



Connecticut Center for Advanced Technology: 'A springboard of Technological Innovation'

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With today's razor-thin cell phones and palm sized MiniPods, one might forget that leading-edge technology can come in giant packages - like the 7 1/2 ton shipment that Karl Prewo and his team are awaiting. Due to arrive this summer from Europe, the high-precision, high-speed laser micromachining system marks the newest addition to the laser applications lab that Prewo helped build at the Connecticut Center for Advanced Technology in East Hartford, where he is the chief of innovation and technology

The first of its kind in the United States, this ground-breaking laser is part of an arsenal of technology and expertise that CCAT has amassed over the past two years in its quest to position Connecticut industry at the forefront of economic competitiveness.

"Our business is to strengthen the region's capabilities through technology," said Prewo, a metallurgist with 58 patents who previously served as director of integrated materials, design and manufacturing programs at United Technologies Research Center. "That means businesses need to have the best technology available. They have to be able to have the people who know how to apply and further it. And they need to use it to become even better at what they do."

For CCAT, serving as a springboard of technological innovation is no idle resolution. Since establishing itself as an independent, non-profit corporation in 2004, CCAT has marshaled an array of state- and federally-funded programs - including a \$41 million national aerospace competitiveness venture - directed at advancing the state's leadership in technology, entrepreneurialism and education.

Because these three areas are as essential as they are interconnected, CCAT's founders concluded that each needed to be addressed synergistically to have far-reaching, sustained impact. Similarly, CCAT recognized early on that to best realize its role as a stimulus for technology-led growth, it could not act alone. Consequently, CCAT has reached out to businesses, government and academia, encouraging a cross-pollination of technology and ideas.

"The region can't just rely on companies to do it on their own," Prewo said. "We are challenged by greater competition among states, among regions, among countries. So regions have to identify their strengths and then capitalize on them to attract and keep good people and companies. And you need government, academia and industry aligned in the same direction, working together for a common purpose."

Those technologies on which CCAT focuses revolve around the region's historic evolving strengths, spanning manufacturing, energy technology, aerospace and defense, biotechnology, and nanotechnology.

Promoting these strengths was a major impetus for CCAT's formation. It grew out of the vision that Congressman John B. Larson (1st Congressional District), originally held for a science and technology park emerging as a national center for excellence.

With Larson's backing, CCAT has taken a significant step in that direction. It is home to the recently-formed National Aerospace Leadership Initiative (NALI). Funded by the US Air Force, NALI is a multi state consortium of government, industry and university leaders concentrated on preserving the superiority of the US aerospace industry throughout its supply chain, from one-shop manufacturer to the multi-billion-dollar defense contractor. Its goal is security - national and economic - Larson said.

"A strong economic-development effort is needed to combat numerous challenges that Connecticut and the region currently face, most notably the continued loss of manufacturing jobs, as well as new challenges that we will meet in the future, some of which come from overseas competition," Larson said. "Our continued economic performance depends on our ability to pioneer the manufacturing technologies of the future and remain at the cutting edge of collaboration and technological innovation. This means our industry and workforce must remain leaders in the aerospace and defense fields while at the same time ensuring that emerging fields such as fuel cells, nanoscience and advanced laser and photonics technology become major parts of our economic fabric."

CCAT's applied-research labs in laser applications and in digital modeling and simulation exemplify the relationships that CCAT has woven to spur the region's economy forward. The labs serve as the core of its Innovation Center, currently located in space leased from the United Technologies Research Center. In addition to the labs, the Innovation Center also provides incubator resources for startup technology companies that complement CCAT's activities.

At its laser applications lab, CCAT engineers are working with the military and contractors to develop faster, more exact manufacturing processes such as high-precision drilling, machining and welding. Other manufactures are benefiting as well. For example, last fall CCAT hosted its first laser hole drilling conference, attracting international participants to Hartford. Recently the lab helped a Connecticut medical-devices manufacturer rectify a flaw that risked delaying 600,000 units slated for delivery. Sharing its knowledge with area colleges and universities, CCAT is helping to create advanced technology programs, including a new master's degree concentration in laser engineering at the University of Hartford.

Meanwhile, finishing touches are being made at the modeling and simulation lab for a virtual three-dimensional factory. Modeling and simulation - the use of sophisticated software that allows the cycle of engineering design and manufacturing to be done on computer - will also serve as a resource for businesses and academia. Students and professors around the region are participating in research and industry projects through CCAT's labs.

During the past two years, CCAT's undertakings have garnered strong support from the state legislature. Currently, CCAT administers the Connecticut Small Business Innovation Research Office (CT SBIR Office) for the state Office for Workforce Competitiveness, an outreach effort dedicated to helping more small companies capture research-and-development funding through the federal SBIR program. SBIR sets aside a portion of grants for small business offering promising new technologies.

State legislators last year also approved CCAT's establishment of a Center for Manufacturing and Supply Chain Integration. It provides training and assistance to help immerse small-to-medium aerospace and defense manufactures in the new technologies and business practices that will raise their global competitiveness.

This last session, the state legislature continued its support by authorizing CCAT to develop a hydrogen fuel economic-development plan. The plan will furnish the state with a blueprint for supporting the use of fuel-cell technology as a clean, stable, Connecticut-made alternative energy. It will be developed in coordination with the Connecticut Hydrogen-Fuel Cell Coalition, which CCAT administers.

In addition, CCAT's energy experts are preparing an energy reliability plan to improve the electrical supply for southwest Connecticut. Funded by the US Department of Energy, the plan will identify solutions to ensure reliable power within all critical public safety and health sites in the region. Its recommendations will incorporate alternative-energy strategies to reduce costs, increase efficiency, cut greenhouse emissions and boost economic development.

"CCAT is important because it consolidates many of the disparate, high-tech activities taking place in Connecticut, particularly regarding fuel cells, the hydrogen highway and nanotechnology," said state senator Gary D. LeBeau, (3rd District), co-chairman of the Commerce Committee. "These are the cutting-edge technologies in which Connecticut must invest to create jobs of tomorrow, and CCAT is helping get that done."

Keenly aware of the shortage of science and technology talent impacting Connecticut industry, CCAT is joining the immense effort required in order to rekindle an interest in engineering, science and manufacturing among US students. It is an effort dependant upon strengthening the math and science skills needed for these careers.

To prime the pipeline of innovators and entrepreneurs at its source, CCAT is reaching out to the elementary and secondary grades bringing into the classroom project-based programs that, while reinforcing the basics, lead students to discover the creativity and expansive possibilities of careers in science, engineering and technology. One such program is Science Act, connecting students in Connecticut and China to work collaboratively on the issue of global warming.

Another is LaunchQuest. This summer, Farmington-based UP Aerospace will launch the first commercial sounding rocket from New Mexico's newly-constructed spaceport. Contained in its payload will be student experiments from 40 schools around the nation, including 14 in Connecticut. CCAT purchased the payload space, visited classrooms and provided special software allowing students to collaborate by computer.

This month two conferences will highlight CCAT's efforts. A June 21-22 conference organized jointly by the CT SBIT Office and NALI, features representatives of six top defense contractors and six federal agencies who will discuss their future technology and manufacturing needs with small companies and suppliers. On June 23, NALI will conduct an in-depth review of its programs and activities both events will be held at The Club at Rentschler Field in East Hartford.

In its near future, CCAT will be fulfilling Larson's vision of having the region anchor a national center of excellence: the National Center for Aerospace Leadership (NCAL). Bringing labs, researchers and technology experts together under one roof, NCAL will be a center of technological advancement for the US military, its contractors and their suppliers - advancements that will spread to commercial industries.

"The region needs and deserves an organization - a catalyst - that focuses on the transition of global technology for people in the region and the nation to use," Prewo said. "Our mission is to assure that Connecticut remains a recognized and vital world leader."

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