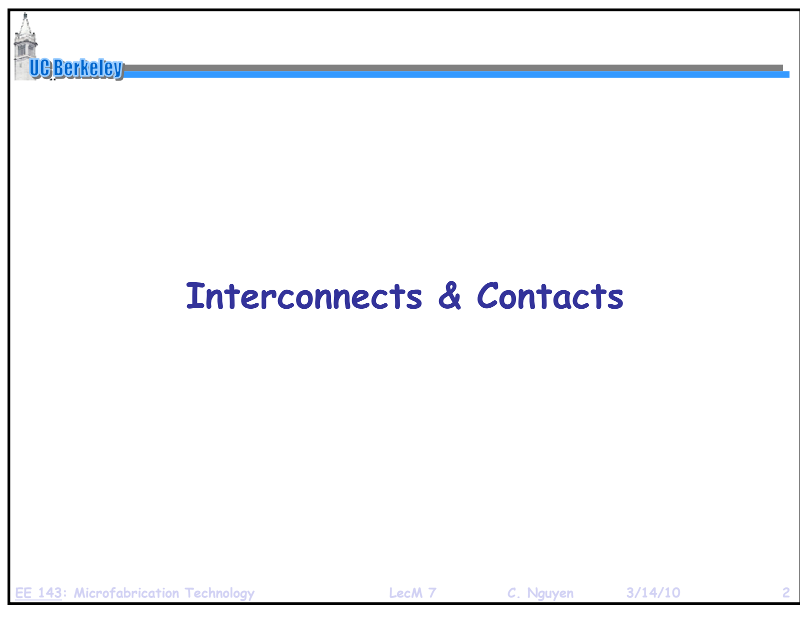

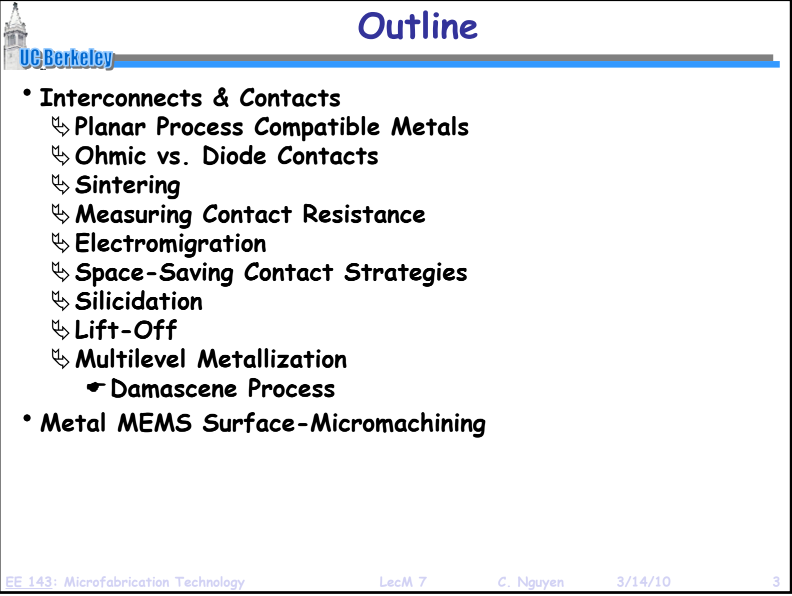

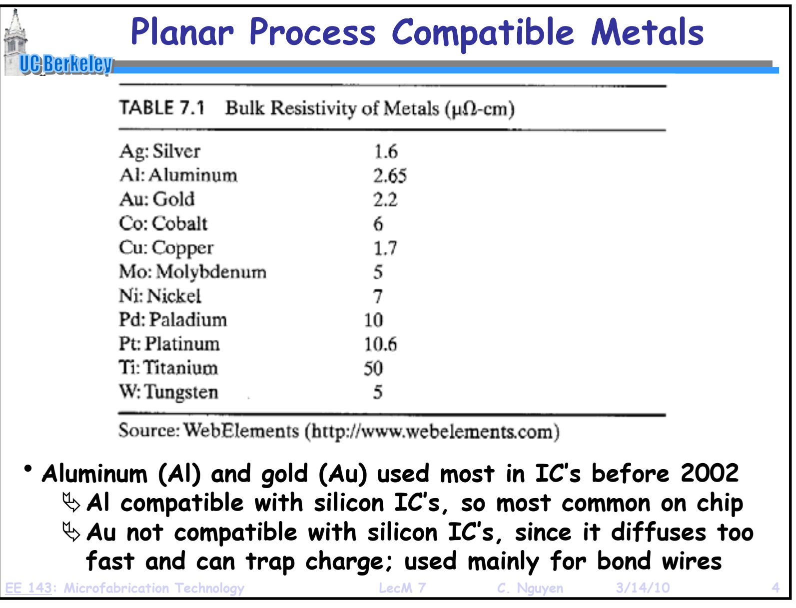

TABLE 7.1 Bulk Resistivity of Metals (μΩ-cm)

Metal	Resistivity
Ag: Silver	1.6
Al: Aluminum	2.65
Au: Gold	2.2
Co: Cobalt	6
Cu: Copper	1.7
Mo: Molybdenum	5
Ni: Nickel	7
Pd: Paladium	10
Pt: Platinum	10.6
Ti: Titanium	50
W: Tungsten	5

Source: WebElements (http://www.webelements.com)

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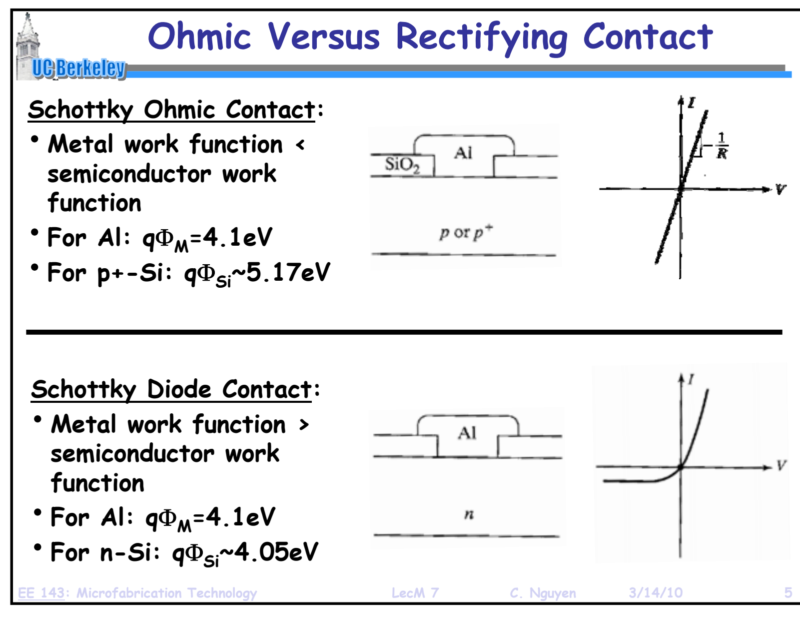

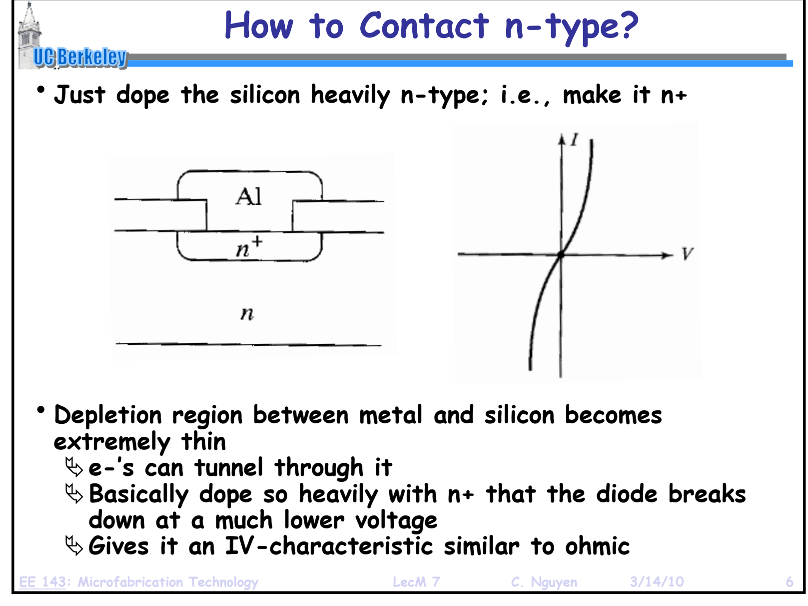

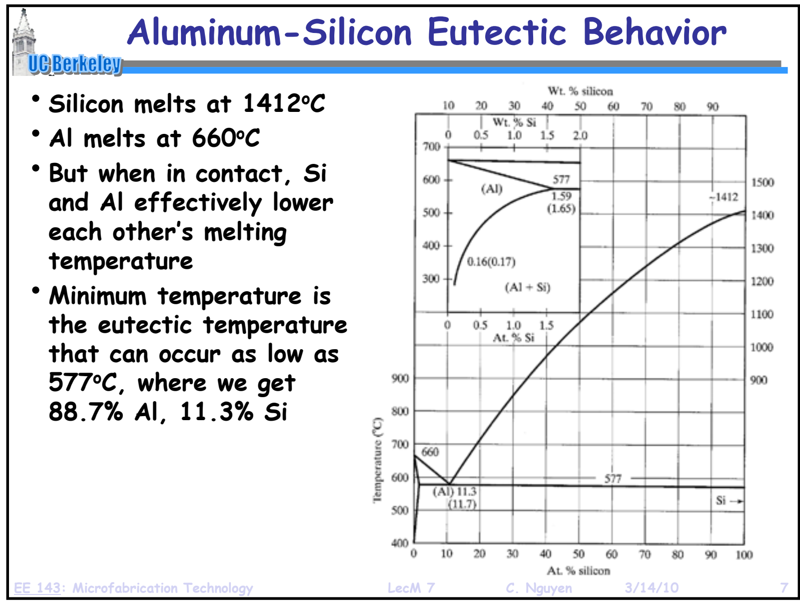

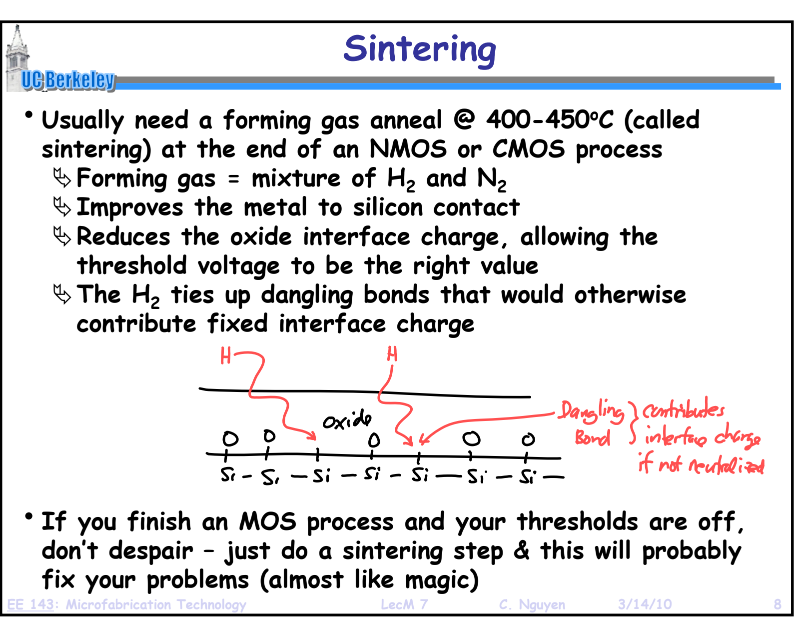

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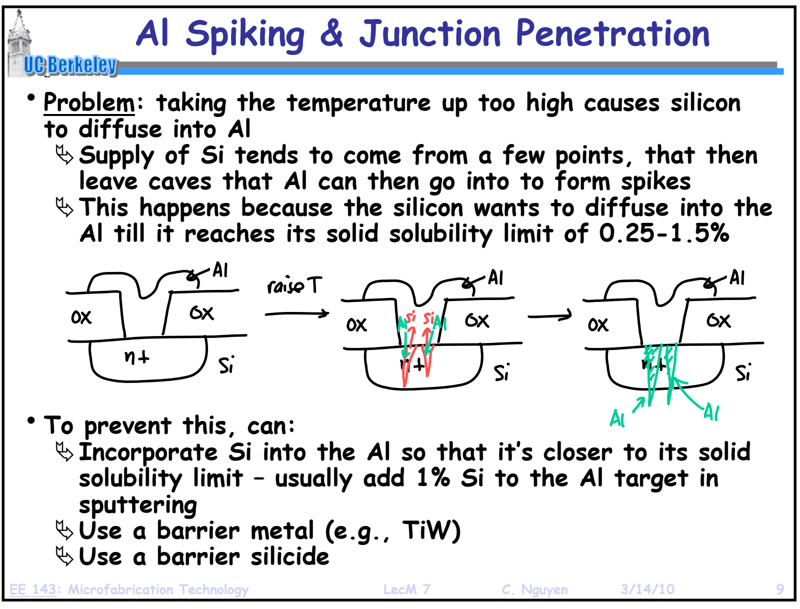

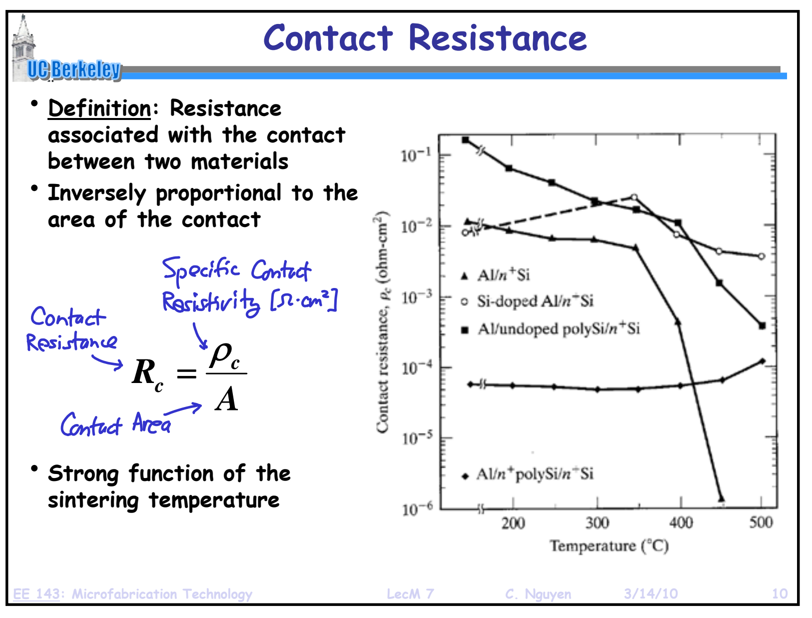

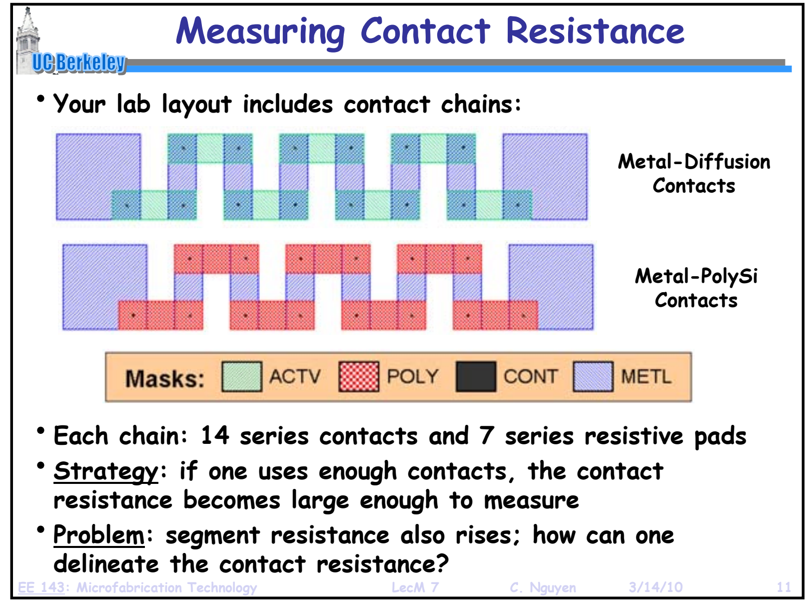

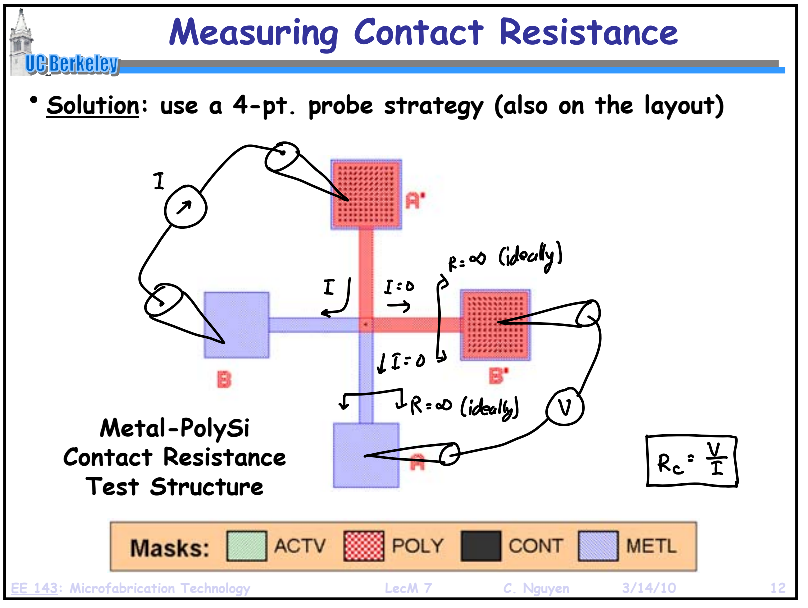

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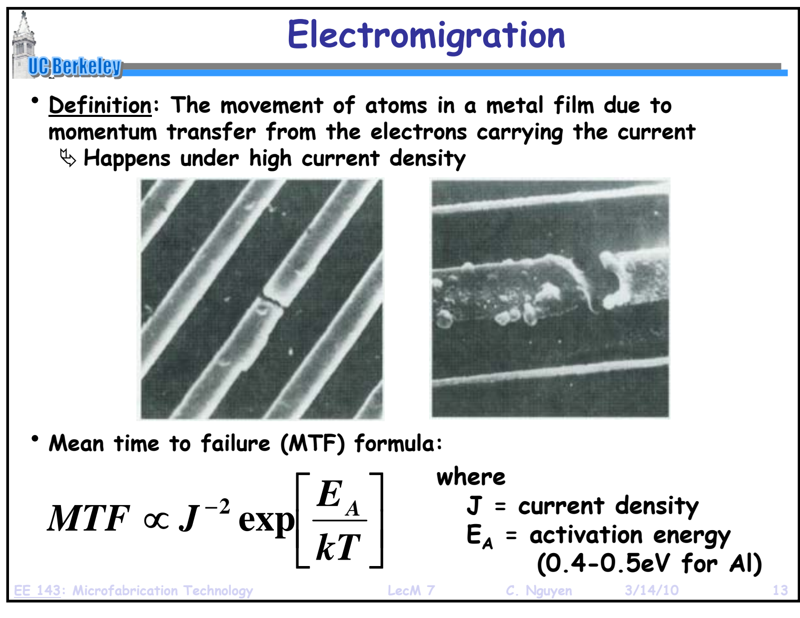

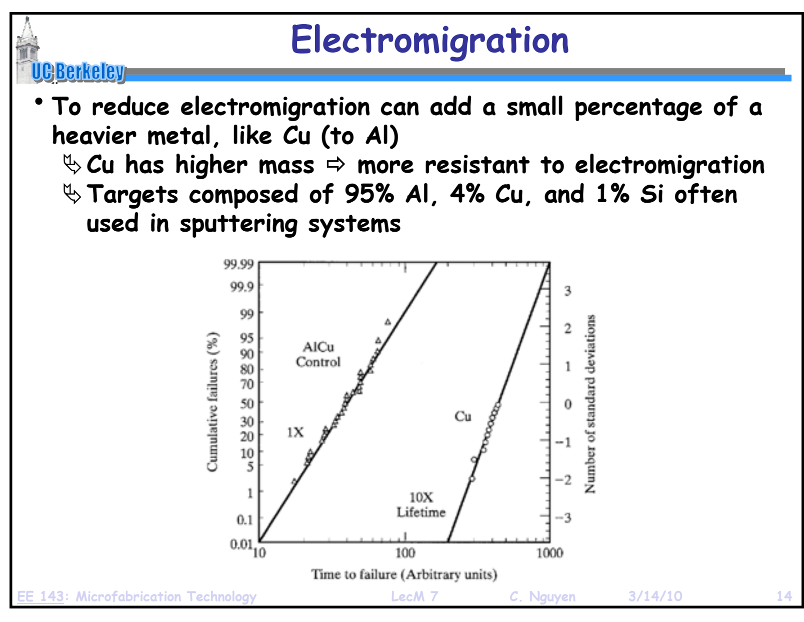

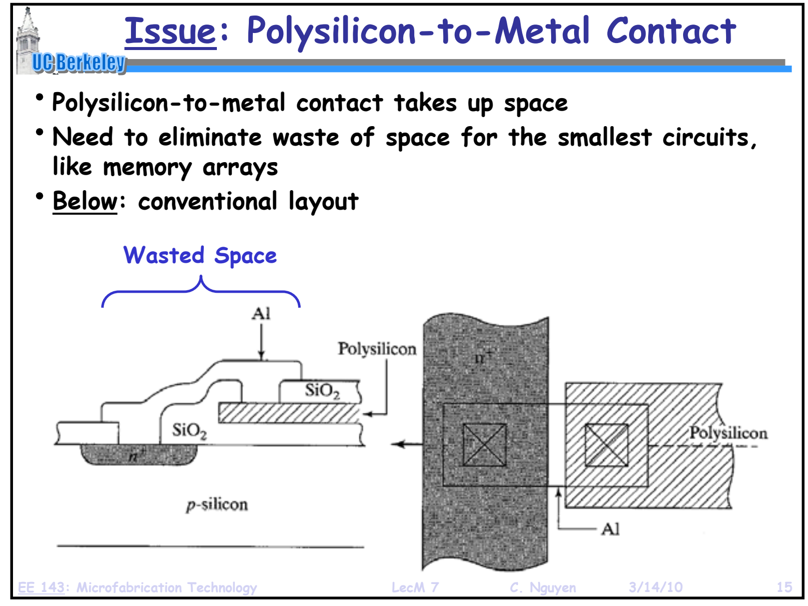

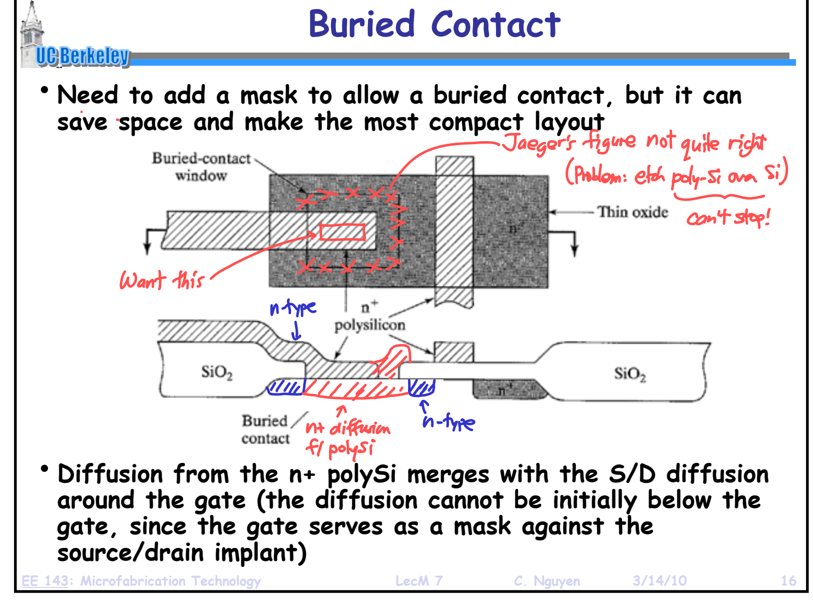

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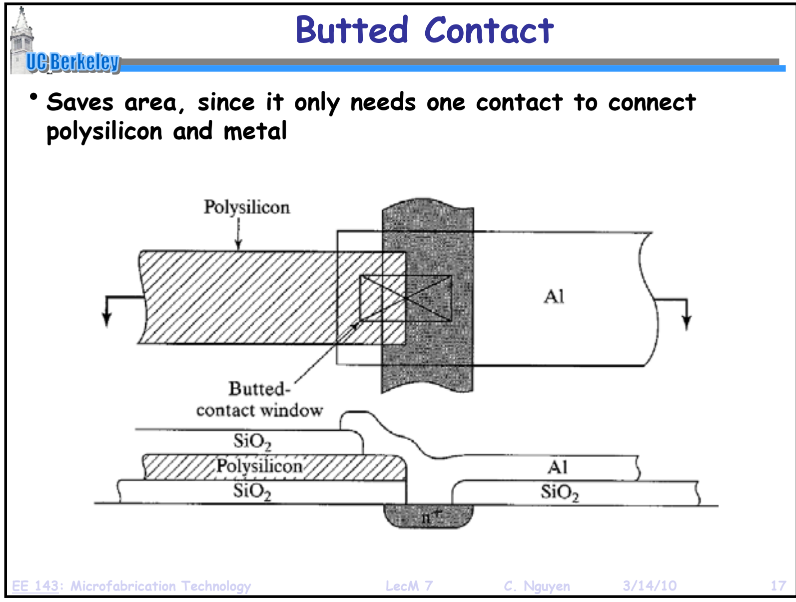


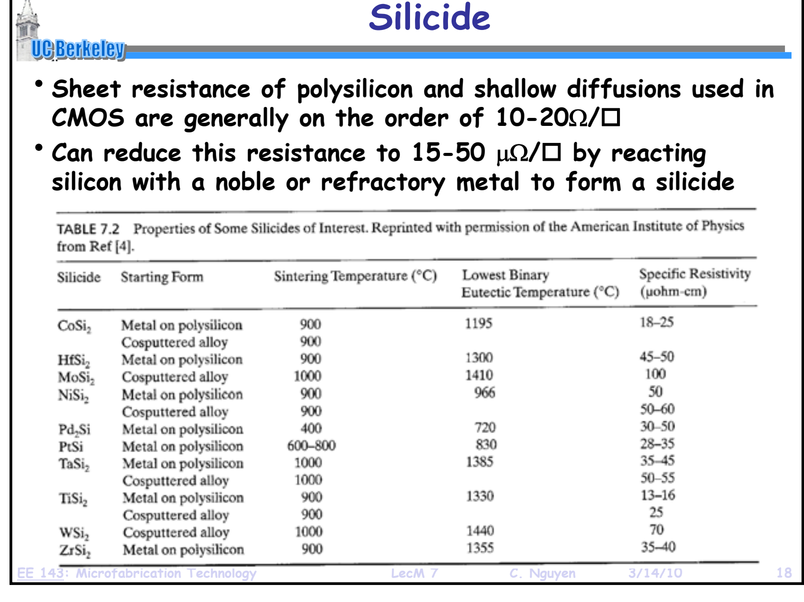
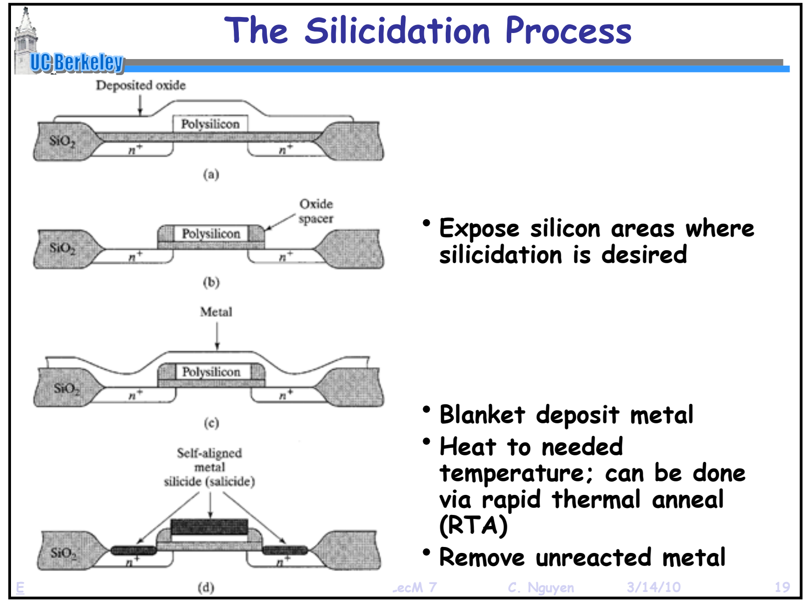


TABLE 7.2 Properties of Some Silicides of Interest. Reprinted with permission of the American Institute of Physics from Ref [4].

Silicide	Starting Form	Sintering Temperature (°C)	Lowest Binary Eutectic Temperature (°C)	Specific Resistivity (μohm-cm)
$CoSi_2$	Metal on polysilicon	900	1195	18–25
	Cosputtered alloy	900		
$HfSi_2$	Metal on polysilicon	900	1300	45–50
$MoSi_2$	Cosputtered alloy	1000	1410	100
$NiSi_2$	Metal on polysilicon	900	966	50
	Cosputtered alloy	900		50–60
Pd_2Si	Metal on polysilicon	400	720	30–50
PtSi	Metal on polysilicon	600–800	830	28–35
$TaSi_2$	Metal on polysilicon	1000	1385	35–45
	Cosputtered alloy	1000		50–55
$TiSi_2$	Metal on polysilicon	900	1330	13–16
	Cosputtered alloy	900		25
WSi_2	Cosputtered alloy	1000	1440	70
$ZrSi_2$	Metal on polysilicon	900	1355	35–40



The Silicidation Process

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Remarks:

1. Often can be self aligned to the region to be silicided, in which case it's called a salicide
2. Polycide: a silicide over polysilicon
   - Also pretty much self-aligned
   - Just put the metal down everywhere, heat, and reaction will only occur over polysilicon areas
3. Achieve resistivities from 15-50 μΩ-cm
4. Can oxidize the surface of a silicide, since silicon diffuses through the silicide to combine with the oxidant
5. Unlike silicon-metals that are unreacted, many silicides can take temperatures much higher than the eutectic temperature, over 1000°C
   - not true for all silicides, e.g., nickel silicide (900°C), platinum silicide (800°C), and palladium silicide (700°C)

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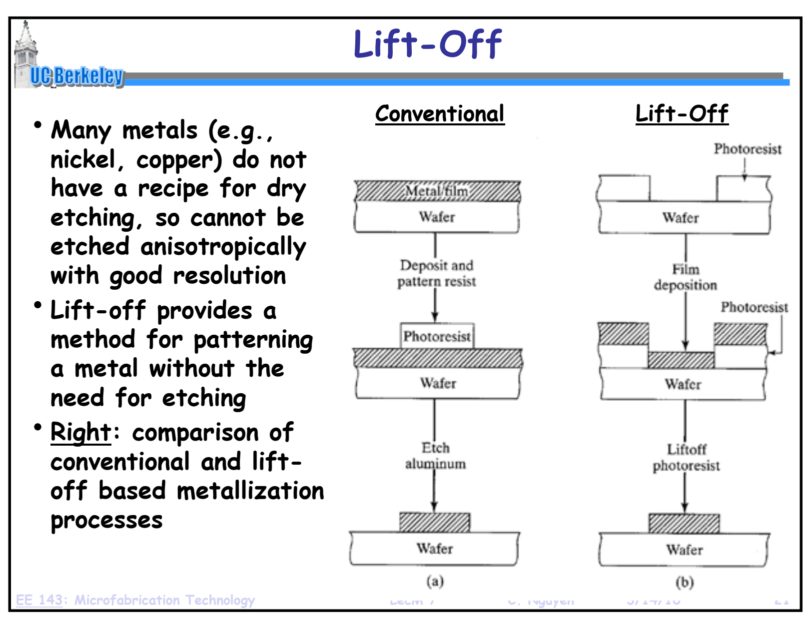

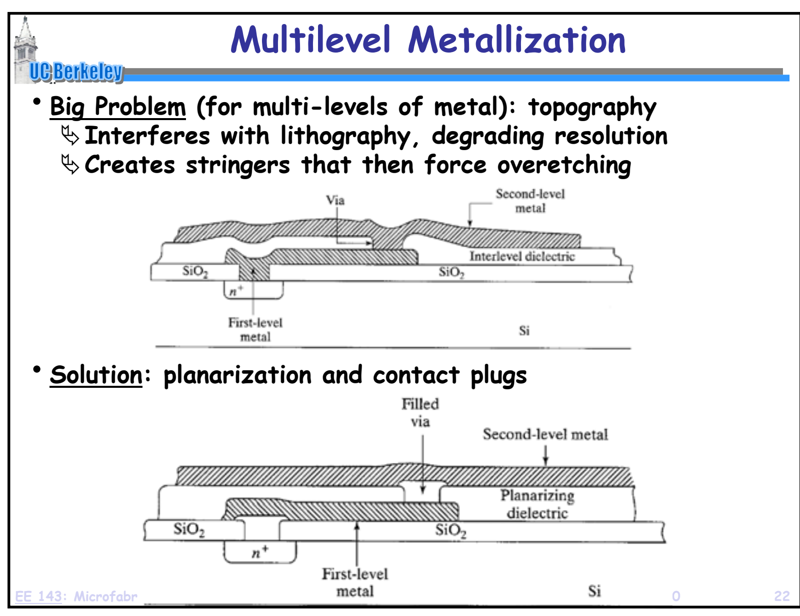

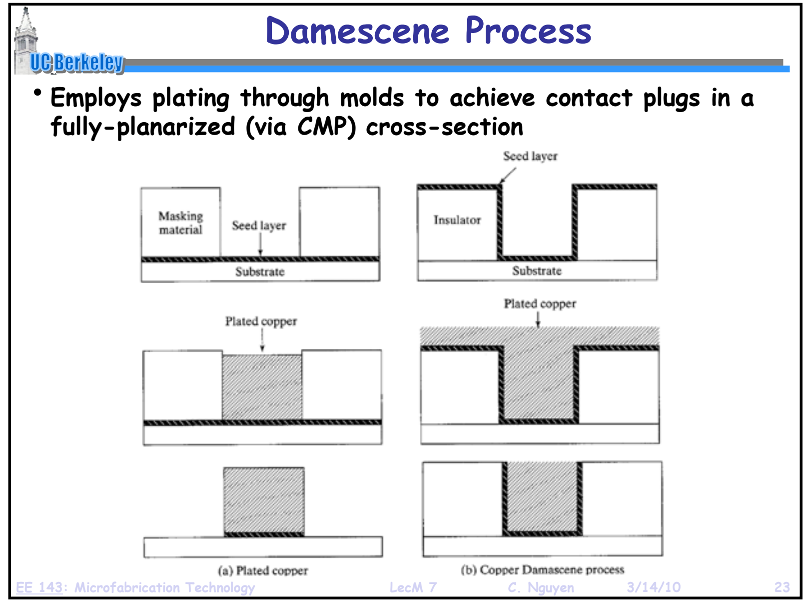

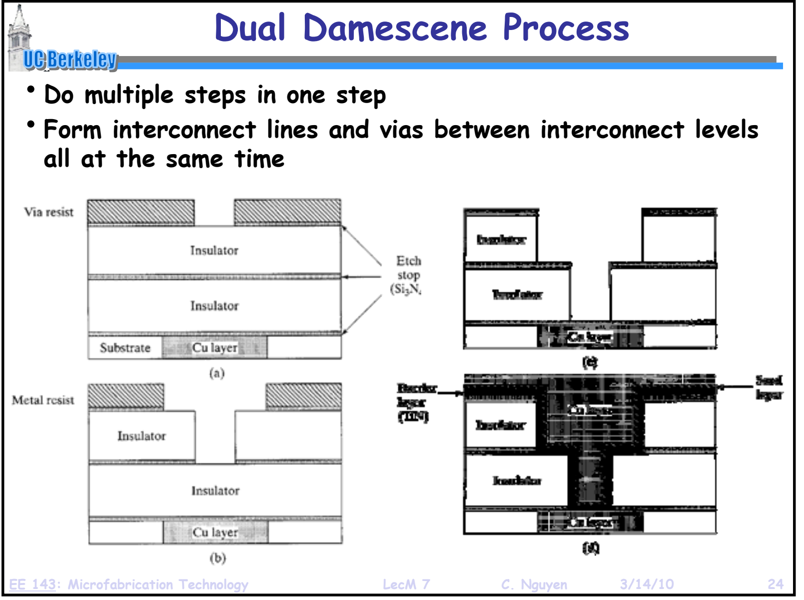

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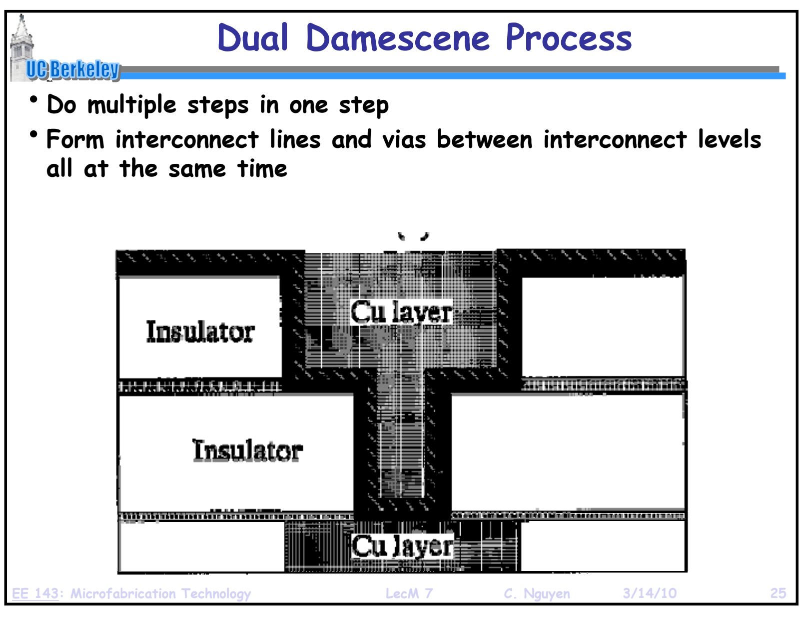

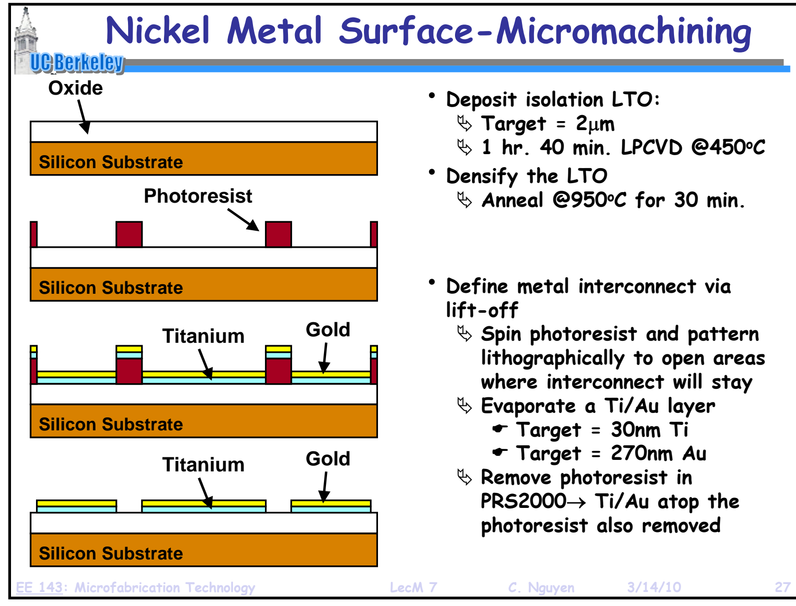

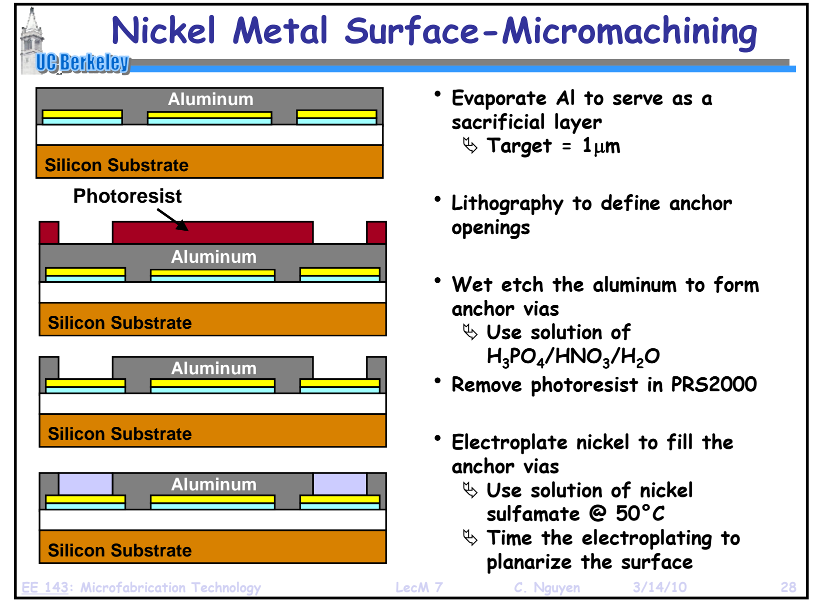

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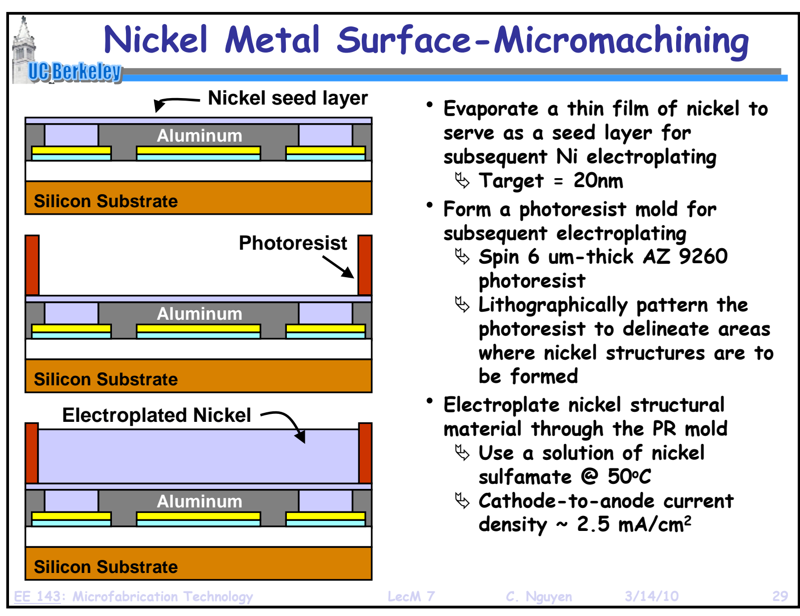

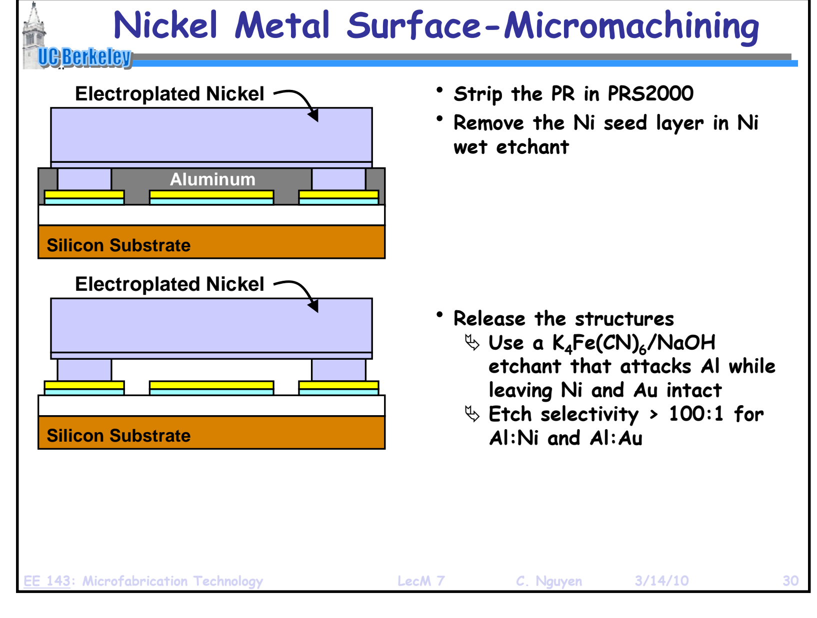

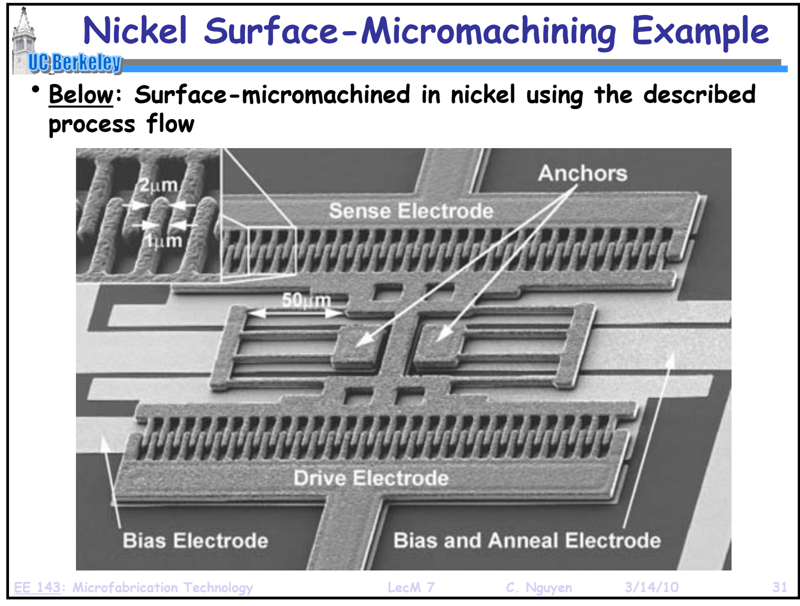

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