize it. That might be through licensing to an established company, soliciting sponsored research in the private sector, or helping to launch a start-up business. The main thing is to avoid the “valley of death” that can claim even the most promising concepts if there are not

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sufficient resources to move inventions from initial interesting science in the laboratory to early-stage prototypes on the path to commercial success as products in the marketplace.

I'm also involved with the NJIT Enterprise Development Center – the EDC – the incubator and accelerator for new businesses we established in Newark to help start-ups become successful and contribute to New Jersey's economy. The majority of companies based at the EDC are what we call "spin-ins." That is, their product or technology did not originate with research at NJIT. However, these entrepreneurs have decided to locate at the EDC because of the resources they can access at NJIT and University Heights Science Park to help them accelerate commercialization. Faculty expertise, specialized lab equipment, technologically knowledgeable student interns, library resources and much

more make University Heights a real hotbed of innovation.

From your research-university perspective, what does "technology transfer" mean today?

Traditionally, technology transfer has been viewed as a very linear process – a scientist invents something, the university patents it, and then tries to transfer it to industry to generate income. But maximizing the benefits for everyone involved requires understanding that the process is really more complex and inclusive.

It's more than just keeping track of the number of inventions, the number of patents and the amount of licensing income. There's a whole new paradigm that takes into account the various ways that universities can contribute to economic progress in the regions where they're

Judith Sheft

located, including activities such as industry-sponsored research and joint product development. We take this holistic view at NJIT.

A recent article in the *Harvard Business Review* talks about the "innovation bazaar" or the "innovation marketplace." The point is that companies are saying that they don't have to do it all on their own. They can bring in good ideas from other sources, like universities. There's now an entire class of intermediaries scouring universities for innovations that could benefit specific companies.

Universities themselves are doing in-depth market research to learn about the problems that industries must solve and what businesses are looking for to meet consumer needs. My job requires being out there to gain these insights and to then put companies in touch with NJIT faculty who can help them.

Can the growing importance of technology transfer in academia be related to a decline in private sector research – like the work once pursued at institutions such as Bell Labs?

In a sense, yes. Research at many companies today is focused on the later phases of product development, and they're more likely to look to cooperative initiatives with universities for the basic work, the original ideas. One example at NJIT is the Industry/University Cooperative Research Center for Membrane Applied Science and Technology. Headed by Professor Kam Sirkar, the center is helping to develop membrane-separation technology that's important for many industries, including the petrochemical, chemical, pharmaceutical, water treatment, and food and beverage industries.

Many states and the federal government actively encourage partnerships between universities and industry. In our state, there's a group called Innovation New Jersey that channels university research into economic growth and job creation. In February, the federal government announced a new program, Start-up America, intended to connect new businesses with university resources that can help them succeed. We hope to be increasingly active in both of these programs.

Are faculty members concerned that commercialization could dampen the freely cooperative spirit that many see as the heart of progress in science?

In my experience, there doesn't seem to be a major conflict between commercialization and basic scientific research. I haven't had a faculty member say to me, "I don't want to give you an invention disclosure because I just want to put it out there in the public domain." There seems to be genuine appreciation of the need to balance the sharing of information about scientific discoveries and the protection of intellectual property that can be patented and commercialized. An important part of our work is to help individuals understand how to present research in publications and at conferences without jeopardizing patent rights.

What are some successes in technology transfer at NJIT?

The Electrical and Computer Engineering Department has produced notable successes. They include advances in wireless communications, networking, data management and imaging that we've licensed to Intellectual Ventures, one of the new university-industry intermediaries that I mentioned. They've bundled a number of innovations from NJIT as well as additional sources and licensed them to others in the marketplace. We've also licensed technology that helps to convert fly ash from power plants into a useful construction material. One of the companies in the EDC is evaluating the commercial potential of solar water heater technology resulting from the work that NJIT students did in Haiti with Engineers Without Borders.

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How do individual researchers and the university benefit from this success?

NJIT's patent policy is probably one of the most generous among universities when it comes to the inventors themselves. The policy was revised when President Robert Altenkirch came to NJIT and took an active part in energizing our intellectual property activities. The first \$5,000 in profit from an invention – after expenses for securing a patent – goes to the inventors. Of the next \$95,000, 50 percent goes to the inventors with the balance shared among their department or research center where the technology was developed and the university. Subsequent income is also shared in a similar manner on a percentage basis.

While there is some financial benefit to the university in general, we don't view this as the only significant aspect of technology transfer. Overall, it's probably just as important with

respect to building our school's reputation for innovative thinking in science and technology, and for engagement in the economic life of New Jersey and the entire country. People want to know more about the university as a result, which can attract very talented faculty and students.

Are there any other thoughts you would like to share about technology transfer and commercialization?

As I said earlier, we always have to be thinking about making connections to be successful in this area. I recently heard NJIT Professor of Physics John Federici talk about the versatility of terahertz imaging technology, applications that can range from security screening to quality control and medical imaging. I immediately asked myself if I knew of any individual

or company that could benefit commercially from this researcher's work. You have to get out of the office, meet people, learn what they are doing and help to build relationships that contribute to the success of businesses, inventors and the university. ■

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Learn more about the NJIT Enterprise Development Center: njit-edc.org

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