State-of-the-Art Transistor Moore's Law Past 32nm

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Talk Outline

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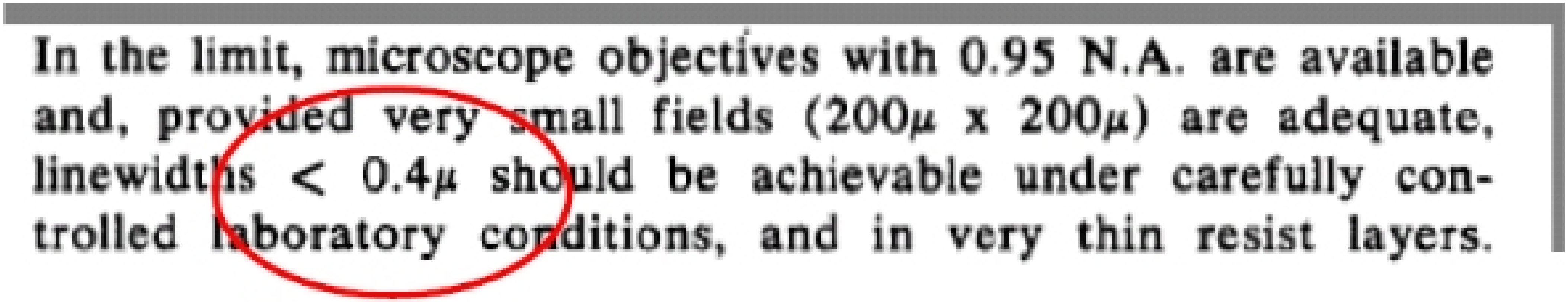
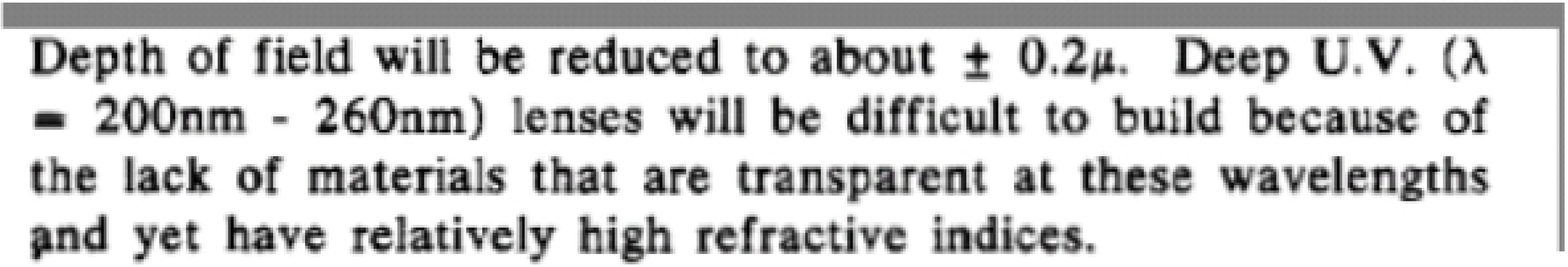
- History
- Architecture
- Capacitance
- Resistance
- HiK-MG
- Orientation
- Strain
- Strain + Orientation
- Summary

Lithography Limits

From Broers [1] IEDM Plenary Session 1980



In the limit, microscope objectives with 0.95 N.A. are available and, provided very small fields (200μ x 200μ) are adequate, linewidths < 0.4μ should be achievable under carefully controlled laboratory conditions, and in very thin resist layers.



Depth of field will be reduced to about ± 0.2μ. Deep U.V. (λ = 200nm - 260nm) lenses will be difficult to build because of the lack of materials that are transparent at these wavelengths and yet have relatively high refractive indices.

1980:

Optical Lithography Limit

~ 400nm