






## Thermal Conductivity in One-dimensional Samples

Geometry of setup:


$4 \times 4 \mu \mathrm{~m}^{3}$ island with gold resistors as heaters and thermometers

minimal width of bridge $w<200 \mathrm{~nm}$
for given geometry


$$
N_{i}=4 \times 4 \text { legs }=16
$$


modes:
1 longitudinal (dilatation)
1 torsional
2 bending

$$
G_{0}=\left(9.456 \times 10^{-13} \mathrm{~W} \mathrm{~K}^{-2}\right) T
$$

- transition roughly at 0.8 K

$$
T_{\text {crossover }} \approx \frac{h \nu}{2 w k_{\mathrm{B}}} \approx 0.8 \mathrm{~K}
$$

expected for: $\quad q_{\mathrm{th}} \approx k_{\mathrm{B}} T /(\hbar v)<\Delta q=\frac{\pi}{w}$

spacing between lowest lying modes

