

CS152
Computer Architecture and Engineering
Lecture 24

I/O and Storage Systems

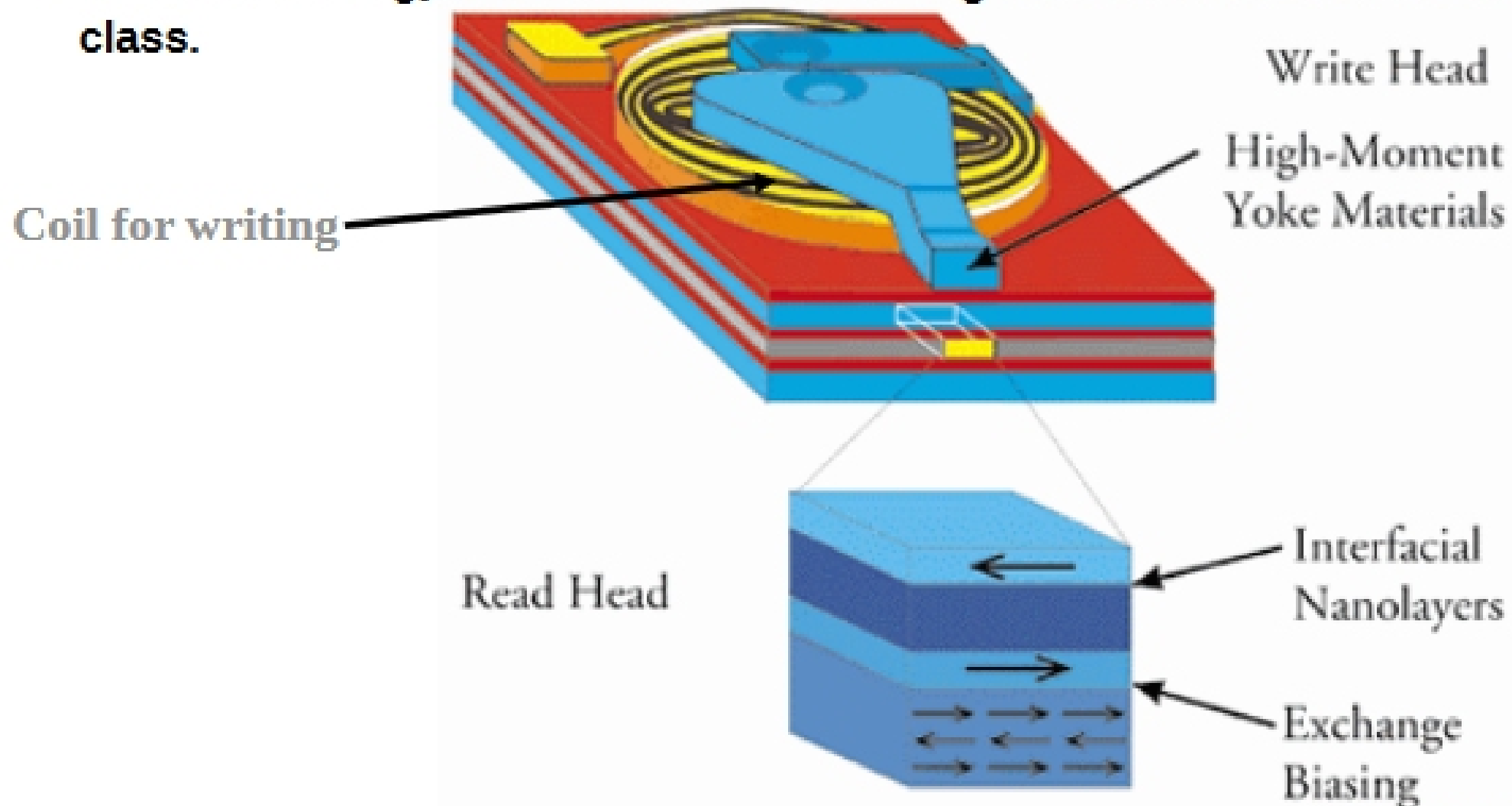
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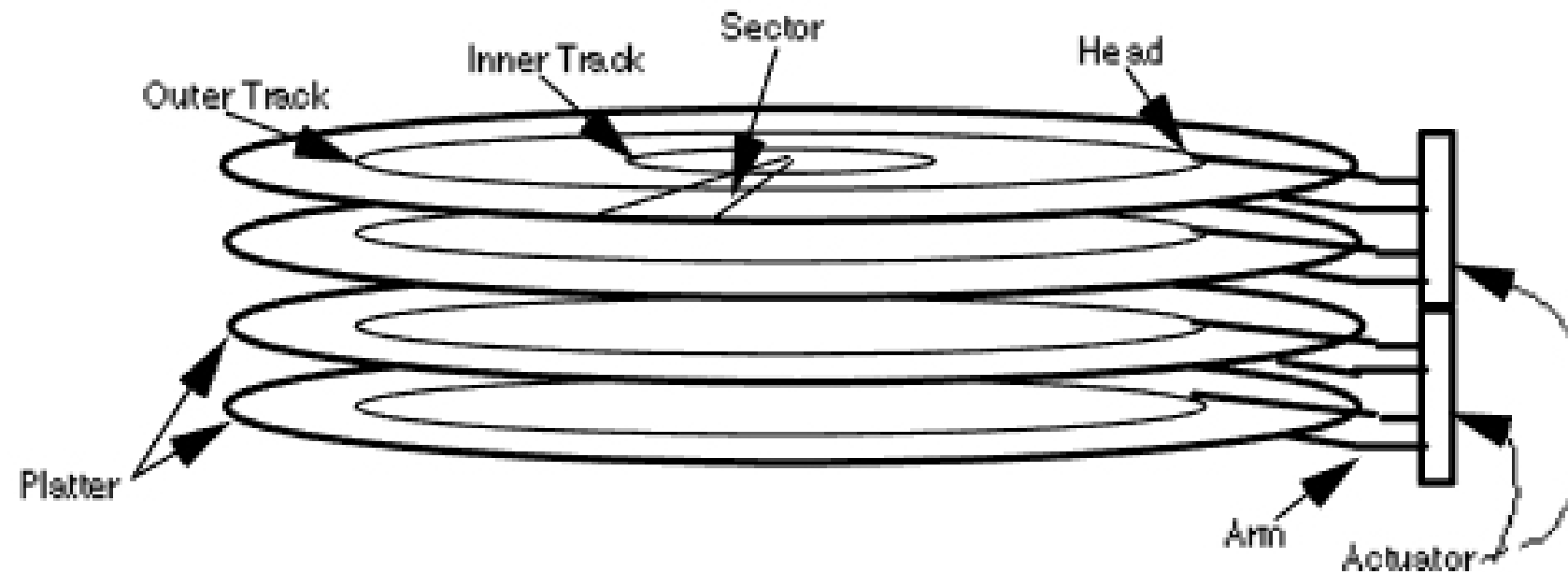
lecture slides: <http://inst.eecs.berkeley.edu/~cs152/>

Recap: Nano-layered Disk Heads

- Special sensitivity of Disk head comes from “Giant Magneto-Resistive effect” or (GMR)
- IBM is leader in this technology
 - Same technology as TMJ-RAM breakthrough we described in earlier class.



Recap: Disk Device Terminology



**Disk Latency = Queueing Time +
Controller time +
Seek Time + Rotation Time + Xfer Time**

Order of magnitude times for 4K byte transfers:

Average Seek: 8 ms or less

Rotate: 4.2 ms @ 7200 rpm

Xfer: 1 ms @ 7200 rpm