



QUAD-C & NANOTECHNOLOGY 101



THE BASICS

What is the CNSE-SUNYIT Quad-C?

The CNSE-SUNYIT Quad-C is a nanotechnology complex being constructed on the SUNYIT campus as a result of the leadership and vision of Governor Andrew M. Cuomo and in partnership with CNSE.

CNSE: SUNY College of Nanoscale Science and Engineering

SUNYIT: State University of New York Institute of Technology at Utica/Rome

Quad-C: Computer Chip Commercialization Center

Nanotechnology: Engineering, designing and making things at a very small scale



I've heard the term "Nano Utica" in the news. What does Nano Utica have to do with the Quad-C?

Yes, there is a lot of buzz about Nano Utica in the news, and that's because it's a really big deal. Nano Utica is Governor Cuomo's \$1.5 billion initiative that will create New York's second major hub of nanotechnology research and development—it will build on CNSE's success in Albany.

Headquartered in the Quad-C, Nano Utica is a group of leading technology companies: Advanced Nanotechnology Solutions Incorporated (ANS), SEMATECH and Atotech; and SEMATECH and CNSE partner companies, including IBM, Lam Research and Tokyo Electron. Scan the QR code to view the Nano Utica announcement.



So, Quad-C looks cool from the outside—what's going on inside?

It's cool inside, too. The \$125 million complex will be 253,000 square feet with 56,000 square feet of Class 100 and Class 1000 capable cleanroom space. Scan the QR code for a sneak peek.



Cleanrooms have controlled levels of contamination and are classified by number and size of particles in the air. The lower the class number, the cleaner the room. The Quad-C cleanrooms are very clean. How clean? Much cleaner than hospital operating rooms, which are typically Class 10,000.

What will happen in the Quad-C's cleanrooms?

It's all about making the next generation of electronics, like your smartphone, faster and more efficient. Nano Utica partner companies will test innovative technologies with a focus on 3D wafer-level chip packaging—"chip stacking"—and the industry's transition from 300 millimeter to 450 millimeter silicon wafers. Quad-C and Nano Utica are in the forefront of the global technology shift.

What's the benefit of Quad-C for the students and the community?

The benefits are huge. SUNYIT students will have unique opportunities for internships with global companies—and opportunities for jobs with those same companies after graduation. From the start of Quad-C's construction, SUNYIT students landed internships with the project contractor, and some were hired full-time. For the community, Quad-C's annual operating budget of more than \$500 million means Nano Utica will create 1,500 high-tech jobs, groundbreaking academic programs, and cutting-edge workforce training opportunities.

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Where is the Quad-C being constructed?

The SUNYIT campus near Cayan Library and Kunsela Hall.

When will it be completed?

Construction began in 2013 and will be completed at the end of this year.

How big will it be?

The four-level complex will be almost as tall as a 10-story building.

What will there be besides cleanrooms?

Laboratories, hands-on education and workforce training facilities, an auditorium, offices, and a utilities building to power the complex.

What's so special about Nano Utica and Quad-C?

The unique public-private partnership bringing global technology leaders to a college campus will give SUNYIT students opportunities available in only a few places worldwide.

What is chip stacking?

Separate chips are stacked to boost chip density and storage capability.

Why is the industry shifting from 300mm to 450mm wafers?

A wafer is a thin slice of semiconductor material that is separated and packaged into a bunch of microcircuits. These microcircuits are in a number of electronic devices, such as iPhones. To help reduce costs and increase manufacturing efficiency and productivity, larger wafers that can produce more individual microcircuits have been developed. Right now most wafers are produced with a diameter of 300mm (12 inches). Next stop- 450mm wafers.

What's the Marcy Nanocenter at SUNYIT?

Separate from the Quad-C, the Marcy Nanocenter is a 420-acre greenfield site on the SUNYIT campus of SUNYIT that is designed to accommodate one or more global corporate chip manufacturers. This site is part of Governor Cuomo's Nano Utica initiative to create an innovation-driven economy.