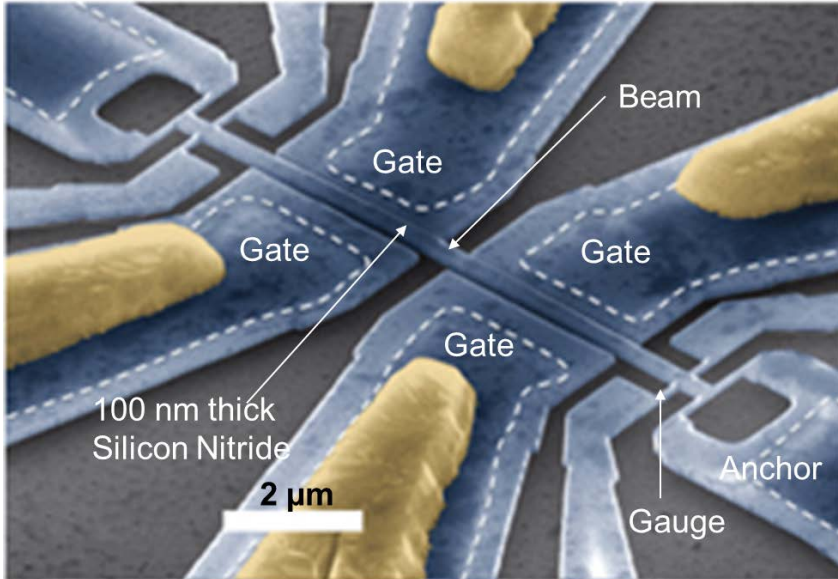


Last Name (print): _____ First Name (print): _____

WORKSHOP 6 - YCL
ALD to Enhance NEMS for Single Molecule Detection, February 18, 2014

We have reviewed a NEMS (nano-electromechanical systems) resonator as shown below. The surface area of the beam is very small. As a result, it is very difficult for the device to capture single molecules to be detected. Please apply atomic layer deposition (ALD) process to increase its area. The resonant frequencies are roughly proportional to $\sqrt{\frac{k}{m}}$, where k is the stiffness and m is the mass of the beam. Can we reduce the thickness while maintaining the same mass? Should we consider the change of the stiffness? What should we do?



Doubly-Clamped Beam