

Lecture 11: Bulk Micromachining I

- Announcements:
- We are in 2 LeConte, from 3-5 p.m., on Friday, 9/30, for this makeup lecture
- HW#3: Online, due Thursday next week
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- Today:
- Reading: Senturia Chpt. 3, Jaeger Chpt. 11, Handout: "Surface Micromachining for Microelectromechanical Systems"
- Lecture Topics:
 - ↳ Polysilicon surface micromachining
 - ↳ Stiction
 - ↳ Residual stress
 - ↳ Topography issues
 - ↳ Nickel metal surface micromachining
 - ↳ 3D "pop-up" MEMS
 - ↳ Foundry MEMS: the "MUMPS" process
 - ↳ The Sandia SUMMIT process
- Reading: Senturia Chpt. 3, Jaeger Chpt. 11, Handouts: "Bulk Micromachining of Silicon"
- Lecture Topics:
 - ↳ Bulk Micromachining
 - ↳ Anisotropic Etching of Silicon
 - ↳ Boron-Doped Etch Stop
 - ↳ Electrochemical Etch Stop
 - ↳ Isotropic Etching of Silicon
 - ↳ Deep Reactive Ion Etching (DRIE)
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- Last Time:
- Going through Module 5 on Surface Micromachining

Which Layer to Align To?

oxide, poly0, poly1, anchor1

Alignment Keys:

poly0, anchor1

Big hole!

Δx , poly0

Align poly1 \rightarrow poly0 : 2x offset

Best option: poly1 \rightarrow anchor1

anchor1, poly1, 0.4um misalignment, 0.1um

if these are aligned after litho