



SUNY's Strategy for Education, Technology, and Workforce Development

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Chair, Board of Trustees
State University of New York

Education, Technology and the Labor Force
NABE Technology Roundtable Session
NABE 25th Washington Economic Policy Conference

March 3rd 2009



The State University of New York

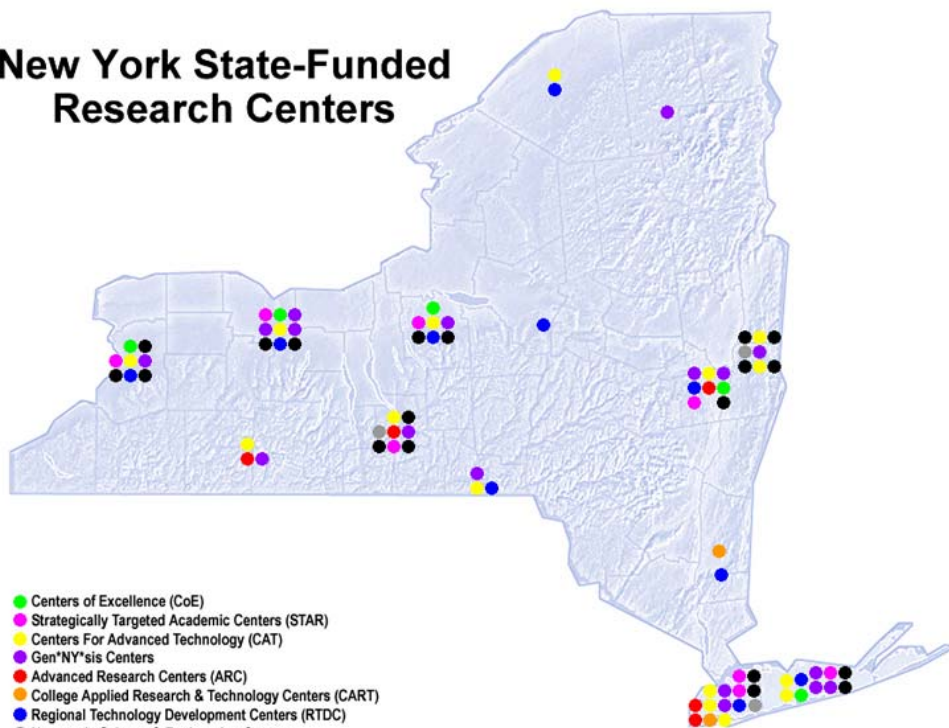
- 64 Campuses
- \$10.7 billion budget
- 435,000 students
- 85,000 employees





SUNY houses many of the nearly 100 state-funded research centers

New York State-Funded Research Centers



- Centers of Excellence (CoE)
- Strategically Targeted Academic Centers (STAR)
- Centers For Advanced Technology (CAT)
- Gen'NY'sis Centers
- Advanced Research Centers (ARC)
- College Applied Research & Technology Centers (CART)
- Regional Technology Development Centers (RTDC)
- Nanoscale Science & Engineering Centers
- Other Research & Development Centers

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Computer Science

(3 centers)

Electronic Devices, IT

(10 centers)

Environmental and Energy Systems

(6 centers)

Life Sciences

(32 centers)

Materials, Material Processing

(10 centers)

Nanotechnology, Microelectronics

(22 centers)

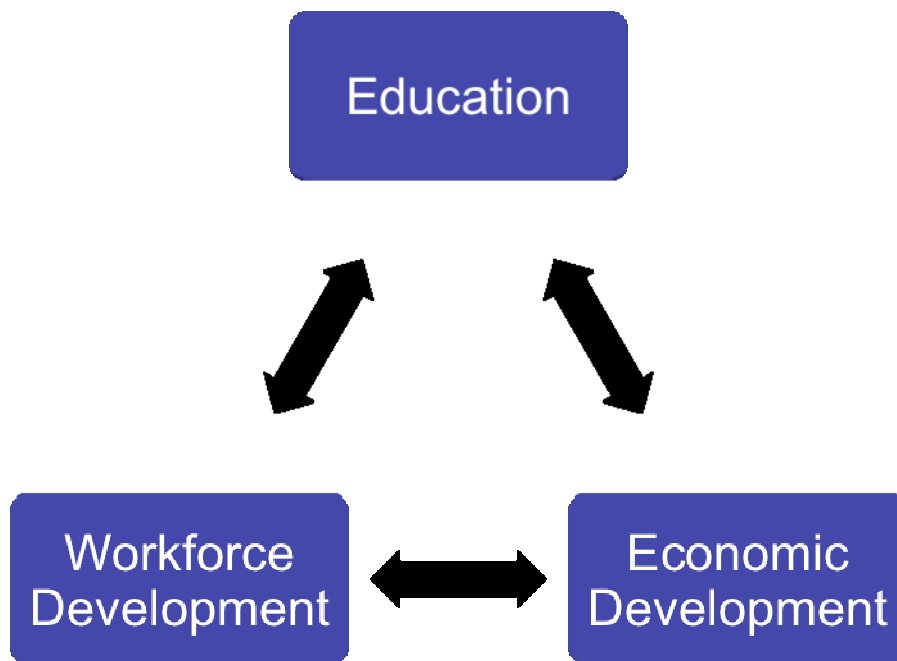
Optics, Photonics, Imaging, Sensors

(9 centers)



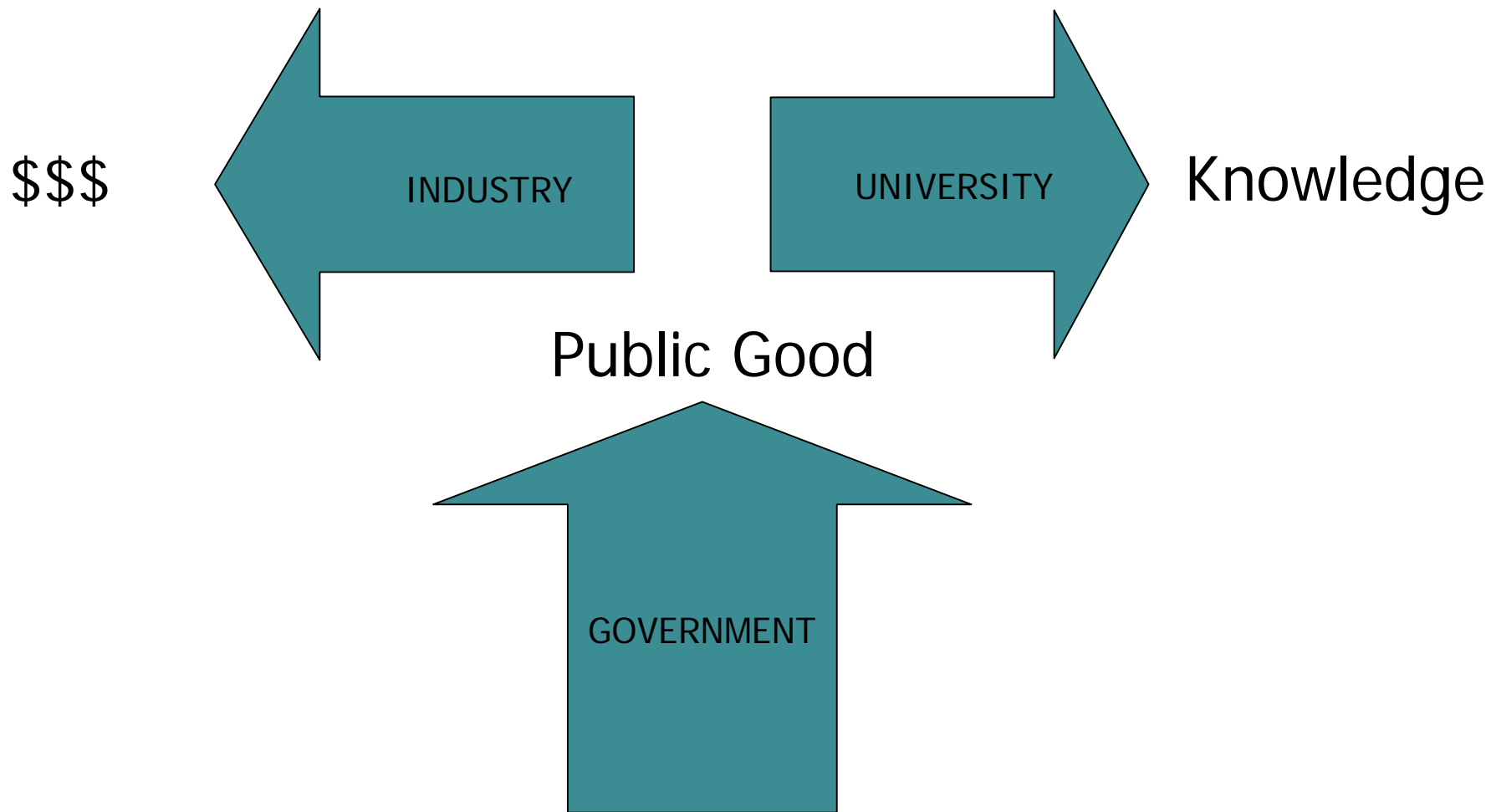
The university of the future is a critical element in the development of the State's educational, technological and workforce infrastructure

- Provide top quality education
- Develop the workforce needed for the 21st century
- Become a catalyst for economic growth





The challenge is to align all the relevant agents





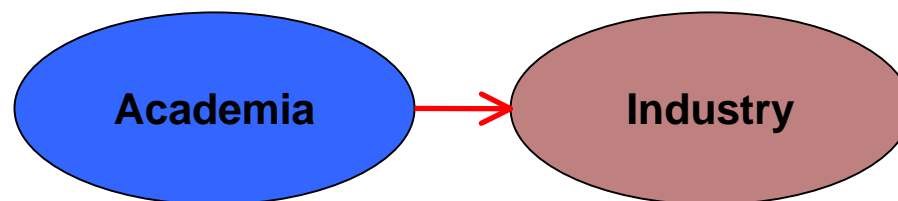
Strengths & Needs

	Industry	University	Government
Strengths	<p>Expertise in developing robust technologies</p> <p>Industrial food chain (partners, suppliers, consortia, etc.)</p> <p>Resources</p>	<p>Discovery & innovation</p> <p>Education & technical understanding</p> <p>Collaborative model</p>	<p>Building infrastructure</p> <p>Strategic timeframe</p> <p>Funding</p>
Needs	<p>Competitive advantage (better, faster, cheaper)</p> <p>Financial & intellectual leverage</p> <p>Asset development & protection (IP)</p>	<p>Funding</p> <p>Relevant problem set</p> <p>Network & access</p>	<p>Attract jobs</p> <p>Promote education</p> <p>Assist in attaining world-wide competitiveness</p>

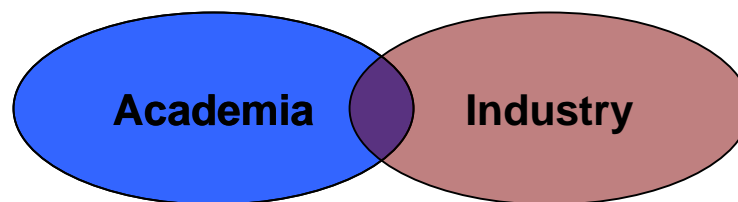


SUNY uses several models of innovation

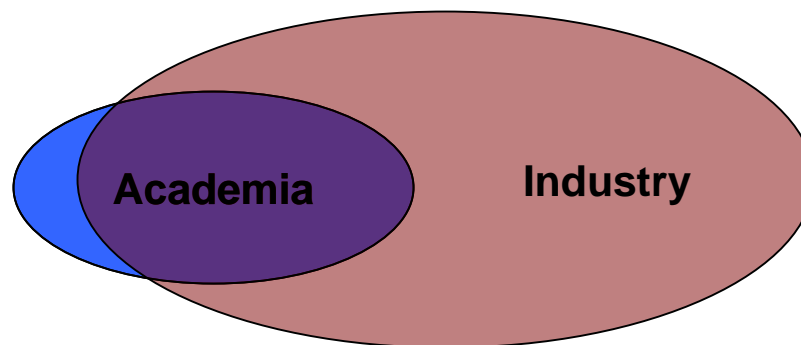
Traditional model



Highly collaborative research
model



21st century model



There is no right or wrong model



Centers of Excellence

The New York State Centers of Excellence concept:

- New High Tech Initiatives
- Academia - Public - Private Partnerships
- One Size Doesn't Fit All
- High Tech Focus



SUNY's Centers of Excellence programs are at the core of the educational-industrial development

- Nanoelectronics & Nanotechnology CNSE – SUNY
- Photonics & Microsystems University of Rochester & Rochester Institute of Technology
- Environmental Systems Syracuse University
- Wireless & Information Technology Stony Brook University – SUNY
- Bioinformatics University at Buffalo - SUNY



An Example: The College of Nanoscale Science and Engineering (CNSE) at the University at Albany SUNY

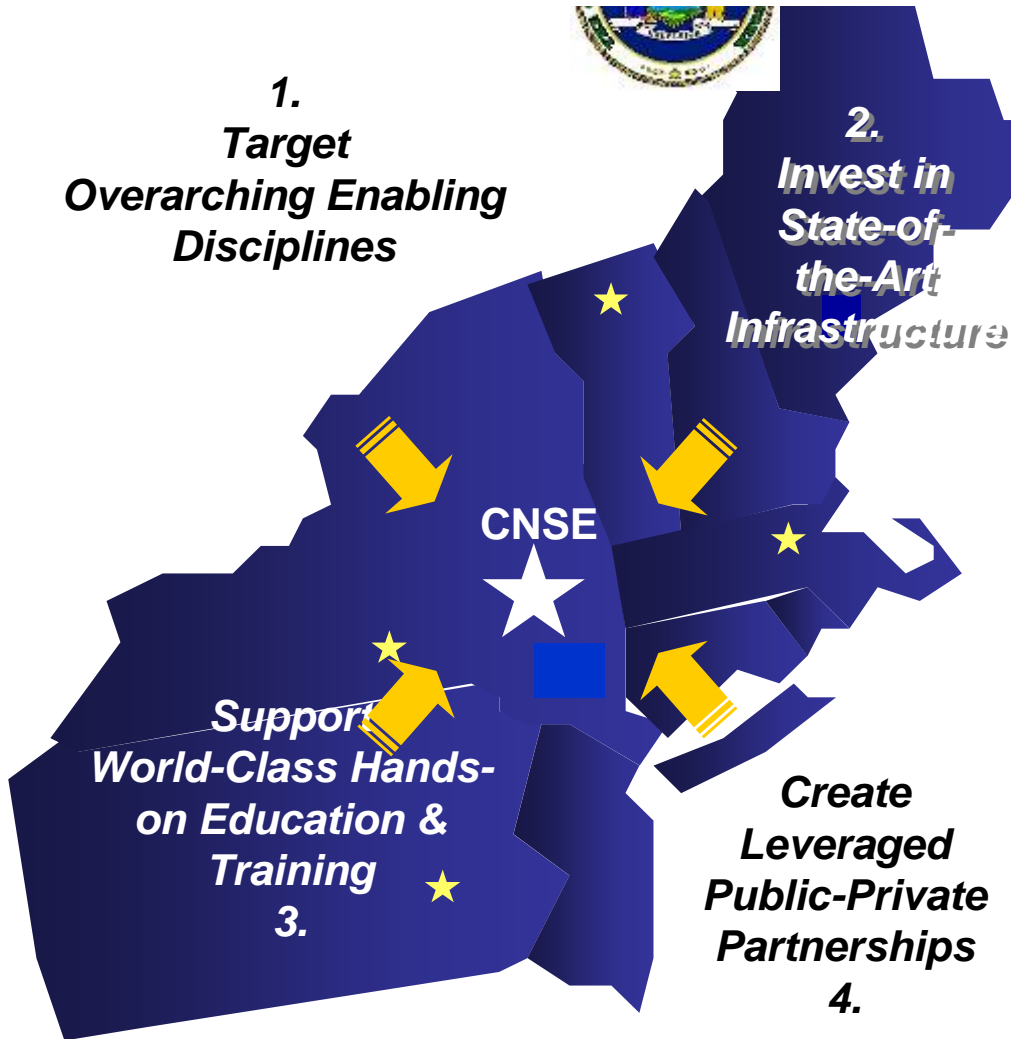


1.
**Target
Overarching Enabling
Disciplines**

2.
**Invest in
State-of-
the-Art
Infrastructure**

Support
**World-Class Hands-
on Education &
Training**
3.

**Create
Leveraged
Public-Private
Partnerships**
4.



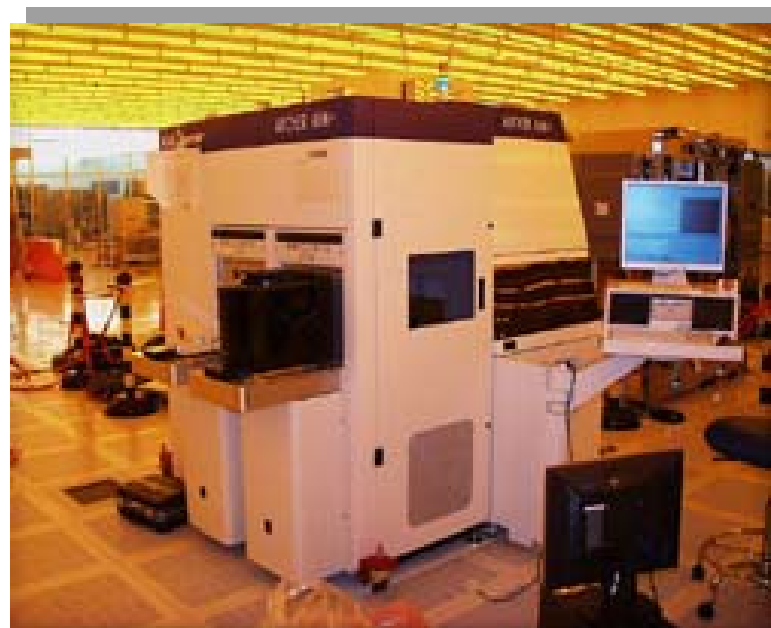


CNSE at University at Albany SUNY

Formed in 2004

CNSE ranking within nanotechnology programs :

- 1st In the U.S. (2005)*
- 1st In the World (2006)*
- 1st Education and Facilities*
- 2nd Commercialization*
- 6th Research*





State-of-the-Art Infrastructure

Shared-Use, Co-Location Model

NanoFab 300 East
Projected Opening: 2009
Total space: 250,000 sq. ft.
Cleanroom space: 15,000 sq. ft.

NanoFab 300 South
Opened: 2004
Total space: 160,000 sq. ft.
Cleanroom space: 27,000 sq. ft.

NanoFab 300 North
Opened: 2005
Total space: 220,000 sq. ft.
Cleanroom space: 38,000 sq. ft.

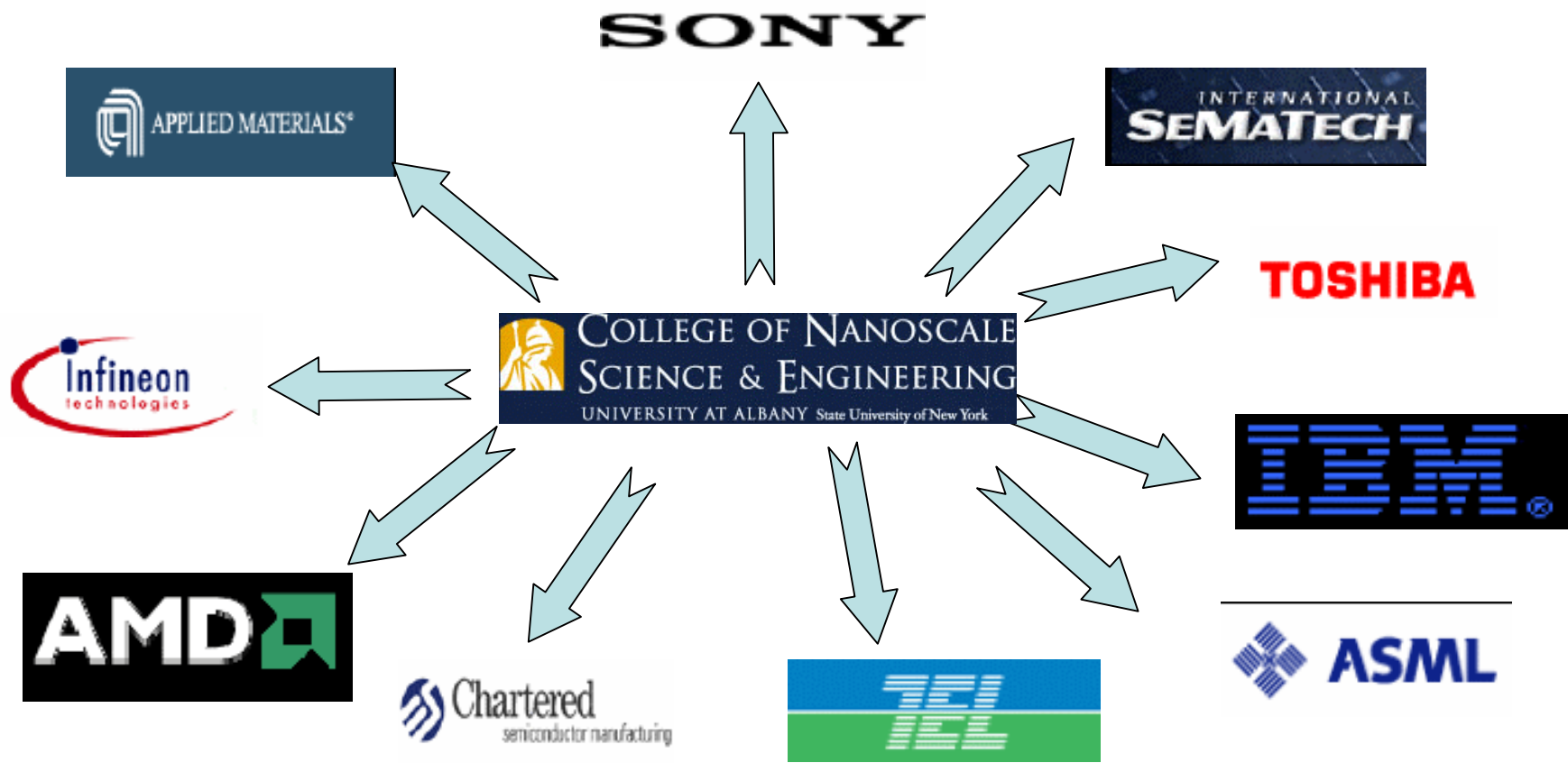
CESTM
Opened: 1997
Total space: 75,000 sq. ft.
Cleanroom space: 6,000 sq. ft.



- 800,000 sq. ft cutting edge facilities (with 80,000 sq. ft of 300 mm Wafer Clean rooms).
- More than \$4.5 Billion in assets.
- 250 Global Partners includes SEMATECH, IBM, AMD, Micron, Infineon, AMAT, Tokyo Electron, ASML.
- Employees: 2,200 Currently. 2,500 By mid 2009.



CNSE . . . Building the “Nano-Mall”





Why do companies partner with SUNY?

Great opportunity to innovate, stay competitive and maximize profits. For example, in 2008, The Research Foundation of SUNY and industry had:

- Invention Disclosures: 289
- U.S. Patent Applications Filed: 209
- U.S. Patents Issued : 44
- Licenses/Options Executed : 52
- Start-Up Companies Operational : 69
- IP: 20% licensed and 80% commercialized.
- SUNY ranks 8th among patent-generating universities
- SUNY ranks 14th among U.S. colleges and universities for royalties received licenses.



THE RESEARCH FOUNDATION
The State University of New York



SUNY is a key player in attracting the best companies in the world



International SEMATECH agrees to locate headquarters at UAlbany NanoCollege

SEMATECH consortia members make up 50 percent of the worldwide chip market



“\$300 million proposal brings equal investment by international semiconductor consortium.”

May 9, 2007
Source: CNSE Website





SEMATECH is the world's catalyst for accelerating the commercialization of technology innovations into manufacturing solutions.

SEMATECH consortia members make up 50 percent of the worldwide chip market



- Its members are the leading semiconductor companies in the world
- SEMATECH reduces the time from innovation to manufacturing.
- SEMATECH addresses critical challenges in advanced technology and manufacturing.
- SEMATECH finds ways to speed development, reduce costs, share risks, and increase productivity.



SUNY is a key player in attracting the best companies in the world

“The Foundry Co. and AMD will build a \$4.6 billion chip plant in Luther Forest Technology Campus in Malta, to make chips for a number of semiconductor companies.”

October 13, 2008





Advanced Micro Devices and I.B.M. have a technology development agreement to cover new research areas through 2011



- The agreement focuses on exploratory research into areas like designing smaller and more powerful computer chips, developing new transistors, lithography and packaging.



- For A.M.D. the agreement helps to reduce development time.
- For I.B.M. the agreement allows them to work with an outside partner to develop technologies that are many years from being marketed

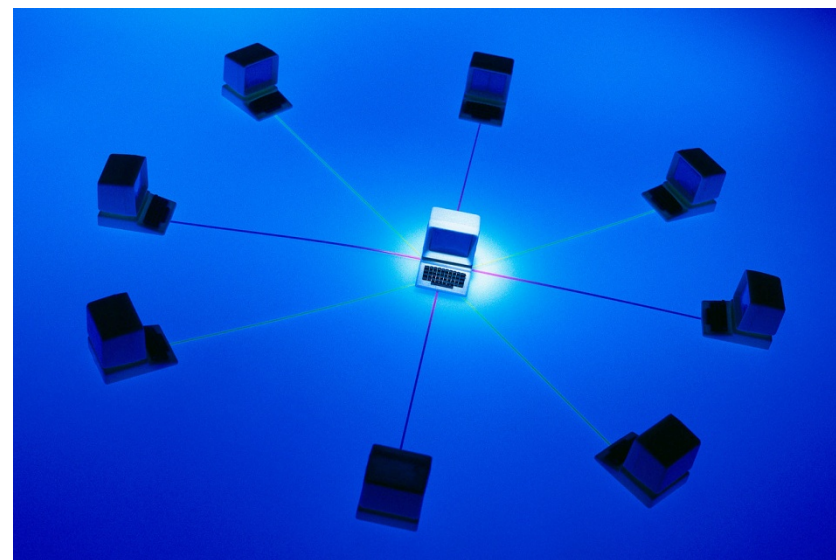


The Power of Current Computation Technologies



6 Billion people
doing one sum a second
For **46** years straight

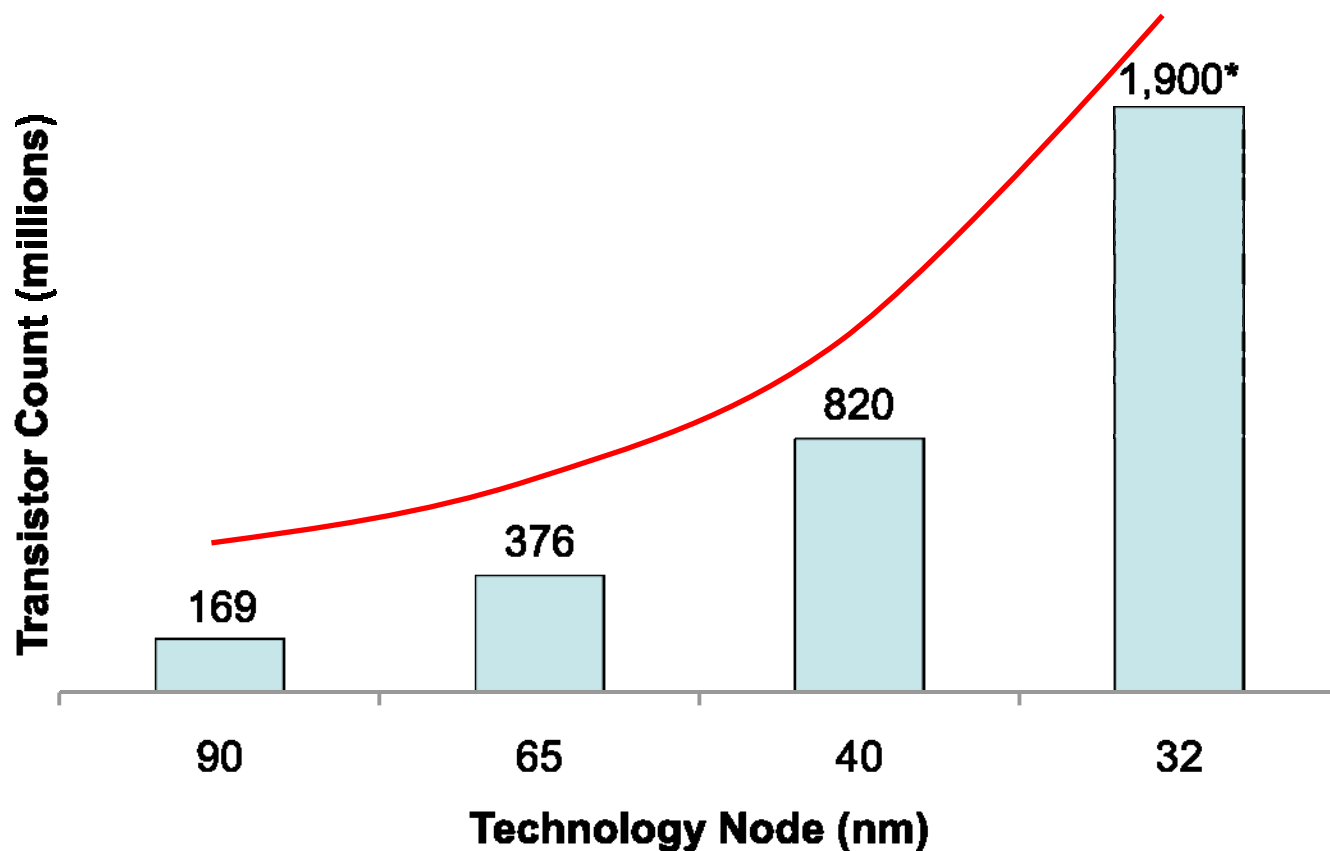
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1 day of calculations
IBM's RoadRunner Supercomputer
Poughkeepsie, NY



Lithography technologies that print smaller lines allow for more transistors on a single chip



Source: INTEL technology nodes.

* Anticipated by INTEL.



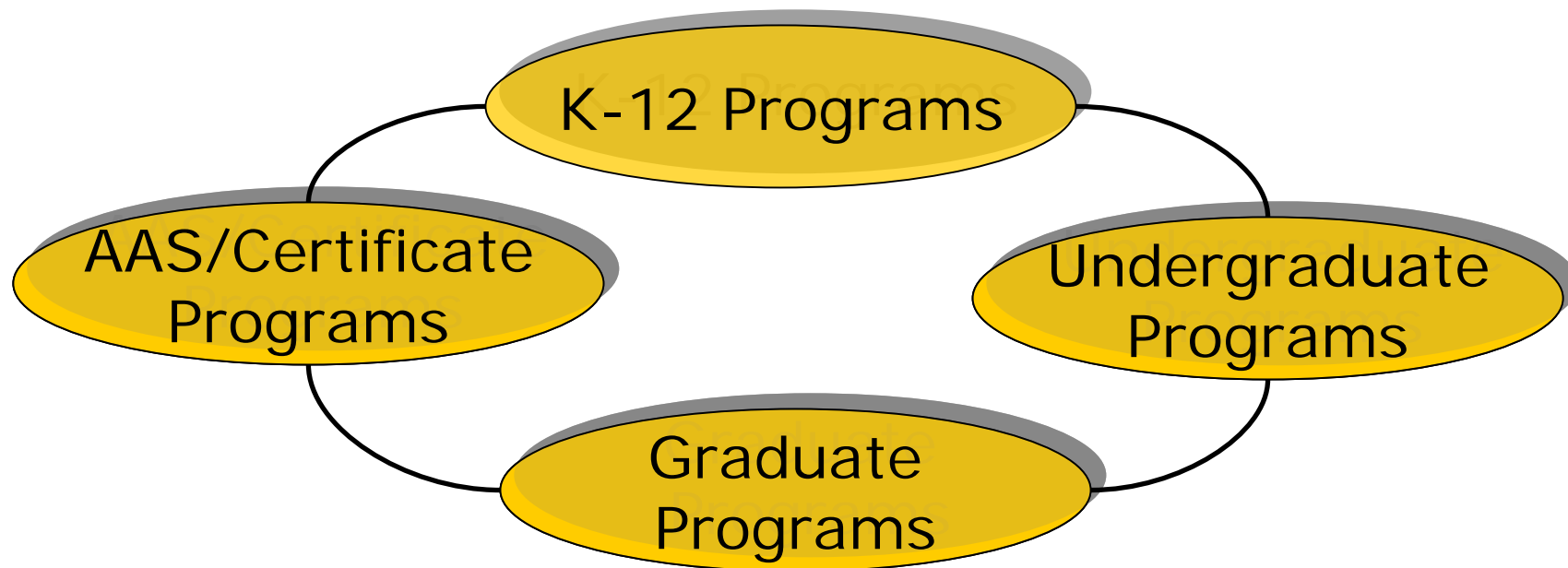
In 2006, ASML delivered to the CNSE the world's first Extreme Ultraviolet (“EUV”) Alpha Demo Tool

- The tool costs \$65 million.
- There are only two of these experimental tools in the world
- Supports the \$600 million International Venture for Nanolithography (INVENT)
- Over \$1 billion has been invested to advance EUV technologies
- Required seven tractor-trailer trucks and a 747-400 Jumbo Jet to transport.





The Workforce Development Challenge



Linking K-12 to higher education is a fundamental component of the SUNY educational strategy



According to Michael Porter of Harvard University

“ Meaningful changes in regional development require investments that generally take decades before significant dividends are reaped. It is not abundant low wage labor that attracts innovative companies, but rather highly talented, specialized, and often expensive labor.”



Thank You