

Cornell NanoScale Science and Technology Facility (NSF NNCI 2025233)

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Capabilities

- Packaging, Backend and Support tools (CMP highlights next slide)
- **Software and Computation**
- **3D Fabrication and 3D Imaging**
- **Dedicated facilities for microfluidics and soft lithography**
- Ability to process a very wide range of heterogeneous materials without cross contamination as well as different wafer sizes – (pieces up to 200 mm)

Most Advanced Lithography Suite in NNCI

Research Highlights

Biologically Inspired Micro-Robotic Swimmers Remotely Controlled by **Ultrasound Waves**

Rapid Identification of DNA Fragments through Direct Sequencing with **Electro-Optical Zero-**Mode Waveguide





Graphene-on-**Polymer Flexible Vaporizable Sensor**

A minimally disruptive method for measuring water potential in planta using hydrogel nanoreporters





• JEOL 9500 and JEOL 6300 • ASML 300C deep UV stepper (248 nm)

• ALD x2, PECVD x2

- 2 UV steppers (i-line and g-line)• Mask fabrication (x2)
- Contact lithography (x3)
- Nanoscribe 3D printer
- Nanoimprint • Direct Laser Writing

Broad Process Support / Test and Characterization

- 20 dry etch chambers
- Deep silicon etchers
- ALE, RIE and ICP RIE
- Vapor HF and XeF2
- Ion milling
- Ashing and descum

- Electron microscopy
 - Optical microscopy
- 10 Atmospheric tubes
- 8 Advanced evaporation
- and sputtering systems
- AIN sputtering

• 11 CVD tubes

- Optical

- Electrical

• Profilometry

Logrus

Microfluidic



T. Luo and M. Wu, Lab Chip, 2021, 21, 4095. This work was supported by National Cancer Institute (R01CA221346). The Nanoscribe Photonics GT printer was made possible via NSF-MRI-1919653

Wanunu et al., Adv. Mater. 2022, 34, 2108479 International **NIH/National Human** Genome Research Institute HG009186 and Systems (MEMS) HG011087 DOI:

Ved Gund and Amit P. Jaina et al., PNAS Lal, 2021 IEEE 34th 2021 118(23) 1-9, e2008276118 Conference on Micro **Electro Mechanical USDA** National Institute of Food and Agriculture 2017-67007-25950; 10.1109/MEMS51782. and AFOSR FA9550-2021.9375341 18-1-0345.

Startup Activities

Startup Culture -NNCI makes it possible

Partnership with two Cornell business incubators:

- **Praxis**: Engineering and Physical Sciences Business Incubator, colocated in Duffield Hall
- The McGovern Center: Life Sciences business incubator at Cornell

3D Fab and Characterization

Cornell Multiscale 3D Fabrication Partnership (CM3FP)

12 3-D printers and laser cutters of various technologies in the Mechanical Engineering Department to supplement CNF's existing 3-D printing capabilities

Cornell Visualization and Imaging Partnership (CVIP)

18 distinct advanced 3-D characterization and imaging tools including a variety of confocal and super-resolution microscopes, fluorescence







Strategic Focus











