

ADVANCED ELECTRONICS R&D AND MANUFACTURING in Albany/New York's Capital Region



Updated July 2024

INDUSTRY ASSETS

► Albany NanoTech Complex:

- The largest, most advanced semiconductor R&D center in North America; owned and operated by NYCREATES
- **\$20B** public/private investment
- **1.65M sf** campus
- **150,000 sf** state of the art cleanroom
- **50,000 sf** cleanroom expansion for **\$10B** High NA EUV Center
- **200** industry partners



Semiconductor Start-Ups:



AMAG nanometro

SEM simulation software and text wafers



Bleximo

Quantum processor microarchitectures



LUX Semiconductors

Semiconductor recrystallization technology for flexible electronics



Geminatio

Materials and infrastructure for low-cost IC shrink paths



NYDesign

Integrated chip design



Menlo Microsystems

Electronic switches



Pallidus

Prouce silicon carbide crystals



NoMIS Power Group

Silicon carbide semiconductor and module development



SMART Pad

Wafer polishing pads with micro features



Xallent

Nanoscale measurement hardware and software tools

GlobalFoundries Fab 8, Malta

HQ and 300 mm facility with 450,000 sf of MFG cleanroom space

GlobalFoundries Fab 8.2, Malta/Stillwater (Planned)

300 mm fab with 475,000 sf of cleanroom space

High NA EUV Center, Albany (Planned)

\$10B partnership with Micron, IBM, ASML TEL, and others to create North America's first and only publicly owned High NA Extreme Ultraviolet Lithography Center

Installation of ASML's High NA EUV lithography tool in 2025

IBM Research AI Hardware Center, Albany

R&D, emulation, prototyping, testing and simulation activities for the new AI cores, with specialization in wafer processing

Materials Engineering Technology Accelerator (META Center), Albany

Applied Materials' R&D hub for prototyping of new materials, process technologies and devices

Center for Semiconductor Research, Albany

Industry partnerships for scaling logic, including development of IBM's 2nm transistor

TEL Technology Center America, Albany

16,000 sf of cleanroom space and 80 Tokyo Electron tools with full flow integrated processing and patterning capabilities

CAPITAL REGION INNOVATION PROWESS

- ▶ **5,000+** semiconductor device patents awarded in U.S. listing at least one Capital Region inventor (2018-2022)
- ▶ **16th** most workers in R&D in the physical, engineering & life sciences (7,636 in 2023*)
- ▶ **\$1.2B** in private business R&D spending in 2021*
- ▶ **\$1.5B** in computer & electronic product exports in 2022 – 33rd top exporting metro
- ▶ **\$8.5M** in SBIR/STTR seed funding for small business semiconductor-related R&D since 2018
- ▶ **\$480M** spent on engineering R&D by Capital Region colleges and universities in 2022
*Albany-Schenectady-Troy MSA



GlobalFoundries Fab8, Malta

SUPPLY CHAIN

Advanced Materials & Chemicals

Crystal IS
Evonik Active Oxygens
Lithoz America
Starfire Systems
YINCAE Advanced Materials

Fittings

Harrington Industrial Plastics
Swagelok

Gas

Air Liquide
Noble Gas Solutions

Engineering

DPS Group Global
Exyte
EYP Architecture & Engineering

R&D

Applied Materials
ASML
IBM Research
KLA
LAM Research
Rapidus
Tokyo Electron

Equipment

Banner Industries
Capovani Bros.
Edwards Vacuum
General Control Systems
Precision Valve and Automation
SCREEN Semiconductor Solutions



Albany NanoTech Cleanroom

ADVANCED ELECTRONICS WORKFORCE (2023)

10,623 Jobs Including:

2,921 Semiconductor & Related Device Manufacturing

7,702 R&D in the Physical, Engineering, & Life Sciences

DEGREES AWARDED (2022)

21,013 Total Degrees

4,560 STEM Degrees

1,843 Engineering & Engineering Technologies

TALENT PIPELINE

4 community colleges and **6** 4-year universities / colleges with **>30** engineering / semiconductor-related programs

1 Semiconductor Technology Certificate

12 Engineering Master's Degree

17 Engineering Technician Associate's Degree

11 Engineering Bachelor's Degree

1 Nanotechnology Minor

9 Engineering Doctor's Degree

Nation's **1st** Semiconductor Related Apprenticeship Program