ION CHANENLING IN CRYSTALS

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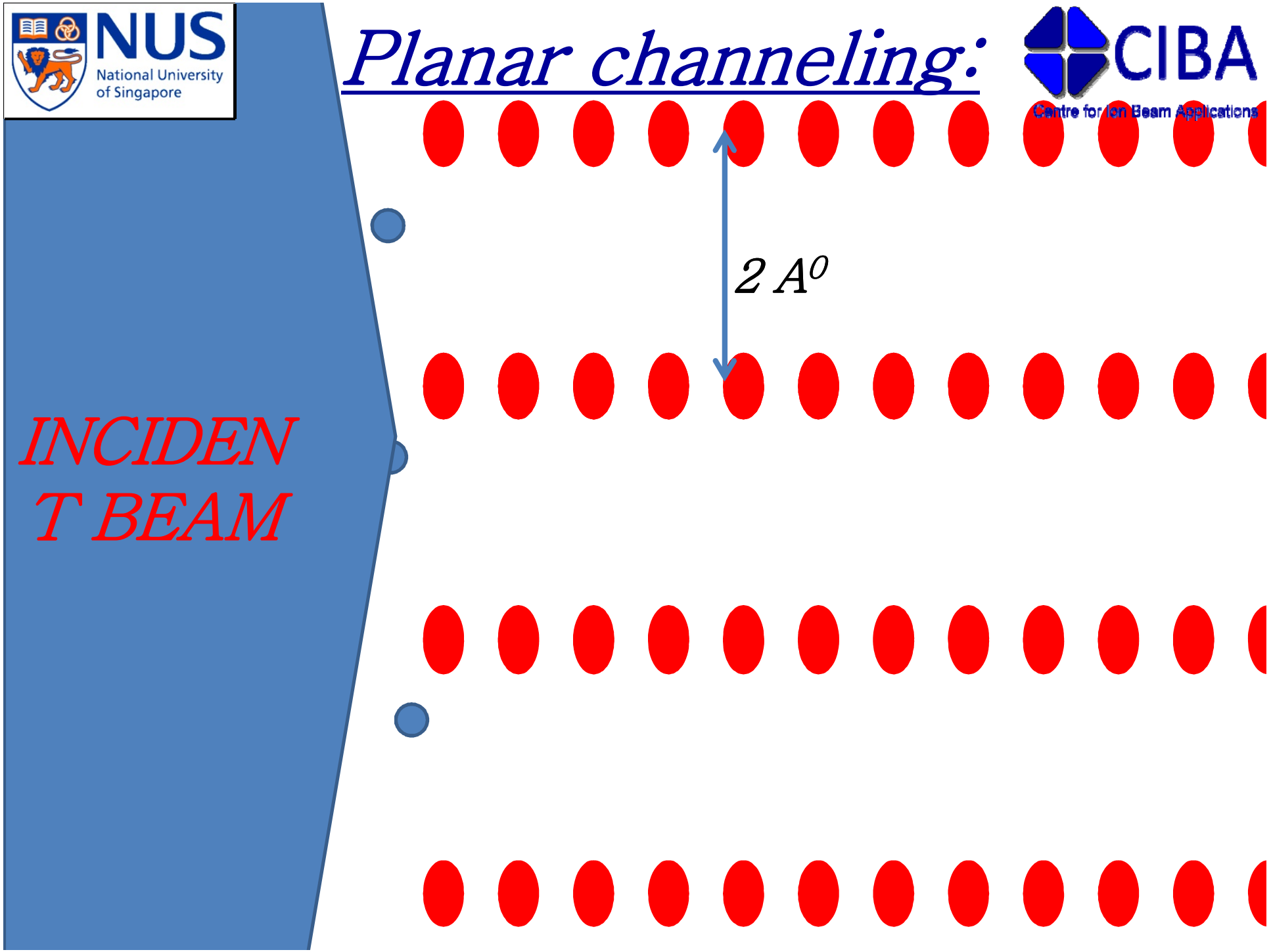
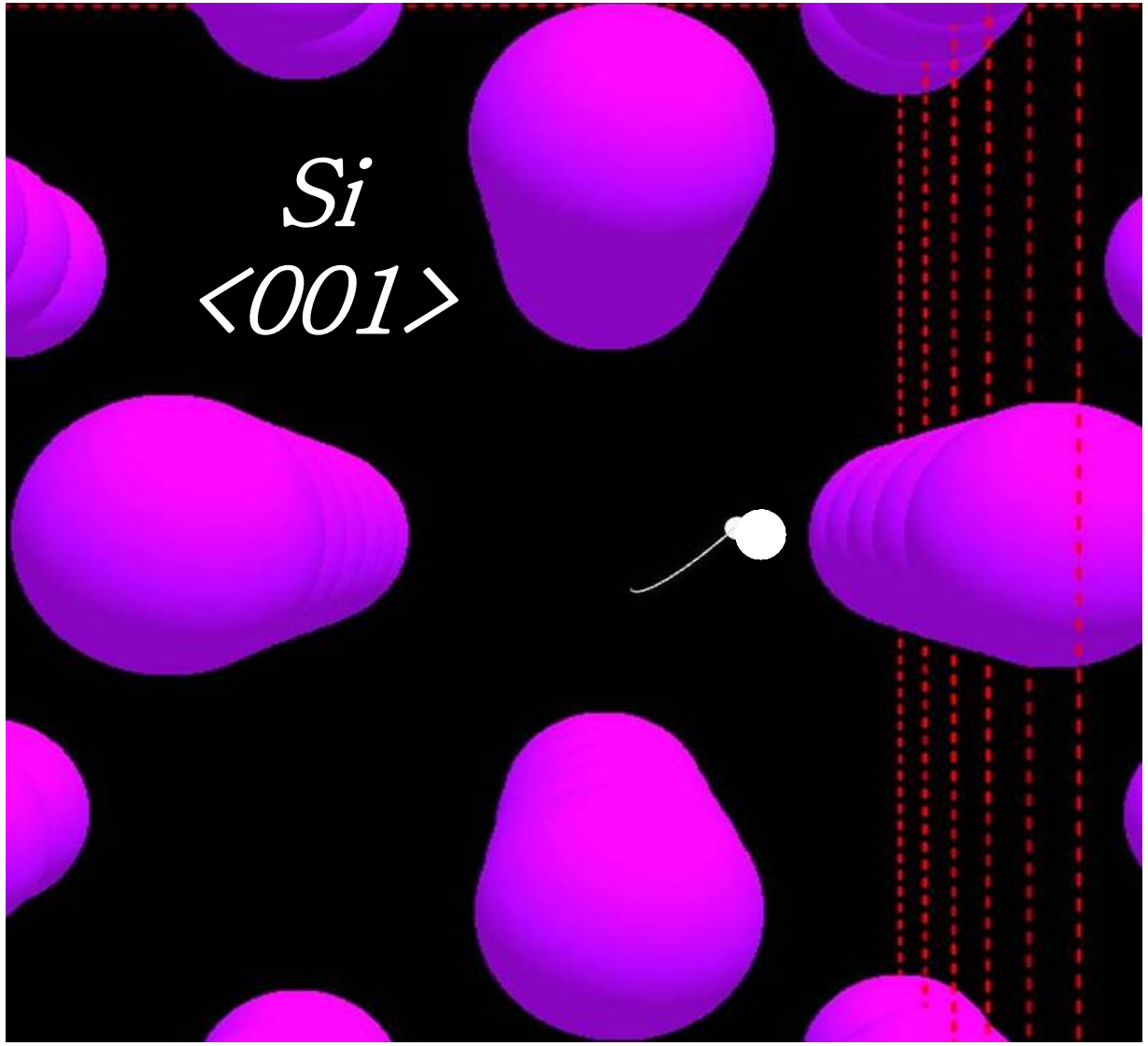
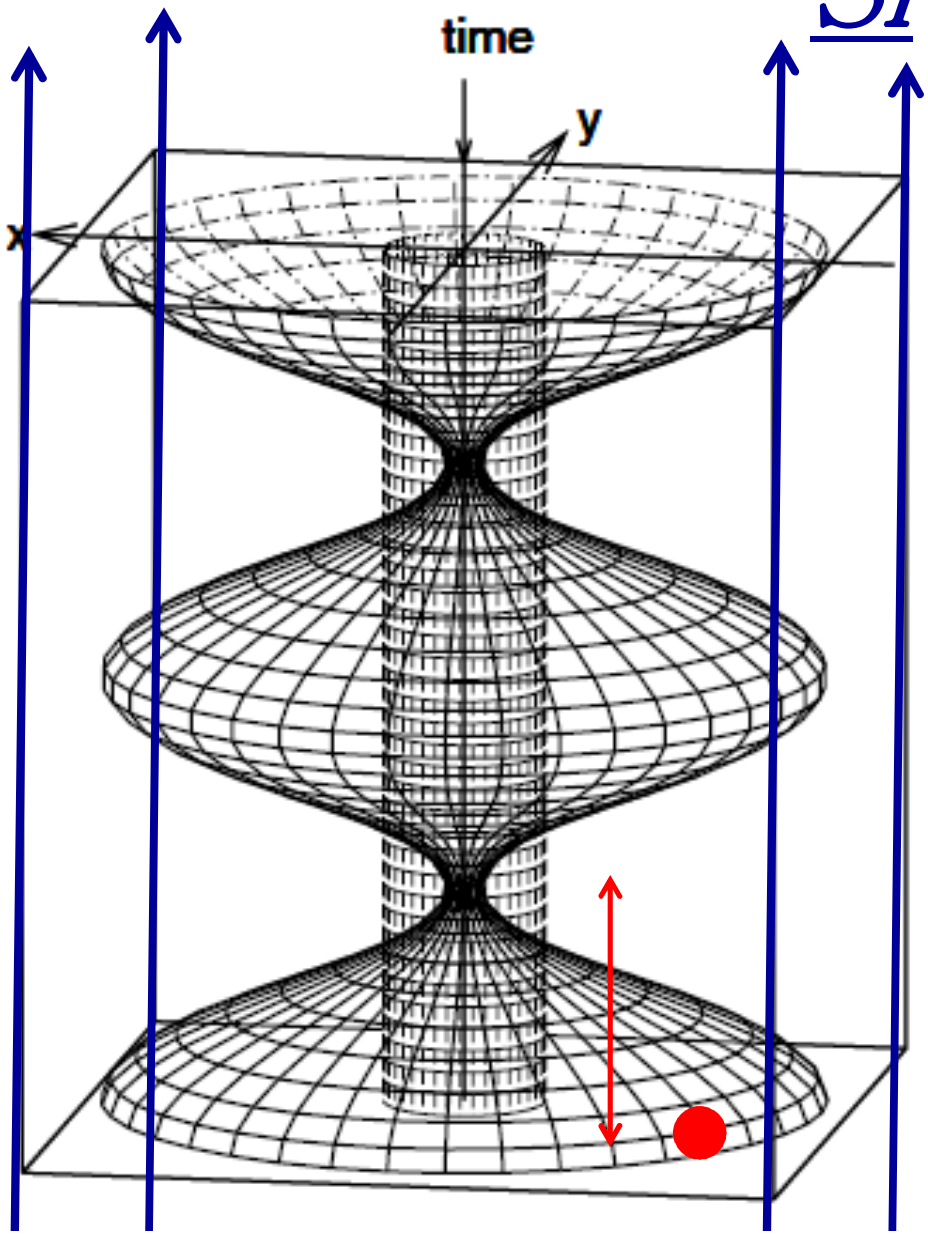
Planar channeling:



Axial channeling



Simulated ion trajectories in [001] Si



Atomic string locations

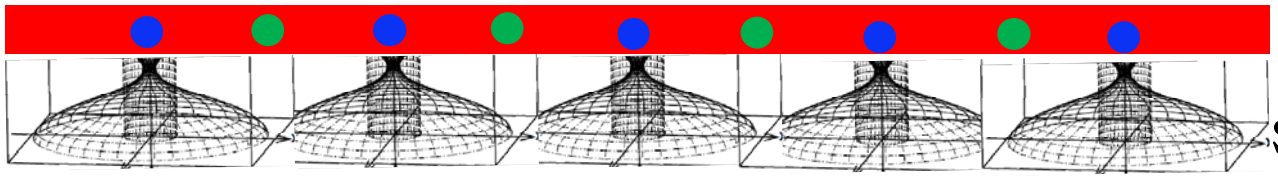
$$\lambda = \sqrt{\frac{\pi E d_p}{2 Z_1 Z_2 e^2 N a_{TF}}}$$

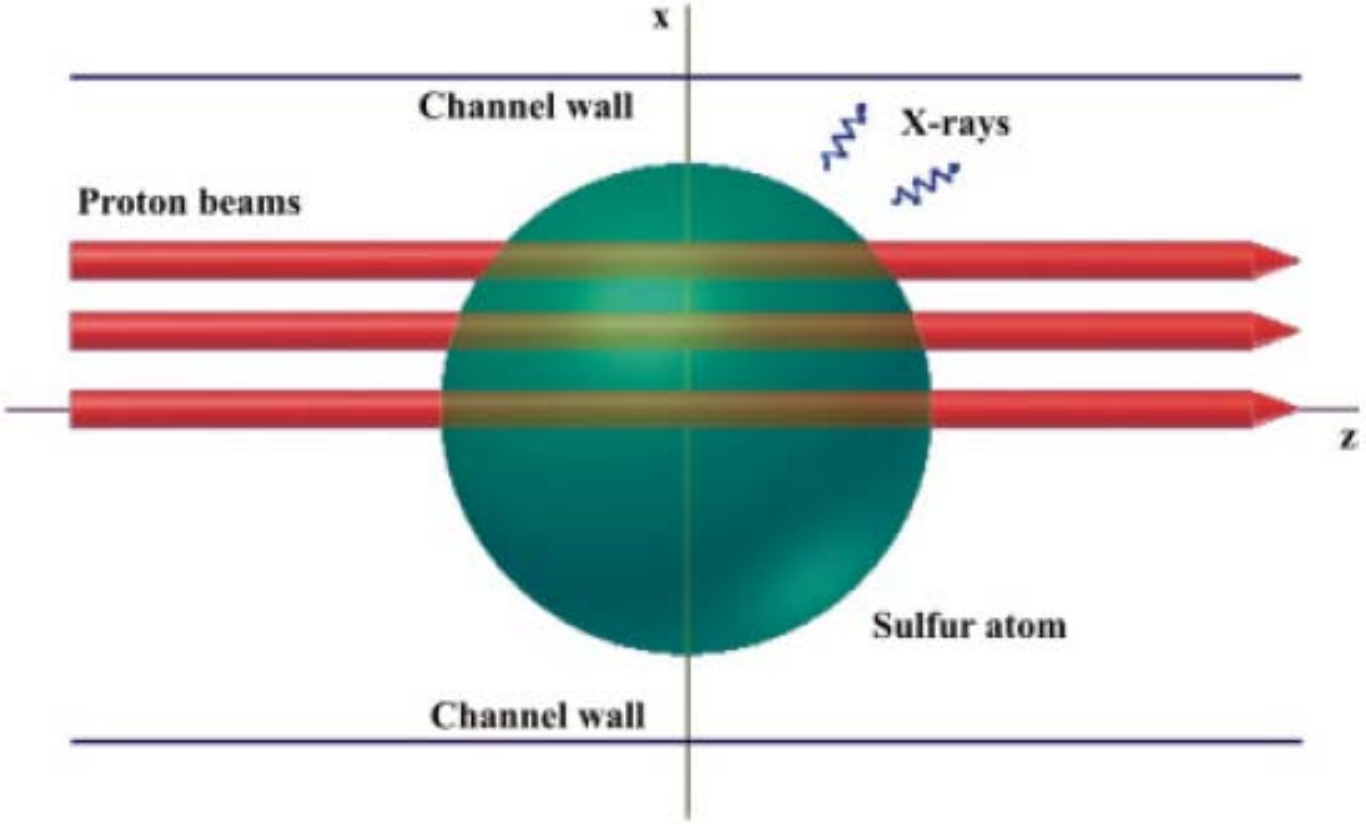
Quarter wavelength=λ /4

Focus spot 5 pm

Sub- atomic microscope

- Observing drastic change in PIXE, **γ**- ray yields.





Axial channeling

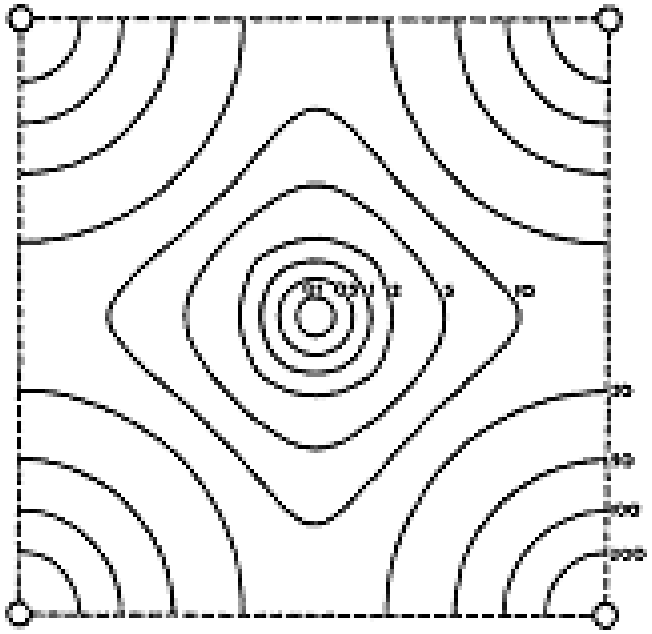
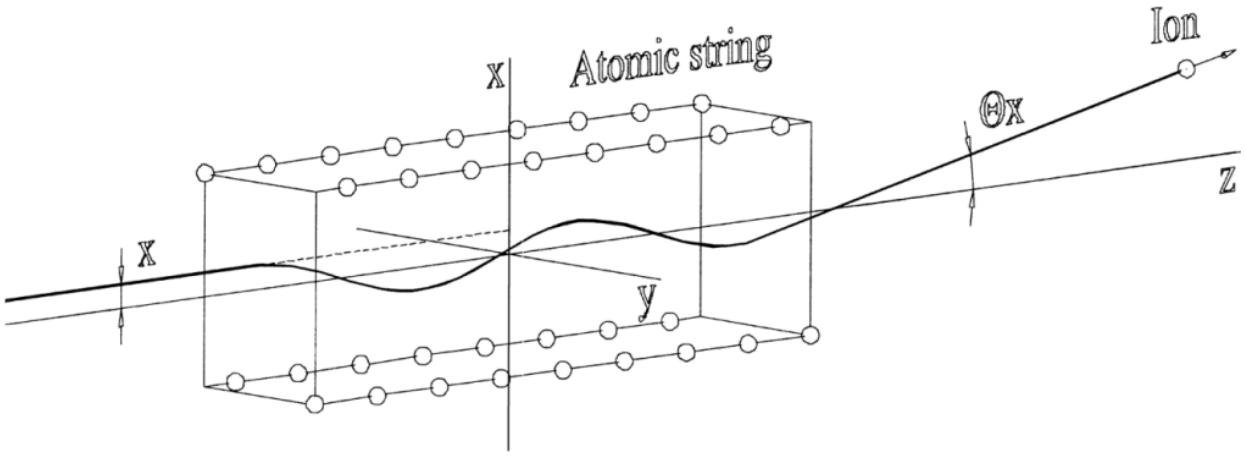


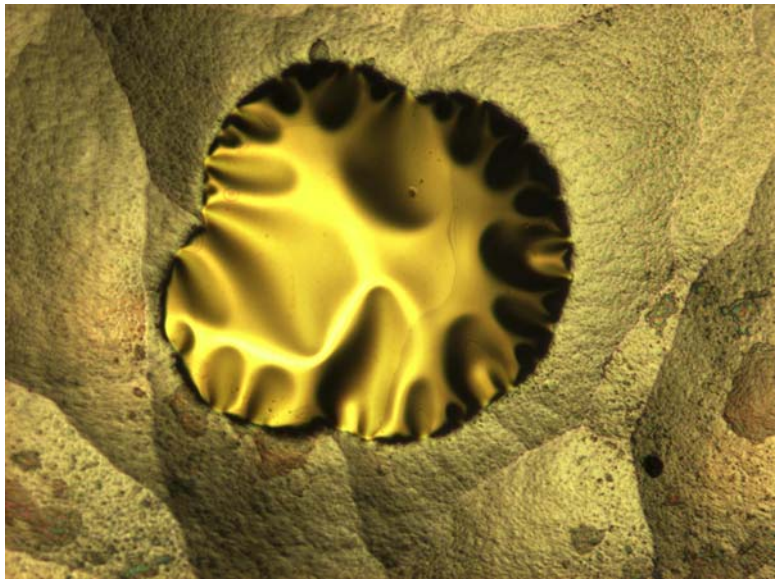
FIG. 3. The net continuum potential $U(r)$ for alpha particles in the $\langle 001 \rangle$ transverse plane of copper in eV.



➢ *Channeling occurs when the transverse energy of an incident ion is less than the continuum potential energy of an atomic row or plane in a single crystal.*

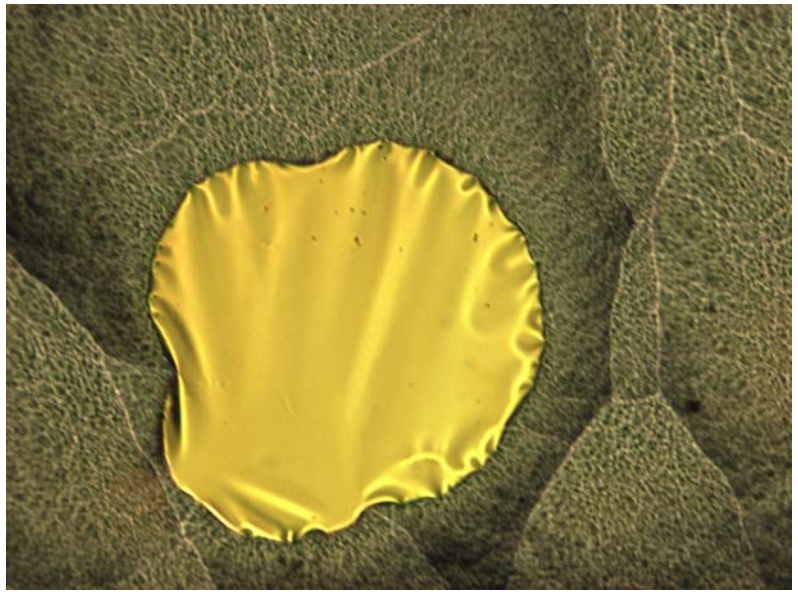
Optical Micrograph pictures: 55 nm thin Si membrane

145 nm SiO_2 on 55 nm Si



(500 μm)

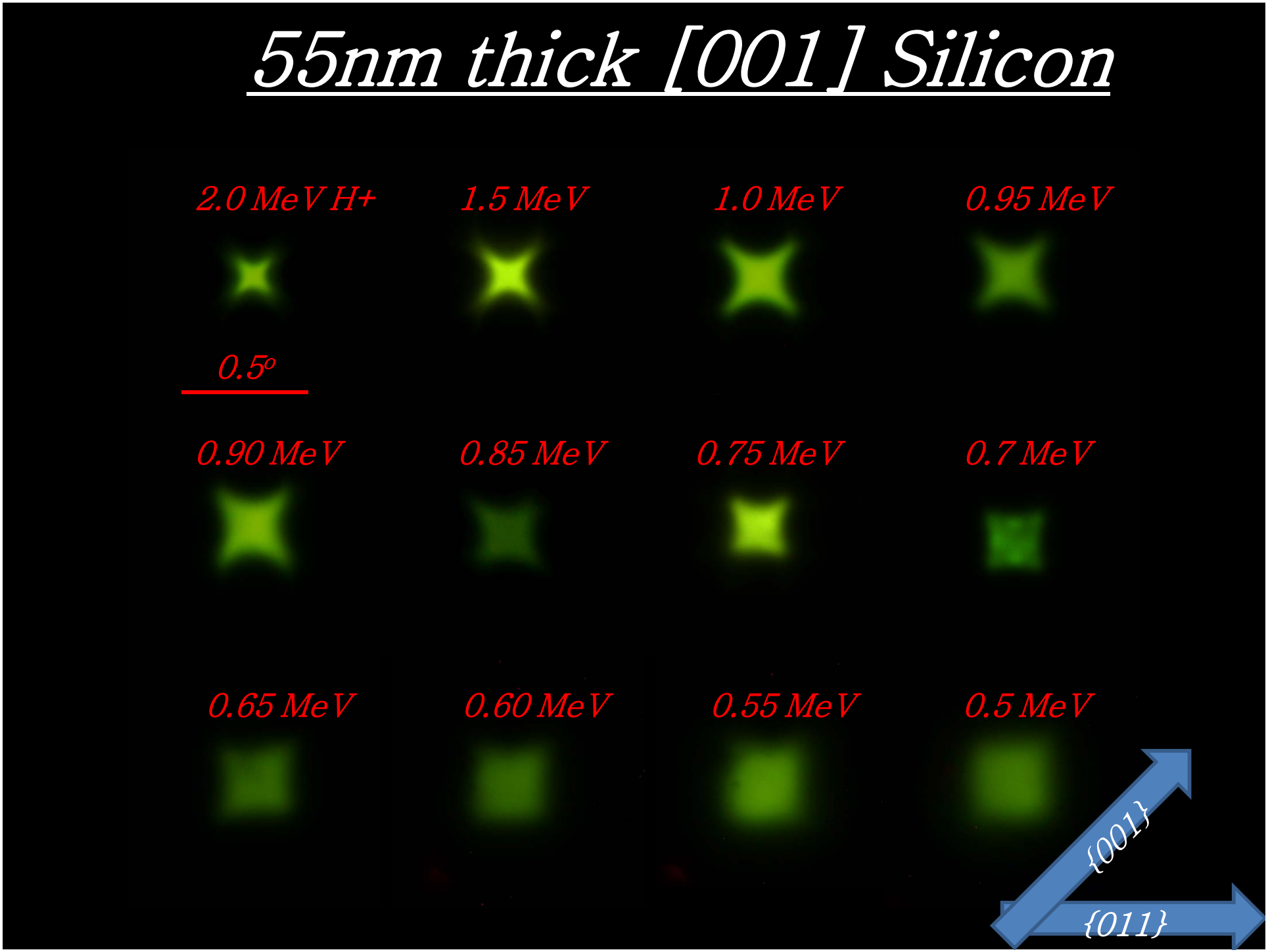
55nm Si



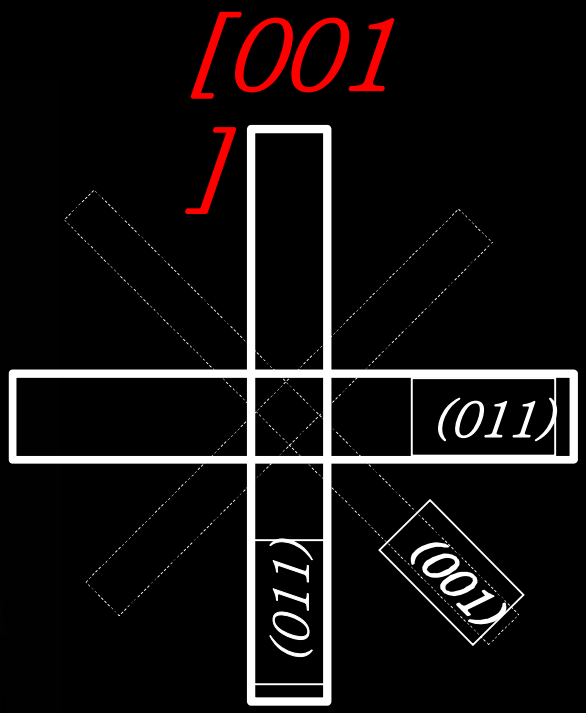
(500 μm)

- Thin Si membrane became more flat after removal of SiO_2

55nm thick [001] Silicon

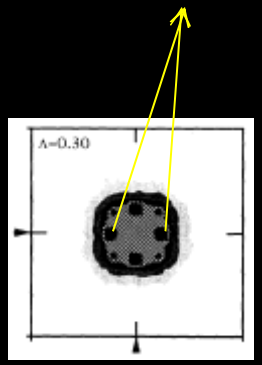


Experiment:700 KeV H+



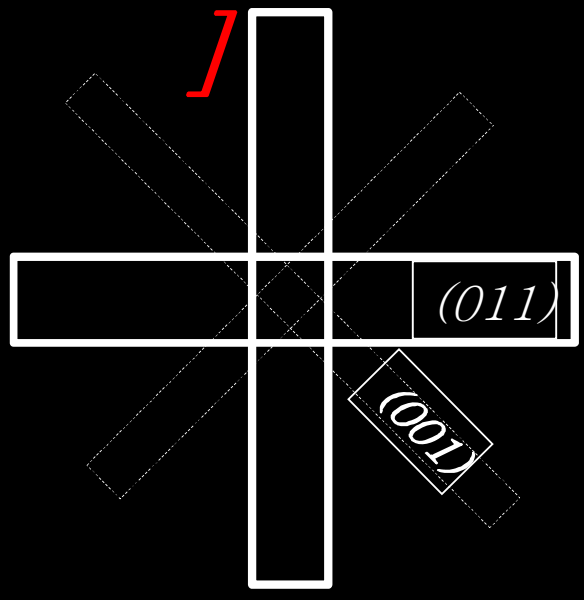
{011} planar tilt at [001] 700 KeV H+

Short movie:
The central bright dots are only moving and merging with the side bright regions by
The large bright dots are coming from the side-middle of the unit cell where the potential is not lowest (moderate).



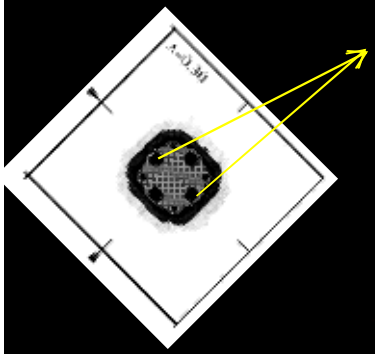
Only 2 middle central bright dots are moving first when tilted

[001]

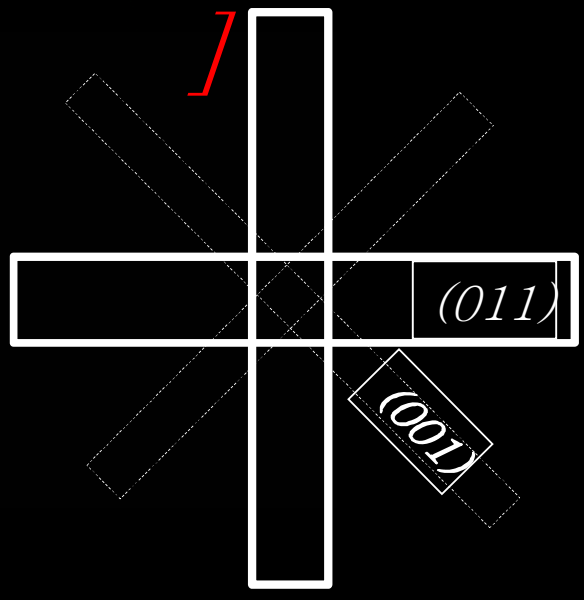


{001} planar tilt at [001] 700 KeV H+

Short movie:
The central bright dots are only moving and merging with the side bright regions by tilting away
The large bright dots are coming from the side-middle of the unit cell where the potential is not lowest (moderate).



All the 4 central bright dots are moving together when tilted



[110] axial projection of Silicon