A SOLAR LINK WITH CHINA

IN JULY 2010, DONALD H. SEBASTIAN, NJIT'S SENIOR VICE PRESIDENT FOR RESEARCH AND DEVELOPMENT, TRAVELED TO CHINA TO MAKE PRESENTATIONS ON NJIT'S NEW PARTNERSHIP WITH APOLLO SOLAR ENERGY, INC. FOLLOWING IS HIS ACCOUNT OF THE TRIP, WHICH INCLUDED MEETING NJIT ALUMNI NOW WORKING ON THE FOREFRONT OF TECHNOLOGY AND COMMERCE IN CHINA.

Last March, NJIT signed a $1.5 million three-year research agreement with Apollo Solar Energy, Inc. of Chengdu, China, an agreement both scientifically and economically significant. The funds will support the Apollo CdTe Solar Energy Research Center at NJIT, which will focus on basic and applied research for increasing the efficiency and manufacturing yield of cadmium-telluride (CdTe), thin-film photovoltaic cells. Apollo is the world's leading miner and refiner of rare earth materials used in major types of thin-film photovoltaics and owns what may be the only source of high-concentration telluride ores.

At the invitation of Apollo, I traveled to China along with NJIT Professor Kenneth Chin, center director, and Dr. Jingong Pan (ECE '08), recently appointed Apollo's chief executive officer. In the course of our ten-day visit, we met with the company's industrial partners and government sponsors to discuss the current state of the solar energy industry in America and projections for growth based on government policy and market trends.

In addition to making presentations in a half-dozen locations on our new solar energy partnership, I met many NJIT graduates who have returned to China and are now business and government leaders. It was my first trip to China and nothing had prepared me for the extent to which Westernization has taken hold. *[continued]*

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NEW YORK ON STEROIDS

Arriving in Shanghai on a direct flight from Newark, my immediate impression was New York City on steroids. The skyline is dominated by new super-sized skyscrapers. City streets and the modern highways are clogged bumper-to-bumper, mostly with late-model, high-end European and Japanese cars. And to my surprise, road signs and billboards had English-language subtitles that added to the Western feel.

All of Shanghai's airports are modern, clean and efficient. Even the provincial airports I encountered later in the trip were on par with regional airports in the U.S., and that is not what I had been led to believe about internal air travel. Security checks were comprehensive without imposing delays and even used face-recognition technology to validate identity throughout our trip.

NO ONE ON THE LINE

My first presentation was in Bengbu, Anhui Province, at the Design and Research Institute for the Glass Industry. Afterwards I saw the facility where special glass for solar panels is manufactured. The production line was several hundred feet long with nary a person in sight. Perhaps four people staffed the automated control center, and one person was housed in an inspection station at the end of the line.

It was an experience repeated throughout my visit – we have given away our manufacturing base in the U.S. on the false premise that we cannot compete with low-cost labor in developing nations. The manufacturing centers that I visited were highly automated and had relatively few workers, and all of them were in skilled positions. Labor content does not seem to be the primary determinant compared to speed of execution in creating or expanding production capacity.

I saw first-hand how Apollo is developing market-pull for their raw materials by assembling a vertical coalition of partners that can move photovoltaics into widespread use. Meeting with representatives of the glass industry and later with the China National Building Material Group in Beijing, I noted the clear focus on fostering "building integrated photovoltaics" as the model for sustainable office and housing design. In essence, every surface of every building can become part of a distributed energy production grid which, when coupled with appropriate storage technology, scales to meet even peak demand.

SOLAR POWER FOR RAILS AND ROADS

Traveling to Zhuzhou in Hunan Province, I met alumna Jackie Zhou (CS '03), leader of the Renewable Energy and IT Industry Group of the Hi-Tech Industry Development Zone. Already prominent in government, she is working to integrate solar technology into the country's massive high-speed railway project. Evidence of this massive infrastructure project was everywhere. It is not hard to believe that there will be 220-mph rail service between Beijing and Shanghai by 2012, and that is only one segment of 11,000 miles of new construction.

In Changsha, capital of Hunan Province, alumnus Tao Qu (Transportation '98) is piloting a novel service using 4G wireless to provide drivers with up-to-the-minute information about traffic conditions while also streaming business news and entertainment. Look for big things as his start-up, GAC Technologies, gets off the three-mile test track and onto the national highway system – and look for thin-film photovoltaics to be a source of power for delivering the services envisioned.

After my presentation in Chengdu, home city of Apollo, to attendees from research institutes and universities, I toured Apollo's metal refining facility. I also saw their pilot production center for manufacturing thin-film CdTe photovoltaics – another impressive high-tech, low-labor operation.

A NEW REGIONAL CLUB

The first order of business in Beijing, our last stop in China, was a wonderful dinner hosted by alumnus Ying Wu '88 that was also attended by a dozen NJIT PhD alumni. It was gratifying to see the extent to which their NJIT education has led to advancement in industry and government. It was also heartening to learn that these graduates wish to maintain a stronger bond with the university by seeking a charter from the NJIT Alumni Association as the China Regional Club. Ying Wu graciously accepted election by acclamation as the first chair of the club.

Wu came to the U.S. for graduate study. He credits the master's in electrical engineering that he earned at NJIT as an important educational asset that led to employment at Bell Laboratories and subsequent entrepreneurial success in the telecommunications field.

TOP: Dr. Jingong Pan '03 and Donald Sebastian take questions from the audience at Bengbu Design and Research Institute for the Glass Industry. ABOVE: Jackie Zhou '03 (far left), Donald Sebastian and Dr. Jingong Pan (4th and 5th from left) in Zhuzhou, Hunan Province, with officials of CSR, a major manufacturer of railroad rolling stock.

Beijing – the first meeting of the NJIT Alumni Association's China Regional Club. FRONT ROW: Jingong Pan, Kenneth Chin, Men Chu Zhou, Ying Wu, Donald Sebastian, Jun Li, Weichen Ye. BACK ROW: Yujia Gao, Jackie Zhou, Helen Cao, Tao Xu, Dequan Liu, Xin Tang, Cathy Sebastian, Matt Hsia, Yan He.

"I learned about state-of-the-art technology and how it could be applied in very practical ways," he says.

Wu went on to found the highly successful China-based telecommunications firm UTStarcom and today is chairman of China Capital Group. His generous support of NJIT includes a gift of $1.5 million for the Ying Wu Endowed Chair in the Department of Electrical and Computer Engineering.

HOMES OFF THE GRID

The next day we presented to an audience assembled by the China Energy Conservation and Environmental Protection Group. Later, we toured the advanced modular home demonstration site created by the China National Building Material Group. The site showcases high-end, 3,000 square-foot, single-family homes. A key goal is to take homes such as these off the power grid with thin-film photovoltaics, and to develop international markets using core fabrication technologies while retaining regional architectural designs.

Although it was a brief exposure to a nation nearing 1.5 billion in population, I did visit seven cities in five provinces. Today, China is clearly a nation with a burgeoning, prosperous middle class. Everywhere, I met people across the private and public sectors who are unabashed entrepreneurs and capitalists with genuine respect and admiration for the United States. I feel that there are forces at work which may be more powerful in uniting the people of our two countries in the common purpose of improving the global standard of living than the disparate political ideologies separating our governments. ■

FIRST PERSON

MORE THOUGHTS ABOUT NJIT FROM ALUMNI IN CHINA

Weichen Ye
1998 PhD Electrical Engineering
Director, Multi-Service Operator Group, Intel China

My NJIT degree helped to launch my career with my first job in the U.S. with Lucent Technologies immediately after graduation. And certainly when I decided to move back to China after 10 years of service at Lucent, my NJIT degree gave me strong credentials for my new job with Intel as CTO of Intel's broadband wireless business unit in China.

Jackie Zhou
2003 MS Computer Science
Renewable Energy and IT Industry Group Leader, Investment Promotion Bureau, Zhuzhou High-Tech Industrial Development Zone

With my NJIT degree, I found my first job with Nu Horizons Corporation, a top North American semiconductor company that needed a native Chinese to expand the South China market. I was the first sales person sent from New York to Shenzhen. Of course, with my NJIT degree, it was easier and quicker for me to start my current work in government, building connections and cooperation with advanced high-tech institutes, companies and other organizations.

Michael Zhu
2006 PhD Chemical Engineering
ARKEMA – Fluoropolymer Group Manager, BD China, Global Market Manager - Battery

My five years of studying at NJIT have enabled me to communicate well with all colleagues or customers around the globe, and equipped me with the necessary expertise in polymer and materials science.