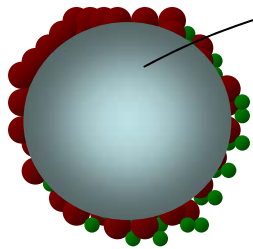
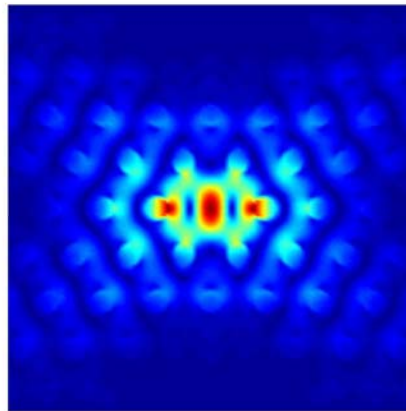


Jeff Young's group
Department of Physics and Astronomy, and
AMPEL, UBC

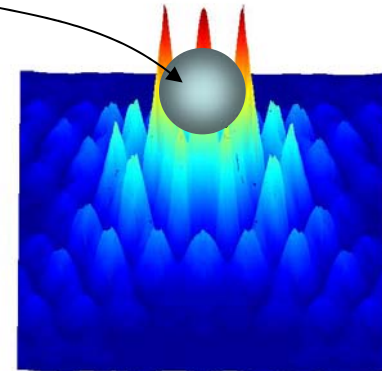
Chemically grafted nanoparticles



Quantum dot Nanoparticle
(~ 5nm PbSe)

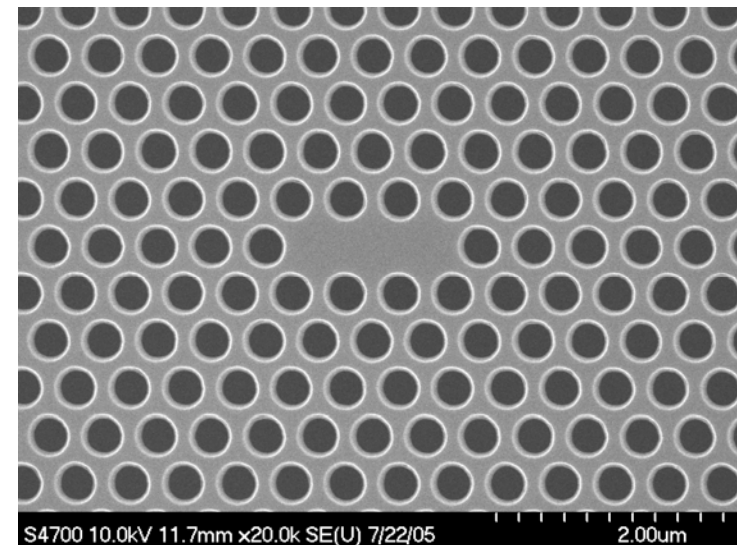
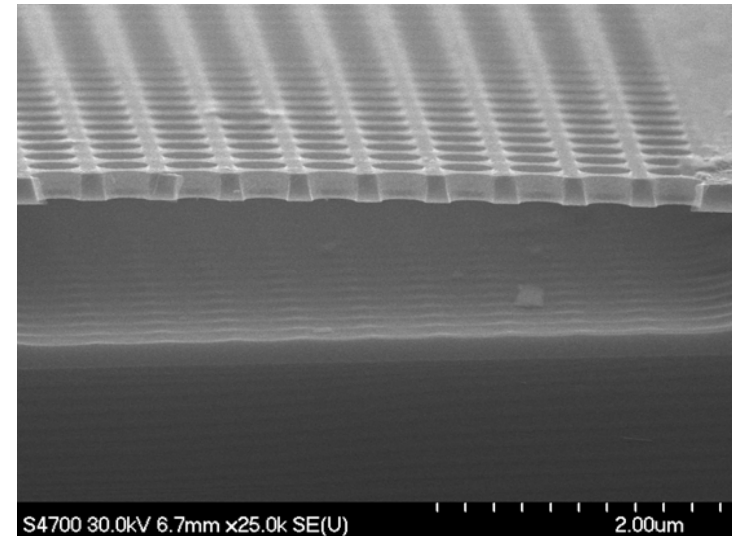
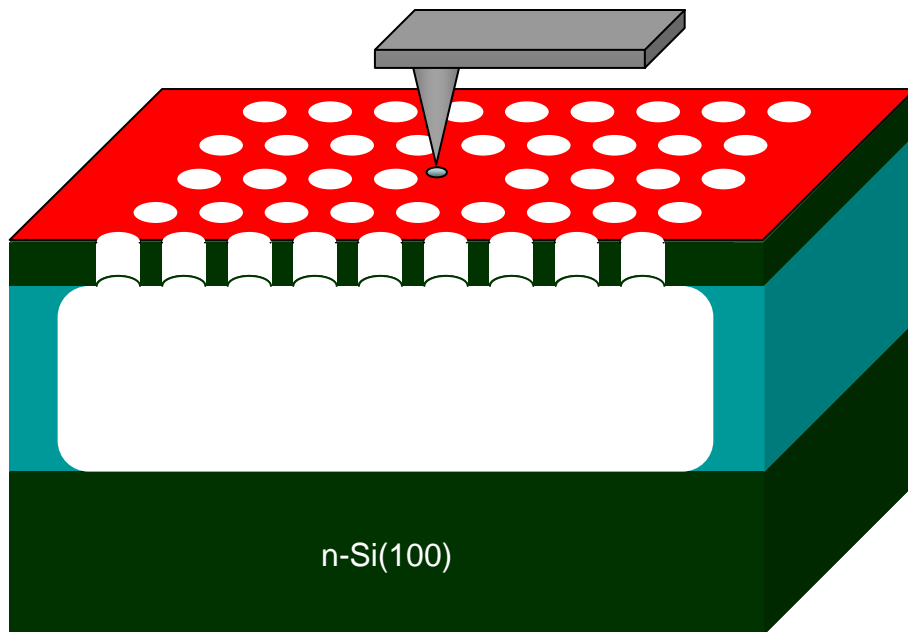


3D localized
Microcavity
mode in planar
photonic
crystal



Schematic of
coupled structure

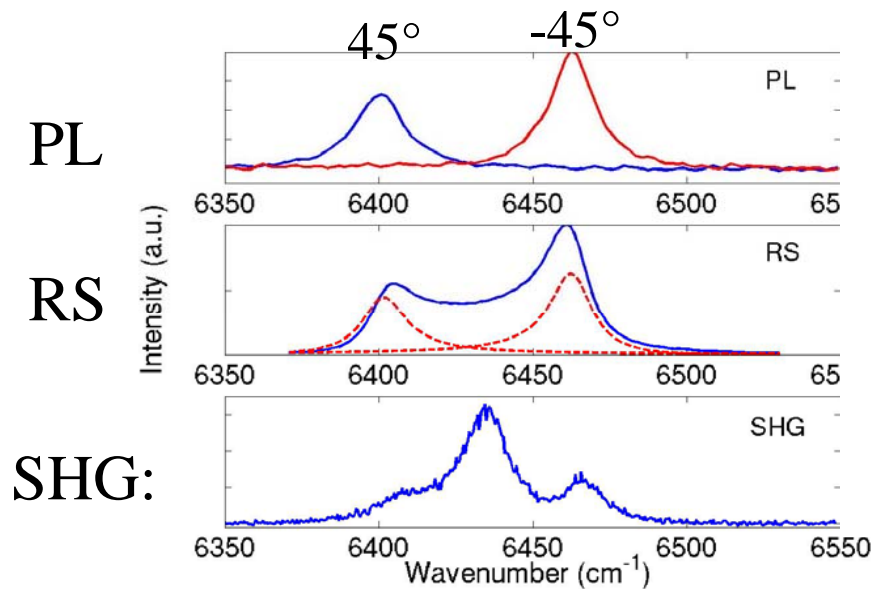
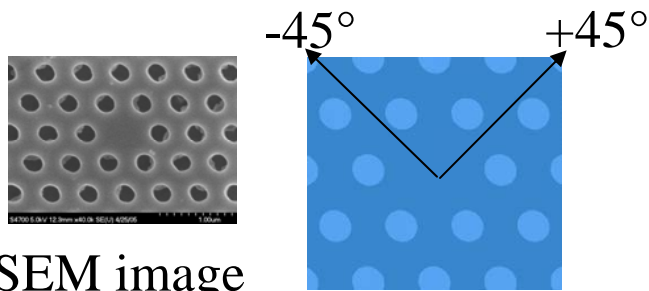
Ebeam+AFM lithographies



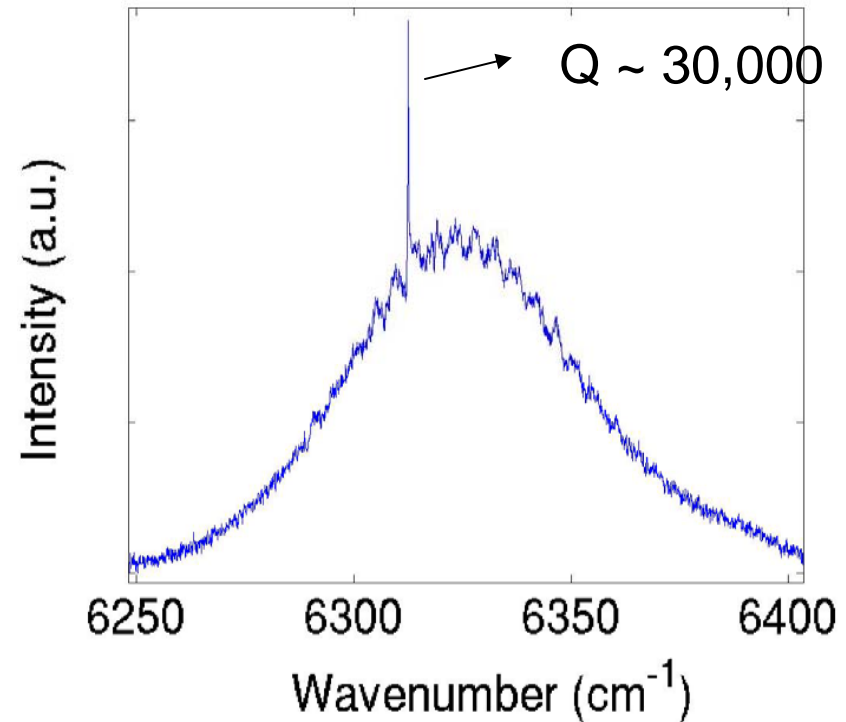
Anodize target area of processed SOI wafer with conducting atomic force microscope tip: tether nanoparticle to oxide dot, or H-terminated pit after HF etch

- “Bare” Q’s $> 30,000$
- Multi-mode, high Q cavities quite feasible (optical qubits?)

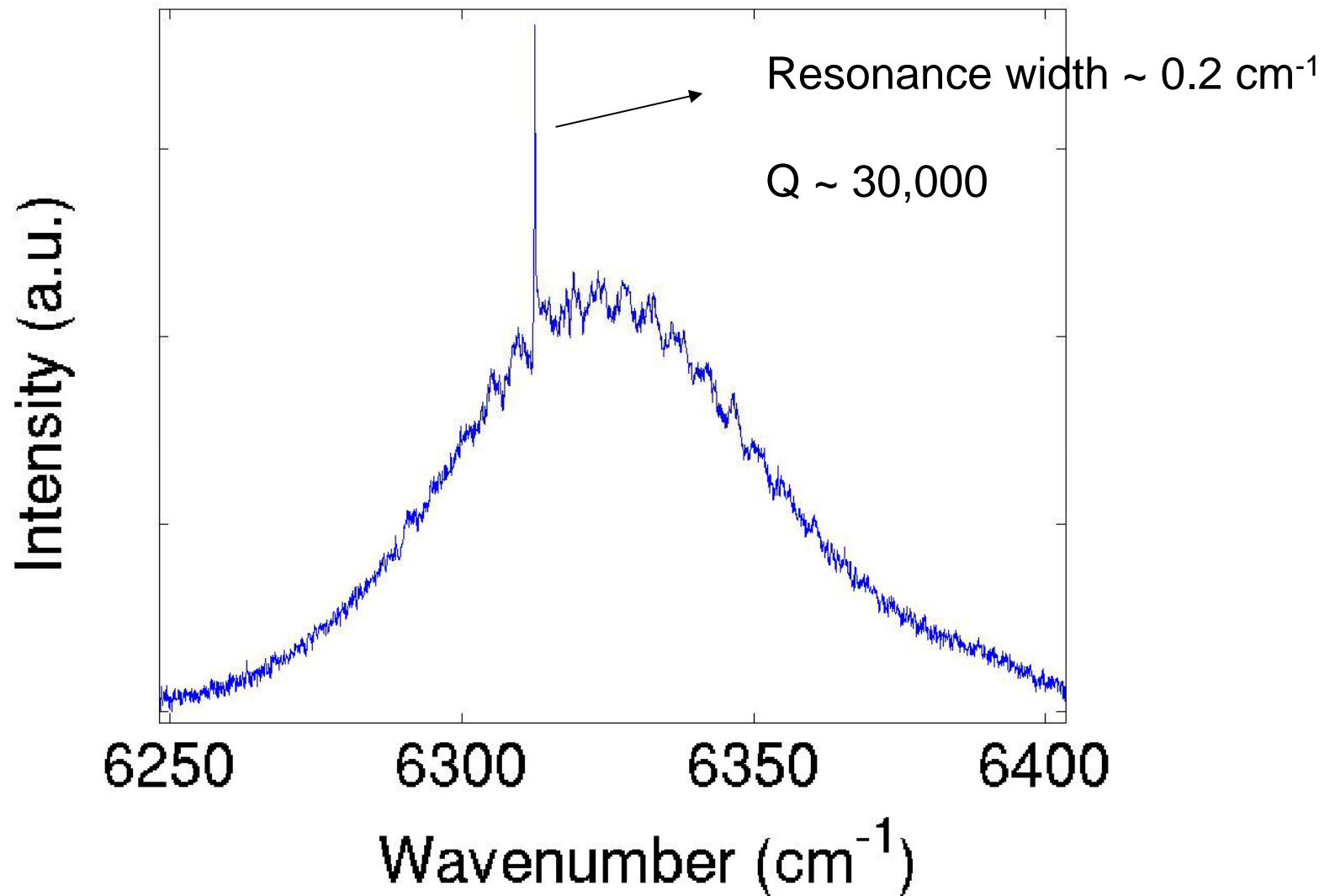
Many Quantum Dots, Low Q



No Quantum Dots, High Q

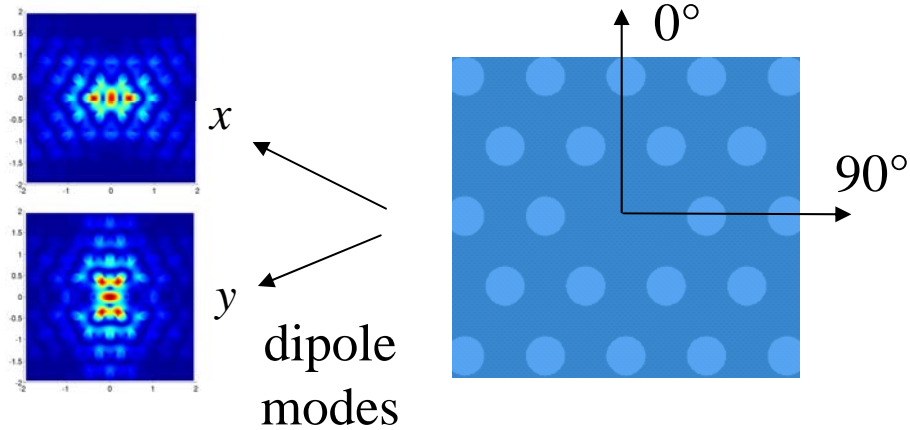


Lab record spectrum

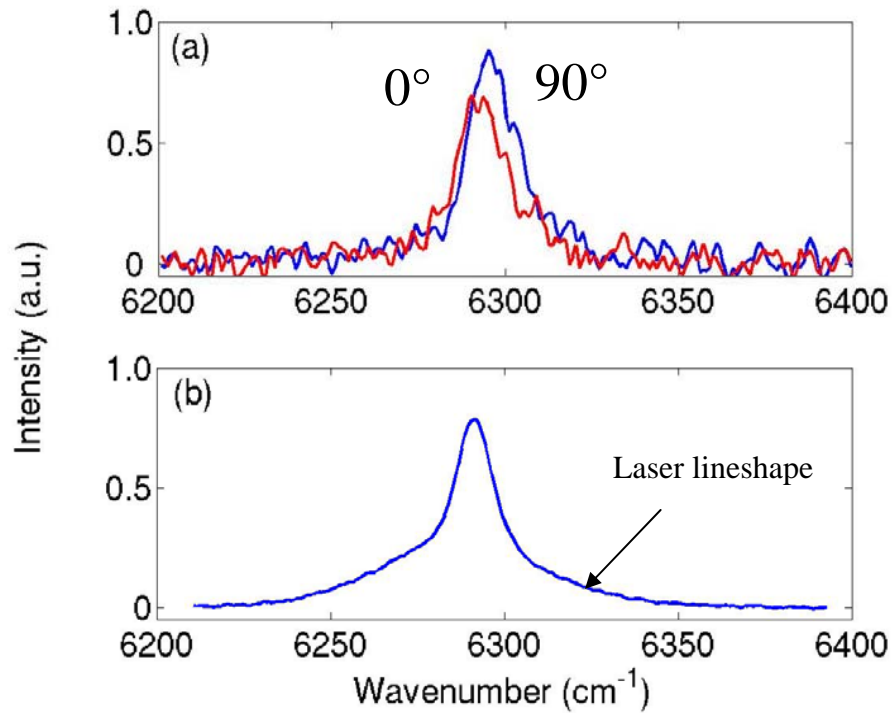


PL and Resonant Scattering

2 orthogonal modes



Photoluminescence (PL):



Resonant scattering:

Second harmonic generation

