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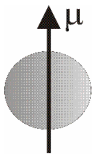
Introducere

Electronica = arta de a manipula electronul !

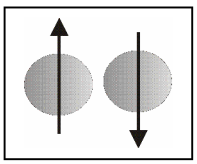
Electronul este o particula elementara cu sarcina negativa, $q = -1{,}6 \times 10^{-19} C$**, si cu un moment magnetic** $\mu = 1/2\mu_B$

Particola	*Simbol*	*Semn*	*Masa (Kg)*	*Sarcina (C)*	*Spin (h/2π)*
electron	e	negativ	$9{,}11 \times 10^{-31}$	$1{,}6 \times 10^{-19}$C	1/2

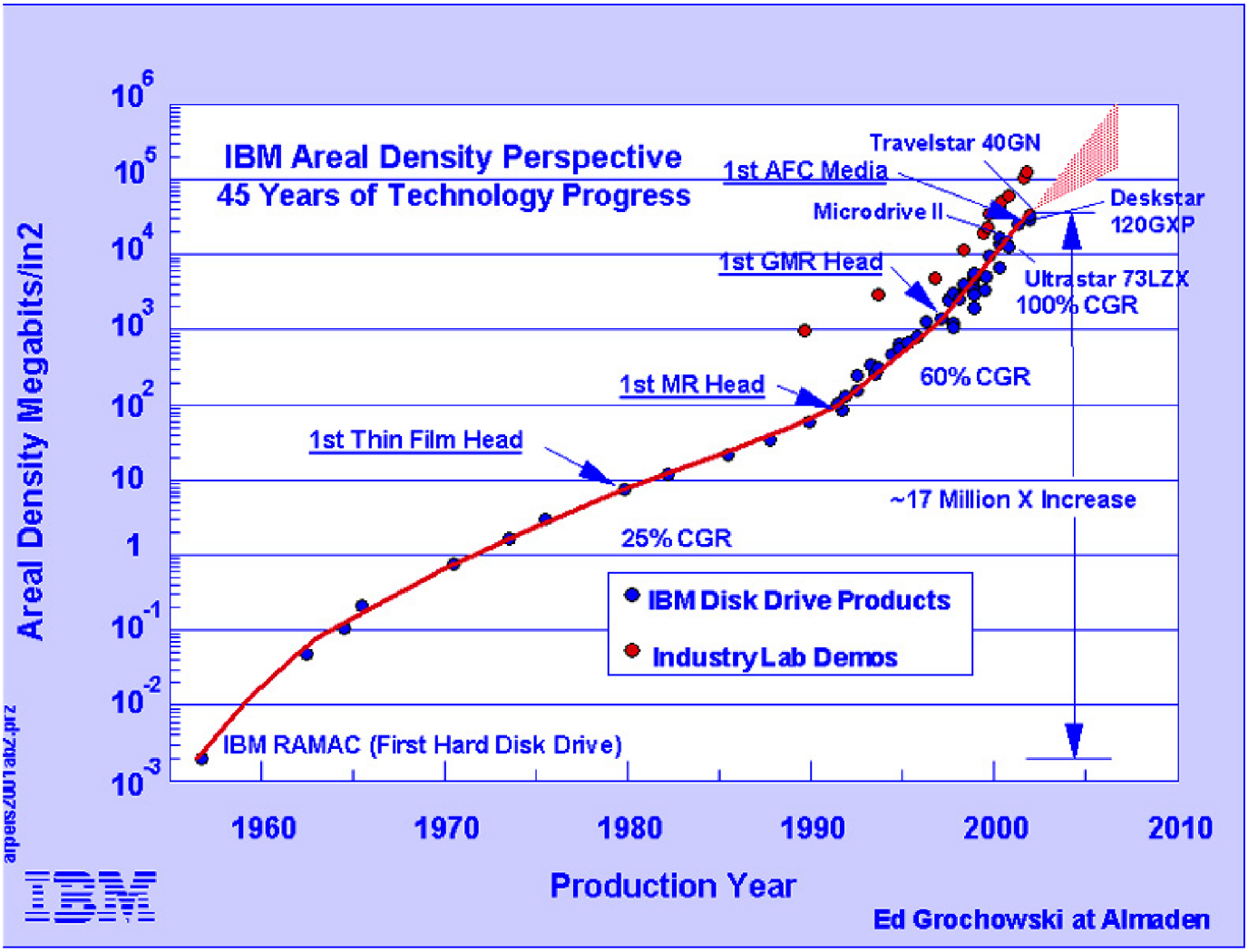
Manipularea sarcinii electronului= electronica conventionala



Manipularea spinului electronului = spintronica



Manipularea a unei perechi de electroni cu spinii opusi= electronica supraconductoare


IBM Areal Density Perspective
45 Years of Technology Progress
Areal Density Megabits/in2
Production Year
Travelstar 40GN
1st AFC Media
Microdrive II
Deskstar
120GXP
1st GMR Head
Ultrastar 73LZX
100% CGR
1st MR Head
60% CGR
1st Thin Film Head
~17 Million X Increase
25% CGR
IBM Disk Drive Products
Industry Lab Demos
IBM RAMAC (First Hard Disk Drive)
Ed Grochowski at Almaden

Mecanica cuantica

Dualitatea corpuscul-unda

Ecuatiile lui de Broglie:

$$h\nu = \frac{mv^2}{2}; \lambda = \frac{h}{p} = \frac{h}{mv}$$

Ecuatia lui Schrödinger:

$$-\frac{\hbar^2}{2m}\frac{\partial^2\Psi(x)}{\partial x^2} + [\mathrm{U(x)-E}]\Psi(x) = 0$$

Mecanica clasica

$$F = m\frac{d^2x}{dt^2} = ma$$

$$p = mv; \frac{dp}{dt} = F(x) = -\frac{dV(x)}{dx}$$

$$E = \frac{mv^2}{2} = \frac{p^2}{2m}$$