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Nanophotonics & Nanomechanics

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https://www.eng.yale.edu/tanglab/

Integrated Photonics

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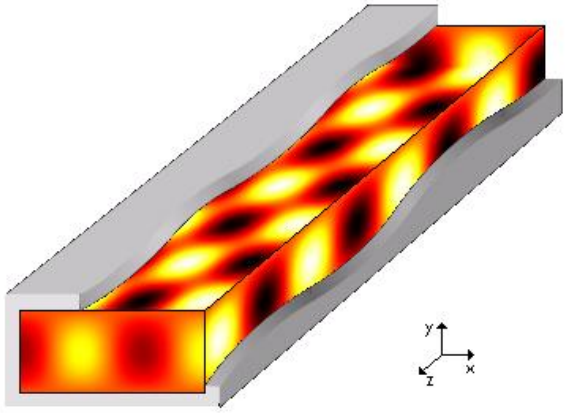
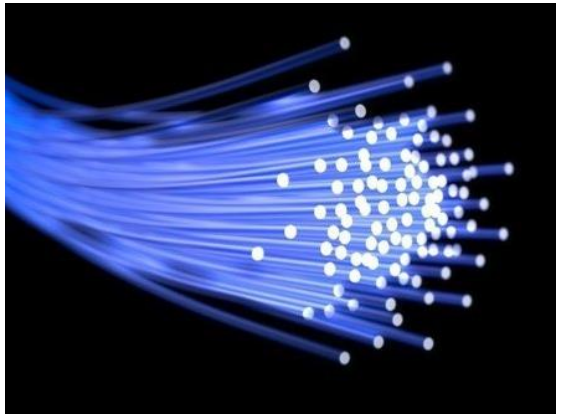
Hose:
Guides “Water Waves”

Optical Waveguide:
Guides Optical Waves



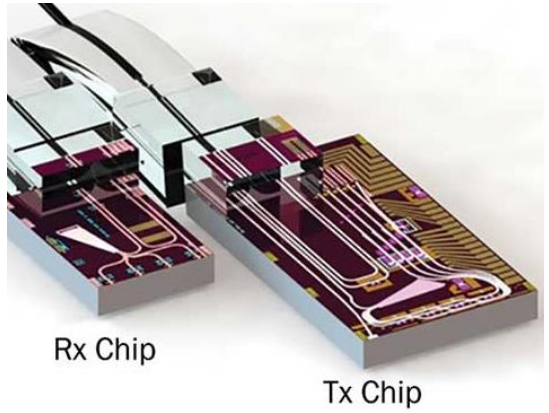
Bulk Waveguides

Optical Fiber: ~50 GBps



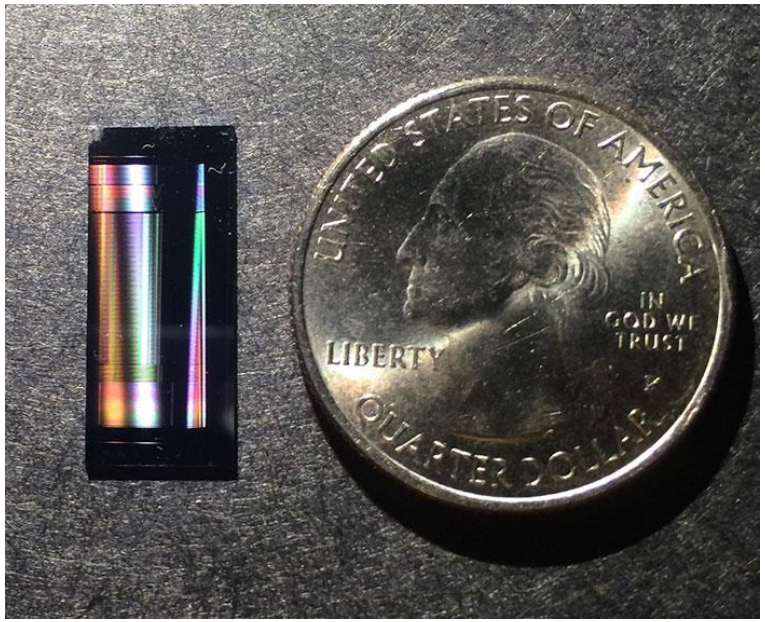
Integrated Waveguides

Silicon Chip: ~500 GBps



Research activities in Tang Lab

- Integrated Nonlinear Optics & Frequency Combs
- Cavity Optomechanics
- Integrated Quantum Photonic Circuits
- Superconducting Devices & Single Photon Detectors



Nonlinear Optics and Frequency Combs

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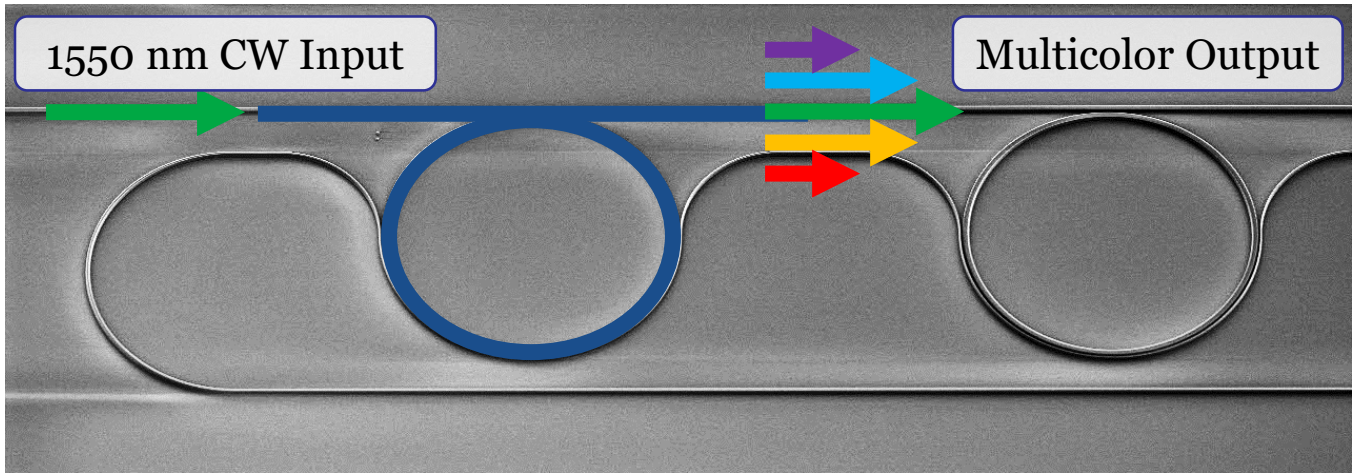

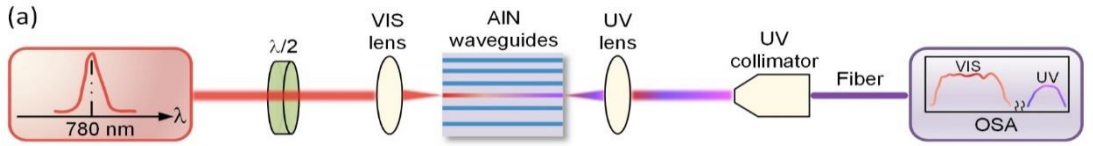

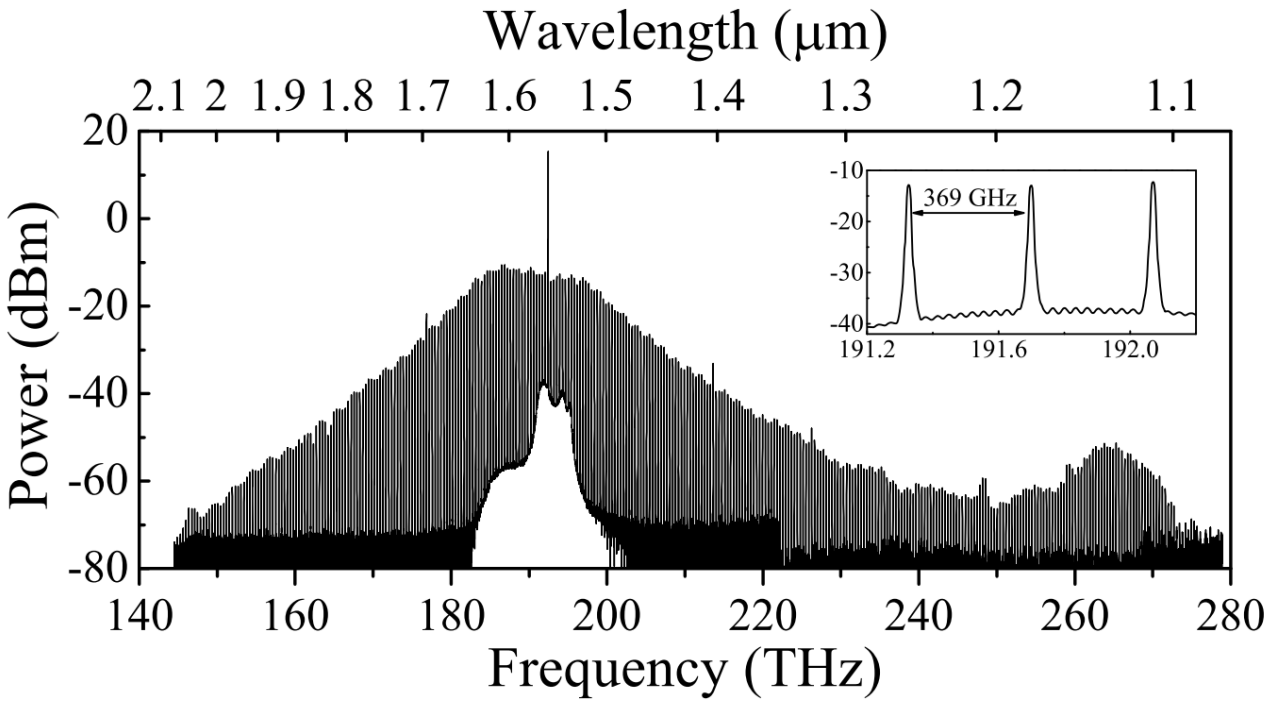

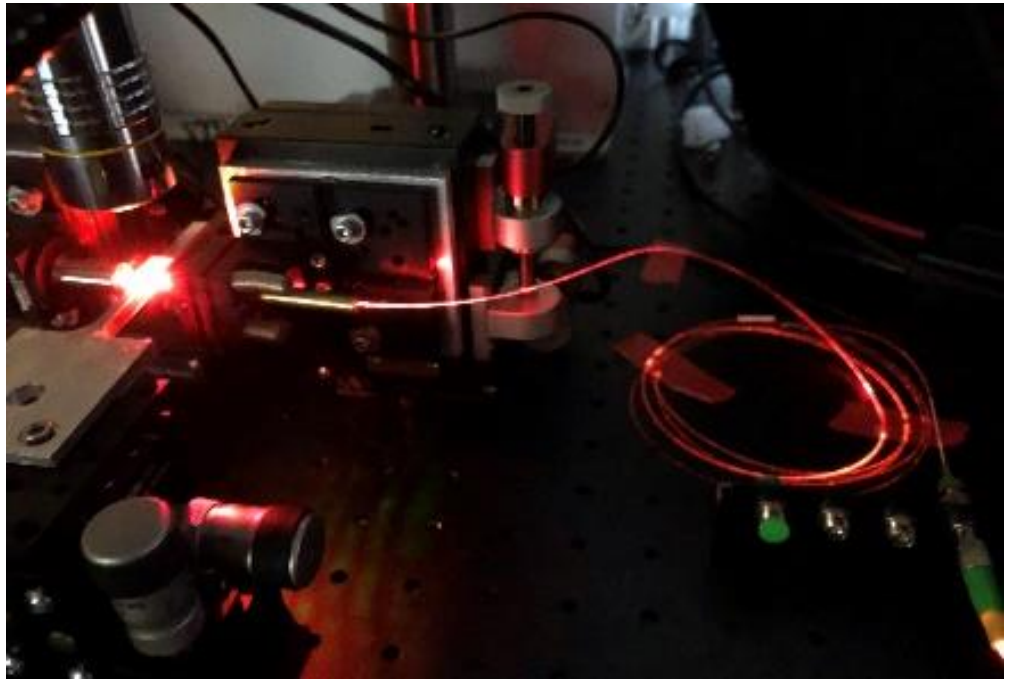

Optomechanics

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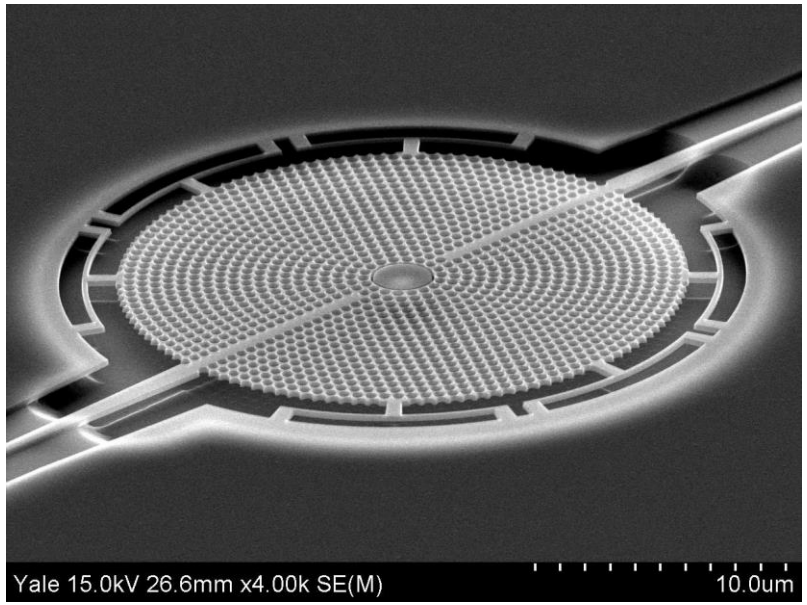

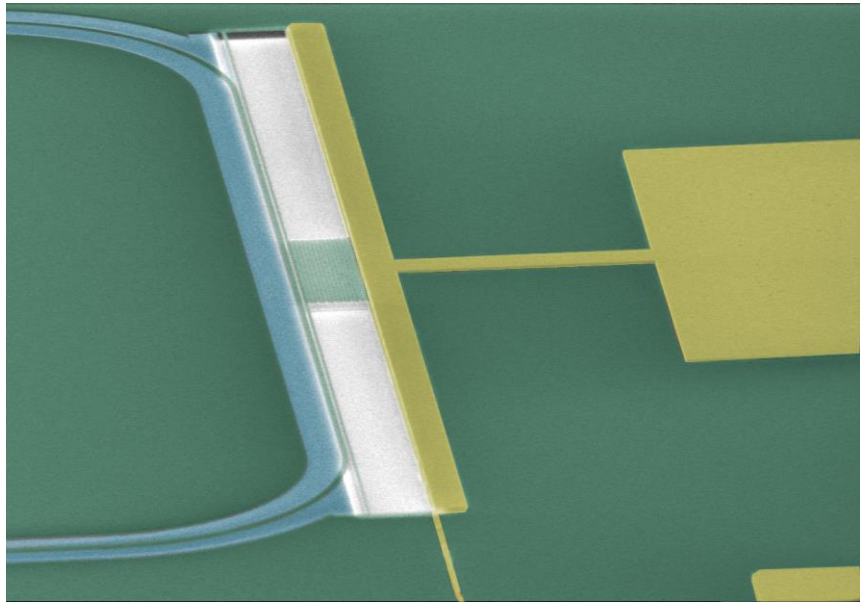

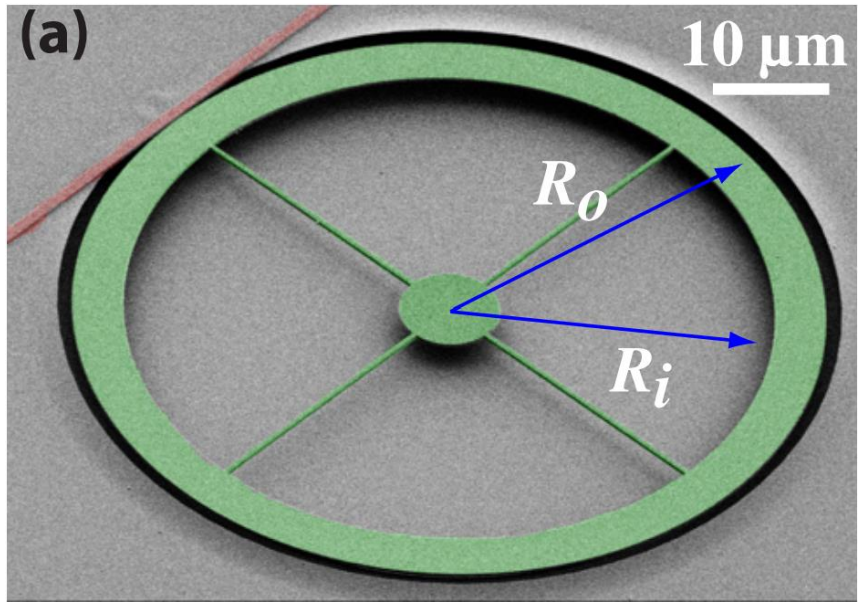

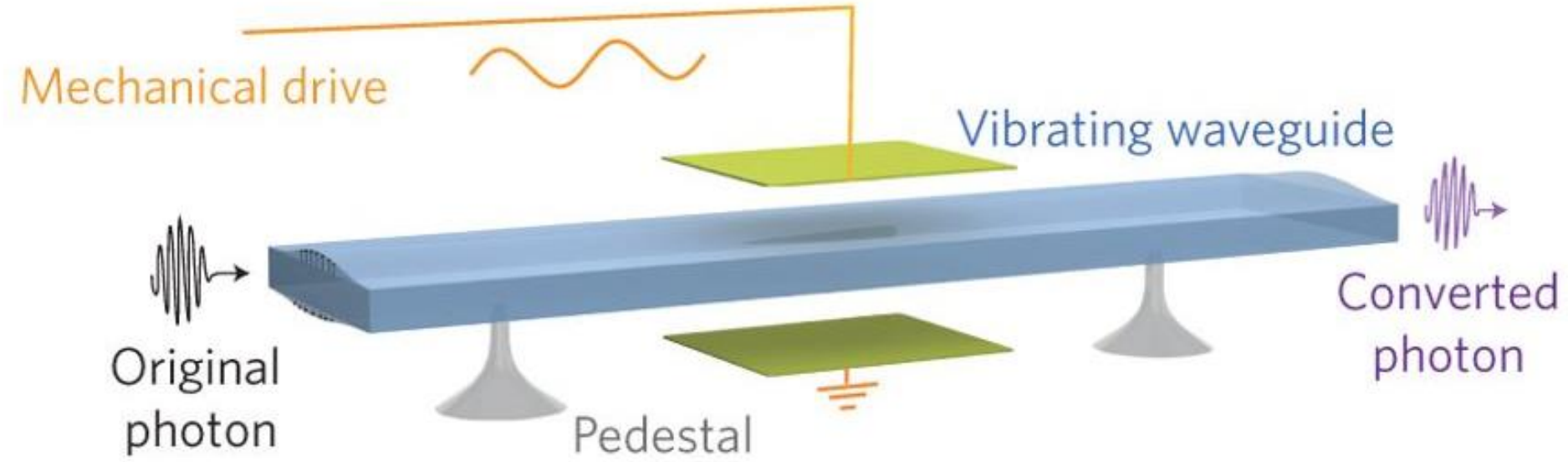

Microwave-to-Optical Quantum Frequency Conversion

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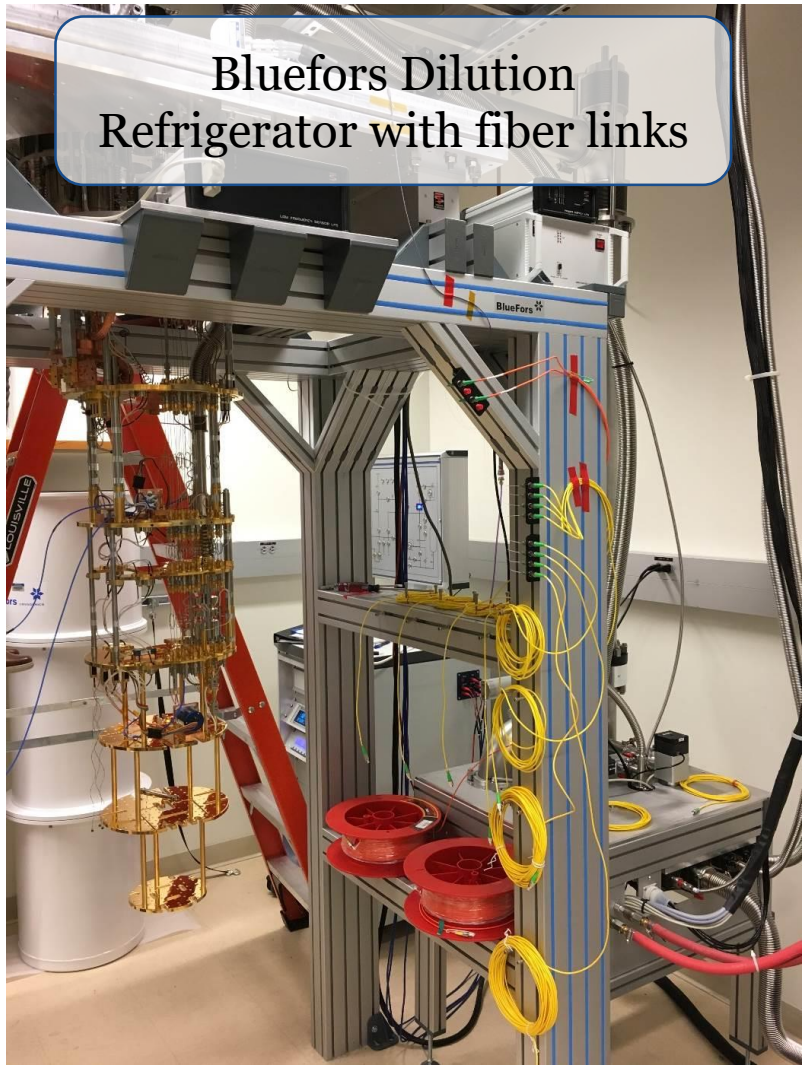

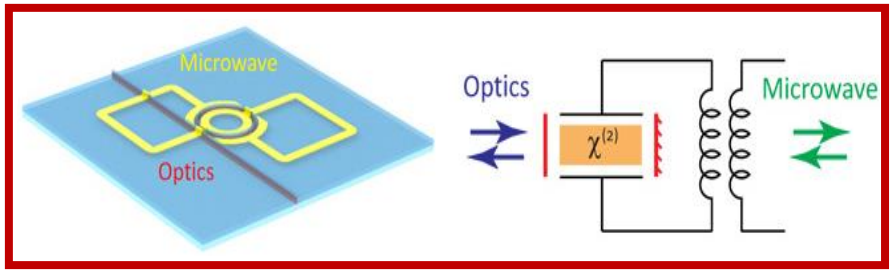

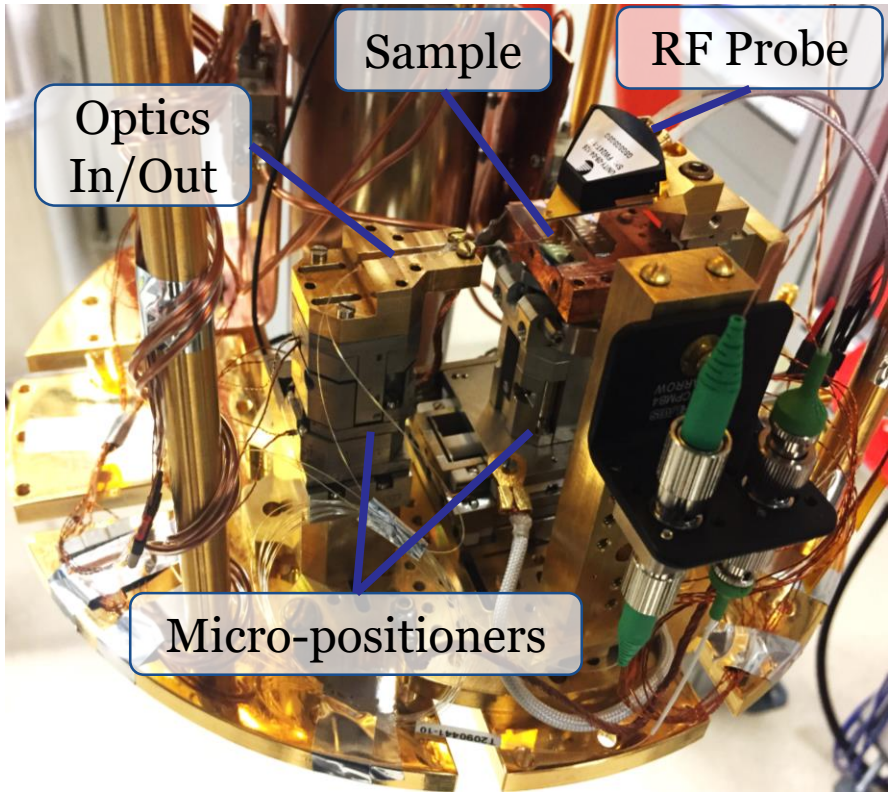

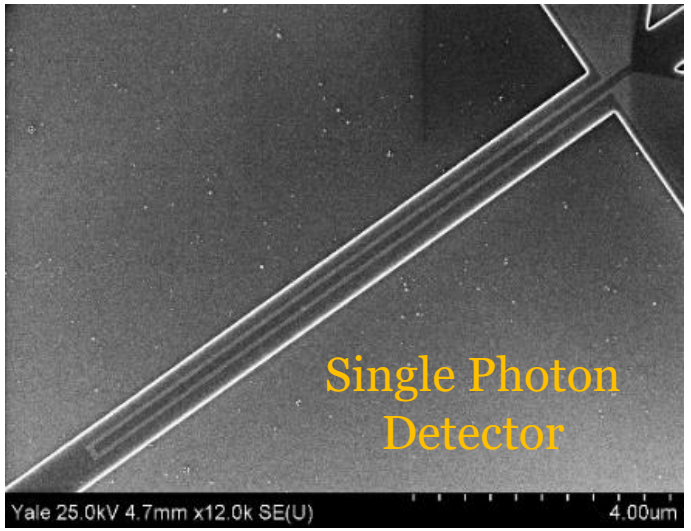

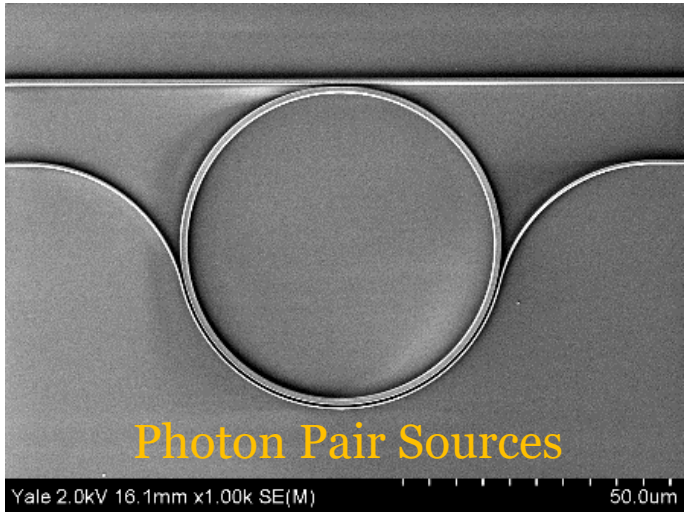

Instrumentation Needs & Expertise

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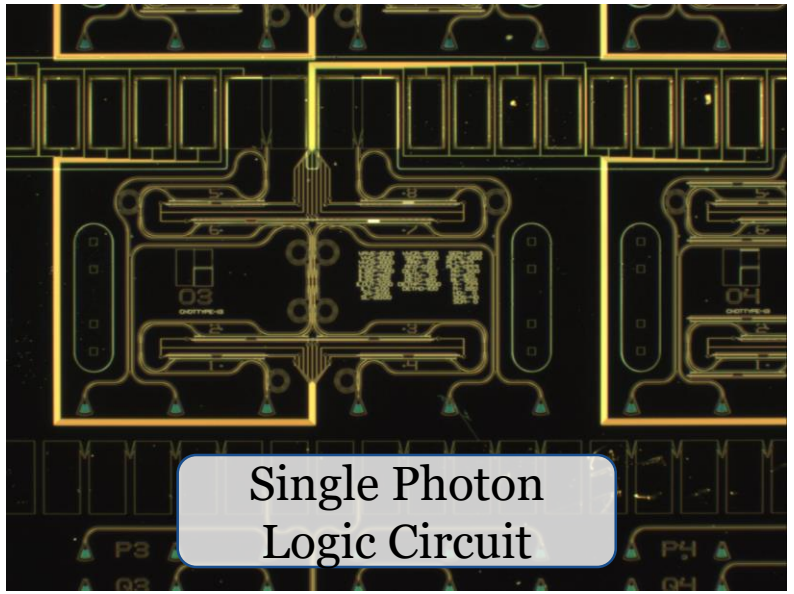
Fabricating Photonic Chips

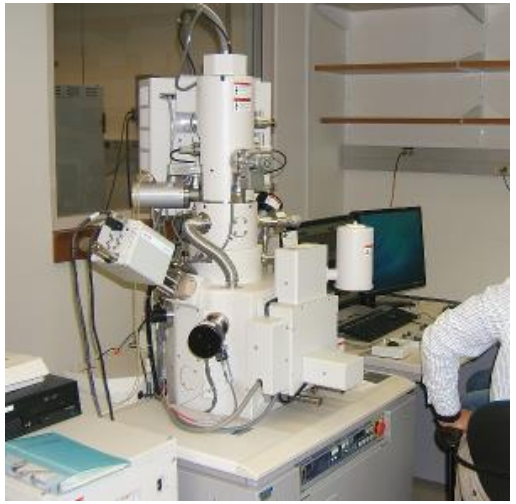
- "Intel-Level Capabilities on an NSF-Level Budget"
- Full Silicon/ III-V chip fabrication flow
- Nanoscale Processing Tolerance
- **Current instrument needs**
  - E-beam deposition systems (aging)
  - E-beam lithography systems (aging)
  - Wafer bonder
  - Chemical mechanical polisher



Single Photon Logic Circuit

Yale SEAS Cleanroom

Hitachi SU-70 Scanning Electron Microscopy



Raith EBPG 5000+ Ebeam Lithography