



Minnesota
STATE COLLEGES
& UNIVERSITIES

INSTITUTION

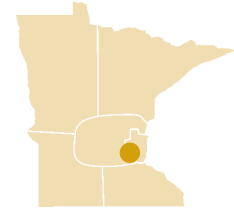
PROJECT/REQUEST

LOCATION

**Dakota County
Technical College**
Rosemount

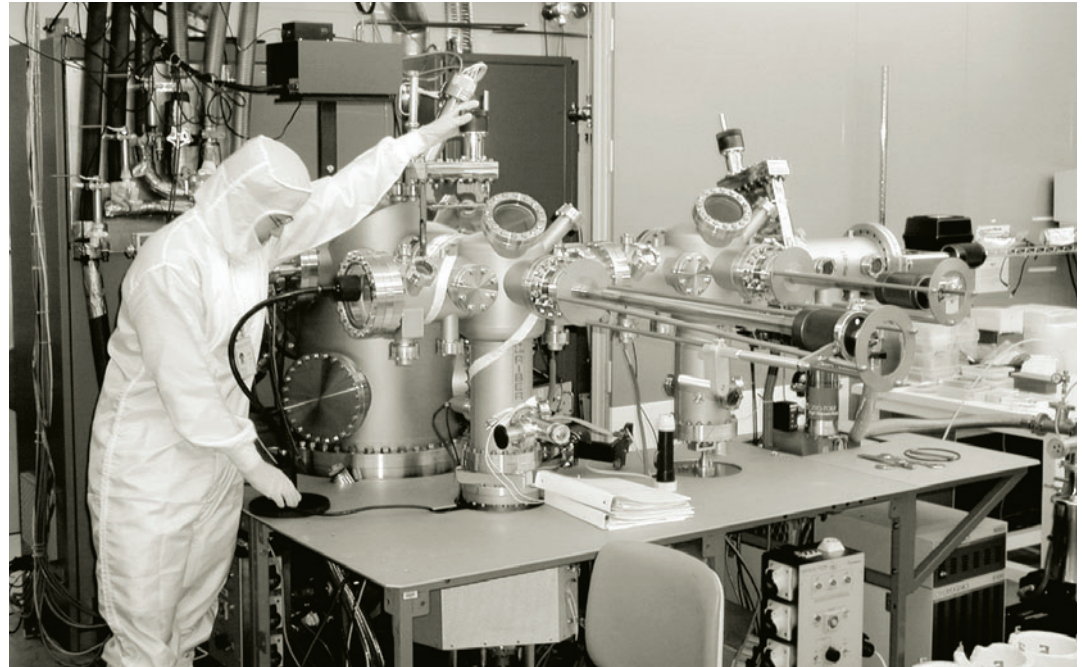
Upper Midwest
Nanotechnology
Education IQ Corridor

\$2,000,000



Project at a Glance

- Expand the state's first multidisciplinary nanoscience technology associate degree program to additional higher education institutions in the Midwest
- Equip laboratories with atomic force microscopes, scanning tunneling microscopes, X-ray diffraction, electron microscopes and remote access capabilities
- Prepare students to work in the emerging field of nanotechnology in bioagriculture, materials and electronics



Project Description

During the next few years, corporations will experience extraordinary technical diversity, bringing together all aspects of the sciences. This convergence is due in large part to understanding materials at the molecular or atomic level through nanoscience or nanotechnology. (A nanometer is 1/80,000th the diameter of a human hair.) Nanotechnology will be responsible for exponentially increasing the rate of scientific discovery that will impact every market segment.

Multiple organizations are forecasting a \$1 trillion market for nanotechnology and related products by 2010. To attain this economic growth, it is

Dakota County Technical College's nanotechnology program provides students with hands-on experiences in a "clean room."

anticipated that 800,000 to 2 million new technical positions are needed. The majority of these jobs will be at a technical or four-year degree level and will require retraining a portion of the current workforce.

Dakota County Technical College has received a National Science Foundation grant for development of a pilot nanoscience technology curriculum, with the fourth semester provided at the University of Minnesota.

After a successful startup, Dakota County Technical College is ready to fully implement this cutting-edge program and provide technical

assistance to other Upper Midwest area colleges where workforce needs require nanoscience technology skills training.

It is critical to provide the necessary equipment for the new programs. Funds are needed for the purchase of atomic force microscopes, X-ray diffraction, scanning electron microscopes, as well as simulation software programs and costs associated with university laboratory access. This equipment is critical for students' visualization of scientific principles. Funds also will be used to provide high school and

college math and science teacher training, curriculum development and nanocamps for K-12 students.

The funds will support communication infrastructure for distance learning, which will enhance the ability of rural students to obtain the most advanced technical training. It is anticipated that over the next three years, this project will support extending Dakota County Technical College's nanoscience technology program to a minimum of five additional college sites across the tri-state area of Minnesota, Wisconsin and North Dakota.

Upper Midwest IQ Corridor

The Upper Midwest IQ Corridor (the “I” standing for intellectual property and investment capital and “Q” for quality) is a technology zone based on a model in the area from San Diego through San Francisco. The IQ Corridor from Chicago to Moorhead is home to as many people, as much capital, as many technology jobs and as many technology companies as the West Coast. The training of nanoscience technicians will provide the work force necessary to attract startup and expansion of nanotechnology companies in the IQ Corridor, as well as assist existing companies as they venture into this new technology.

Several colleges have been identified to serve as leaders in providing the projected need for employees with nanoscience technician skills for companies in the Upper Midwest IQ Corridor.

Under the leadership of Dakota County Technical College, nanoscience technicians will be trained at:

- Waukesha County Technical College in Waukesha, Wis.
- North Central Technical College in Wausau, Wis.
- Chippewa Valley Technical College in Eau Claire, Wis.
- Minnesota State College - Southeast Technical in Red Wing and Winona
- Minnesota State Community and Technical College in Moorhead
- North Dakota State College of Science in Wahpeton, N.D.

Relationship with the University of Minnesota

University of Minnesota faculty from the Nanofabrication Center, the Characterization Facility, the Particle Technology Lab and the Biotechnology Lab are participating with Dakota County Technical College in this new nanoscience technology program. The relationship with the University of Minnesota is critical since access to specialized equipment and the expertise of the university faculty will support the vision of this project. Fourth-semester courses will transfer to the technical colleges for students to complete their associate degrees. Minnesota companies have offered to host student internships at their research and production facilities.

Participating Institution:

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IQ Corridor Business Participants:

IQ Corridor Business Collaborators

- Allen Bradley
- Aveka
- Bloomer Plastics
- Cima NanoTech, Inc.
- ConAgra
- Cray, Inc.
- Dakota Electric Association
- Entegris
- Extrusion Dies
- General Mills
- Genesis Business Centers, Ltd.
- Goodrich
- Haas Automation
- Hutchinson Technology, Inc.
- Hysitron, Inc.
- Imation
- Kell Container
- Marshfield Clinic
- Mayo Clinic
- Medtronic
- Minnesota Biotechnology Association
- Minnesota High Tech Association
- Molecular Manufacturing Enterprises, Inc.
- MRM Elgin
- Phillips Plastics
- Plank Enterprises
- Reality Works
- Rex Systems, Inc.
- Riverside Engineering
- Rushford Institute for NanoTechnology
- SCIMED (Boston Scientific)
- Silicon Graphics, Inc.
- Silicon Logic Engineering
- Smart Skin
- Surmodics
- 3M
- Xcel Energy



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