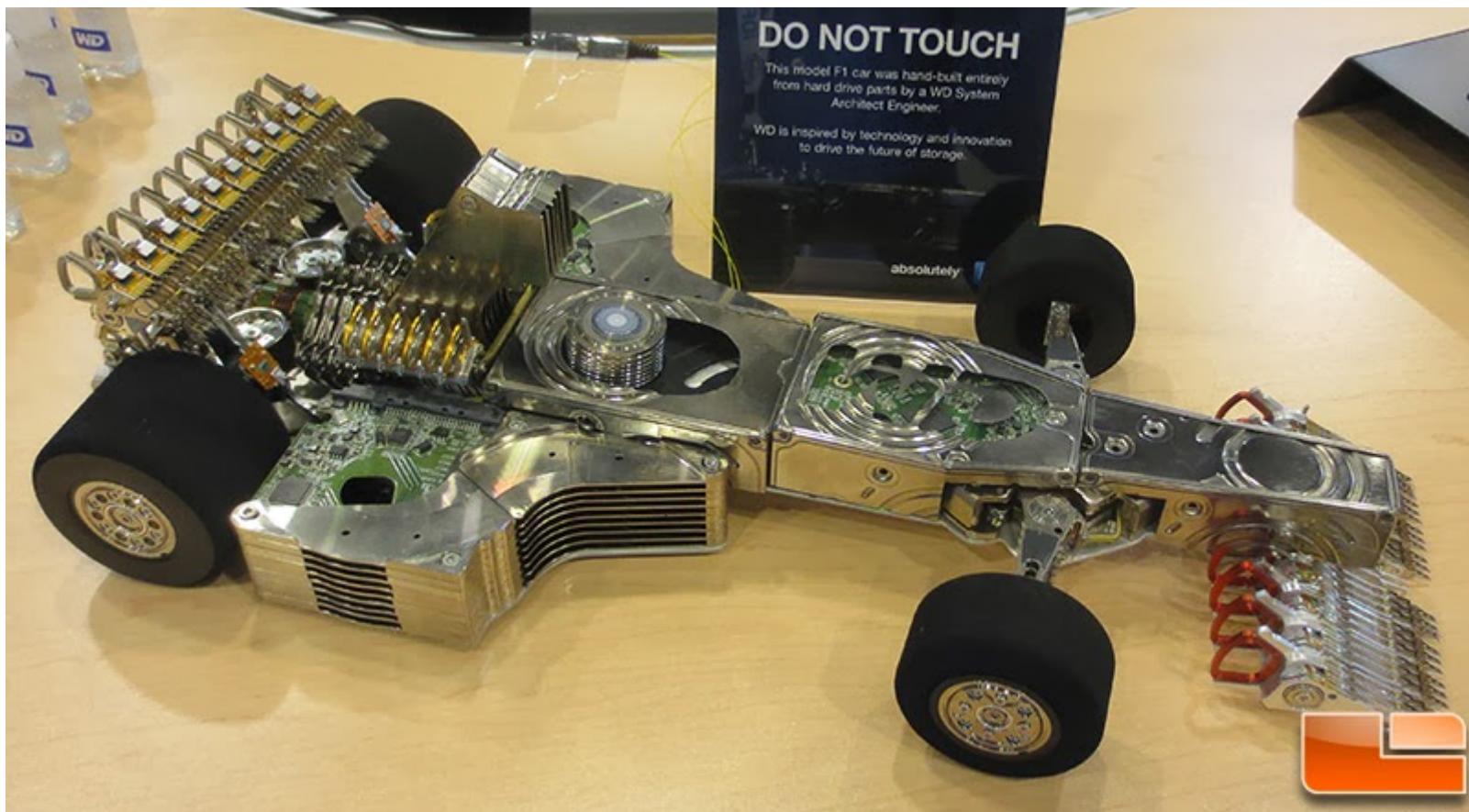


Mass Storage Systems

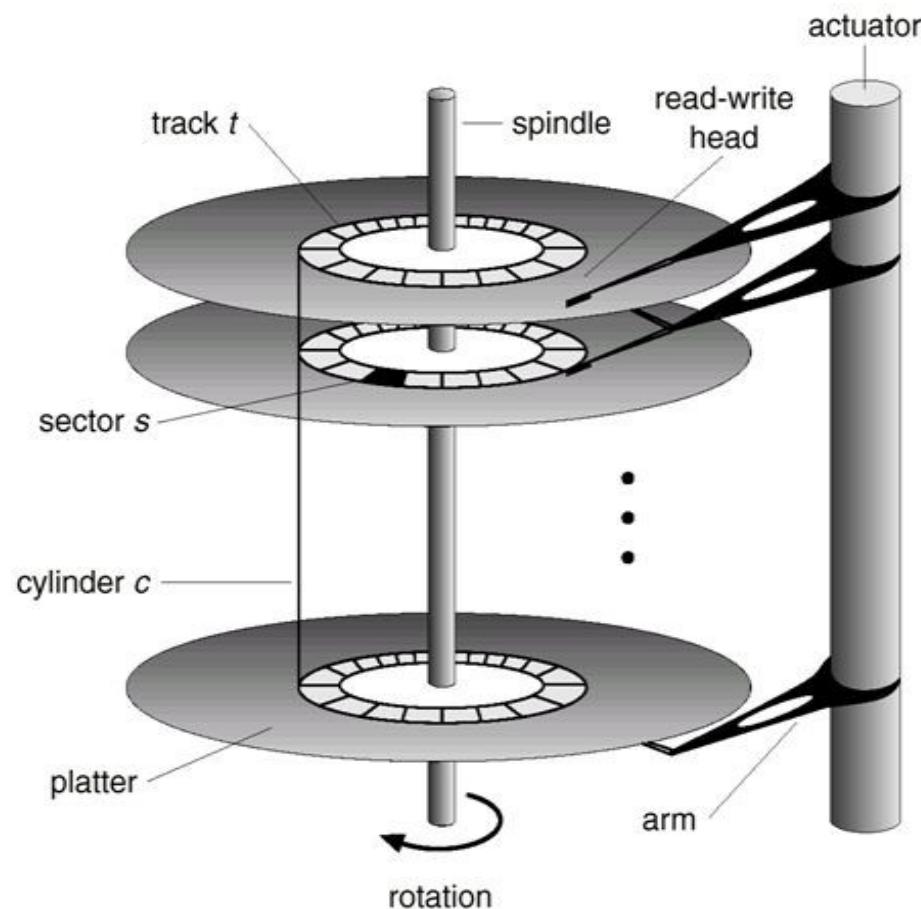


Hard Disks



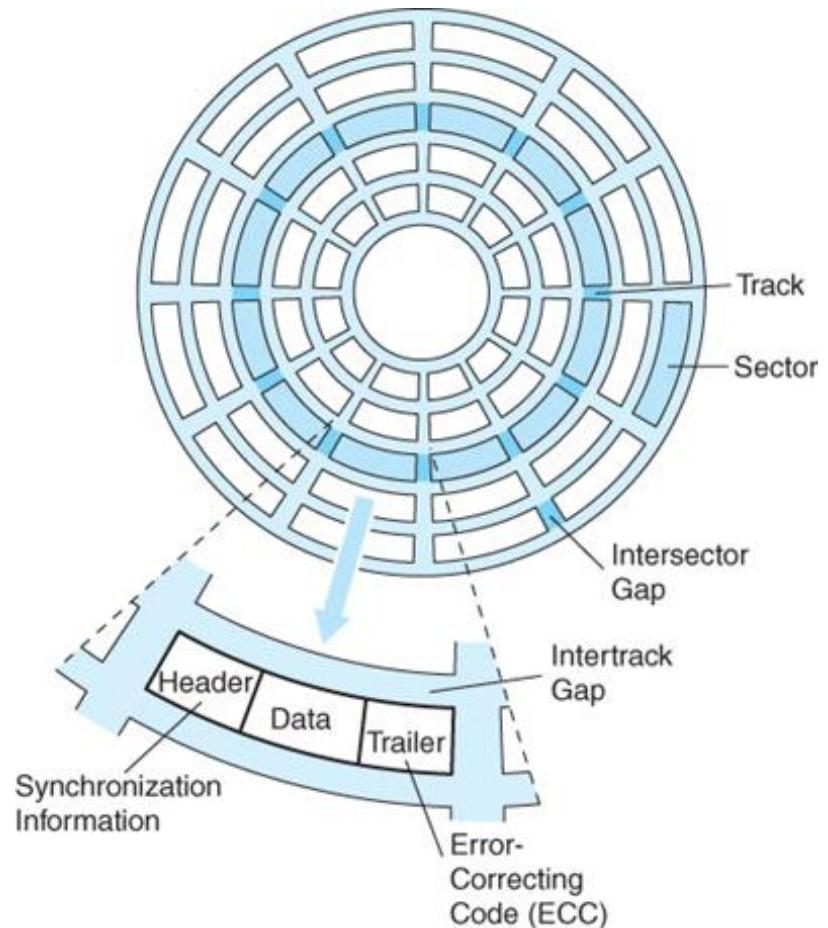
Hard Disks

Overview: Moving-Head Disk Mechanism

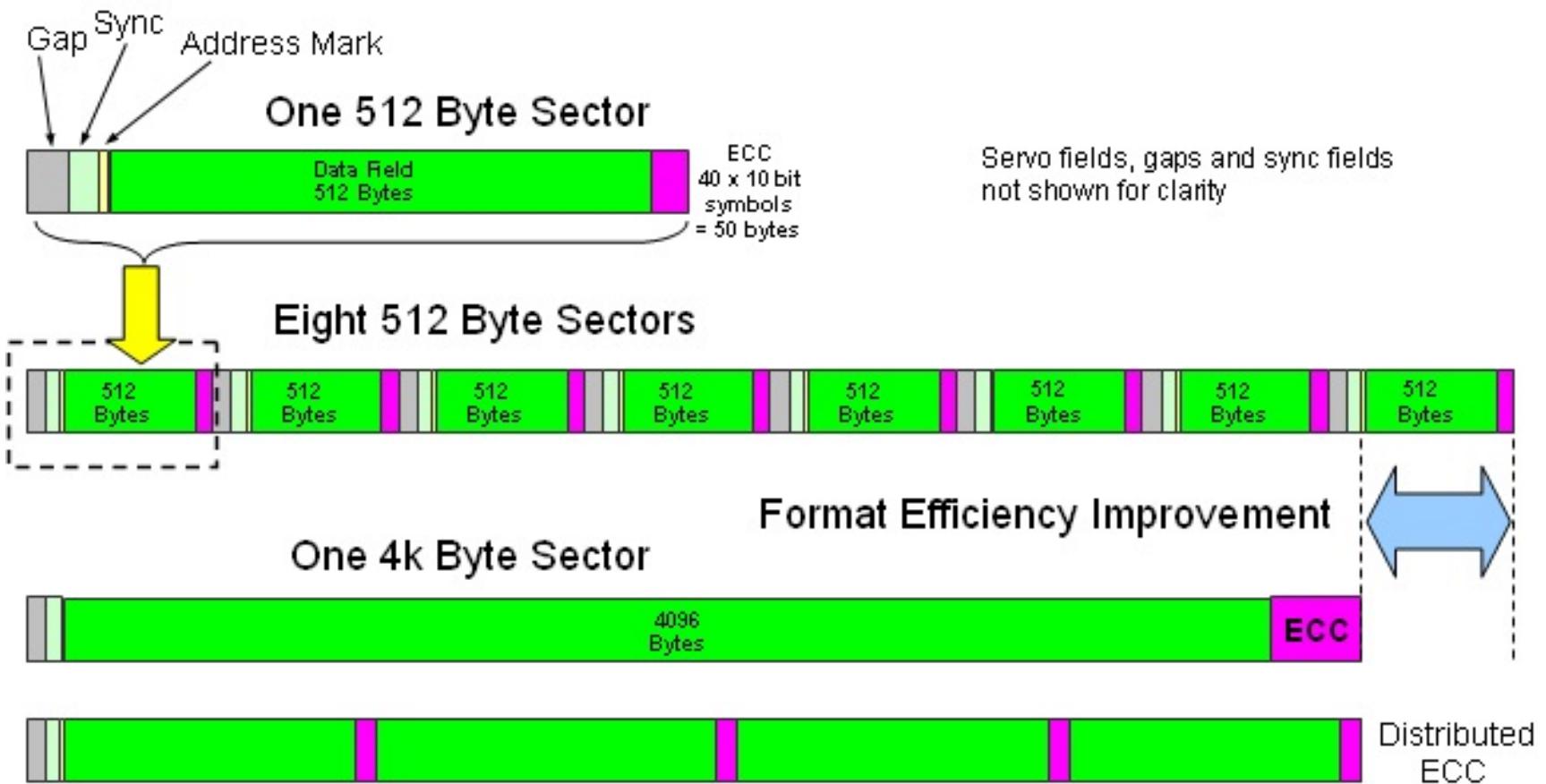


Structure

- Components
 - Platter (Head)
 - Track
 - Sector
 - Inter sector gap
 - Inter track gap

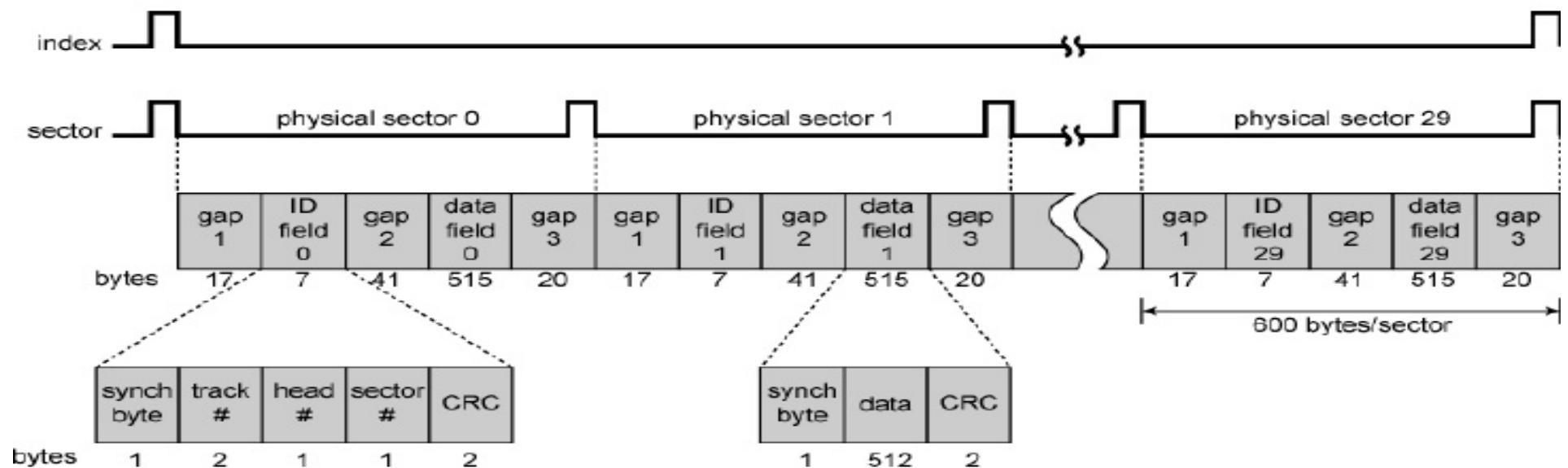


Sector formats

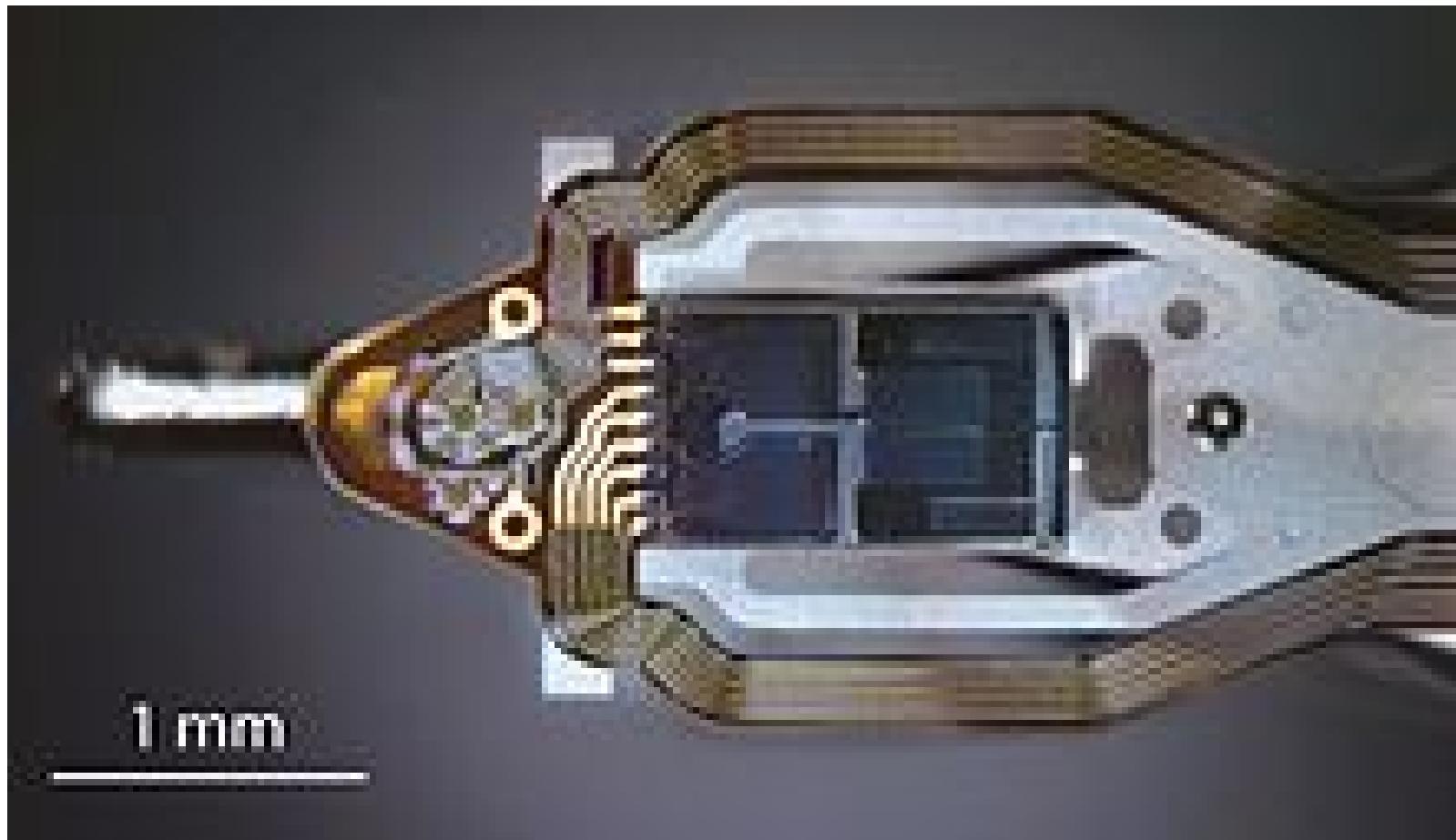


Sector internals

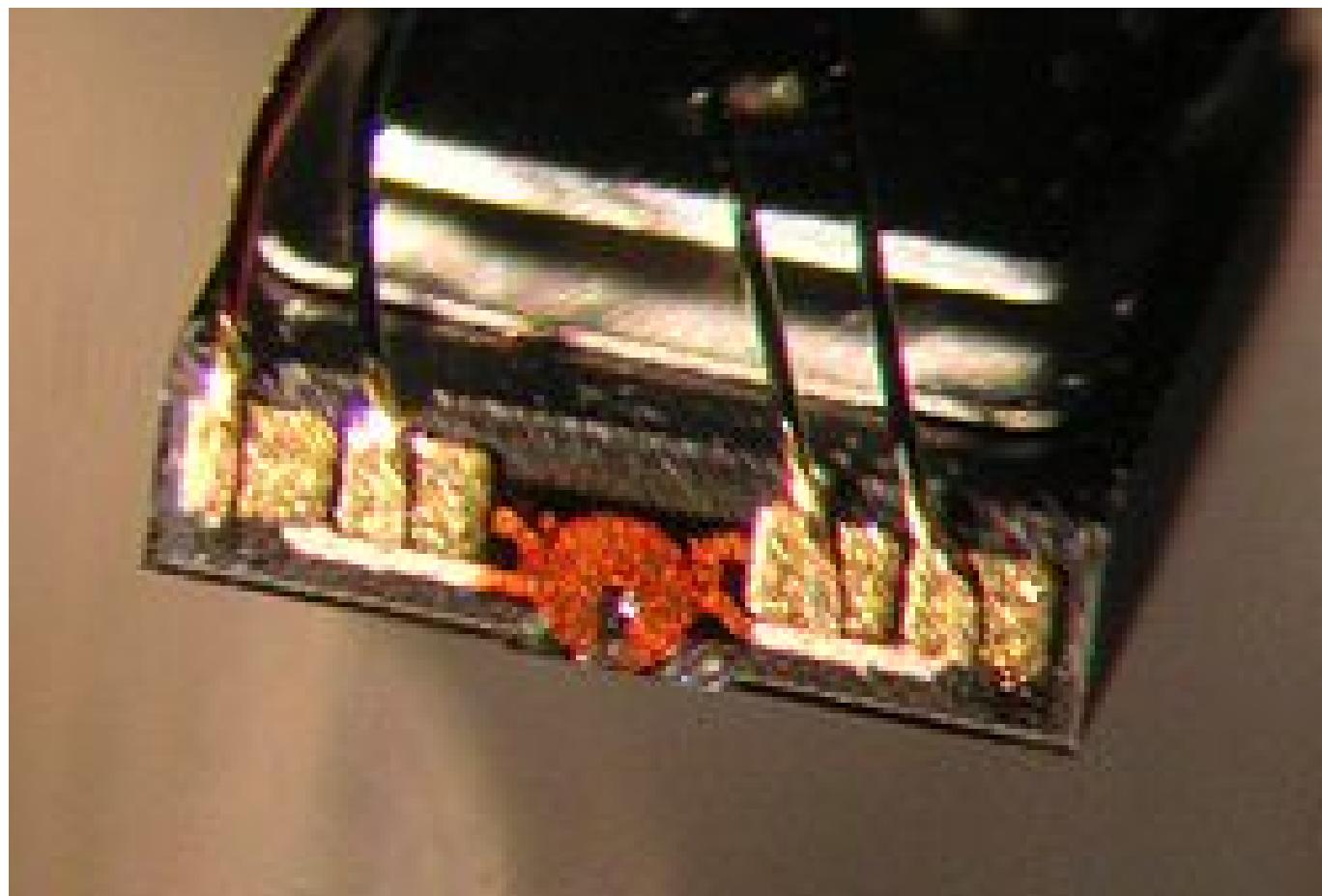
Winchester Disk Format Seagate ST506



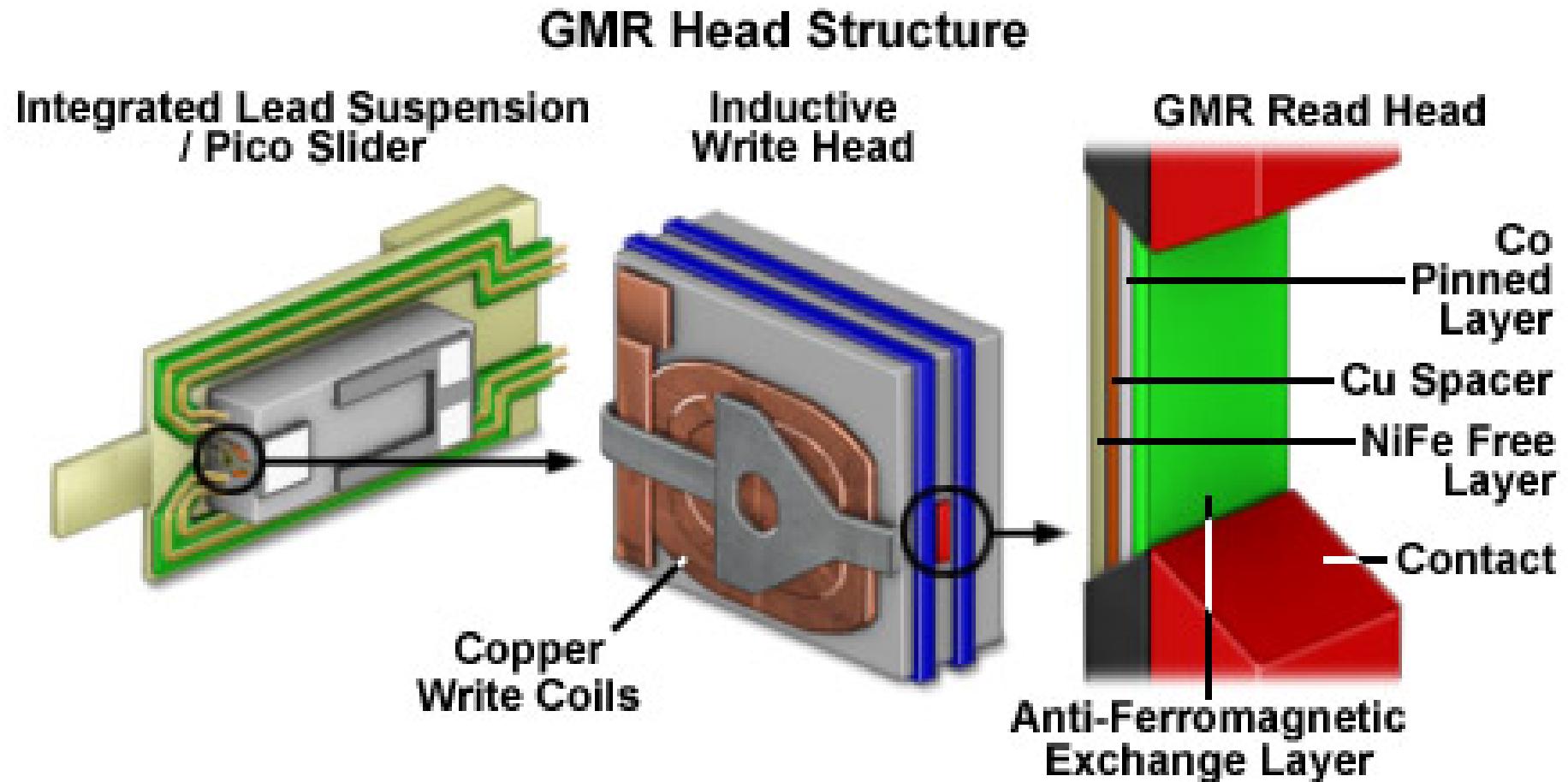
Read/Write Head



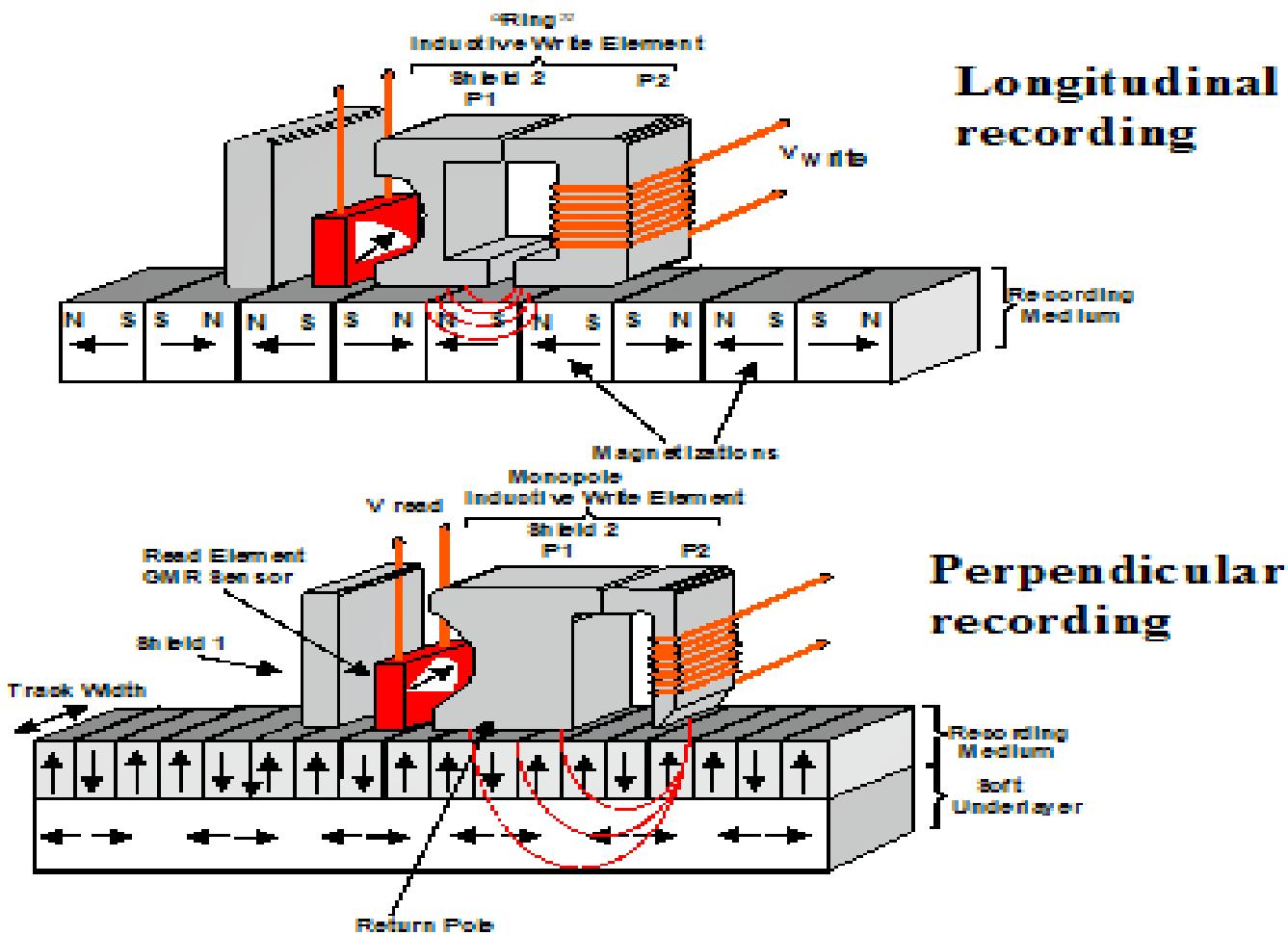
Read/Write Head



Read/Write Head Schematics

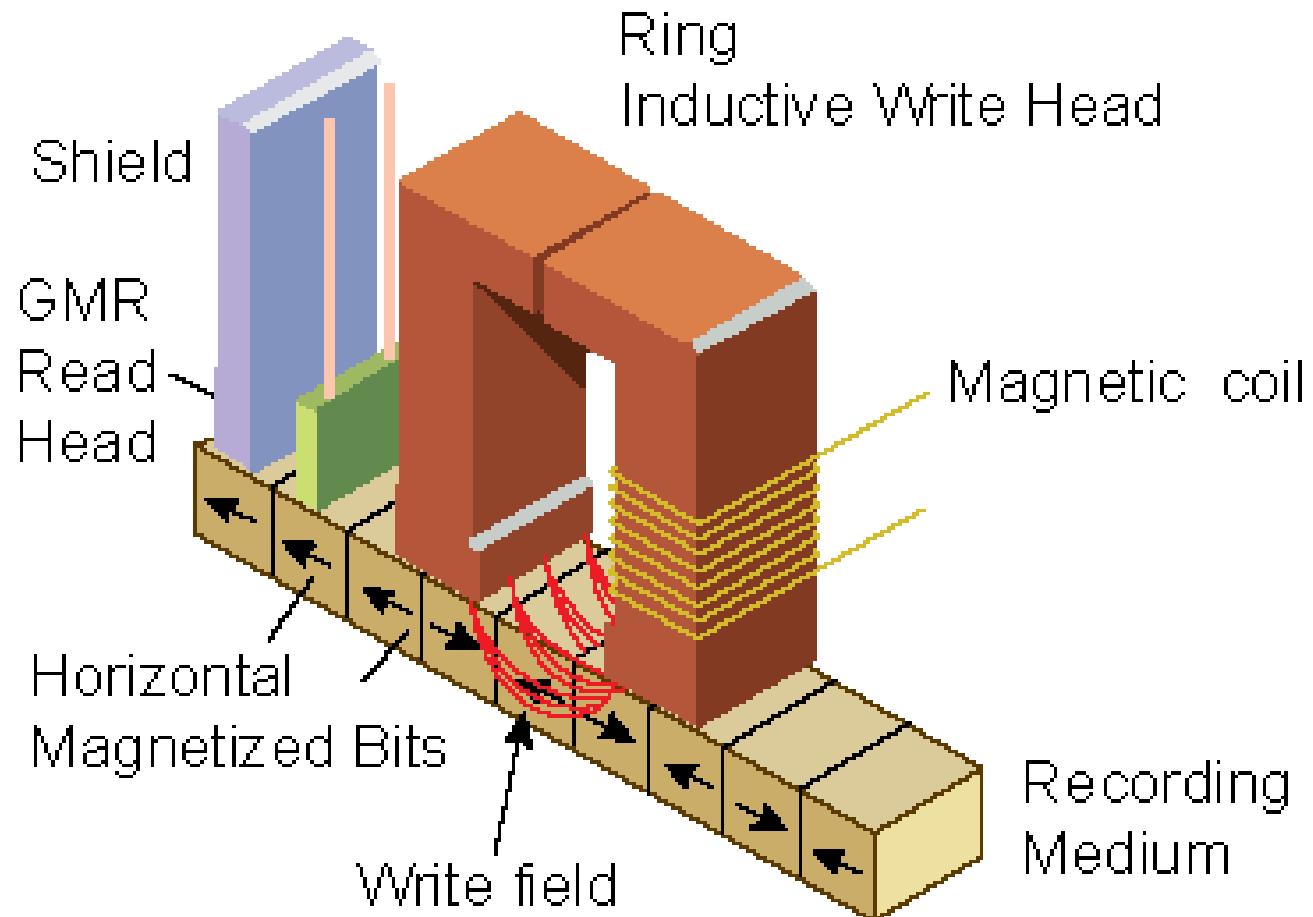


Magnetic recording

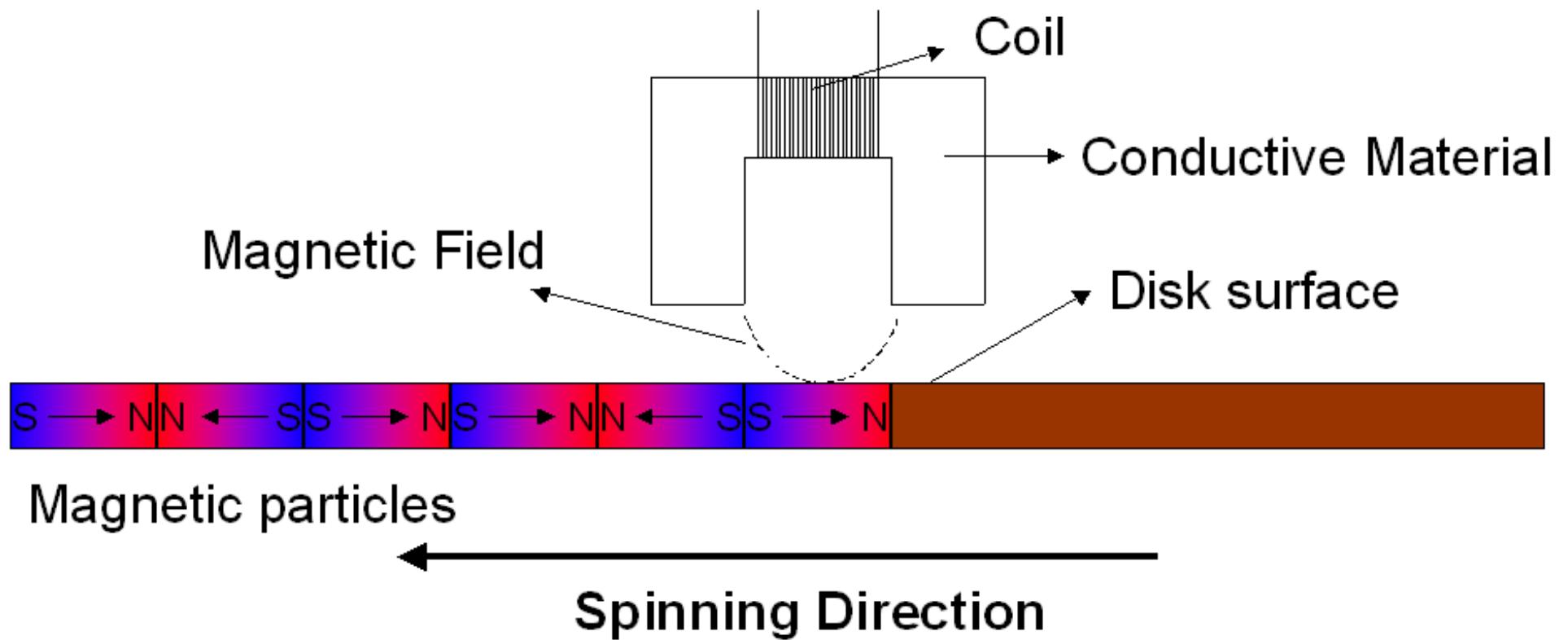


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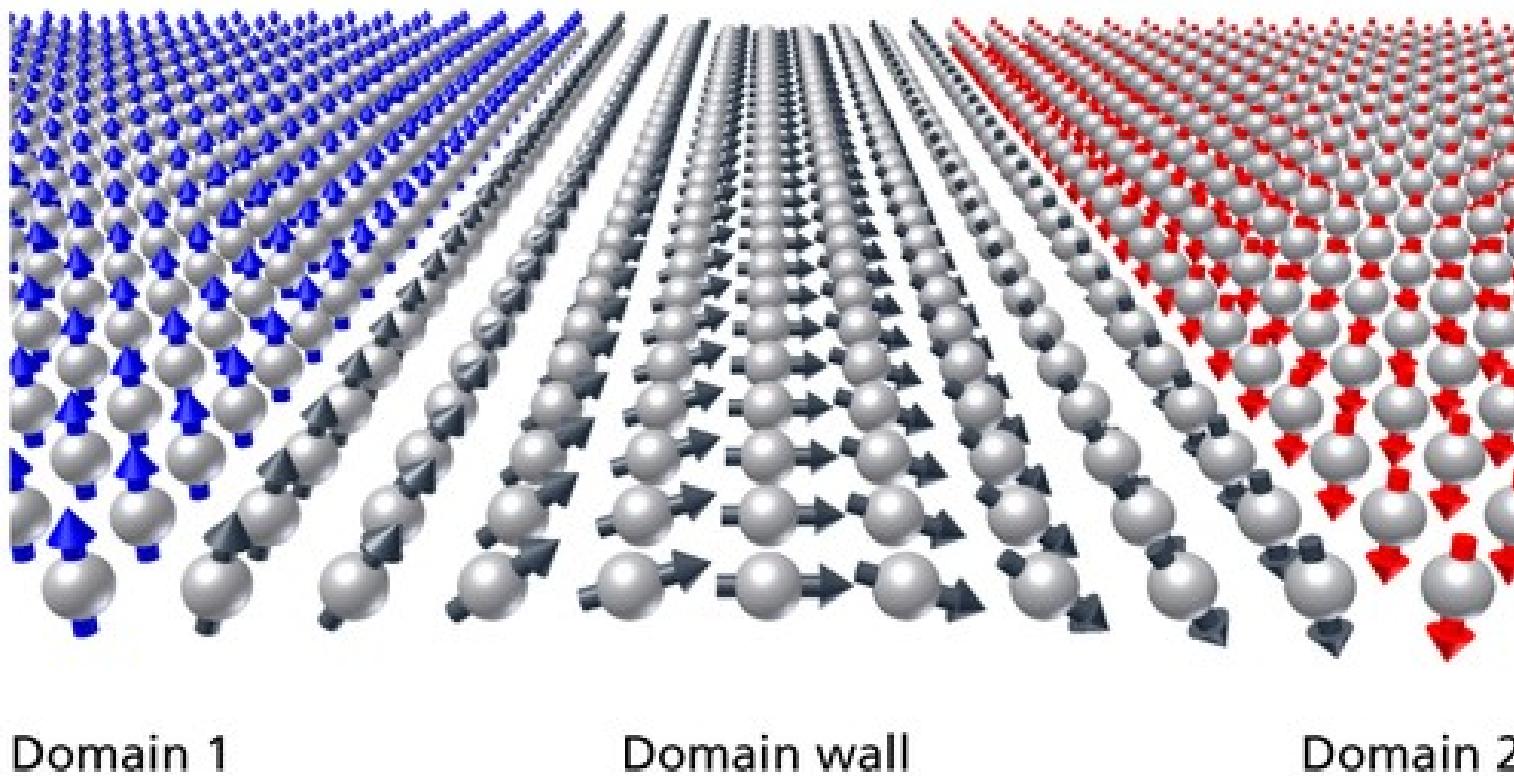
Magnetism schematics



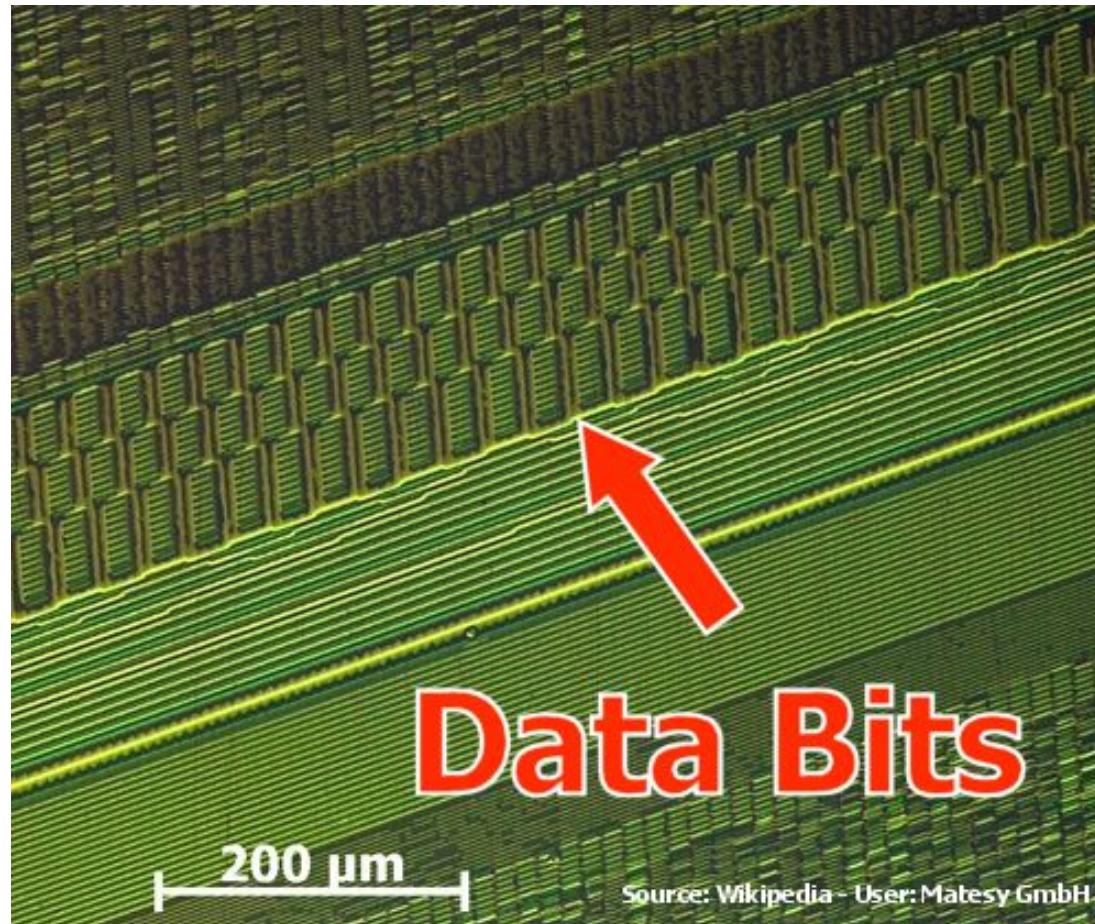
Read/Writing Head



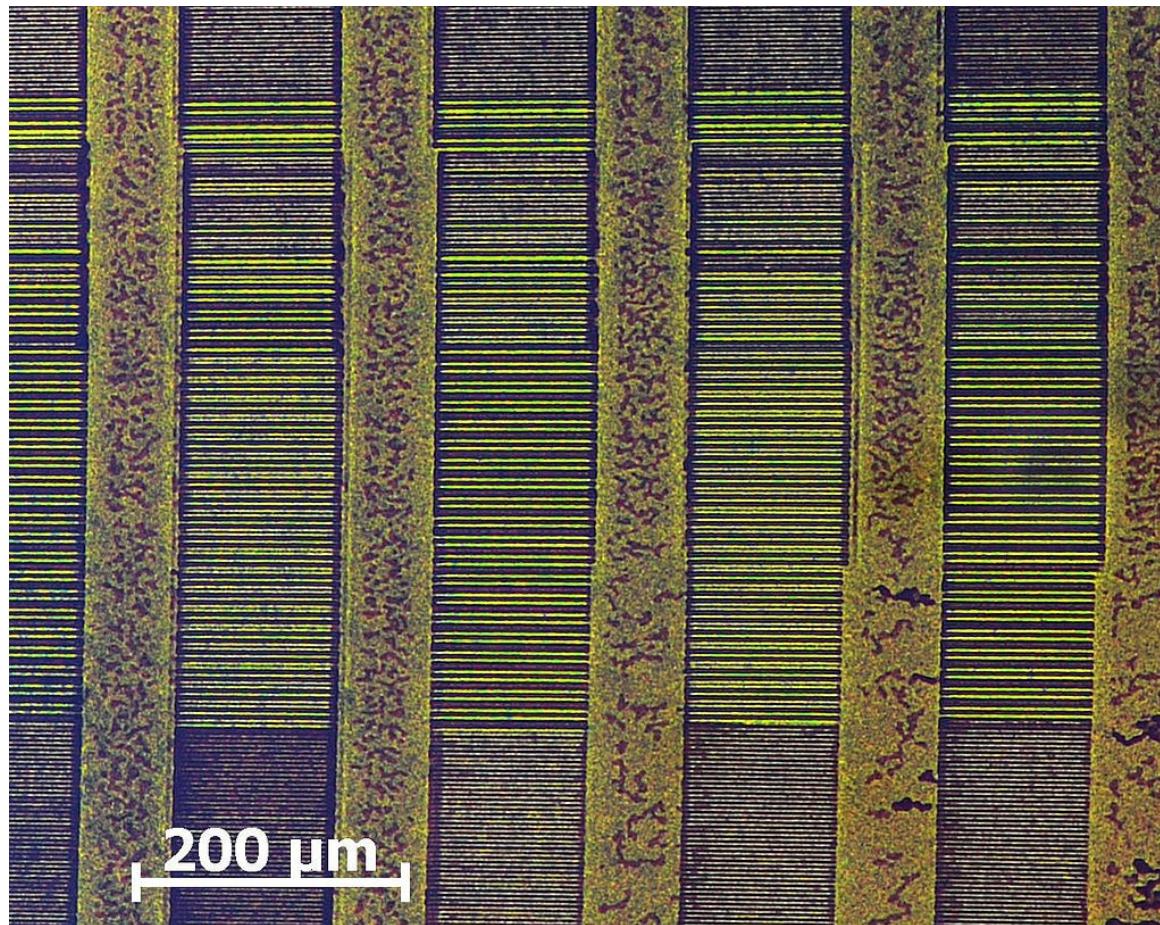
Bits organization



Bits imaging

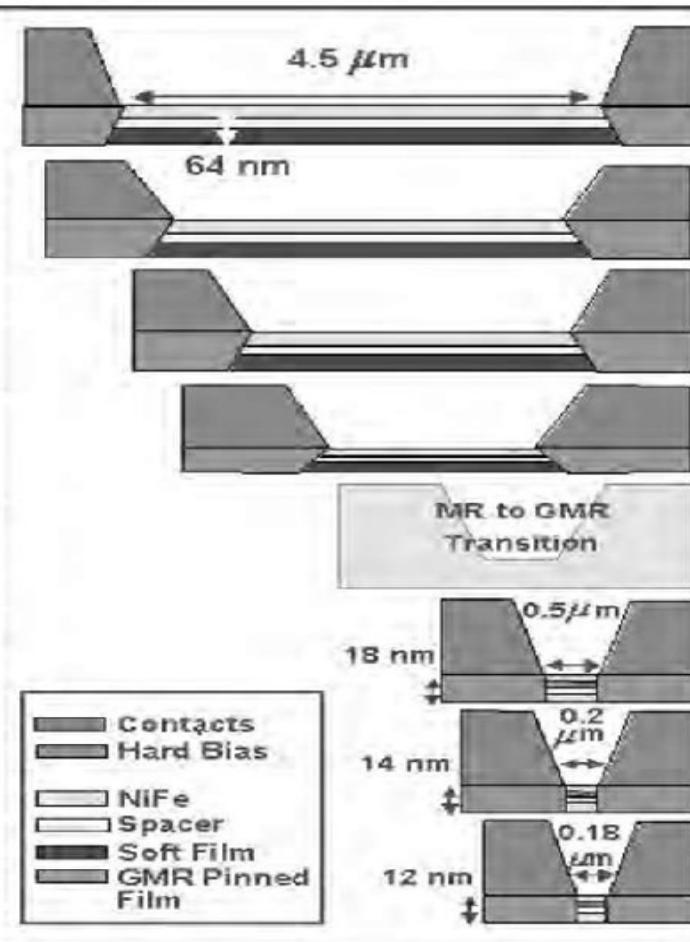


Floppy disk bits

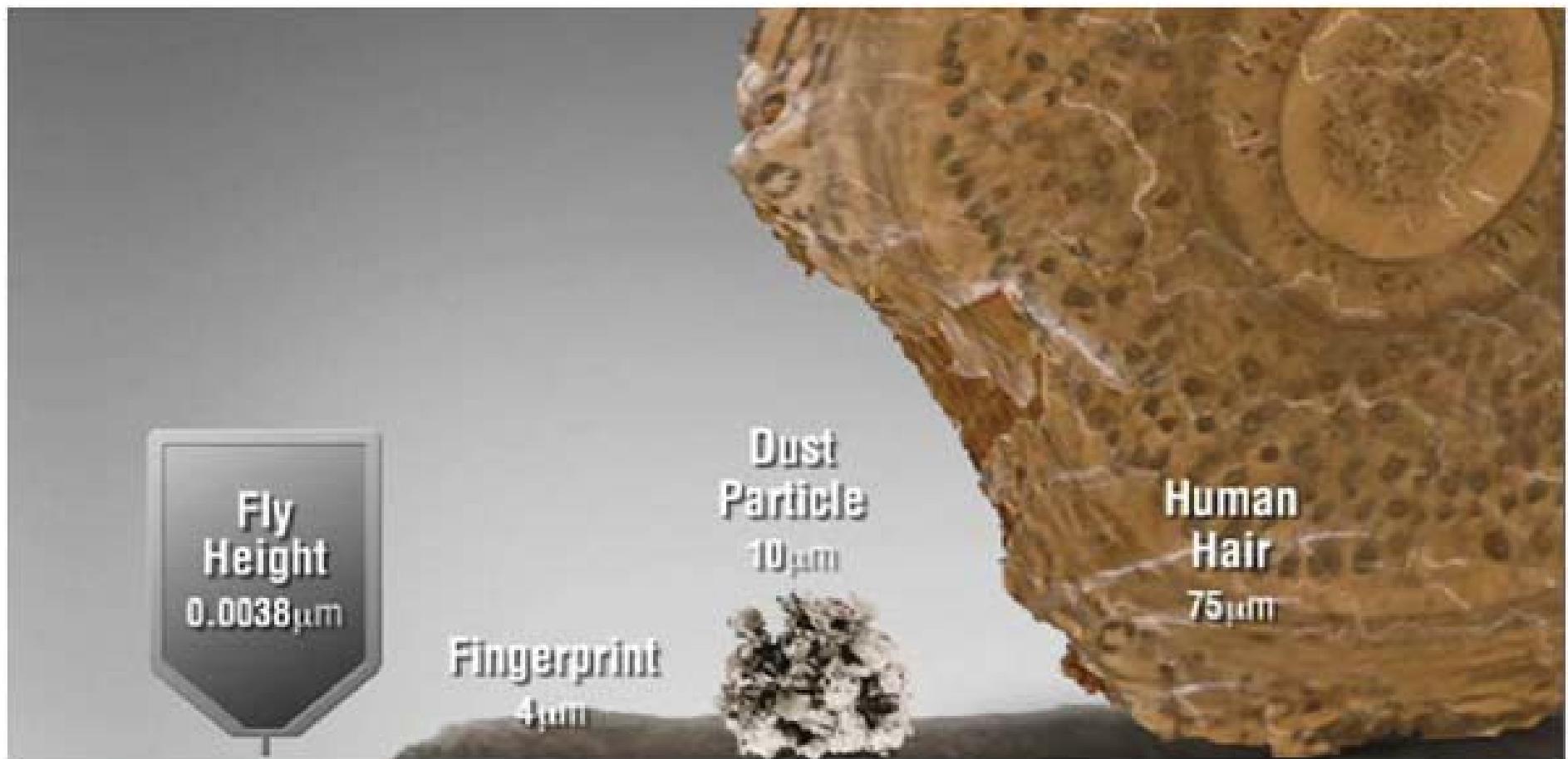


Head size evolution

Year	Areal Density Gbits/in ²	Bit Pitch μm	Track pitch μm
1991	0.132	0.431	11.3
1992	0.260	0.310	8.02
1993	0.354	0.292	6.23
1994	0.578	0.191	5.84
1995	0.829	0.189	4.12
1996	1.32 1.45	0.167 0.158	2.95 2.82
1997	2.51 2.68 3.12	0.126 0.131 0.114	2.03 1.85 1.81
1998	3.74 4.1 5.7	0.109 0.0991 0.0886	1.65 1.59 1.28
1999	10.1	0.0713	0.891
2000	14.5 17.1	0.0612 0.0562	0.726 0.668
2001	25.7 29.7 34	0.0504 0.0485 0.0477	0.498 0.448 0.391
2002	50	0.037	0.25
2003	~100	0.032	0.2
2004	~150	0.027	0.16



Head fly height



Hard Disks

