

Micro / Nanotechnology



A **Large** Part of Your Future

Oakland County Michigan Information

- ◆ More than a third of the state's R&D facilities are located in Oakland County
- ◆ 47% of *Fortune* 500 companies have a business location in Oakland County
- ◆ Michigan ranks second in the nation in R&D spending
- ◆ Michigan companies file over 3,000 patents a year placing it in the top 10 states for total number of patents granted
- ◆ Michigan ranks fifth in the United States for the development of micro and nanotechnology

Organizations To Support You:

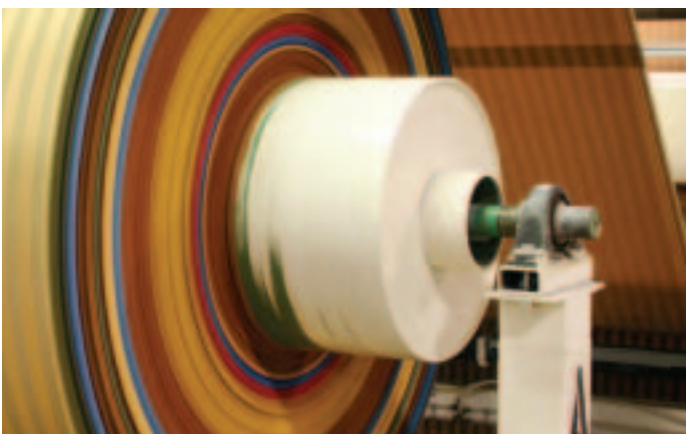
- ◆ Automation Alley- Southeast Michigan's Regional Technology Cluster
- ◆ Core Technology Alliance
- ◆ Michigan Molecular Institute
- ◆ Michigan Research Institute
- ◆ Michigan Small Tech Association
- ◆ Nanoscience Center
- ◆ Nanotech Institute
- ◆ NextEnergy
- ◆ NSF National Nanotechnology Infrastructure Network (NNIN)
- ◆ SME's Micro Manufacturing Technical Community
- ◆ TARDEC's National Automotive Center (NAC)
- ◆ U.S. Army Tank-Automotive Research, Development and Engineering Center (TARDEC)
- ◆ U.S. Tank-Automotive and Armaments Command (TACOM)

Workforce: Educated, Innovative & Motivated

- ◆ Over 40% of Oakland County residents have college degrees (national average is about 26%)
- ◆ Oakland County has the third highest number of high-tech workers in the nation and twice the corporate R&D professionals compared to the national average
- ◆ Population of Michigan's workforce: 5.1 million
- ◆ 15 public universities, 50+ independent universities and colleges, 29 community colleges
- ◆ Over 96,000 college degrees are granted every year in Michigan - almost twice as many as the national average
 - ◆ 2 ½ times the number of master's degrees are granted in Michigan than the national average
 - ◆ Close to 1,500 Ph.D.s are granted in Michigan every year - almost twice the national average
- ◆ Michigan is third in the nation with an average of 6,000 engineering degrees granted annually.



Courtesy Oakland University



Courtesy Hi-Tex, Inc.

Photo Credits:

All photos are of Oakland County companies and products

Cover: Upper panel Courtesy Hi-Tex, Inc.

Cover: Lower panel images Courtesy Oakland University & RHK Technology.

Page Image Elements: Courtesy Autoliv, Siemens & Oakland University.

Michigan Universities: Research Centers

Central Michigan University

- ◆ Dendrimer Nanotechnology Research Laboratory (DNRL)
- ◆ Center for Applied Research and Technology (CART)
- ◆ Advanced Nanoscale Research

Kettering University

- ◆ Crash Safety Laboratory

Lawrence Technological University

- ◆ NanoMaterials Laboratory

Michigan State University

- ◆ Micro & Nano Engineering Center
- ◆ The Nanoscale Interdisciplinary Research Team (NIRT) Structure of NanoCrystals
- ◆ The Institute for Quantum Sciences
- ◆ The Keck Microfabrication Facility
- ◆ Center for High-rate Nanomanufacturing
- ◆ Composite Materials and Structures Center (CMSC)
- ◆ Center for Nanostructured Biomimetic Interfaces

Michigan Technological University

- ◆ Multi-Scale Technologies Institute (MuSTI)

Oakland Community College

- ◆ Customized Programs and Clean Room/Lab Certificates

Oakland University

- ◆ Nanotech Institute

University of Michigan

- ◆ Center for Biologic Nanotechnology
- ◆ Nanotechnology Institute for Medicine and the Biological Sciences
- ◆ Wireless Integrated MicroSystems (WIMS) Center
- ◆ Solid State Electronics Laboratory (SSEL)
- ◆ National Nanotech Initiative (NNIN) Hub
- ◆ Michigan NanoFabrication Facility (MNF)
- ◆ Fraunhofer Institute

Wayne State University

- ◆ NanoBioScience Institute
- ◆ Smart Sensors & Integrated Micro Systems Laboratory
- ◆ Physics & Astronomy Laboratory

Western Michigan University

- ◆ Nanotechnology Research & Computation Center

Green - These universities are either located in or have campuses in Oakland County

Access to Capital

Oakland County's Economic Development Team will help your company find potential sources of capital and financing.

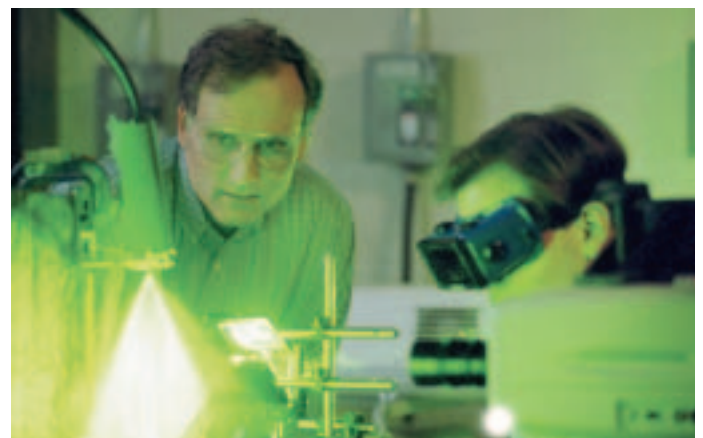
Michigan Venture Capital Association - Established by venture capital and private equity investors in the state, the Michigan Venture Capital Association (MVCA) is the state's premier public policy advocate for the private equity/venture capital industry. MVCA works to promote entrepreneurship and private equity investment.

Venture Capital - In four years alone, over \$694 million in venture capital has been invested in over 100 businesses in Michigan. For new emerging technology initiatives, the state has created the \$150 million Venture Michigan Fund to catalyze investment in early-stage firms operating here. With the matching requirement, this initiative will attract an additional \$450 million in capital to Michigan for investment in promising new companies.

Angel Networks - Aimed at helping companies with early stage seed financing, Michigan is fortunate to have three active Angel Networks: The Great Lakes Angels, The Grand Angels and The Ann Arbor Angels.

Traditional and Non - Traditional Financing - Oakland County's Business Finance Corporation and Economic Development Corporation help companies with the SBA 504 Loan and with Tax-Exempt Revenue Bond programs. Through the Automation Alley Technology Center, emerging companies can be assisted with securing non-traditional and unique sources of financing and capital.

State Incentives / Tax Credits - Michigan has a wide variety of incentive programs and tax credits for companies that qualify.



Courtesy Oakland University

Research Projects at Michigan Universities:

- ♦ Atomic force microscopy to discover porosomes
- ♦ Using nanotechnology for immobilization and removal of contamination from soil and water
- ♦ Micro- and nano-scale photonics
- ♦ Laser physics
- ♦ Opto-electronics and integrated optics
- ♦ Molecular electronics and sensors
- ♦ Development of ion beam techniques for layer splitting of oxide materials
- ♦ Ultrafine grained and nanostructured ceramics
- ♦ Microelectromechanical system design and fabrication technology
- ♦ Solid-state and microsystem device design
- ♦ Integrated circuit fabrication technology
- ♦ Biomedical electronics
- ♦ Nanoemulsions
- ♦ Radioactive nanocomposites to treat tumor microvasculature
- ♦ Microenvironomics
- ♦ Use of PARTCELL to study subcellular EGF signaling
- ♦ Disposable fluorescence-activated cell sorters (FACS)
- ♦ Optically induce and detect quantum coherence in an extended structure
- ♦ Agrifood nanotechnology
- ♦ Atomic Clusters
- ♦ Nanotube-based computer memory
- ♦ Nano Velcro
- ♦ Dendritic Nanotechnologies
- ♦ Military equipment and gear that heals injured soldiers and protects from chemical and biological weapons
- ♦ Amorphous semiconductor materials research
- ♦ Semiconductors - the next generation
- ♦ Molecular valves and spintronics
- ♦ Nanoelectronics and connections
- ♦ Carbon-based nanoelectronics
- ♦ Ion beam nanofabrication
- ♦ Nanomaterials properties and structure characterization
- ♦ Cellular manufacturing
- ♦ Using microarrays to look at environmental exposure
- ♦ Structure of nanocrystals
- ♦ Synthesis, characterization and modeling of nano-structured materials
- ♦ Silicon micromachined capacitive sensors and methods of manufacture
- ♦ High-frequency ultrasound detection
- ♦ Nanotechnology switches to prevent bottlenecks on the Internet
- ♦ Silicon flexible skin-MEMS
- ♦ The Copernicus clock for microprocessors
- ♦ Priostar dendrimers
- ♦ Carbon nanotubes



Courtesy Oakland University

Micro / Nanotechnology Companies

Adaptive Materials

ADCO Circuits

Advanced Sensor Technologies

Altarum Institute

American Systems Technology

ApoLife

Applied Diagnostic Solutions

Ardesta Integrated Systems

Assay Designs

BASF Corp.

Bio Nano

Brandish Technologies

Clark-MXR

Cobasys

Cybernet Systems Corp.

Delphi

Dendritic NanoTechnologies

Dexter Research Center

DaimlerChrysler R&D

DNA Software

Dow Chemical

Dow Corning Corp.

E2M Corp.

Eaton Corp.

EcoSynthetix

Energy Conversion Devices

Ford Motor Company R&D

Futuristic Design International Corp.

General Dynamics

General Motors R&D

Gyricon

HandyLab

IMRA America

Innovative Cell Technologies

Integrated Sensing Systems

Internet2

Iso Systems

Kelly Scientific Resources

Key Safety Systems

LMI Technologies

Mayaterials

Michigan Aerospace Corp.

Micronas Semiconductors

Microstar Technologies

Mobius Microsystems

Molecular Therapeutics

NanoBio Corp.

Nanocerox

NanoCure Corp.

NanMed Pharmaceuticals

Nanorex

NanoScience Engineering Corp.

nanoTEN

Nitrate Elimination Co.

Noble Polymers

Osmic

PICOCAL

Q Ltd.

QUARTRx Pharmaceuticals

RHK Technology

Robert Bosch

Rubicon Genomics

Saline Lectronics

Sensicore

Syneptics

T/J Technologies

Tellurex Corp.

TiniLite World

Translume

Troy Polymers

United Solar Ovonic

U.S. Army Tank- Automotive & Armaments Command

Velcura Therapeutics

Virent Energy

VTI Technologies

X-Rite

Integral Vision Inc.

Nanorex



Courtesy RHK Technology

Green - Oakland County companies

Blue - Southeast Michigan companies

Black - Michigan companies

Contact us with any additions or changes to this list.

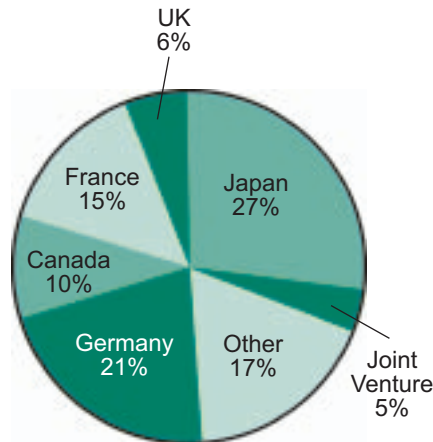
Oakland County Can Help Your Business

The Economic Development Team offers assistance in:

- ◆ Site location
- ◆ Financing
- ◆ Tax incentive
- ◆ Liaison with state and local agencies
- ◆ Workforce development
- ◆ Business Assistance Center (business consulting)
- ◆ Information products - to ensure you make the right decision for your company's location

Oakland County is an International Hub

Foreign firms make the strategic decision to locate in Oakland County because of the highly skilled workforce, strong educational systems and the international support services available to them.



- ◆ 653 Foreign-owned firms from 24 countries are in Oakland County
- ◆ 259 of these firms came to Oakland County in the last 12 years-that's an average of two foreign companies a month opening up a location in Oakland County



L. Brooks Patterson,
Oakland County Executive

*With the support of
The Oakland County Board
of Commissioners*

Oakland County is Strategically Located



- ◆ Centrally located between Chicago, Toronto and Cleveland, Oakland County is strategically positioned to capture the entire Midwest market
- ◆ The Michigan-Ontario border is the busiest U.S.-Canada crossing in the country, making this area an ideal location to reach the United States and the Canadian markets. Ontario, less than an hour's drive from Oakland County, generates some 40% of Canada's total gross domestic product



Contact us today for more information:

**Oakland County Department of Economic Development & Community Affairs
Planning & Economic Development Services**

2100 Pontiac Lake Road, Building 41 West
Waterford, MI 48328
Phone: (248) 858-8706 | Fax: (248) 975-9555

Website: www.emergingsectors.org

Oakland County's Micro / Nanotech
Contact: **Irene Spanos**
Email: spanose@oakgov.com