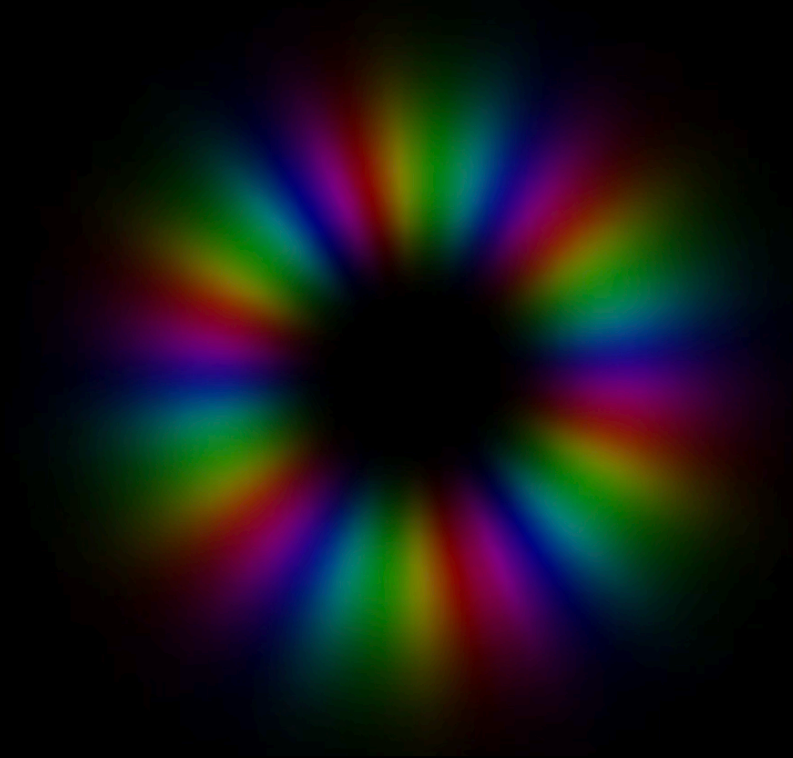




UNIVERSITÀ
DI TRENTO

Dipartimento di
Fisica



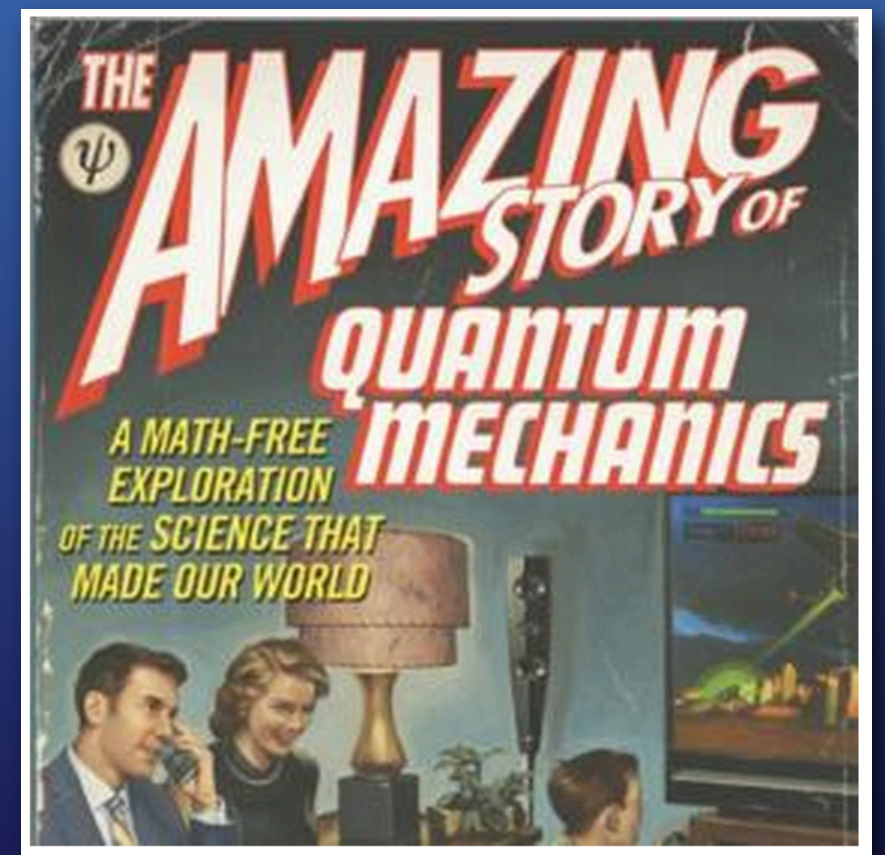
Elementi di Fisica Moderna

2025

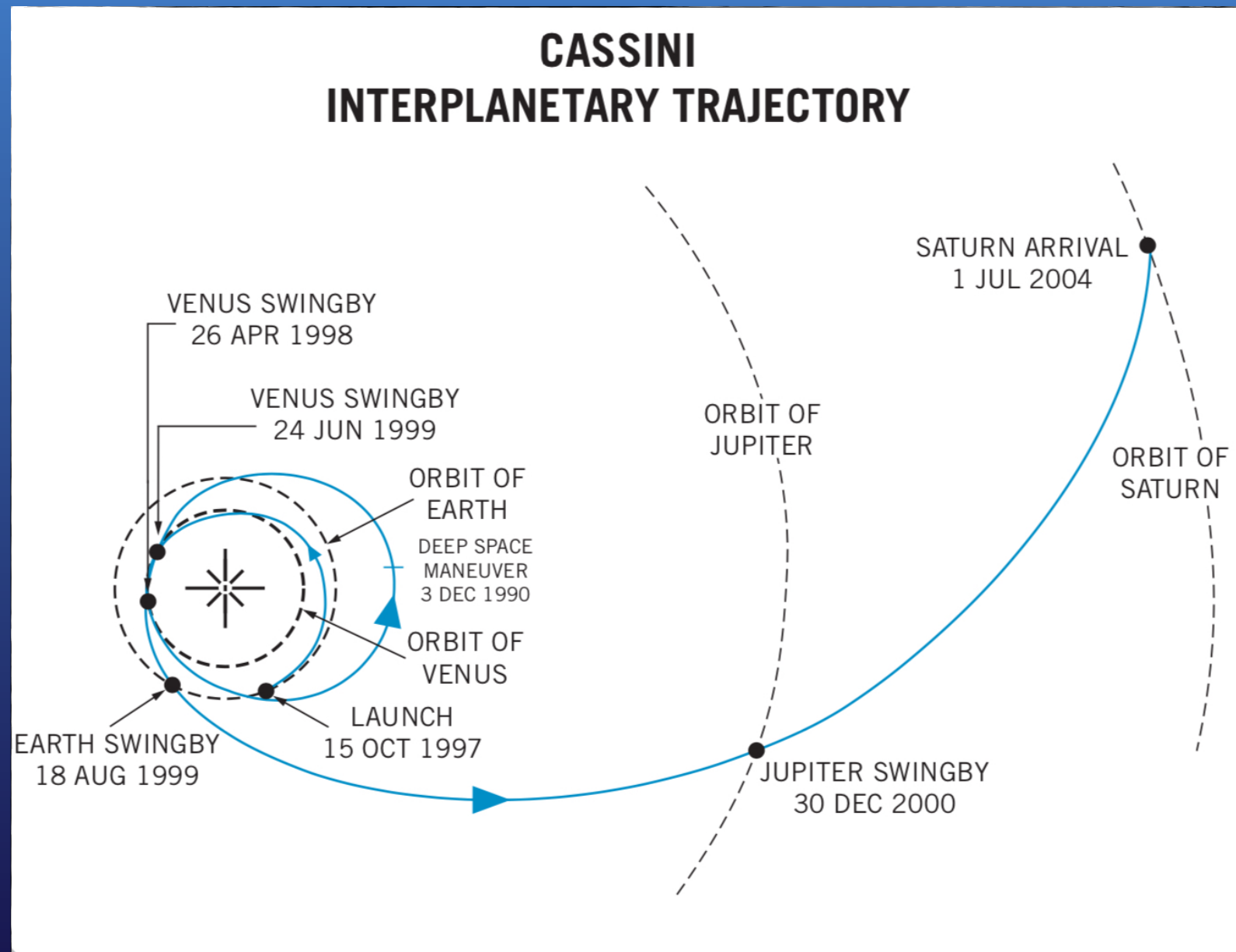
[& intelligenza artificiale]

un corso di fisica « moderna » :
un mondo quantistico &
relativistico !

- Non solo
Conoscenza
- Non solo Tecnologia



Successi (indiscutibili) della fisica classica



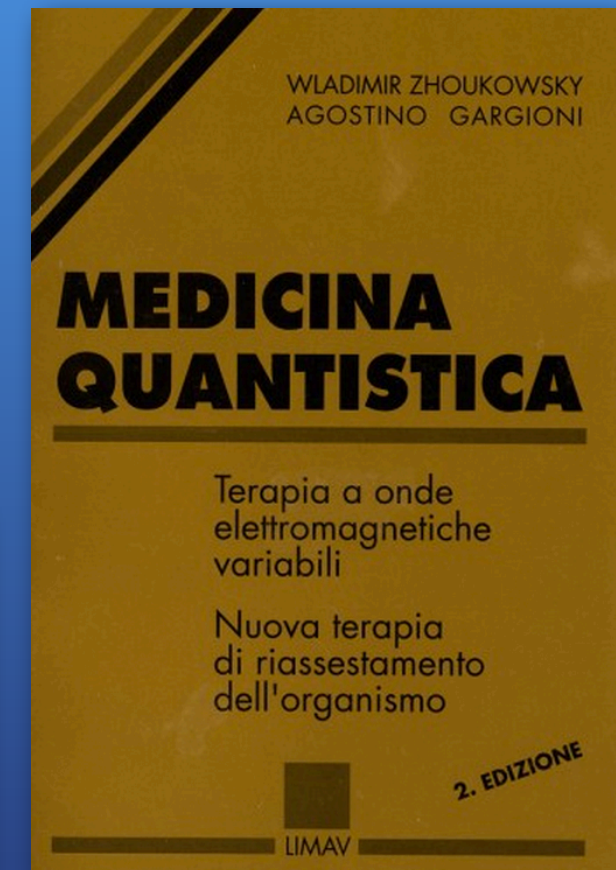
di cosa parlare

- Industria
- Spettroscopia
- Medicina
- Microscopia
- Informatica
- Elettronica
- Navigazione



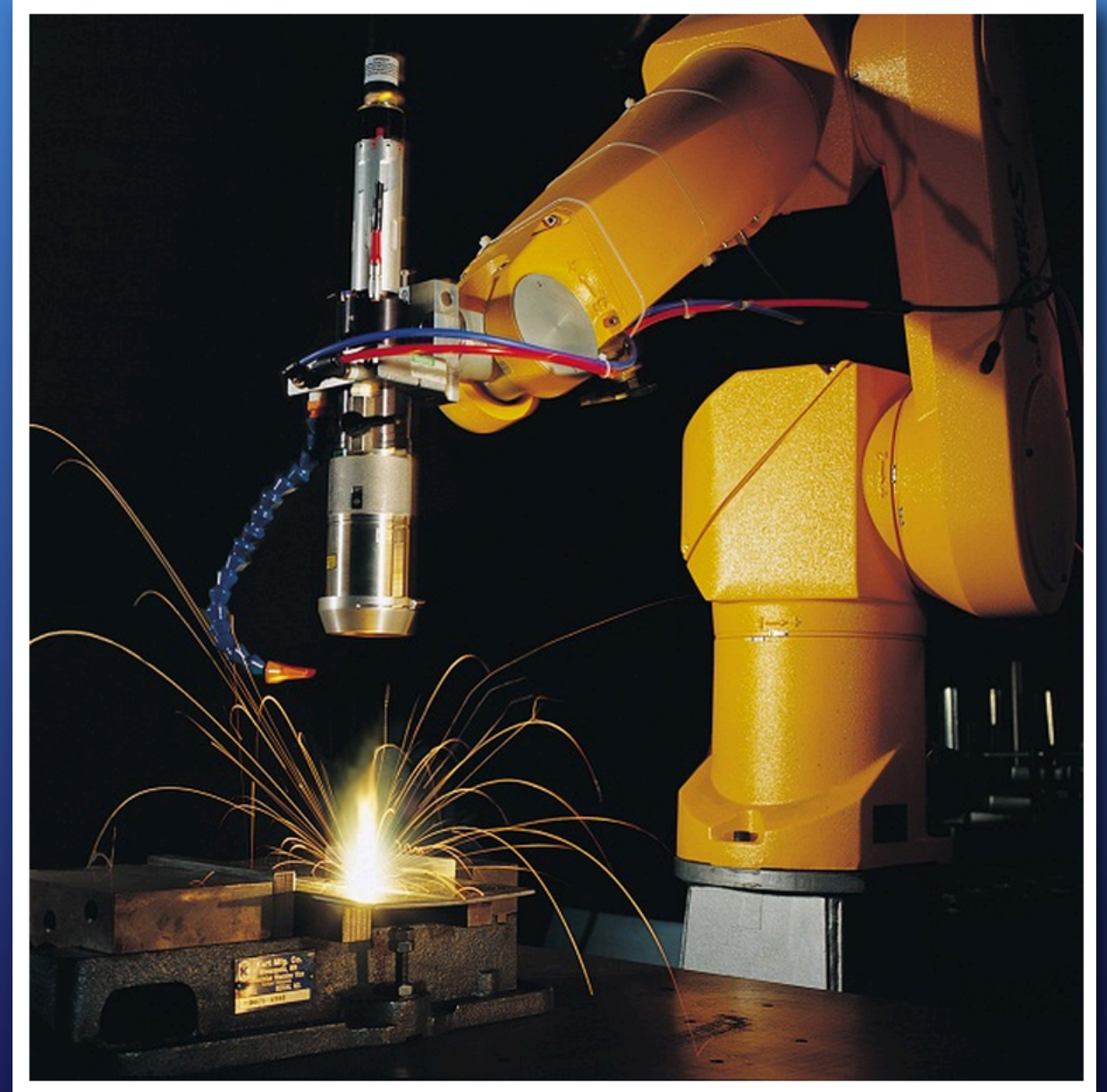
Filosofia della Scienza

di cosa NON parlare (bene)



INDUSTRIA

Light
Amplification
by
Stimulated
Emission
of Radiation



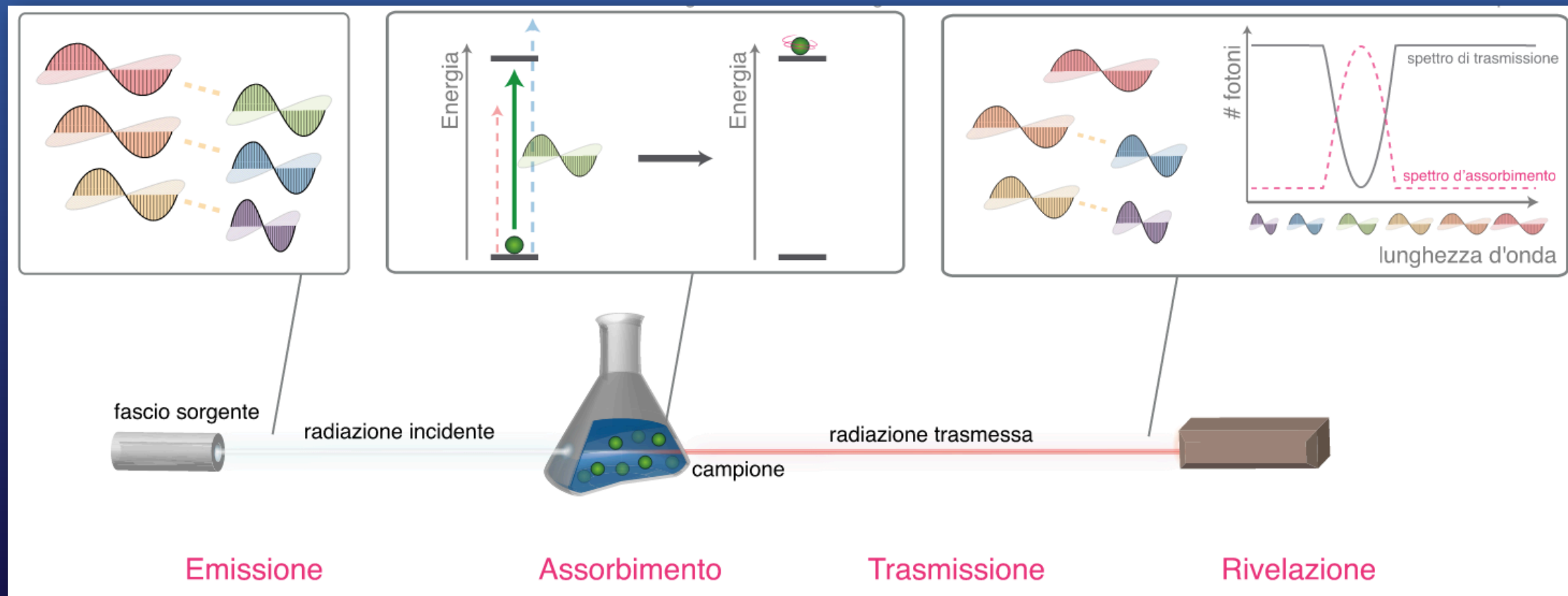
Spettroscopia

Atomica

Molecolare

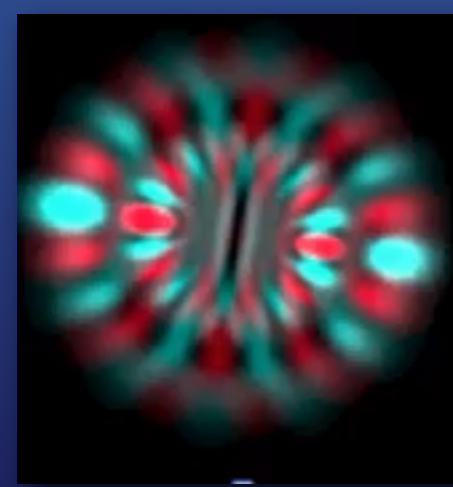
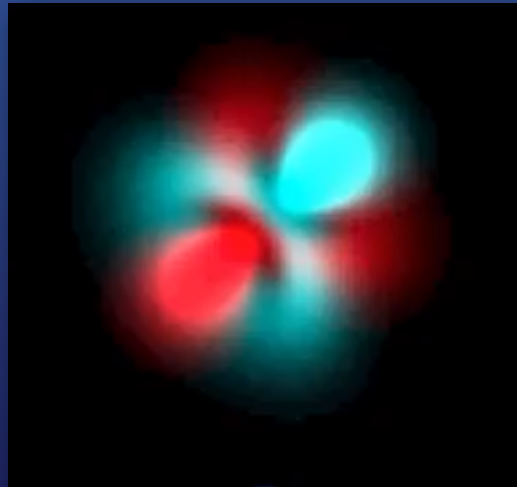
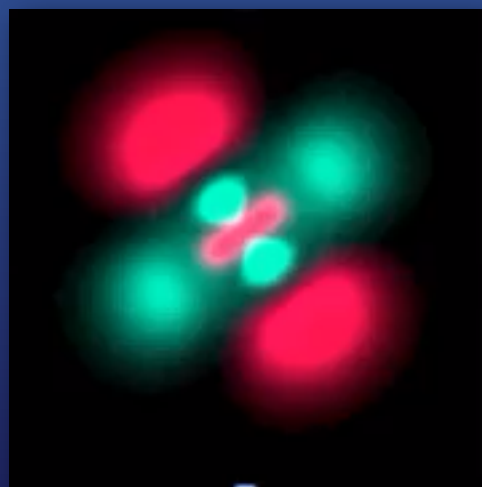
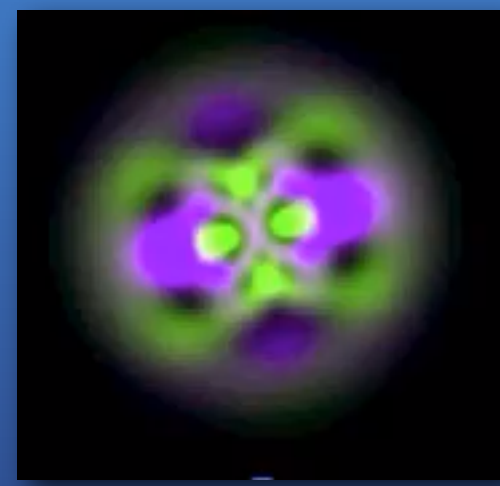
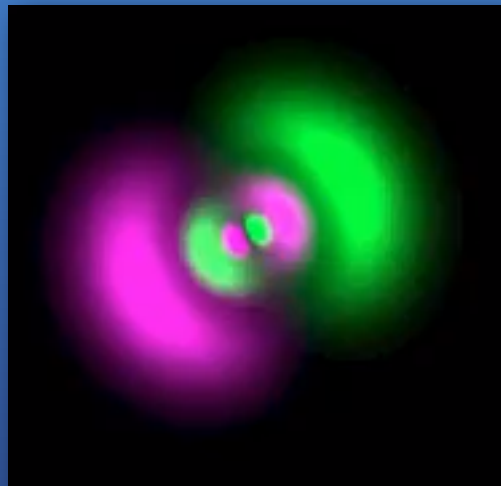
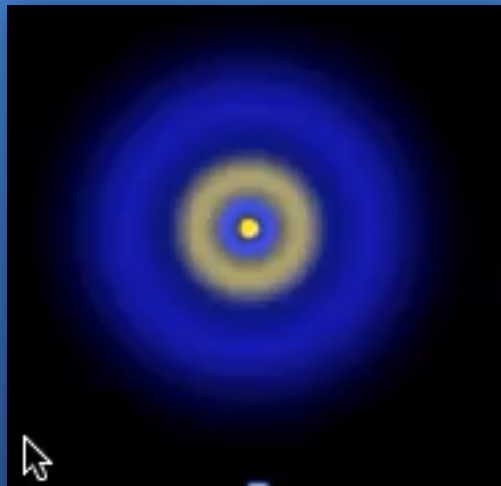
Nucleare

Subnucleare



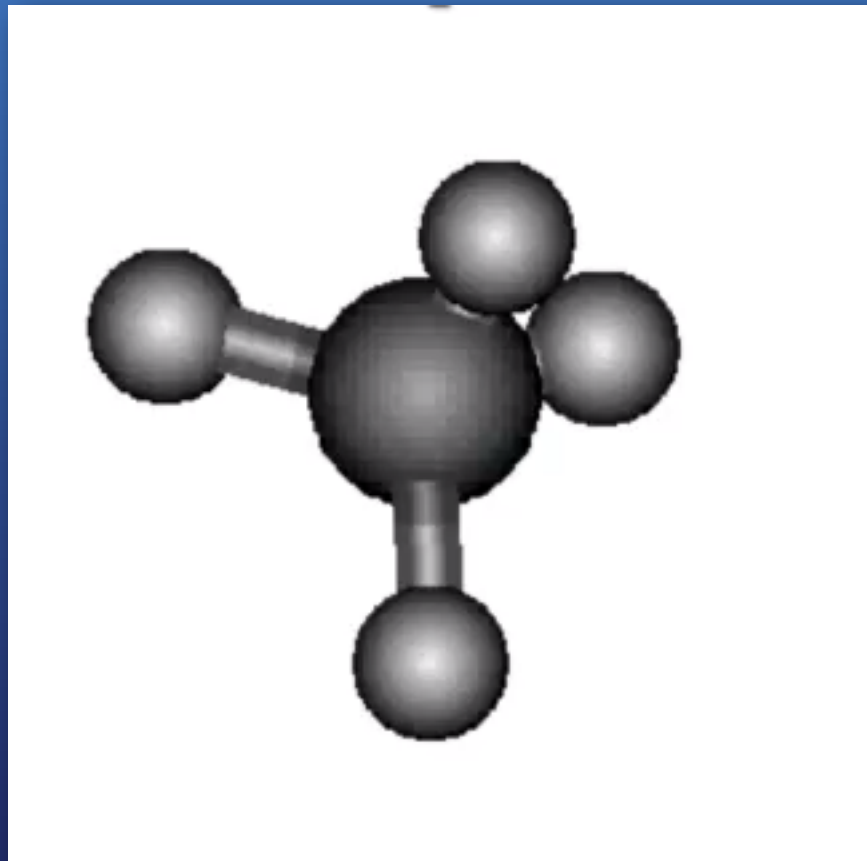
Spettroscopia

Atomica



Spettroscopia

Molecolare (rotazioni)



MEDICINA

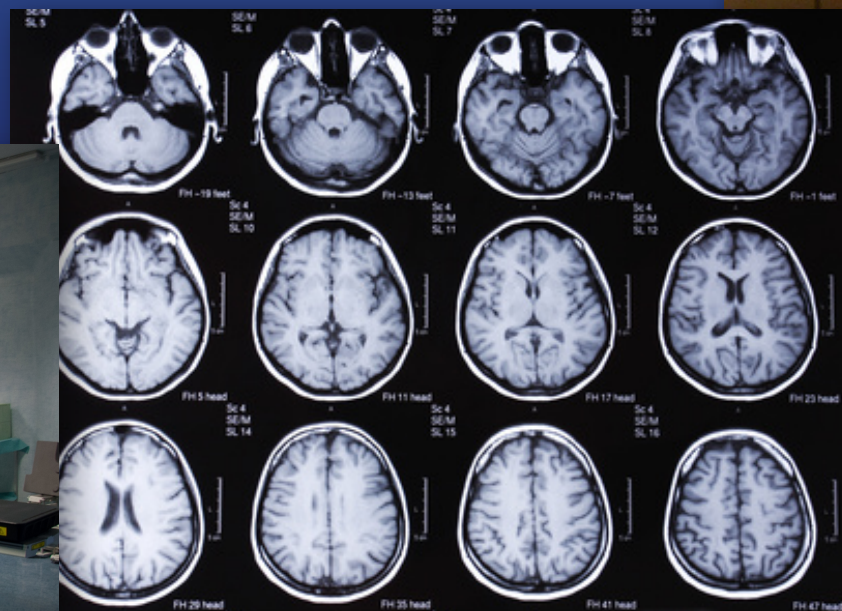
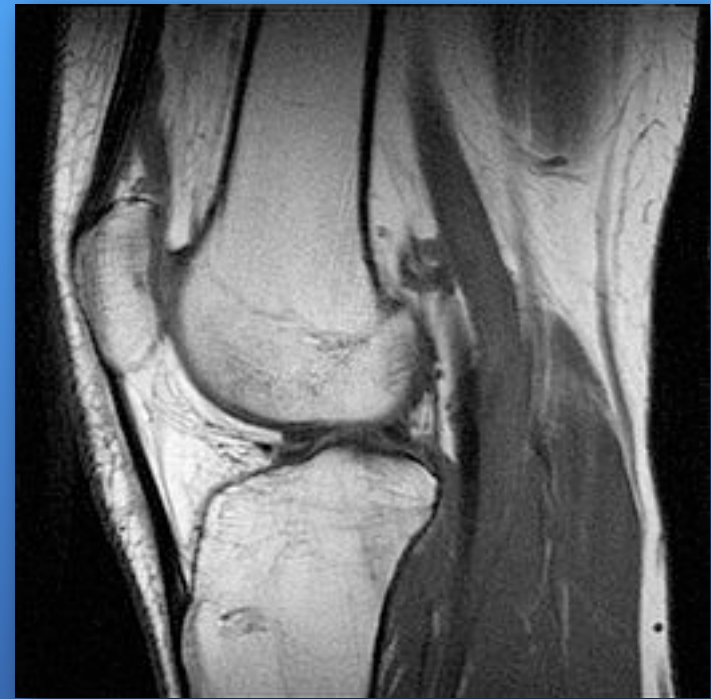
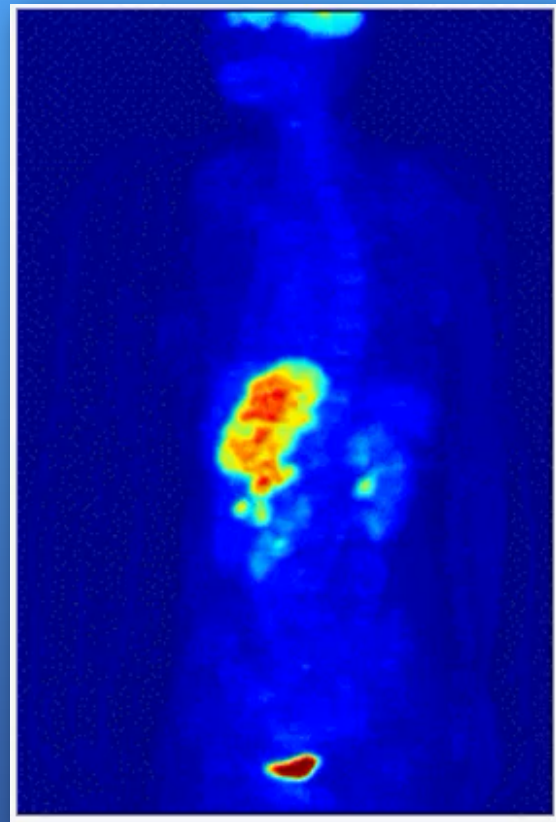
Diagnostica
e Terapie

Laser

NMR e IRM

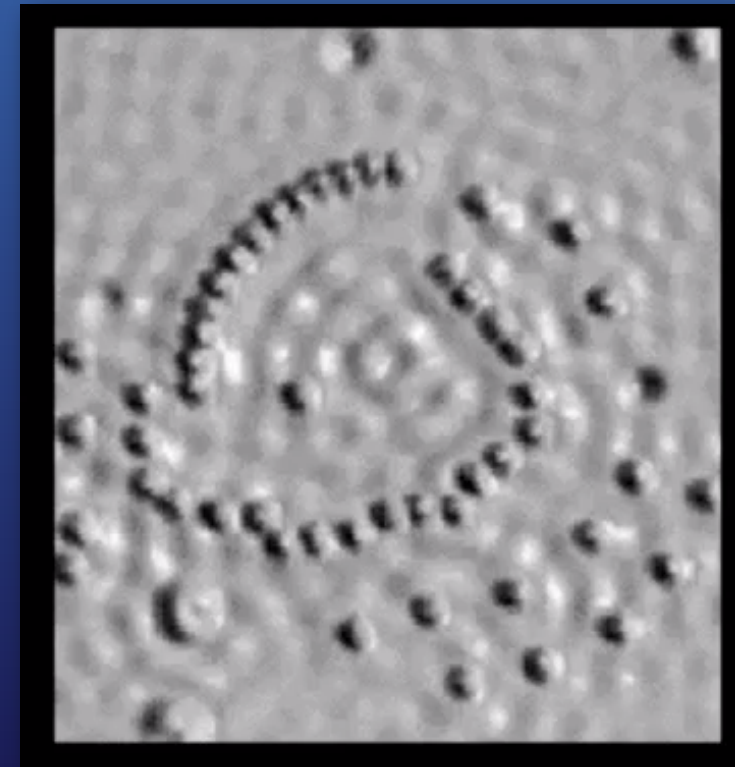
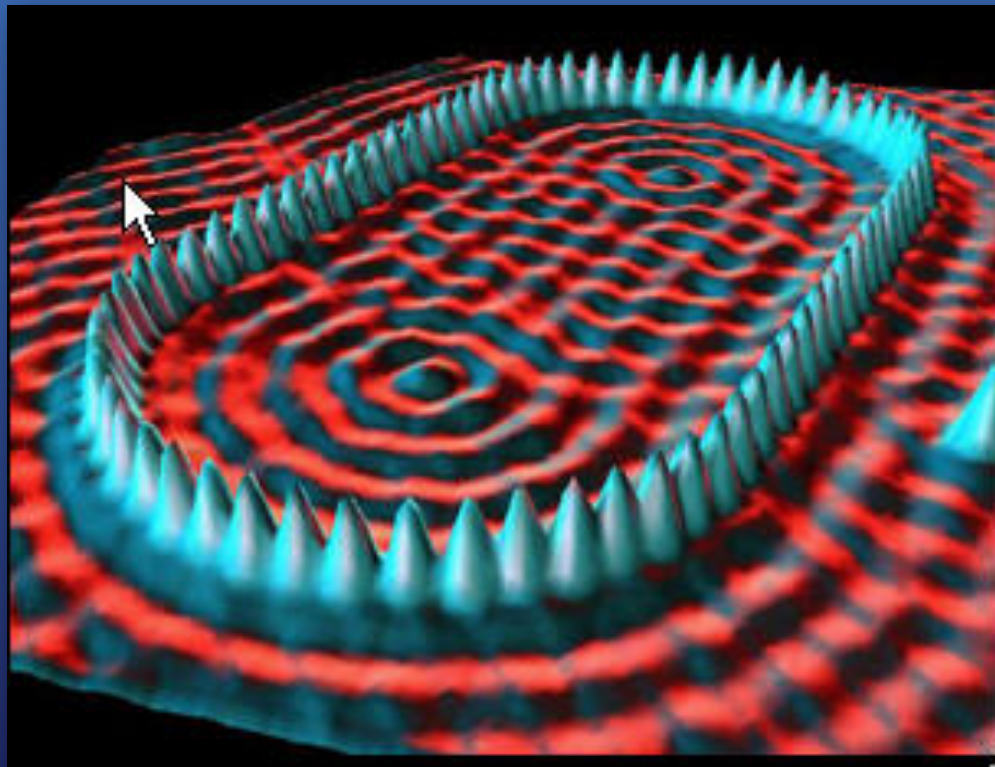
PET

Raggi X e TAC



SUPER MICROSCOPY

Effetto tunnel



ELETTRONICA

Transistor

Semiconduttori

giunzione PN

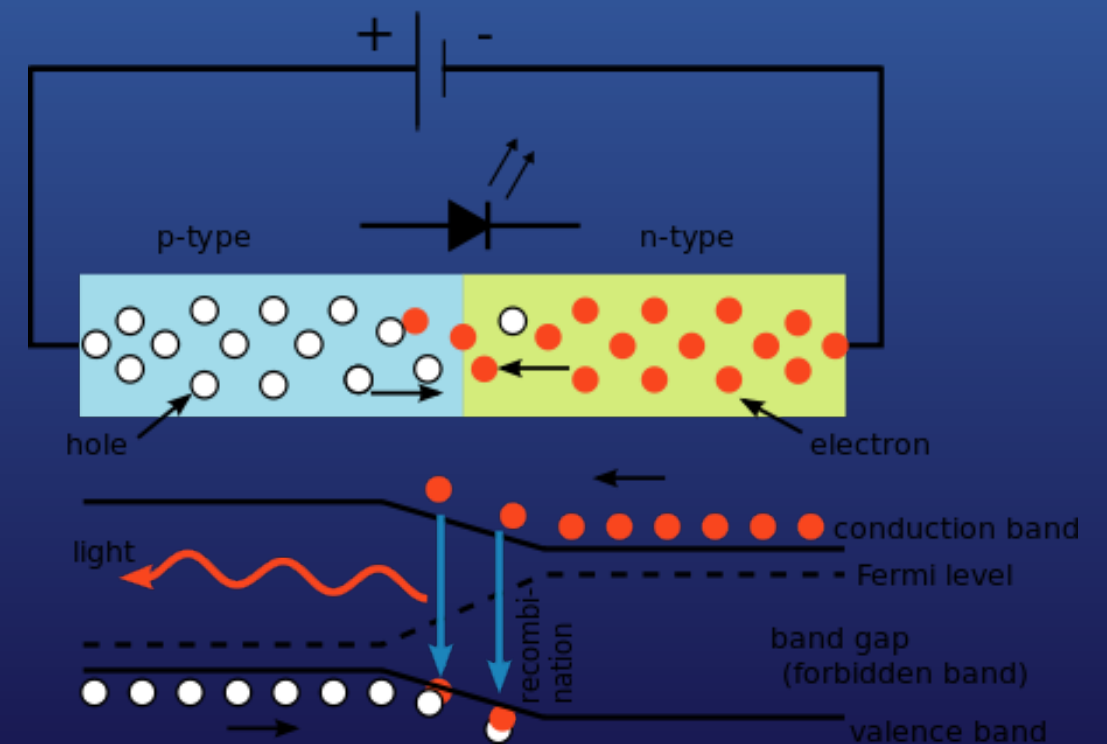
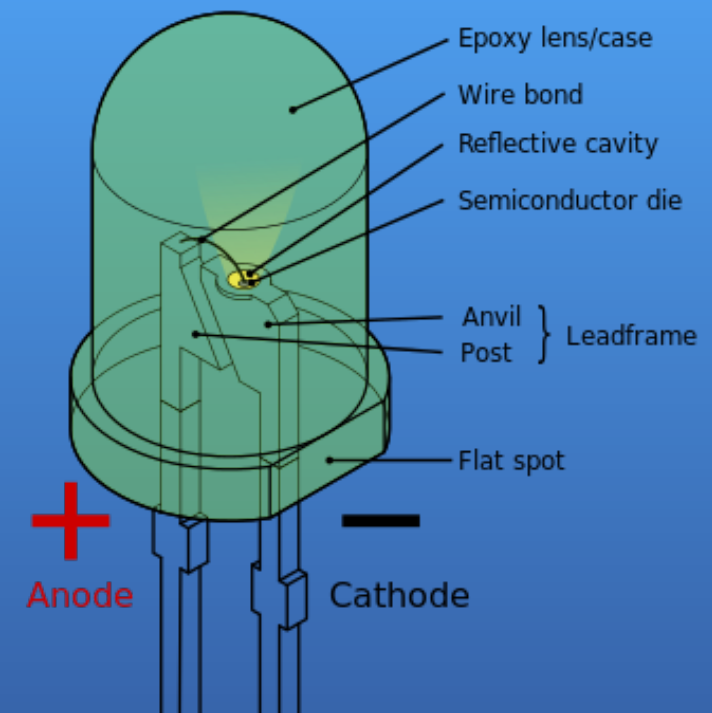
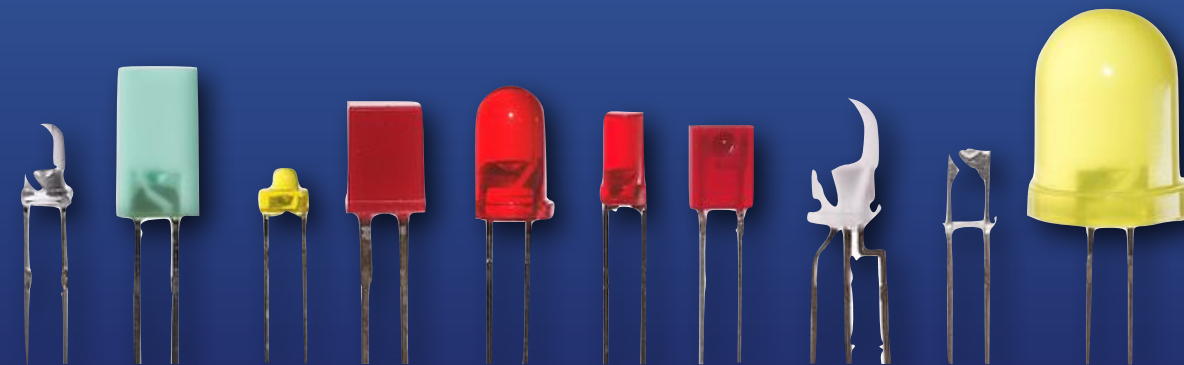
Integrazione a scala elevatissima



ELETTRONICA

Diodi LED

Semiconduttori giunzione PN



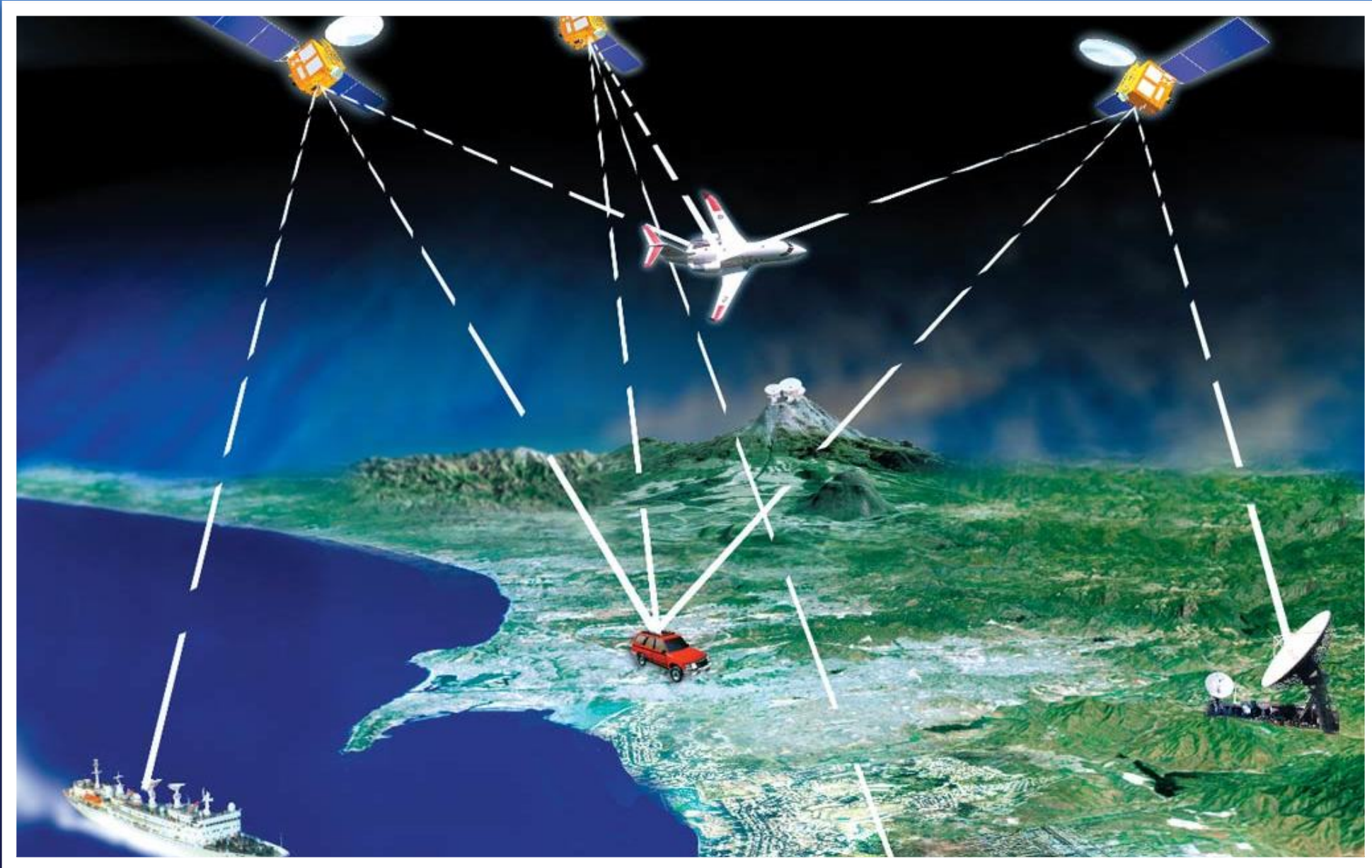
ELETTRONICA

Memorie Flash

Semiconduttori
giunzione PN



Le costellazioni GPS



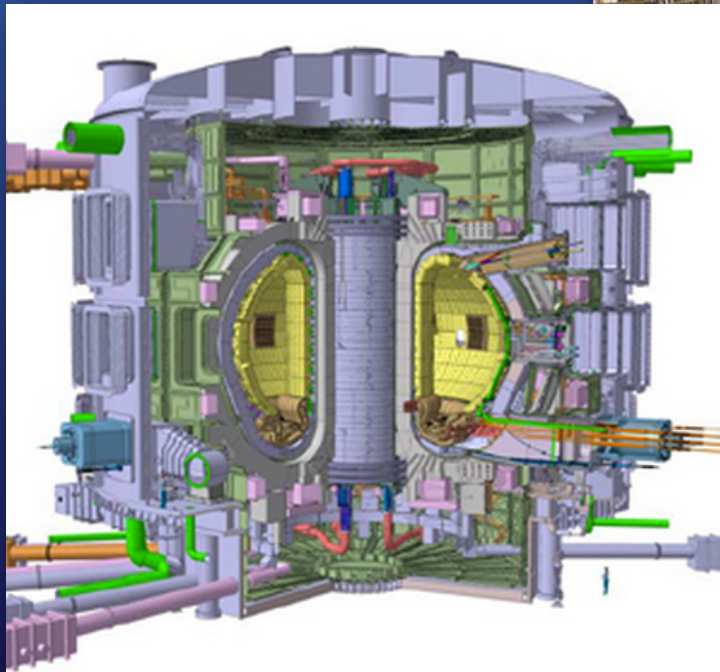
ENERGIA

Fotovoltaico

Fissione

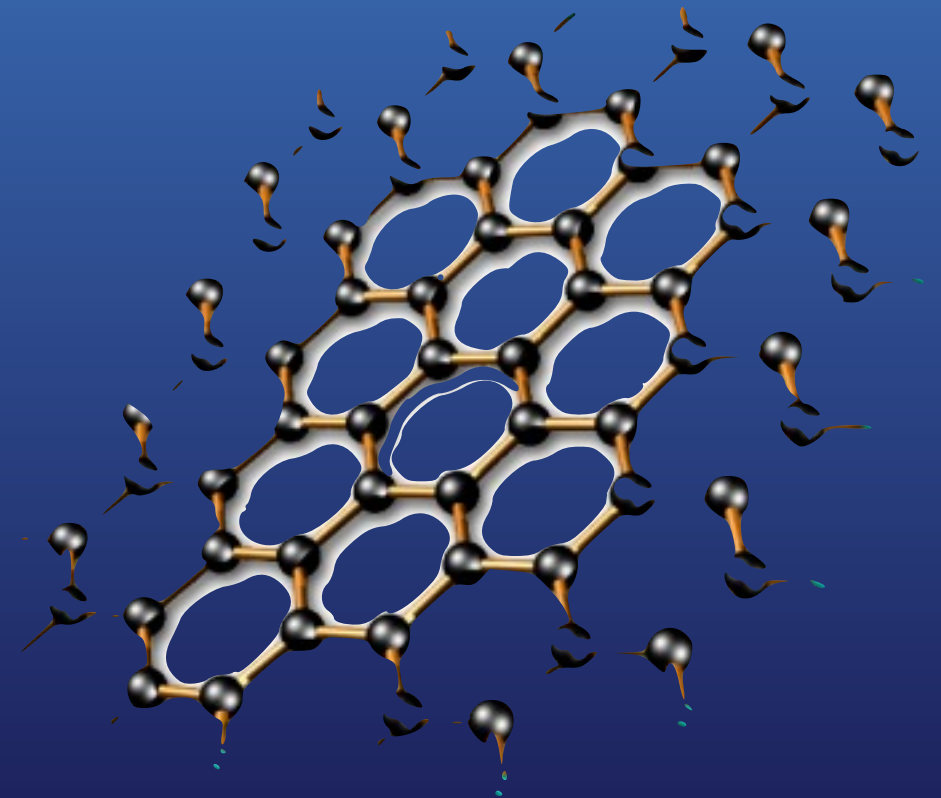
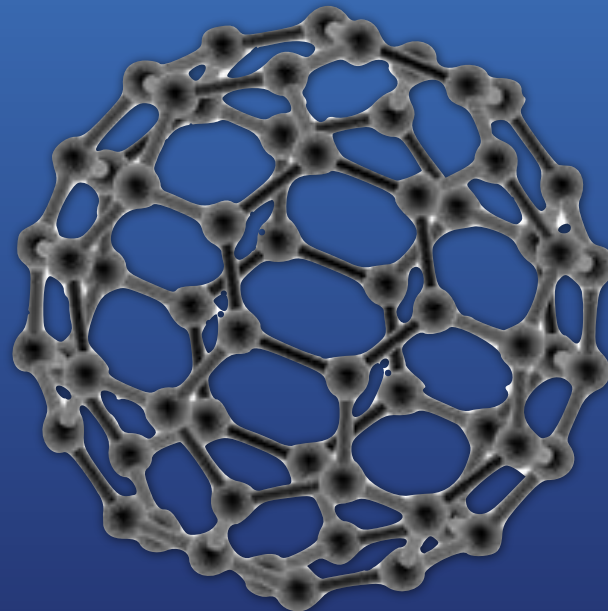
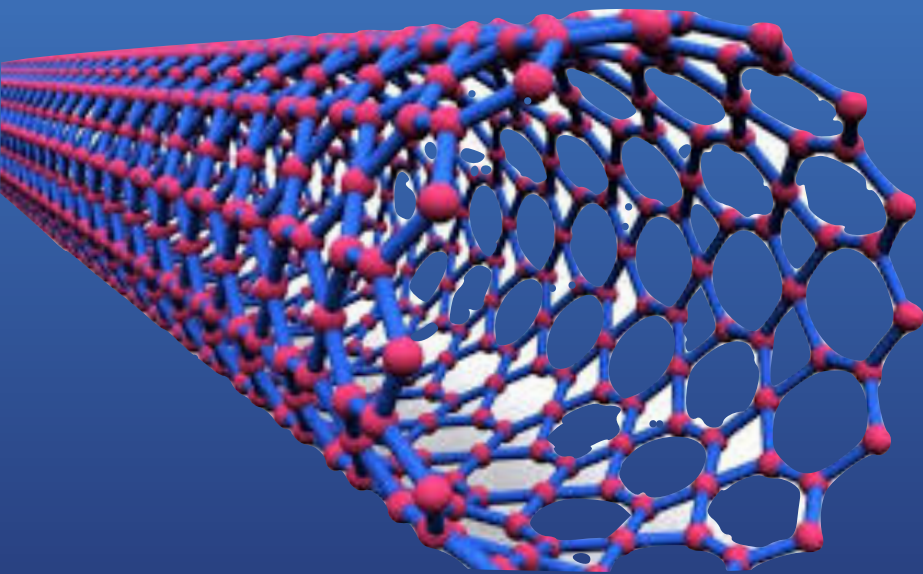
Fusione

Idrogeno



MATERIALI

Nano-Scienze e Nano-Tecnologie



E MOLTO ALTRO :

COME PARLARNE ?

$$i\hbar \frac{\partial \psi}{\partial t} = \mathcal{H} \psi$$

Piano dell'opera

① da Galilei a Einstein
(più veloci della luce)

② Luce: onda o particella?
[questo è - e resta - il problema...]

③ DUALISMO & INDETERMINAZIONE
[saperne moltissimo ma capirci poco...]

④ Atomi (quasi) invisibili e divisibili
[modelli quantistici della materia]

⑤ Fisica e chimica a braccetto
[la fabbrica delle meraviglie]
quantistica

⑥ Il Lego della fisica
[due, molti, moltissimi atomi...]

⑦ Nuclei atomici bollenti
[incredibilmente piccoli, densi,
pericolosi, indispensabili]