

# Northwest Nanotechnology Infrastructure (NNI)

University of Washington / Oregon State University

PI: Karl F. Böhringer

NNCI Annual Conference

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NNCI NORTHWEST  
NANOTECHNOLOGY  
INFRASTRUCTURE



# NNI 2.0 Team – Facilities and Principal Focus Areas



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Maria Huffman



Lara Gamble



John Conley



Todd Miller



Daniel Ratner



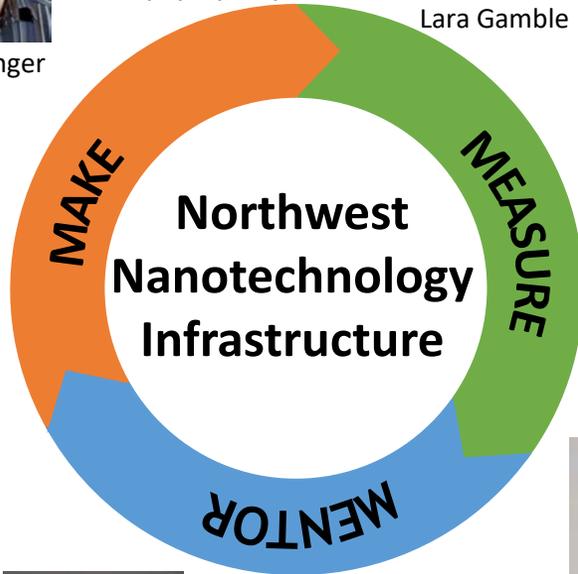
Joe Baio



Greg Herman



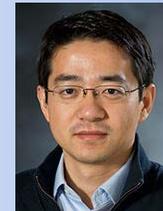
Liney Árnadóttir



## Integrated Photonics / Quantum



Kai-Mei Fu



Mo Li



Oksana  
Ostroverkhova

## Energy Materials & Devices



Chih-hung Chang



Zhenxing Feng



David Ginger



Daniel Schwartz

## Bio-nano Interfaces



Joe Baio



Daniel Ratner



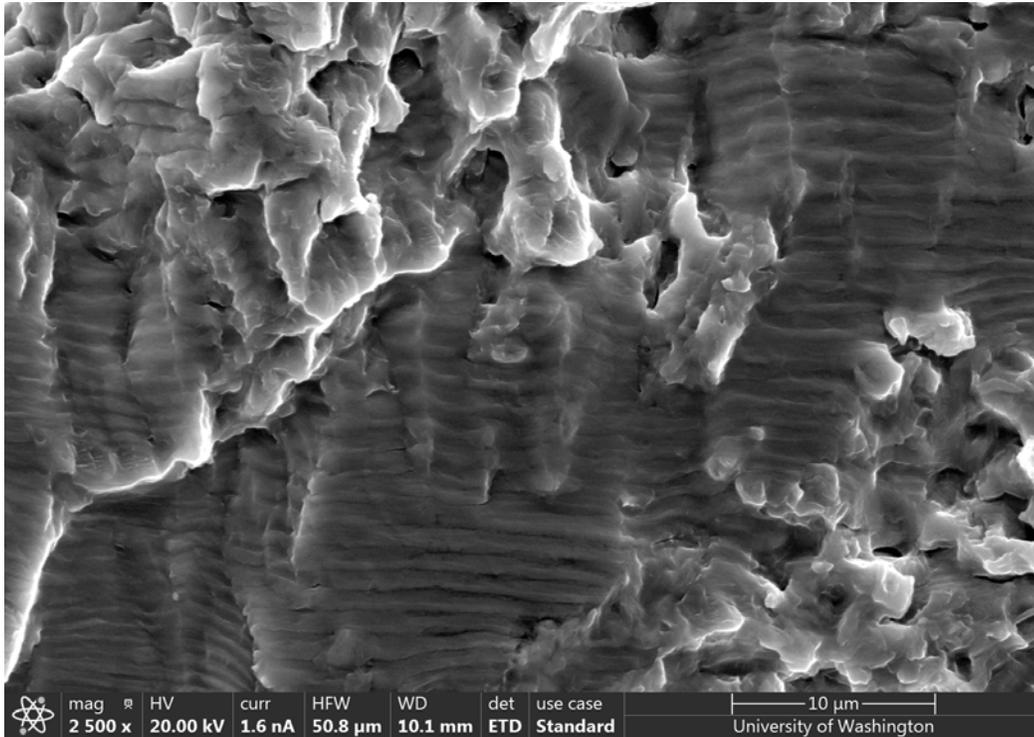
Lara Gamble

# NNI – Vision

The NNCI Northwest Nanotechnology Infrastructure acts as an engine for innovation and economic development by providing world-class nanotechnology infrastructure for a broad and diverse user base, paired with technical and educational leadership in photonic and quantum devices, advanced energy materials and devices, and bio-nano interfaces and systems.

# NNI – Plenty of Beauty at the Bottom

Most unique capability (winner 2022)

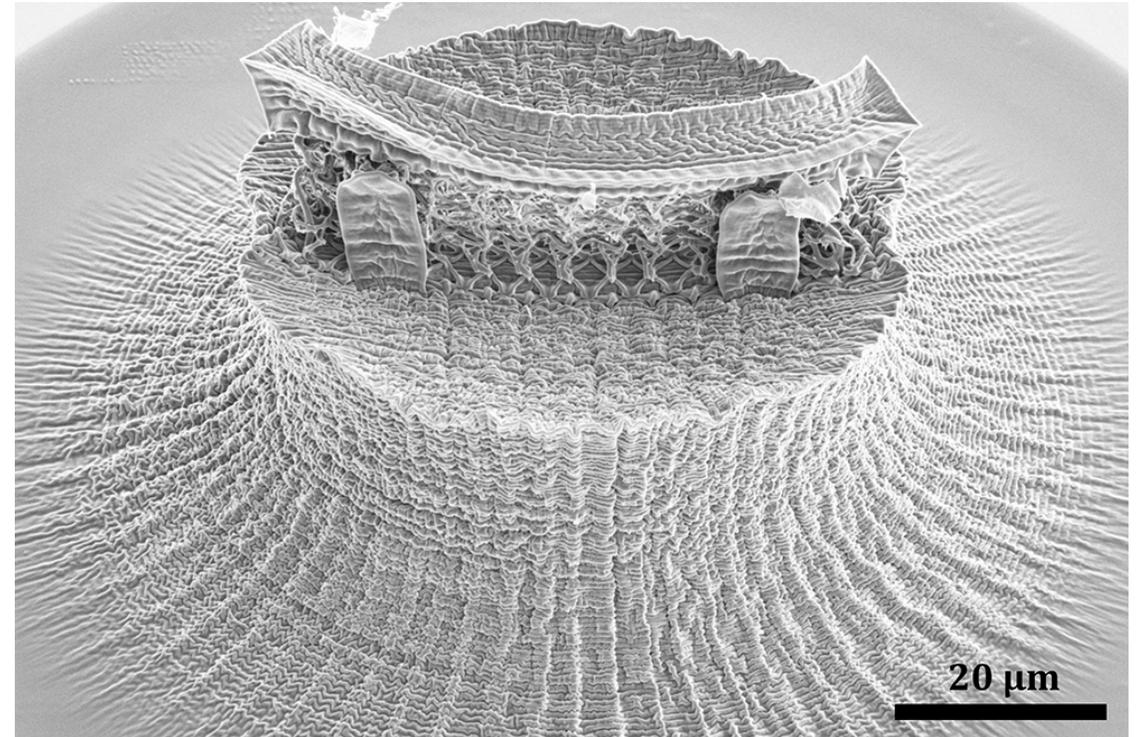


“Plenty of waves at the bottom”

Mohammad Sayem Bin Abdullah, grad student, UW

Crack propagation in additively manufactured titanium

Most stunning (honorable mention 2021)



“Nano wrinkled head”

Zainab Patel, grad student, UW

Pyrolyzed 3D printed fracture test assembly

# NNI – New Programs

## Community engagement (in person and virtual)

- Nano-engineered systems innovator series (occasional, targeting entire community)
  - Example: April 14, 2022, Transforming patient care with nano-engineered devices
- Industry workshops (full-day, targeting staff and users)
  - In-depth discussion on specific topic
  - Example: October 25, 2022, PlasmaTherm workshop on plasma processing
- “Talk with a real engineer” series (1 hour, targeting students)
  - What is it like to work as an engineer/scientist in industry?
  - Speakers from Intel, Micron, others
- Northwest Nanotech Lab Alliance (biennial meeting, targeting staff in Pacific NW)
  - Joint effort with NNCI-MONT
  - First meeting: November 8-9, 2021; next meeting: June 22-23, 2023
- Seed grants (annual competition, targeting internal and external academic users)
  - Emphasis on new users, commercialization potential
  - 4 awards in 2022, including 1 external user from WWU, Bellingham, WA

# NNI – Accelerating Growth of Site

- Expand capabilities in growth areas
  - 5 year / \$10M investment in quantum infrastructure (launched last week at UW)
- Stronger engagement at state/federal level, and with business community
  - Emphasize workforce development
  - Device design, process development, prototyping
- Specific challenges
  - “Graduating” industrial users require resources (throughput, stability) beyond university capabilities but too early for commercial foundries
- General challenges
  - High cost of sustaining cutting-edge equipment
  - Attracting and retaining highly qualified staff

# NNI – Microelectronics and the CHIPS+Science Act

More than 20% of US semiconductor jobs are in Pacific NW

Need better integration of strategic public sector and academic institution involvement to maximize impact on workforce development, innovation, entrepreneurship

Efforts to align with National Semiconductor Technology Centers:

- New Advanced Lithography Center in Hillsboro, OR
- New Memory Center of Excellence, \$15B Micron memory fab in Boise, ID
- Currently 8 universities in ID, MT, OR, UT, WA and numerous community colleges involved

New Semiconductor Center of Innovation Excellence

Include OSU, Intel, Oregon Business Council (planning grant)

NSF ENGINES Type-1 (lead Greg Herman, OSU):

Northwest Engine for Advancing the Semiconductor Ecosystem



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