Objectives of 6.720J/3.43J

1. *Solid understanding of basic physical phenomena pervasive in microelectronic devices*:

- carrier transport (drift and diffusion)
- carrier generation and recombination
- carrier injection and extraction
- energy scale, time scale and length scale of key phenomena
- minority-vs. majority-carrier type devices
- pervasive non-ideal and parasitic effects
- energy band diagrams

Objectives of 6.720J/3.43J (cont.)

2. *Solid understanding (physics and modeling) of main-stream integrated microelectronic devices*:

- p-n diode
- Schottky diode
- **MOSFET**
- BJT

3. *Appreciation of major trends in microelectronics industry*.

Boundaries of 6.720J/3.43J

- Almost no light → no optical devices
- No heterostructures → no HBT or MODFET
- No *E-K* diagrams → need to "fudge" physical description at times
- No device applications → discuss only device-level figures of merit

"One shouldn't work on semiconductors, that is a filthy mess; who knows if they really exist!"

Wolfgang Pauli, 1931