

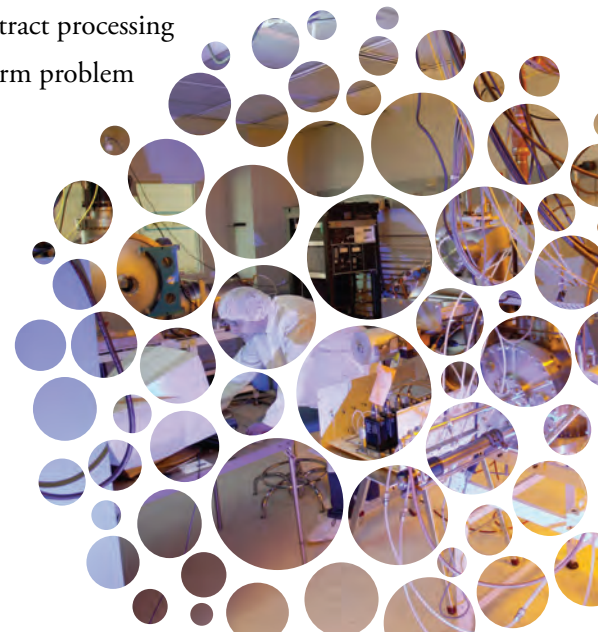
# Make Your R&D Faster, More Profitable



Business Oregon can connect your company with the research power of **450 scientists and researchers** who can help turn your ideas into exciting new opportunities, or improve existing product lines to make your company more competitive.

Oregon's three state-of-the-art Signature Research Centers bring together the top research talent and cutting-edge laboratories of the state's research universities. The High Tech Extension Service connects businesses with these R&D resources, providing companies with access to research, technology development, prototyping and testing **without the added cost of in-house staff and facilities**. You get immediate access to highly skilled workers, clean rooms, contract processing for remote customers and on-site training, whether you need a quick fix to a short-term problem or help with the long-range development of new products.

At the ONAMI Signature Research Center, that access includes the resources of the Lorry I. Lokey Nanotechnology Laboratories in Eugene, an internationally-recognized facility containing more than 20 advanced materials characterization and nanofabrication instruments. ONAMI provides micro-level manufacturing and engineering research at the Microproducts Breakthrough Institute in Corvallis, and the Center for Electron Microscopy and Nanofabrication in Portland is the only state-of-the-art characterization facility in the Portland area. **More than 100 businesses** are already taking advantage of ONAMI's unique facilities.



## Oregon's High Tech Extension Service

- More than 30,000 square feet of laboratory space in Eugene, Corvallis and Portland
- Rapid prototyping for microscale non-silicon devices, and nanomaterials
- Includes imaging and chemical analysis (SEM, S/TEM, Dual Beam, Microprobe, XRD, AFM, XPS, ToF-SIMS)
- Competitive rates without the added cost of in-house staff and facilities

**CONTACT:** High Tech Extension Service  
Director Janet Teshima  
hted@onami.us  
541-636-3712

or

Business Oregon  
Business Development Division  
503-229-5634



**ONAMI**

OREGON NANOSCIENCE AND  
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discover • develop • deploy

**CEMN**  
Center for Electron  
Microscopy and  
Nanofabrication

**Portland State  
University**

**What it does:**  
Provide electron  
and ion microscope  
capability for  
industrial users

**CAMCOR**  
Center for  
Advanced materials  
Characterization in  
Oregon

**University of Oregon**

**What it does:**  
Full service materials  
characterization  
services and  
industrial R&D  
partnerships

**MBI**  
Microproducts  
Breakthrough  
Institute

**Oregon State  
University**

**What it does:**  
Process  
development and  
microfluidic device  
prototyping

# Our Labs' Capabilities

## The Center for Electron Microscopy and Nanofabrication (CEMN) [www.emc.pdx.edu](http://www.emc.pdx.edu)

### Materials Characterization (Imaging & chemical analysis)

FEI Tecnai Spirit 20-120 Kv  
JEOL 100CX TEM  
FEI Sirion XL30 SEM  
FEI Strata DB-237 Dual Beam

### Sample Preparation

FEI Strata DB-237 Dual Beam  
Specimen preparation for TEM and SEM

## Center for Advanced Materials Characterization in Oregon (CAMCOR) [camcor.uoregon.edu](http://camcor.uoregon.edu)

### High Resolution and Analysis (Atomic level imaging & analysis)

FEI Titan 80-300 TEM with Cs corrector  
FEI Tecnai Spirit 20-120 Kv

### Nanofabrication, Imaging and Sample Preparation

Zeiss Ultra-55 FESEM with lithography  
FEI Helios Dual Beam FIB/SEM  
Sample preparation equipment

## Who uses the High Tech Extension Service?

Companies as diverse as SpectraWatt, which uses ONAMI R&D to reduce cost and improve solar cell manufacturing efficiency, to industry leader Intel, which uses CAMCOR's materials characterization R&D.

Current clients using ONAMI labs in Eugene, Corvallis and Portland include:

- **SolarWorld** - a world leader in solar power technology
- **Micro Systems Engineering** - producing medical microelectronics
- **Hewlett-Packard** - global tech company
- **ON Semi** - semiconductor fabrication
- **Floragenex** - developing new DNA sequencing systems

### MicroAnalytical (Quantitative materials analysis)

FEI Quanta 200 environmental SEM  
Cameca SX100 Electron Microprobe  
Cameca SX50 Electron Microprobe

### X-Ray Diffraction (3-D atomic structure)

Bruker Smart Apex CCD area detector  
Enraf-Nonius CAD-4 Turbo Diffractometer  
Bruker D8 Discover XRD  
Philips Panalytical XRD  
Scintag XDS-2000 Diffractometer

### Nuclear Magnetic Resonance (Molecular structure determination)

NMR Varian INOVA-300-500-600  
NMR Bruker ER300 EPR

### Surface Analysis (Surface topography and chemistry)

ThermoScientific X-Ray Photoelectron Spectroscopy (XPS)  
Veeco Atomic Force Microscopy (AFM)  
ION-TOF Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS)  
Woollam Spectroscopic Ellipsometry  
Waters MALDI/ESI Mass Spectrometry  
WITEC Scanning Near-Field Optical Microscopy (SNOM)

### Polymer Characterization (Thermal properties, molecular weight)

Dimatix Materials Printer 2381 (DMP)  
TA Dynamic Mechanical Analyzer Q800 (DMA)  
TA Differential Scanning Calorimeter 2920 (DSC)  
Perkin Elmer Pyris 1 (DSC)  
TA Thermal Gravimetric Analyzer Q500 (TGA)

## ONAMI in Action

McMinnville-based Northwest UAV is the largest unmanned aerial vehicle engine manufacturer in the country. NWUAV has grown from 7 employees in 2008 to more than 40 today.

Driven to meet new federal regulations that require a large reduction in exhaust emissions, NWUAV set out to develop a unique fuel injection engine that will run on heavy jet fuels.

Business Oregon staff connected NWUAV with R&D facilities at ONAMI to design and prototype the new fuel injector. Using ink-jet technology, ONAMI and NWUAV have already developed potential solutions and prototypes.

## Microproducts Breakthrough Institute (MBI) [mbi-online.org](http://mbi-online.org)

### Fabrication Capabilities

Atomic layer deposition  
Sputter deposition  
Polymer embossing  
PDMS molding  
MicroEDM  
Laser machining  
SU-8 photolithography  
Diffusion bonding/brazing  
Forming gas annealing  
Injection molding  
Machining

### Analysis Capabilities

Laser scanning microscope  
Profilometer  
Microscopes with video capture  
Scanning electron microscope  
Metallography  
UV detector

### Design and Modeling Capabilities

SolidWorks  
Cosmos 2007  
SmartCam  
EdgeCam  
Comsol  
LEdit