



Jones Hall

Creating Research Opportunities through Innovative Models of Engagement

Michael Hripko

Associate Vice President

Office of Research

Youngstown State University

One University Plaza

Youngstown, OH 44555

Youngstown State University

- 12,551 Students
- 1,198 Graduate Students
- 145 acre urban campus
- Offering more than 100 undergraduate majors, including bachelor's and associate degrees and certificates
- 44 master's programs
- Doctorates in education, materials science and engineering, and physical therapy



Colleges

- Bitonte College of Health and Human Services
- Creative Arts and Communications
- Beeghley College of Education
- Liberal Arts and Social Science
- Williamson College of Business Administration
- Science Technology, Engineering, and Mathematics
- Graduate College

2020 Strategic Cornerstones

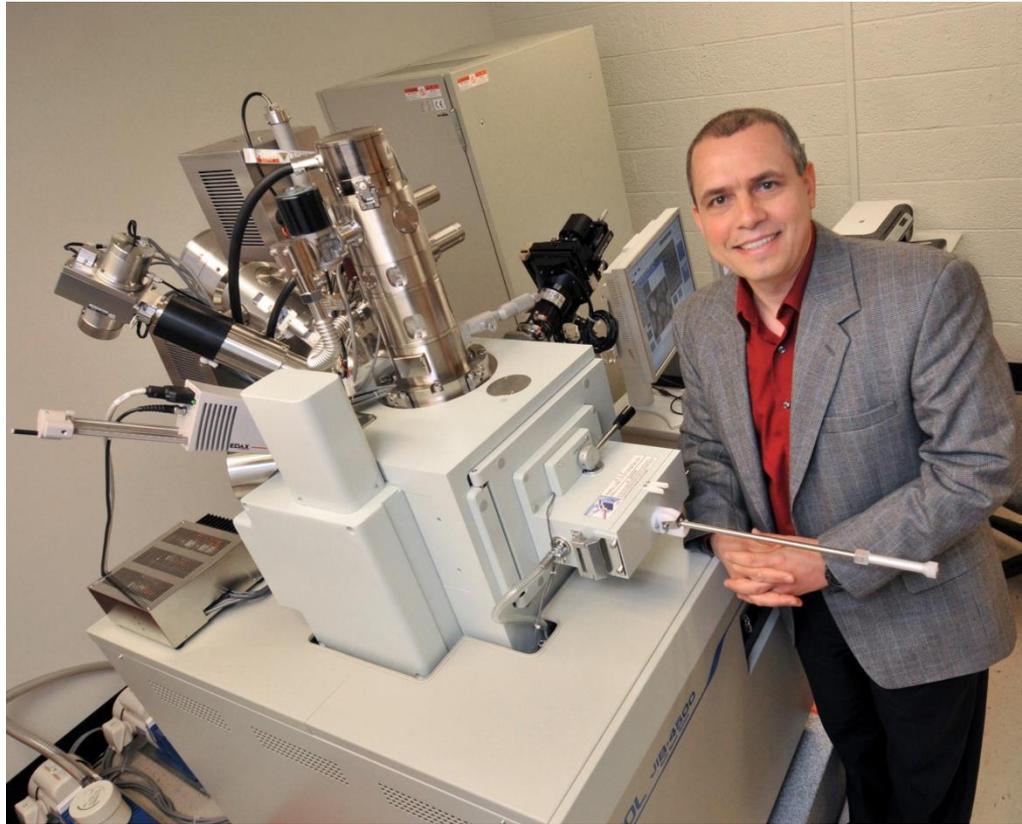
1. Accountability and Sustainability
2. Student Success
3. Urban Research University Transition
4. Regional Engagement

“Macte Virtute” - Increase Excellence

Advanced Materials and Manufacturing

- Research Focus
 - Specialty Steels, Ceramic Composites, Alloys, High Performance Plating and Coatings, Titanium, Nano-structures
 - Material composition, analysis, design, applications, and manufacturing
- Leveraging historical regional strengths
 - 35% of manufacturing is in metals and machinery
 - 20% growth forecast
 - Strength in available skilled workers

Ph.D. Program in Materials Science and Engineering



Advanced Material Analysis

- EOL 2100 Scanning/Transmission Electron Microscope
- JIB 4500 Combined Focused Ion Beam (FIB)/ Scanning Electron Microscope (SEM)
- Cambridge Stereoscan 200 SEM with EDAX capability.
 - Analysis of soft material surfaces, layered polymers used in liquid crystal applications
- Agilent Technologies Atomic Force Microscope
- Newport Class A Solar Stimulator
- Kaiser Optical Systems Raman Microscope

Material Structure and Instrumentation

- GC-MS, chromatographic, spectroscopic, physical, and analytical instruments
- X-ray diffraction facility
 - Three single crystal and one powder X-ray diffractometer
 - X-ray fluorimeter
 - Two Varian multinuclear NMRs (300 and 400 MHz)
 - Varian EM-360 60 MHz instrument

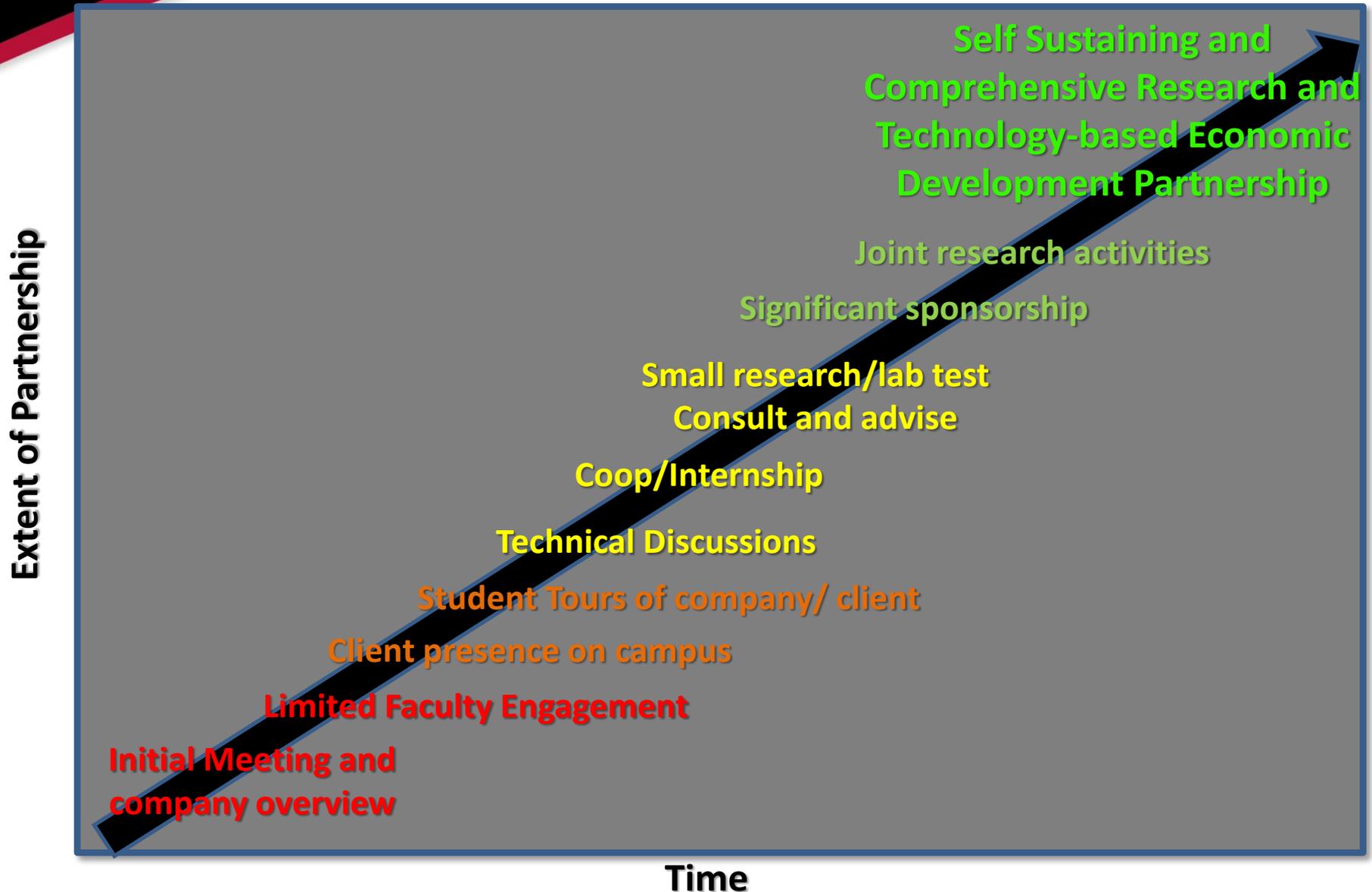
Center for Innovation in Additive Manufacturing

- **ExOne M-Flex and X1-Lab binder jetting printers** capable of printing metal and ceramic parts
- **Stratasys Fortus 250mc** for fused deposition modeling
- **Hyrel 3-D printer** with high resolution and thin wall capability
- **3-D printing kiosk** in the lobby of Moser Hall with two MakerGear M2 printers available for the campus community
- **MakerBot Replicator 2X** dual extruder printer
- **Siemens NX PLM software** including the full suite of drawing, analysis, automation, manufacturing and production modules

The YSU Model

- University/Community leadership
 - The University is integral to the resurgence of the city, state, region, nation
 - The University employs a model for collaborative research and development
- Partnership Continuum

Partnership Continuum



Highlighted Research

Topic	Sponsor	Partners
Consortium for Advanced Hybrid Manufacturing—Integrating Technologies	NIST	<ul style="list-style-type: none"> • North Carolina State Univ. • America Makes
Accelerated Adoption of Additive Manufacturing for the American Foundry Industry	America Makes	<ul style="list-style-type: none"> • Youngstown Business Incubator (YBI) • American Foundry Society • Humtown Patterns (Salem, OH) • University of Northern Iowa • ExOne
Precision Printed Parts Network	Ohio Economic Development Agency —Edison Advanced Manufacturing Program (AMP)	<ul style="list-style-type: none"> • Youngstown Business Incubator (YBI)
In Situ measurement of 3D printed structures	Ohio Third Frontier	<ul style="list-style-type: none"> • M*7 Technologies • Siemens
Multivariate Materials for Spacecraft	America Makes	<ul style="list-style-type: none"> • University of Texas El Paso (Lead) • Northrup Grumman • University of New Mexico • Air Force Research Laboratory
Cyber-enabled Additive Manufacturing Training	Appalachian Regional Commission	<ul style="list-style-type: none"> • Applied Systems/Technology Transfer • Youngstown Business Incubator • Eastern Gateway CC

Mahoning Valley Innovation and Commercialization Center

- **Maker Space**
- **Integrated Vocational Center, Community College, and Engineering Technology assets, resources, and programming**
- **Fully integrated regional ecosystem for design, build, repair, prototype, test, and commercialization**





● PUBLIC / CLASSROOM / OFFICE - 30,600 SF

● TECH SHOP - 12,000 SF

● SHARED PUBLIC SPACE - 10,500 SF

● LABORATORY BUILDING - 35,700 SF

● PROJECT SPACE - 16,000 SF

Youngstown: “Molecules to Manufacturing”

- Youngstown - one of the nation’s Top Ten entrepreneurial communities - Entrepreneur Magazine
- Ranked #1 in Ohio and 25th nationally, “Bang-for-buck” Community by *Forbes Magazine*
- Youngstown Business Incubator ranked #1 University-affiliated Incubator in the World by University Business Incubator Index
- World class YSU capabilities for additive manufacturing and materials analysis
- Historical regional expertise in manufacturing
- Strong partnership amongst University, Regional Chamber, Business Incubator, Industry Partners, Community College, Local Schools and Elected Officials

FALL 2015

Y YOUNGSTOWN STATE UNIVERSITY
NEW FRONTIERS

Celebrating Outstanding Research and Scholarship

