FIB Target preparation for 20 kV (S)TEM

A new method for obtaining ultra-thin lamellas

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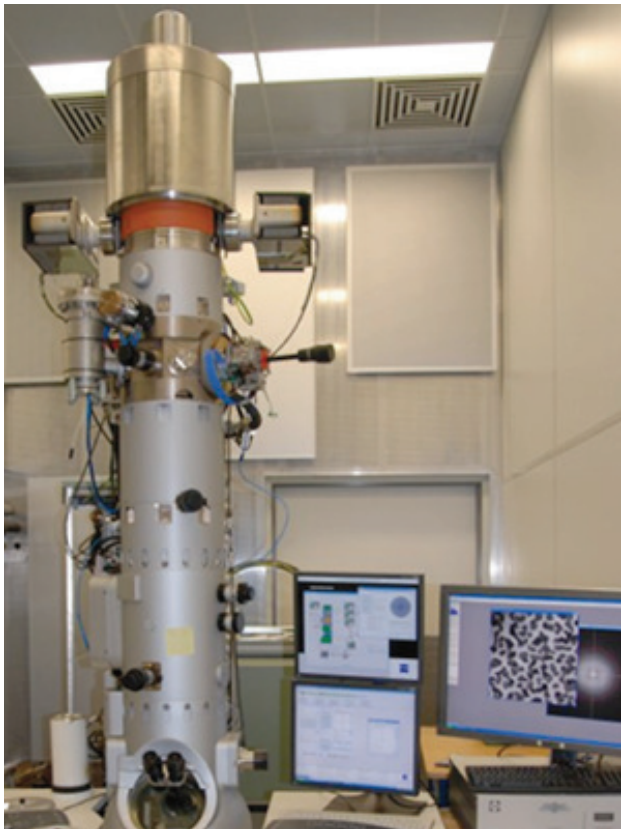
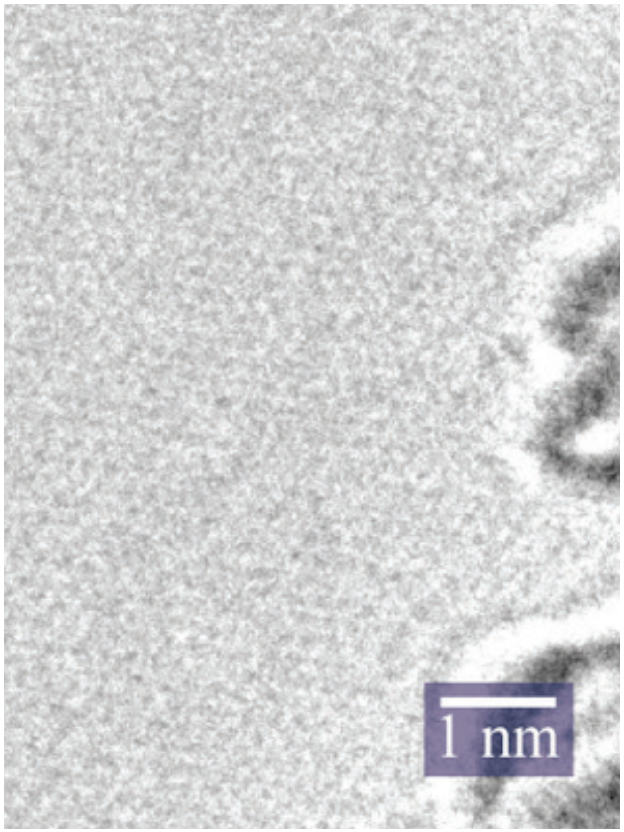
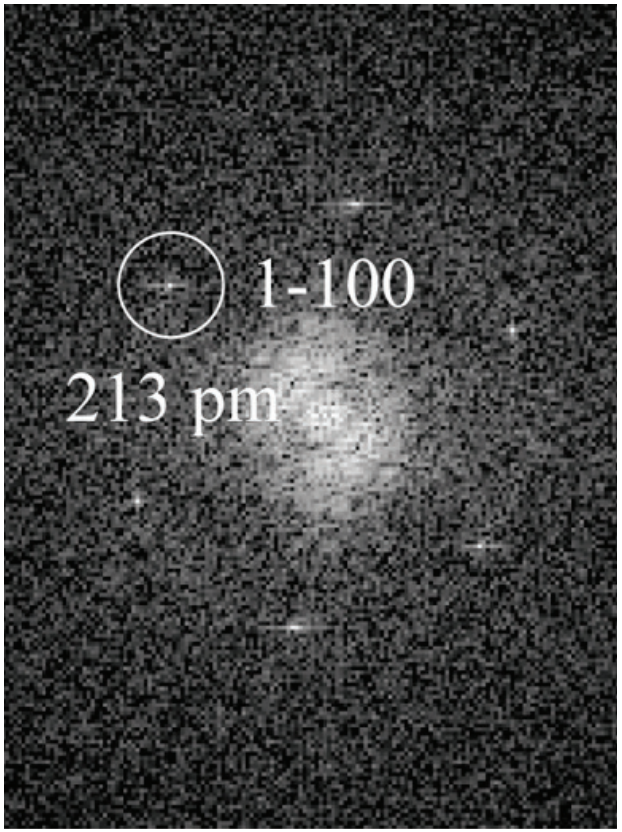
Motivation

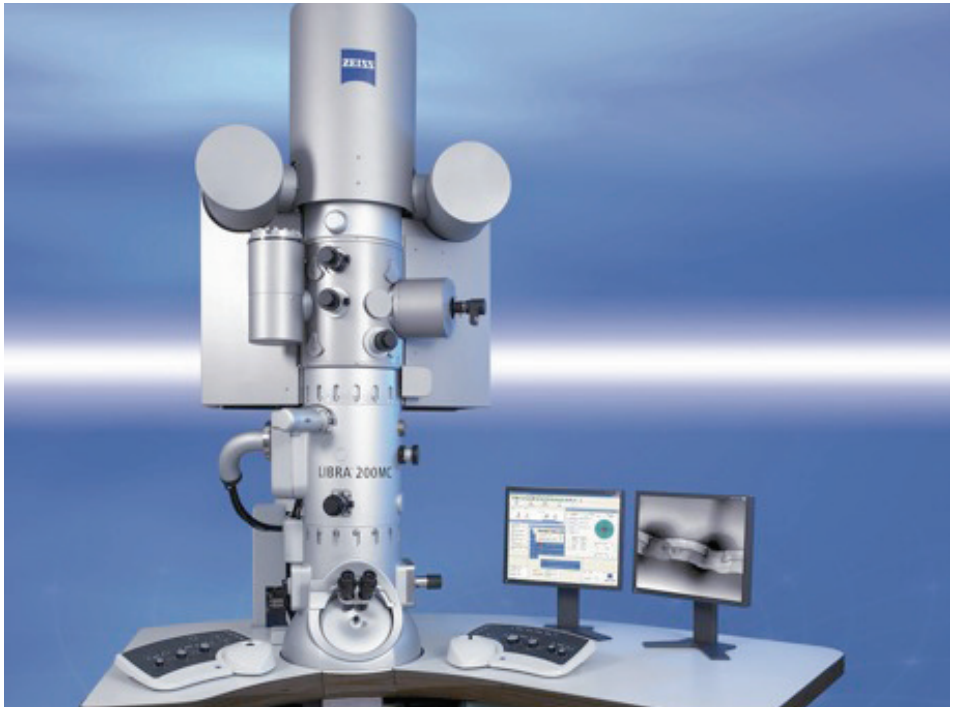






Sub-Ångström Low Voltage Electron Microscopy

SALVE



20 kV TEM

< 30 kV STEM

New (old) challenges...

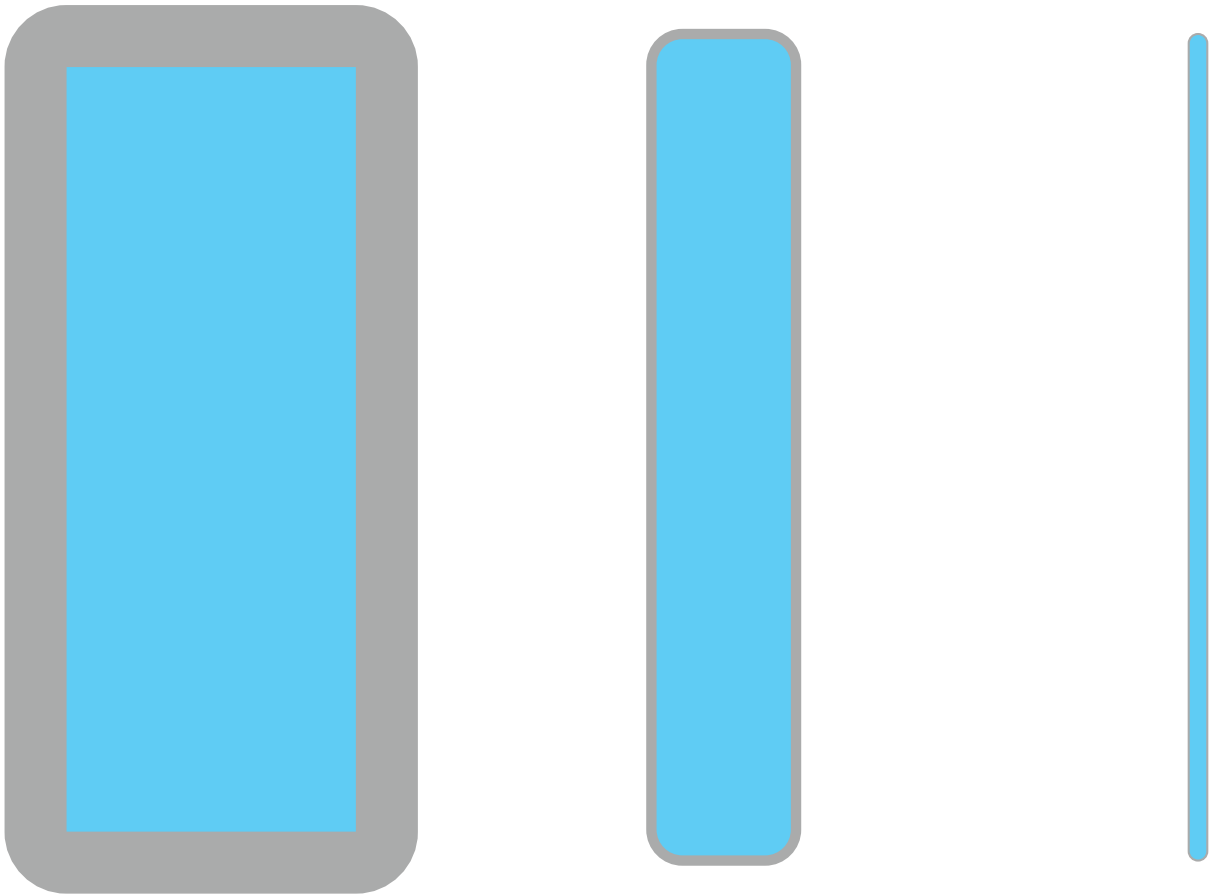
Instrument

Nvision 40 Ar

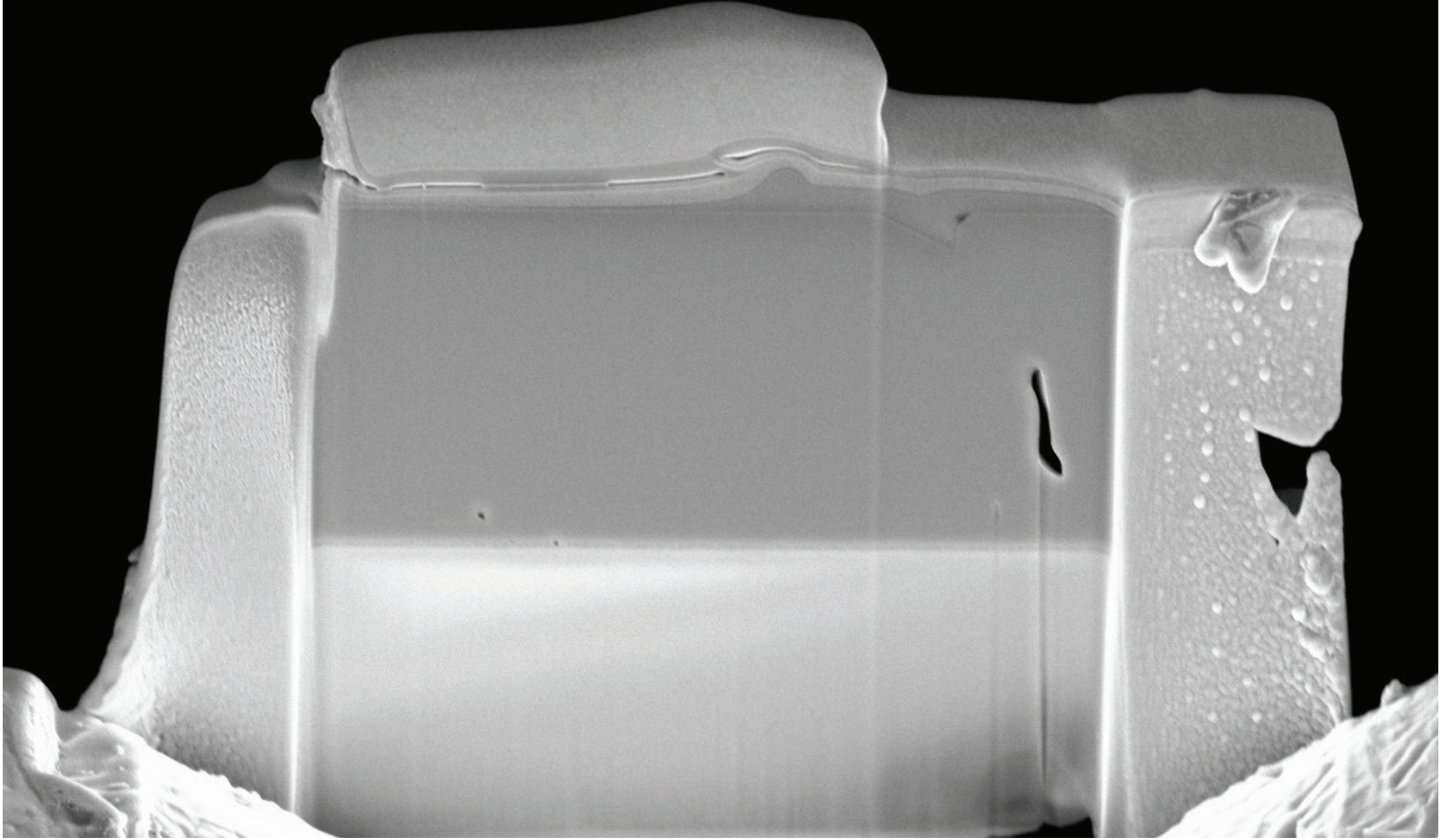
- Ar Gun (.1-1kV, 100 μm)
- GIS (Pt, C, H_2O, XeF_2, SiO_x)
- 2 MM3A, LCMK, RoTip
- EDX (EDAX, TEAM)
- Cold Stage (Leica)
- STEM (SS + Conversion)

FIB Lamella Preparation

Specimen Requirements

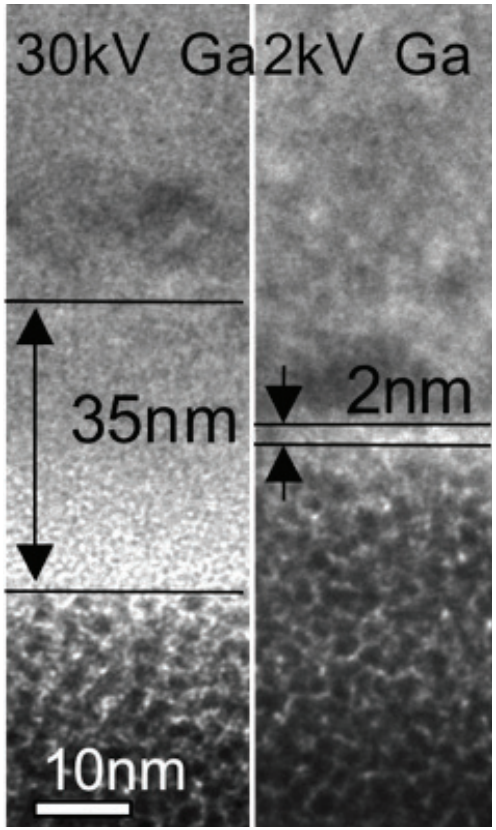


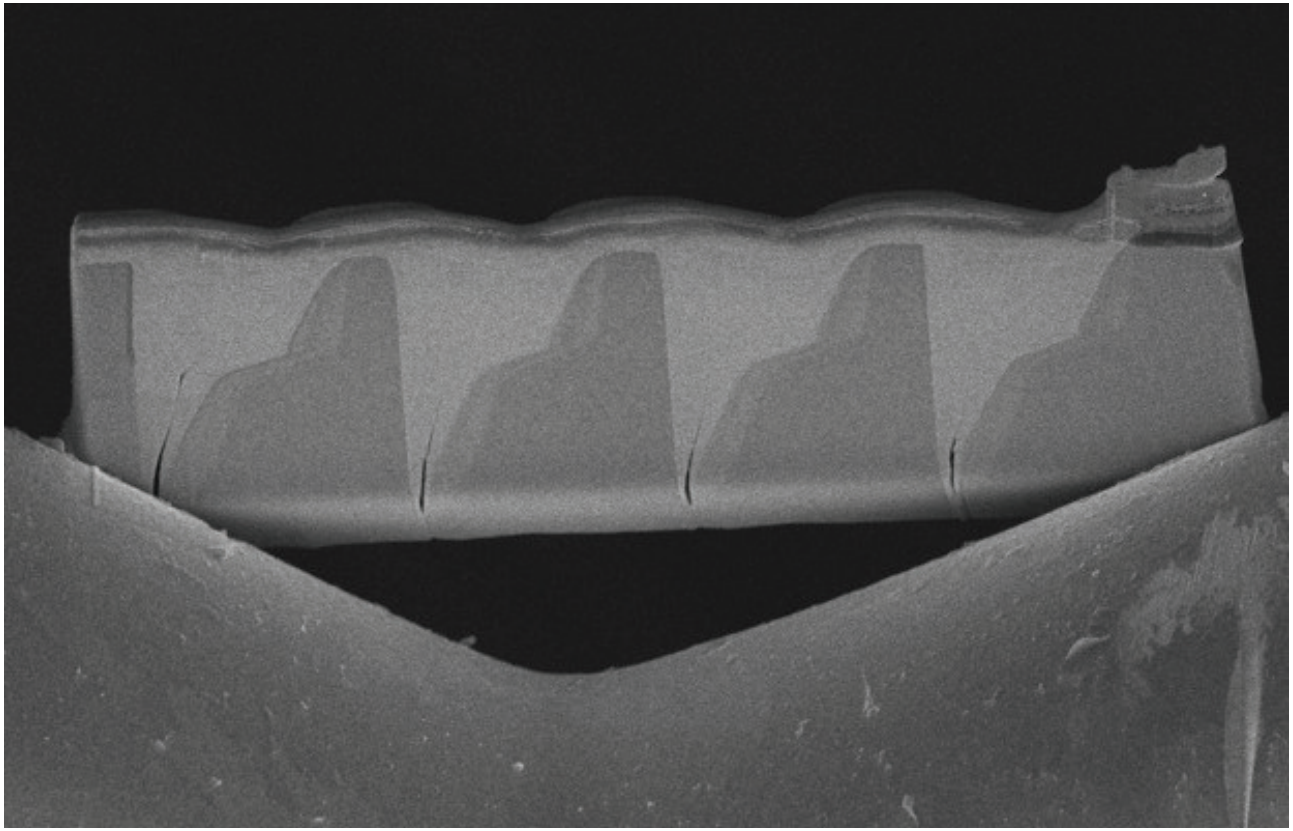
TEM HRTEM SALVE



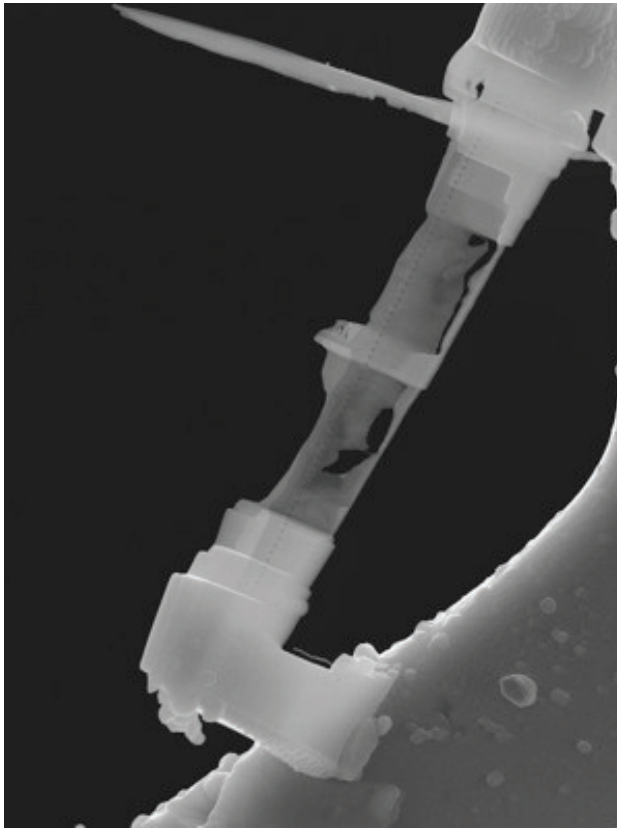
Conventional Preparation

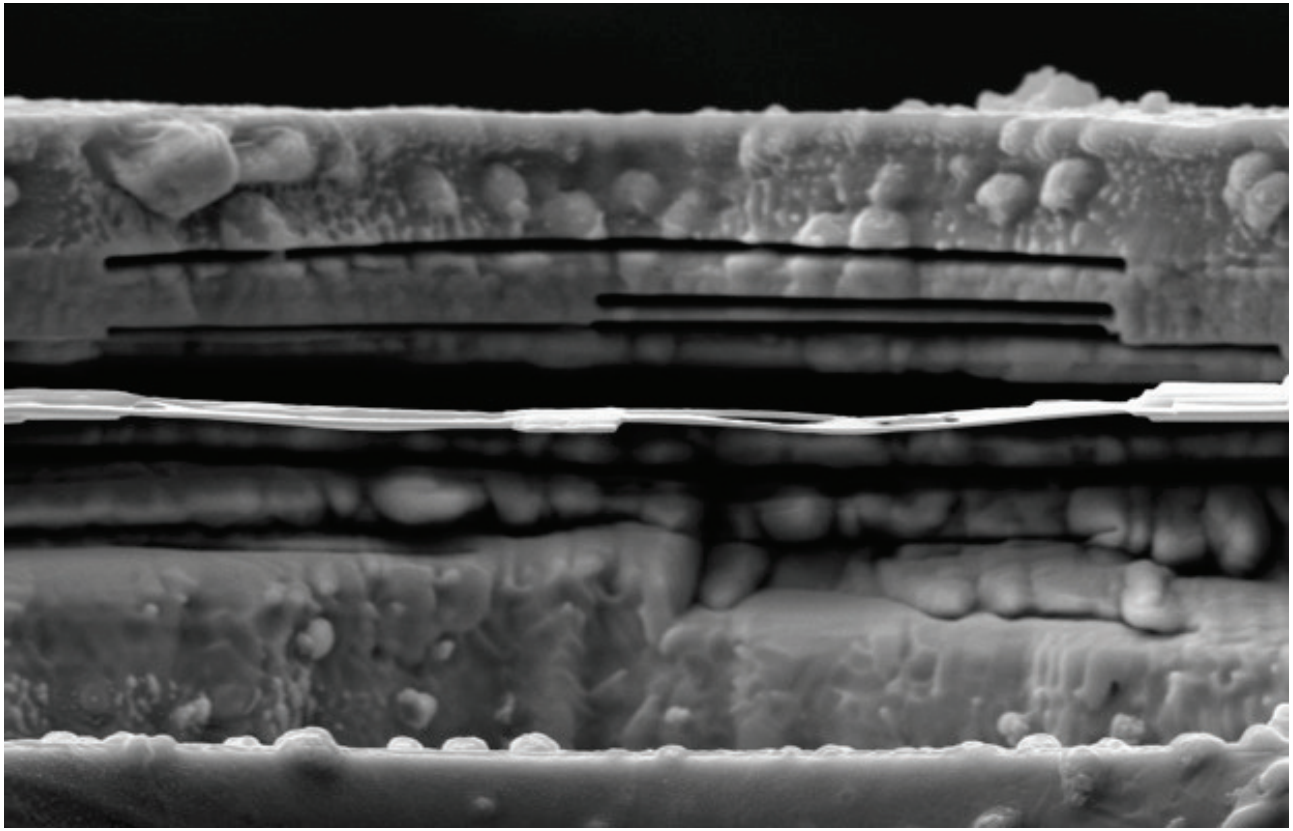
Limits to scalability



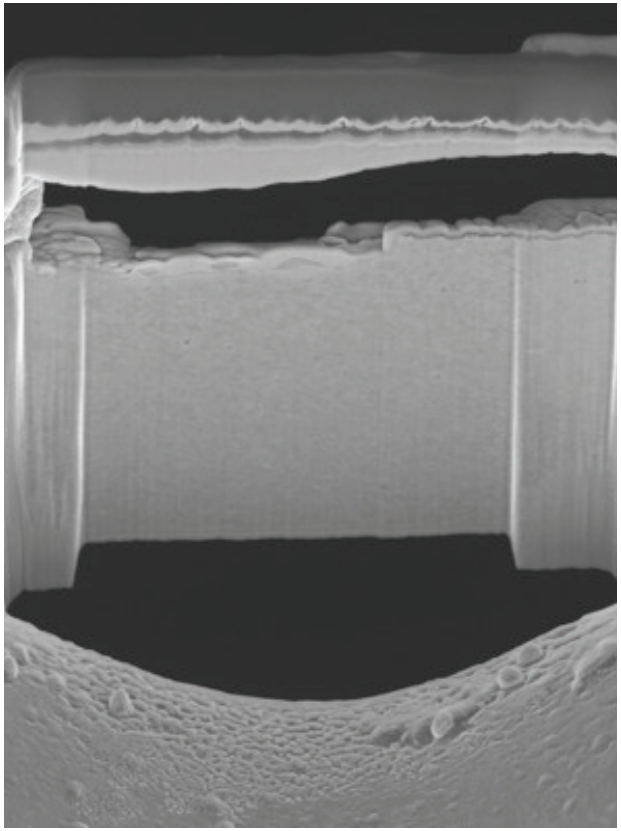


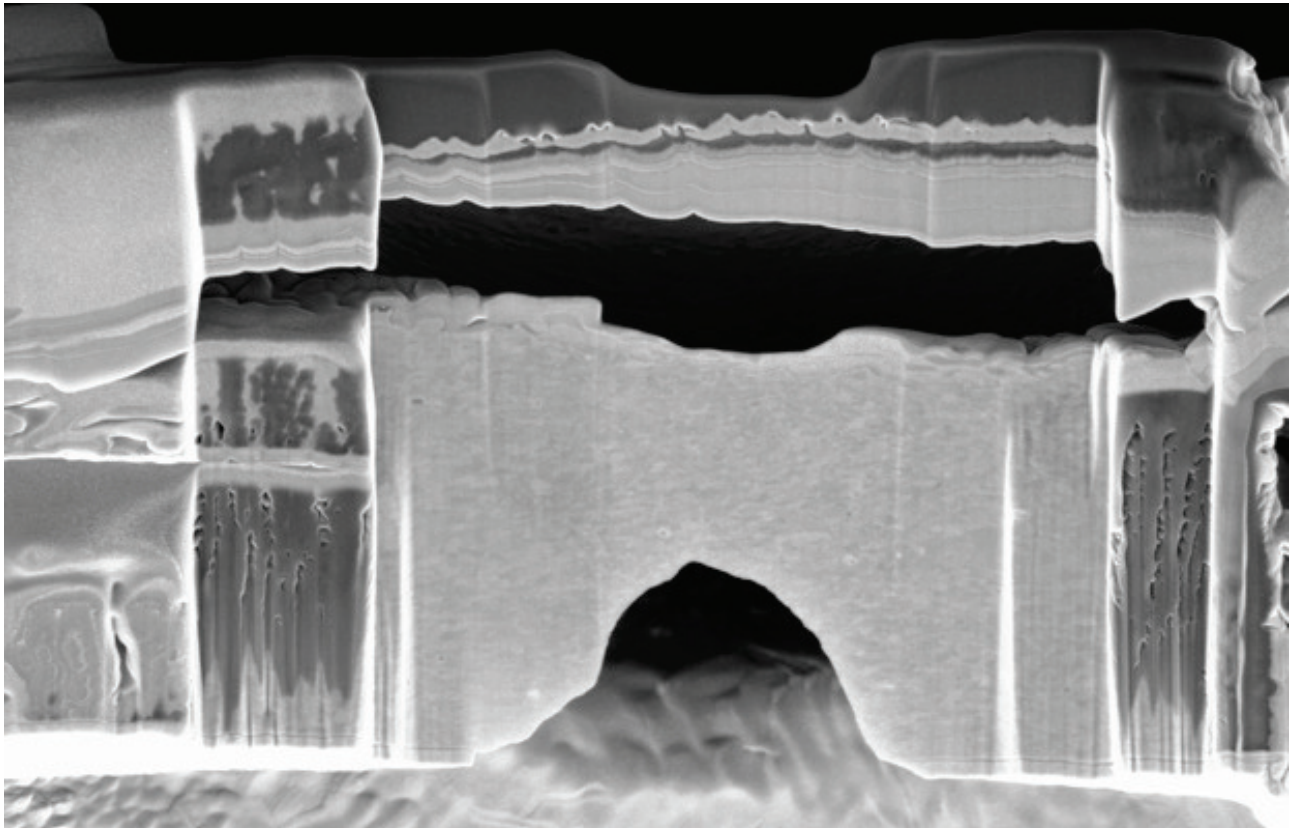
Amorphization



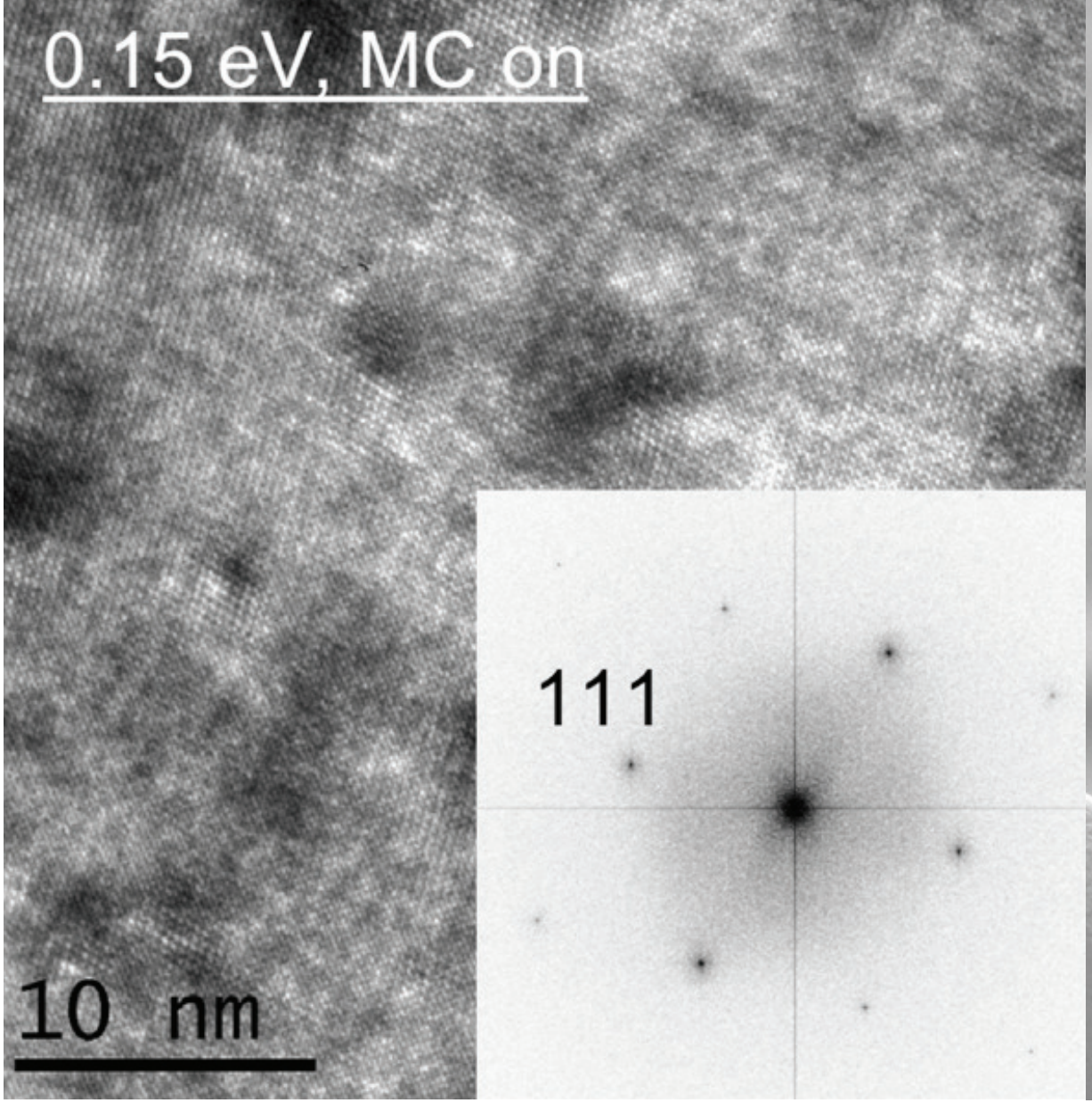


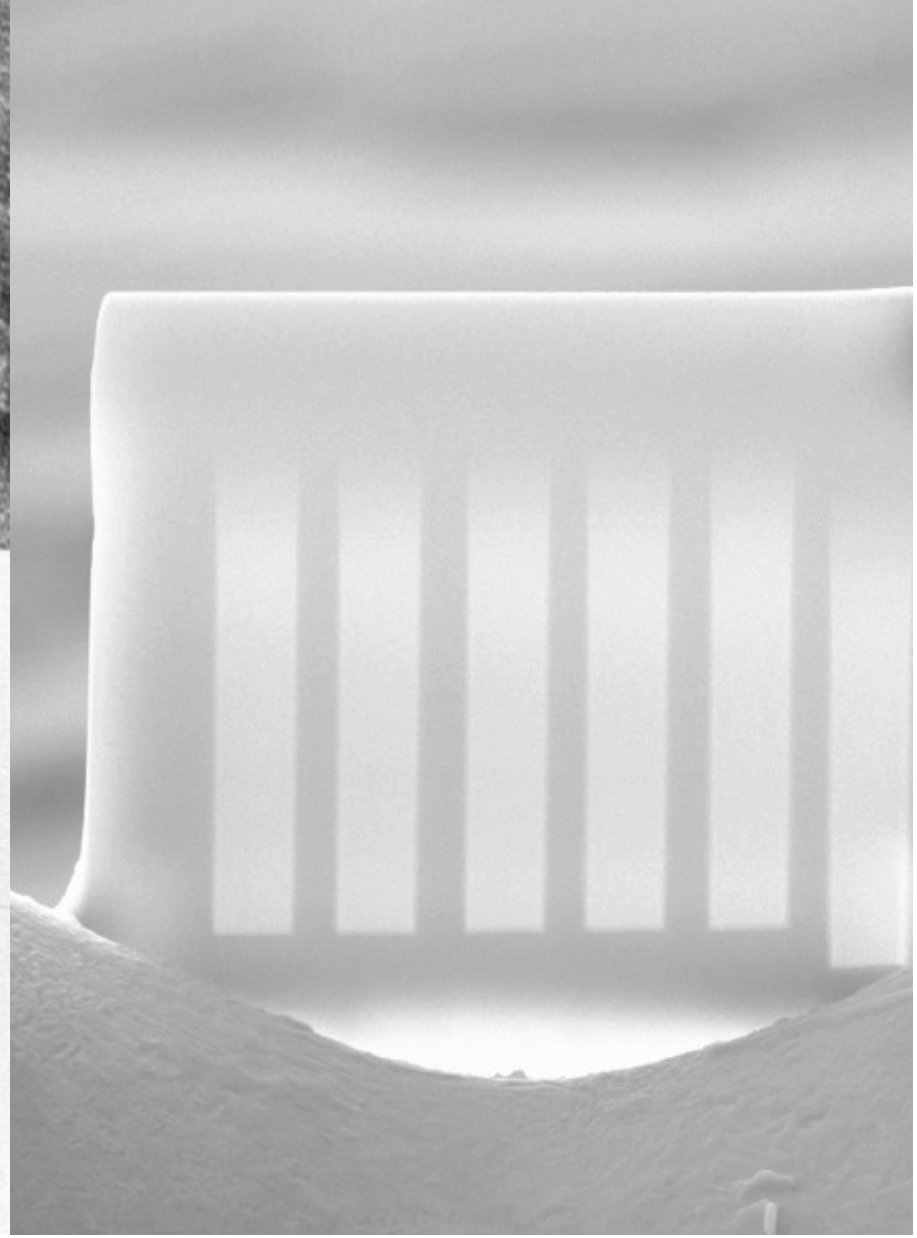
Warping



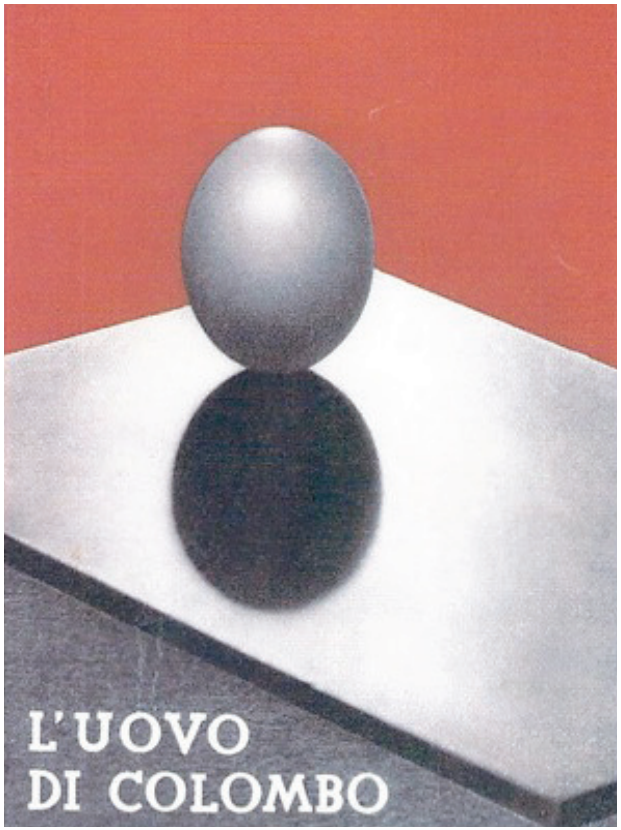


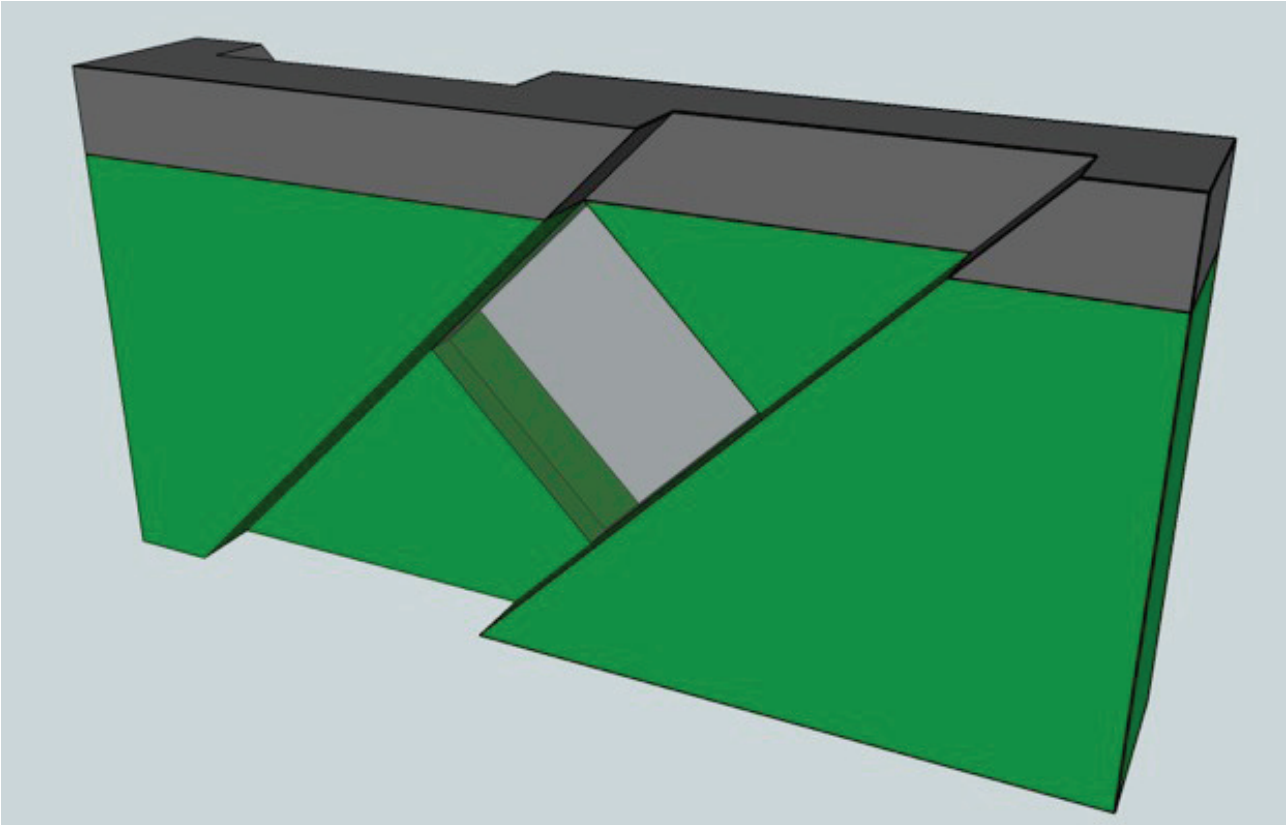
Shrinking



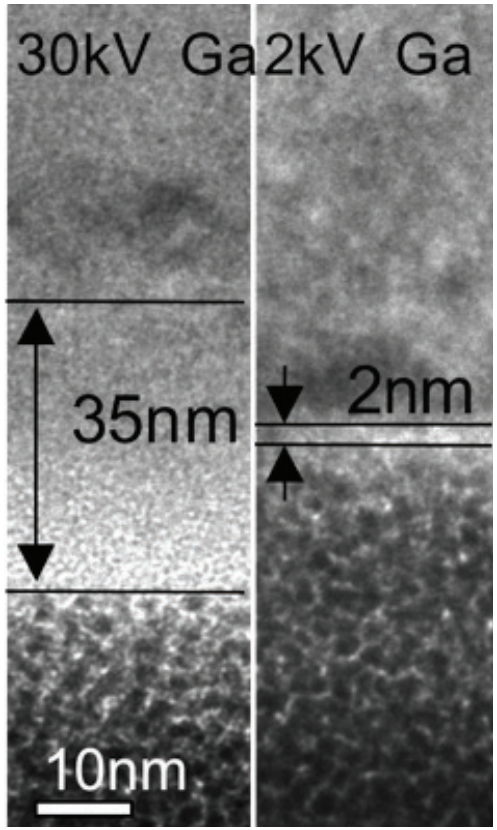


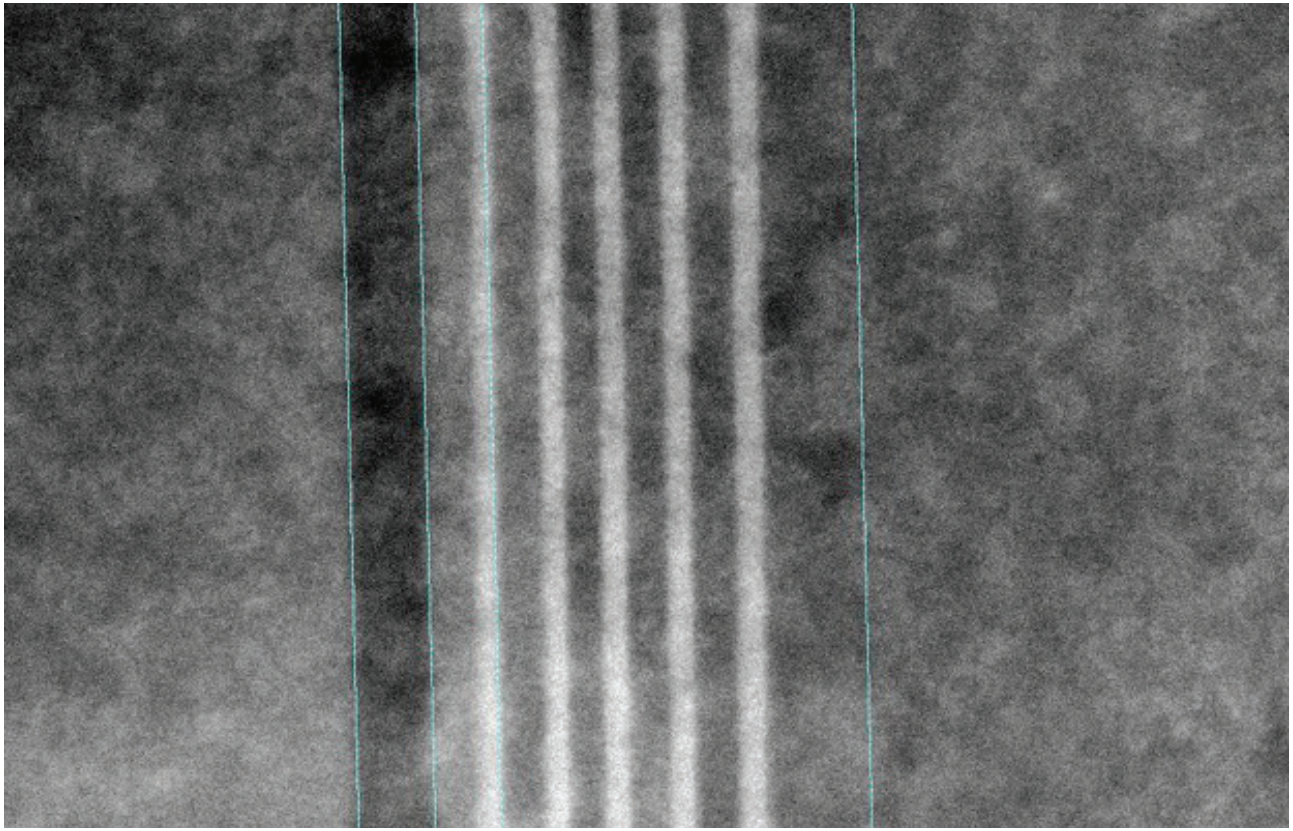
X²-FIB | A simple solution.



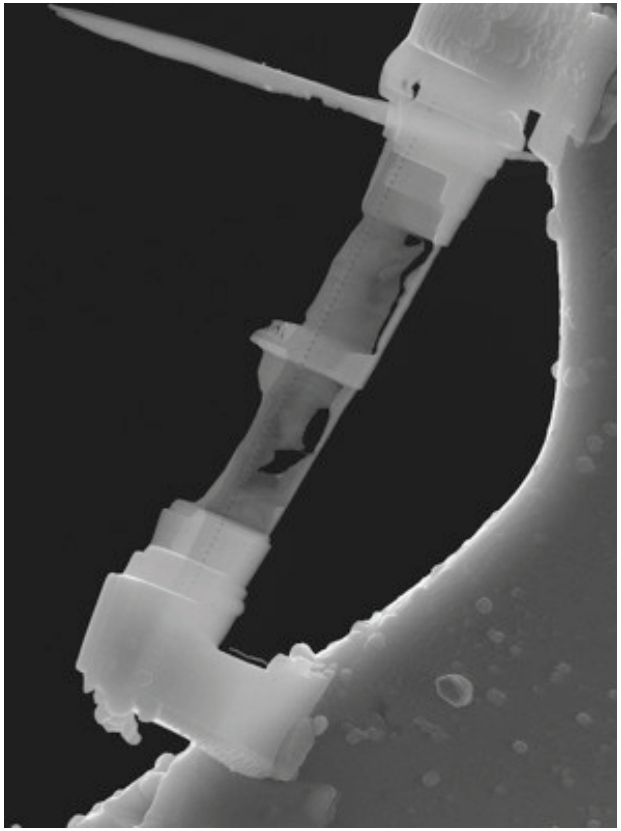


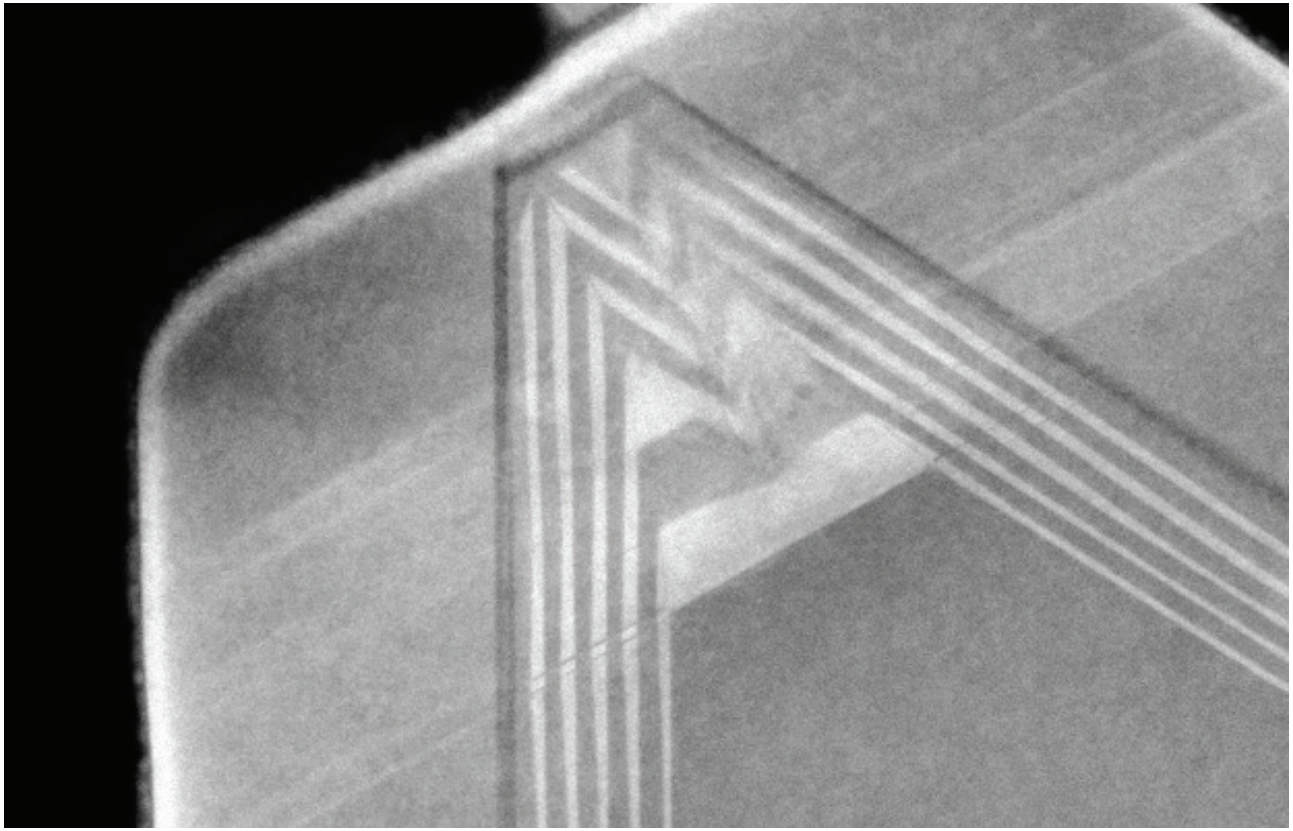
Concept



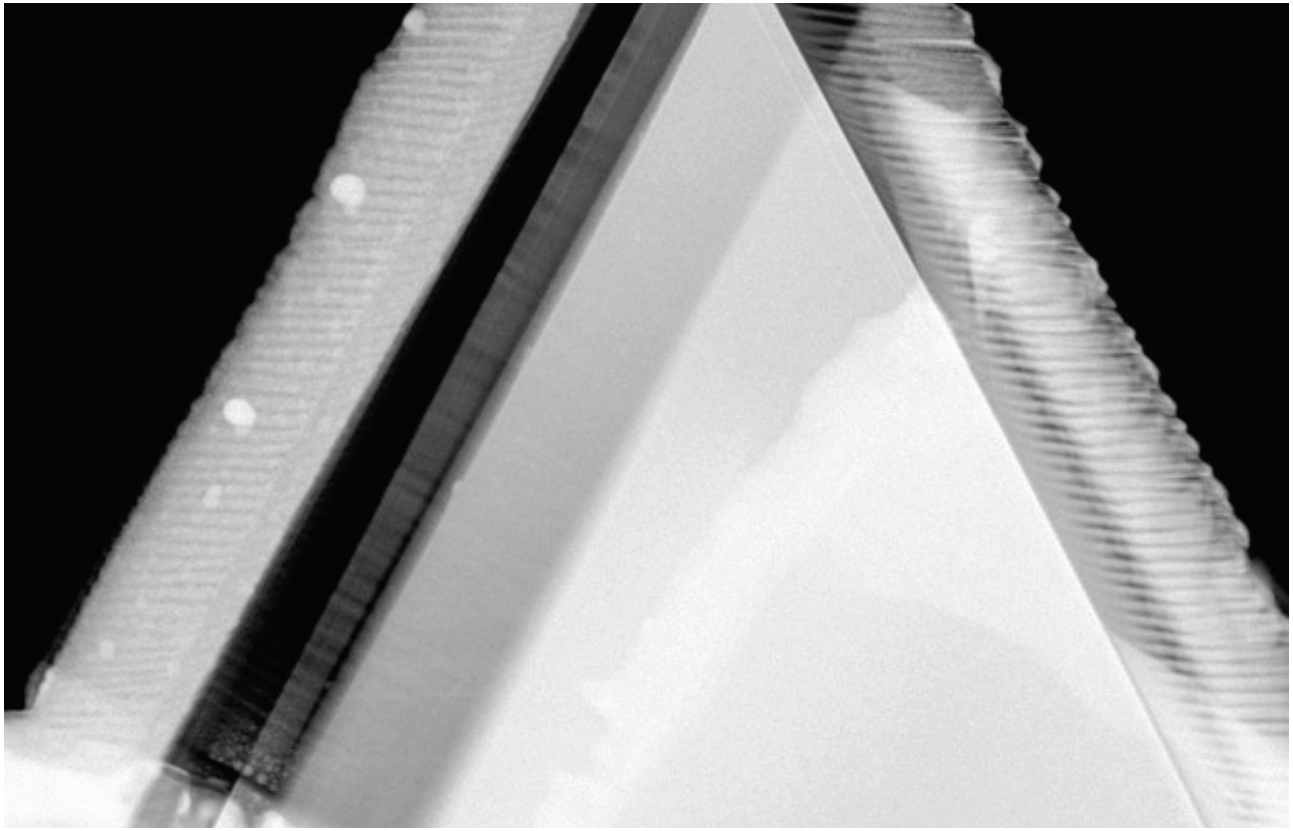


Reducing amorphization depth

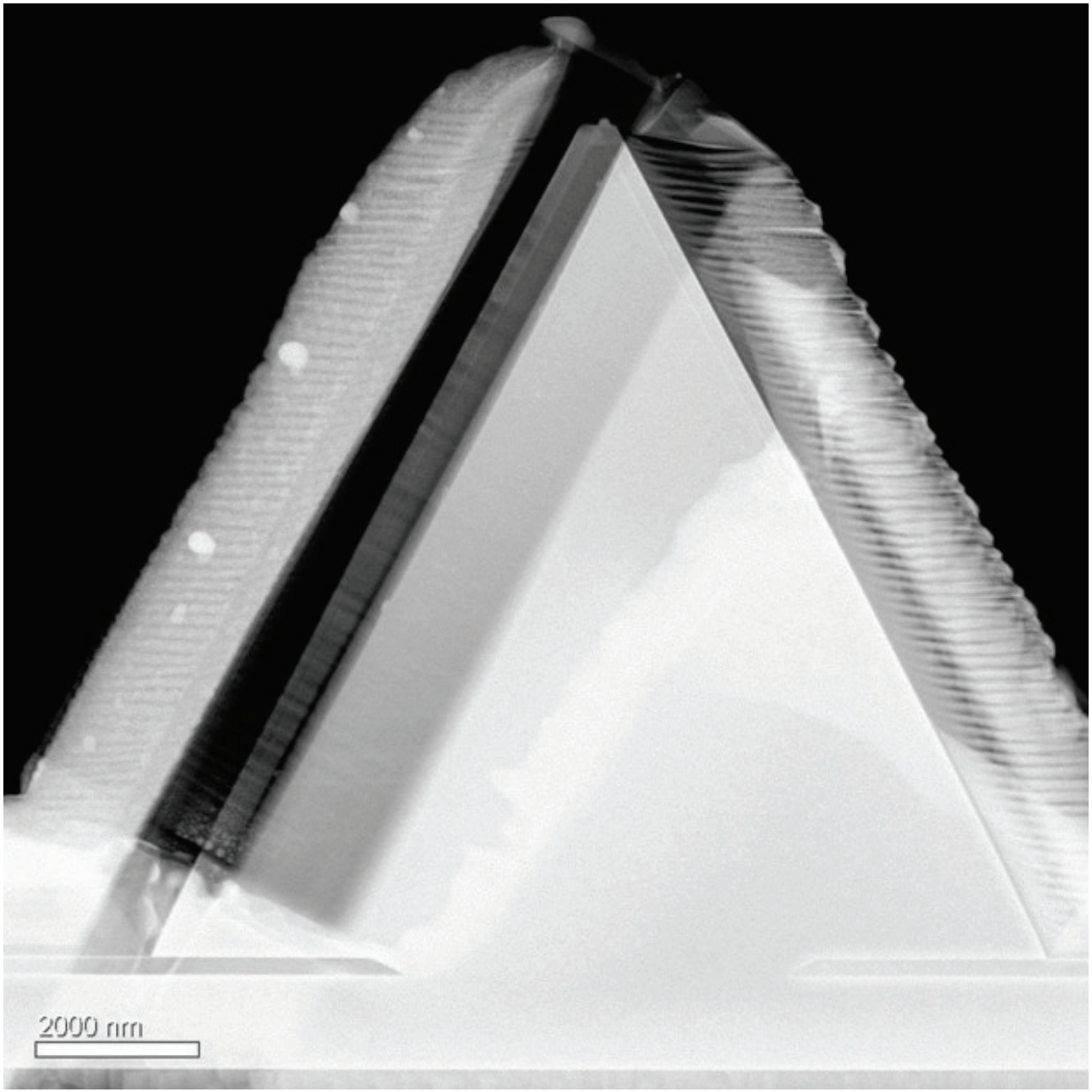




Preventing lamella warping



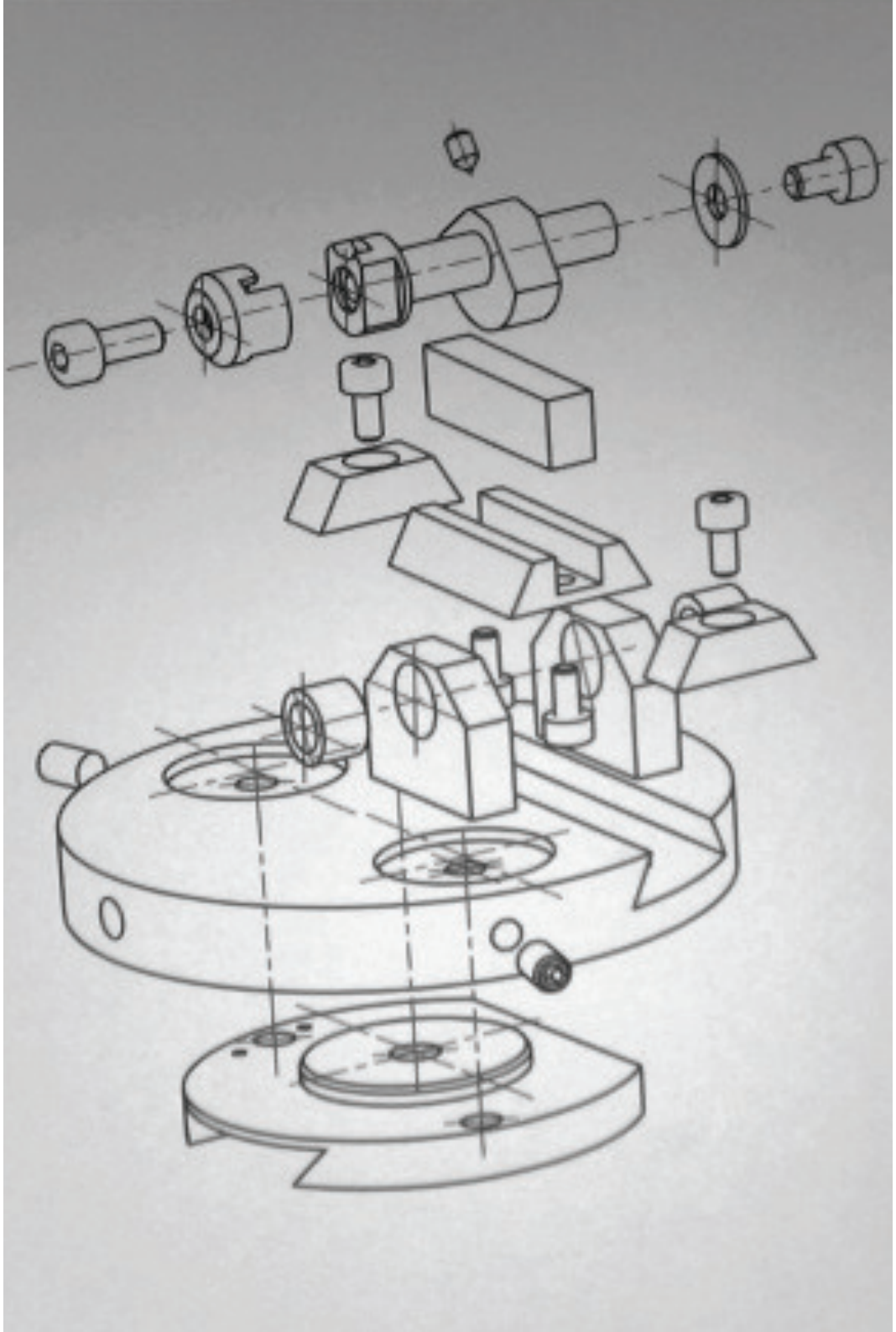
Eliminating shrinking



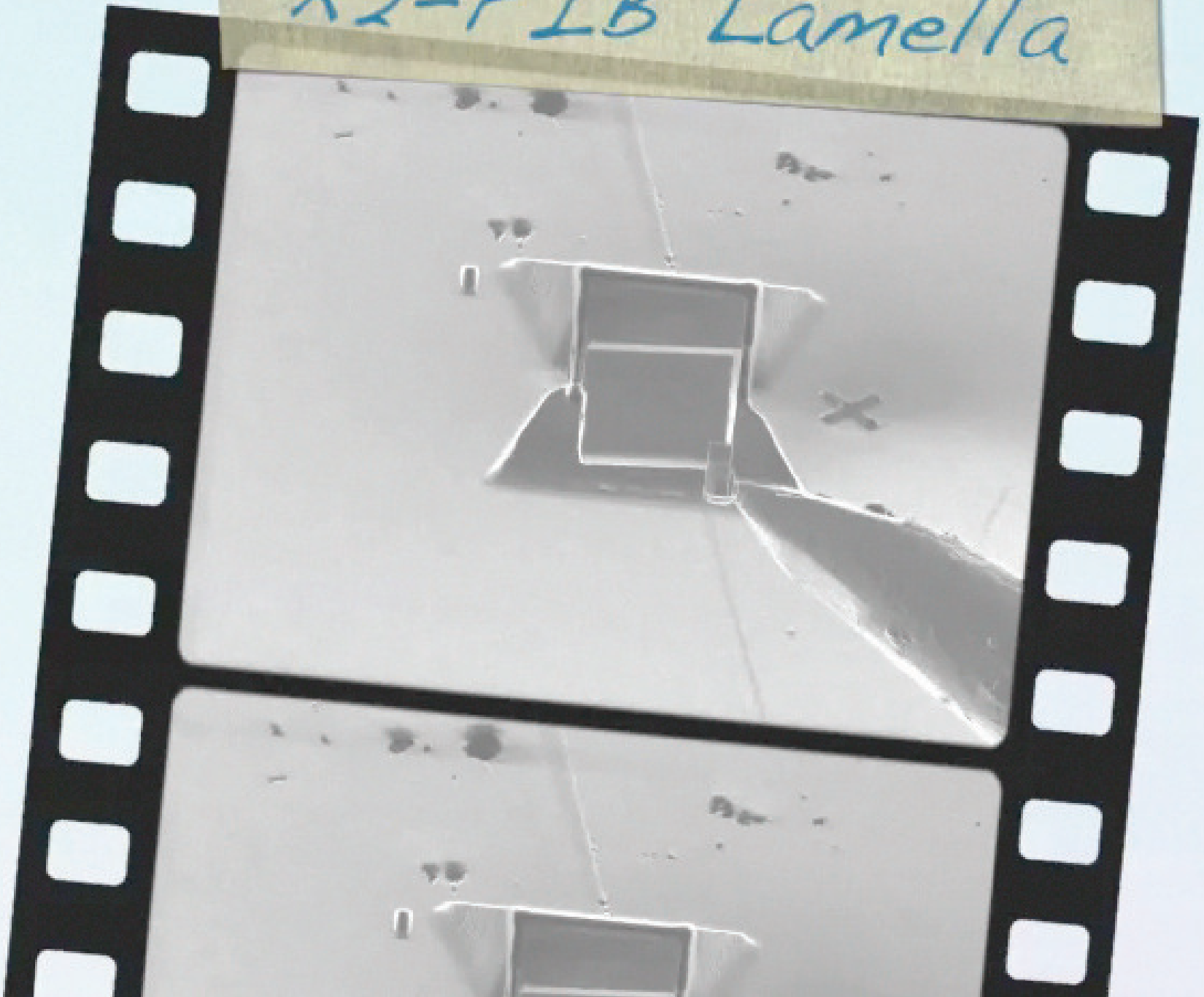
Eliminating shrinking

Implementation

Another simple solution.



Using rotation to operate 2nd tilt axis.

Demo

X2-FIB Lamella