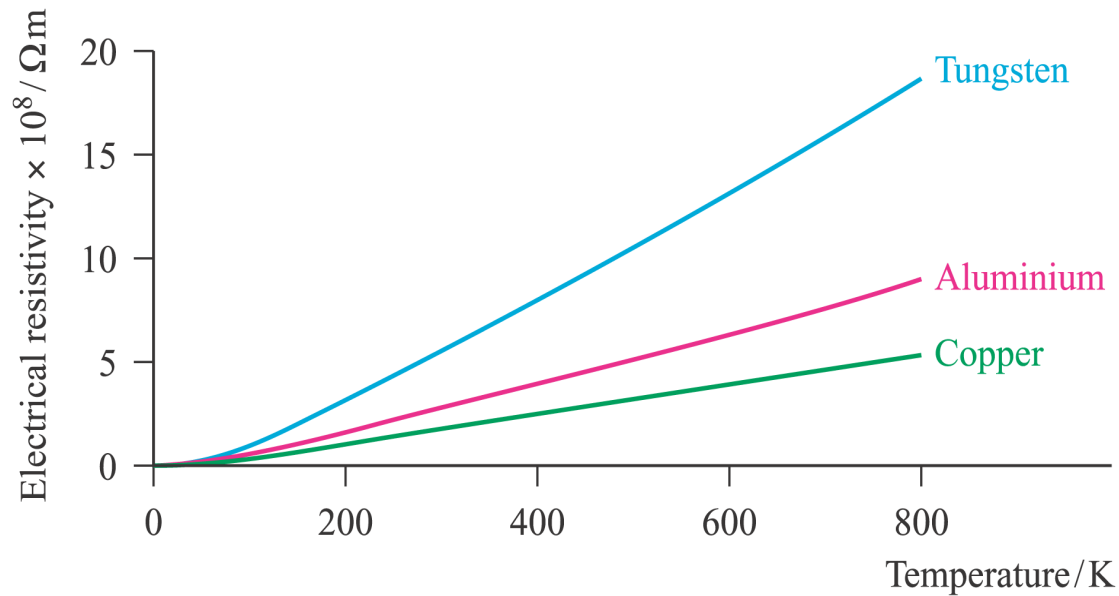
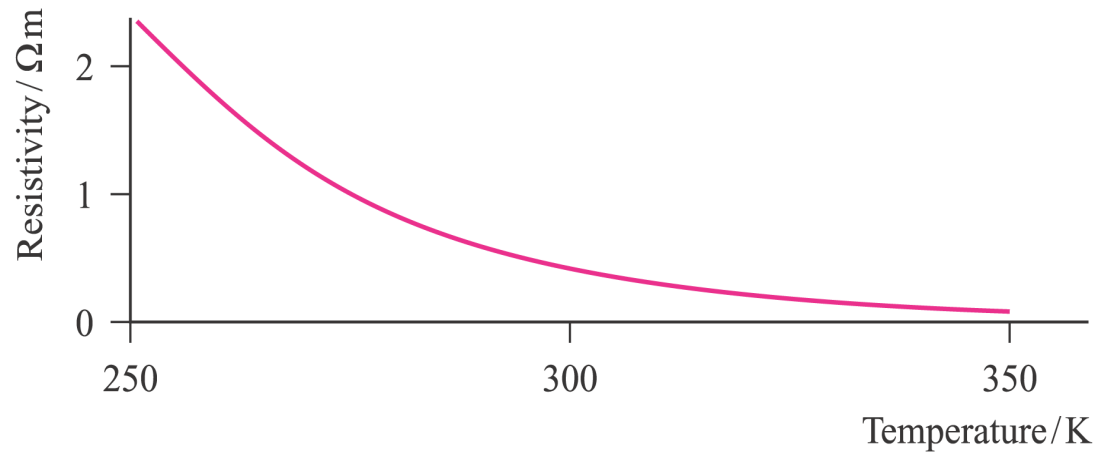
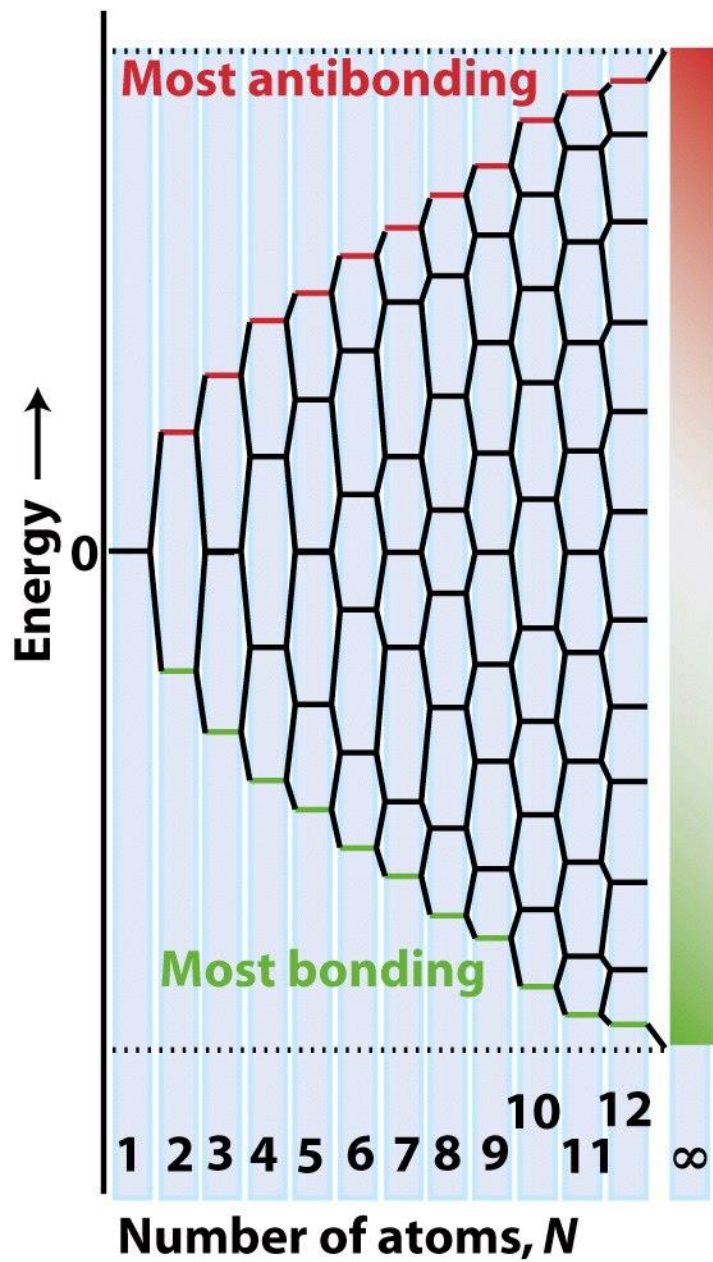


# Resistività di alcuni metalli in funzione della temperatura



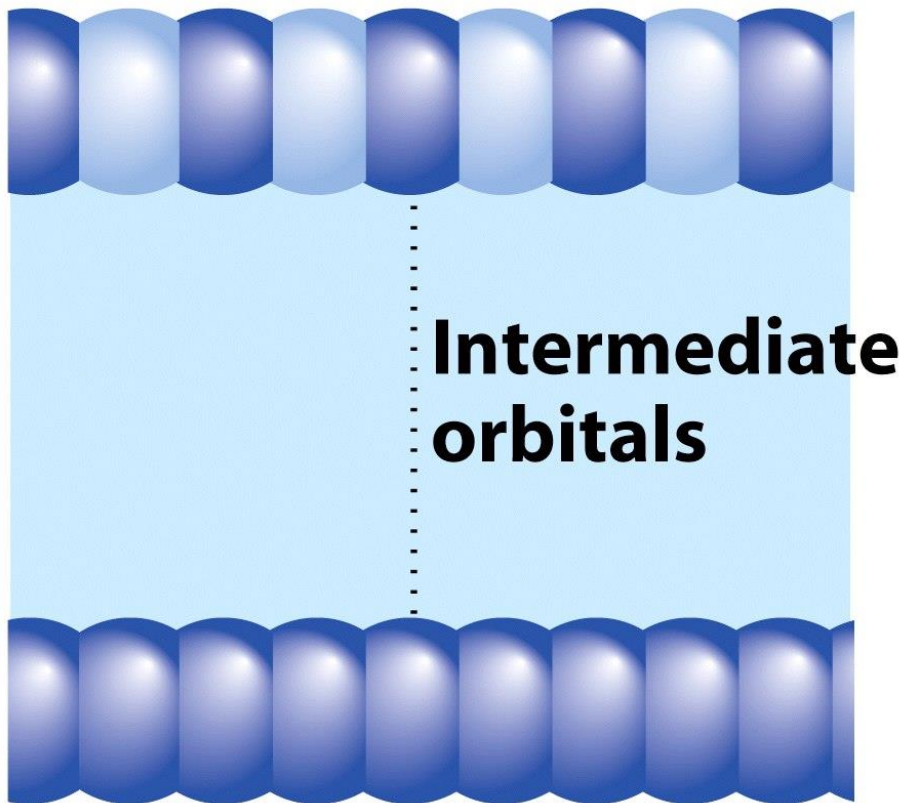
# Resistività del semiconduttore Ge in funzione della temperatura





## Banda s

**Most antibonding**

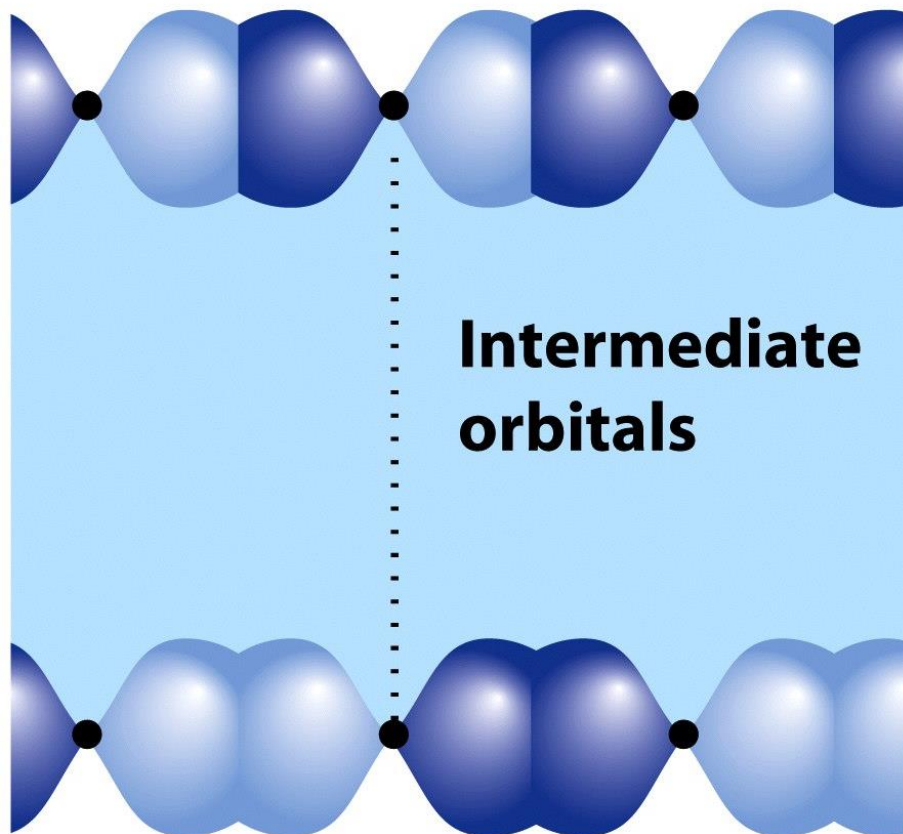


**Intermediate orbitals**

**Most bonding**

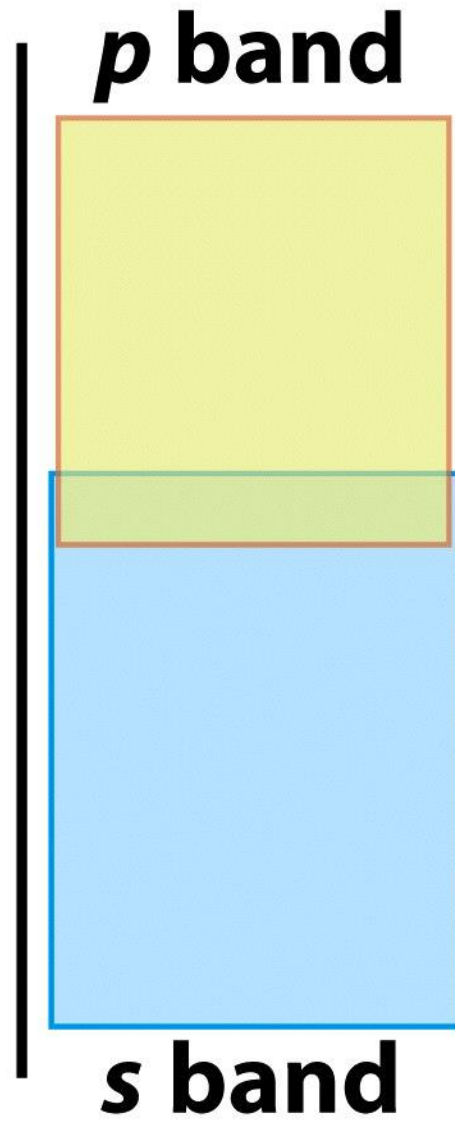
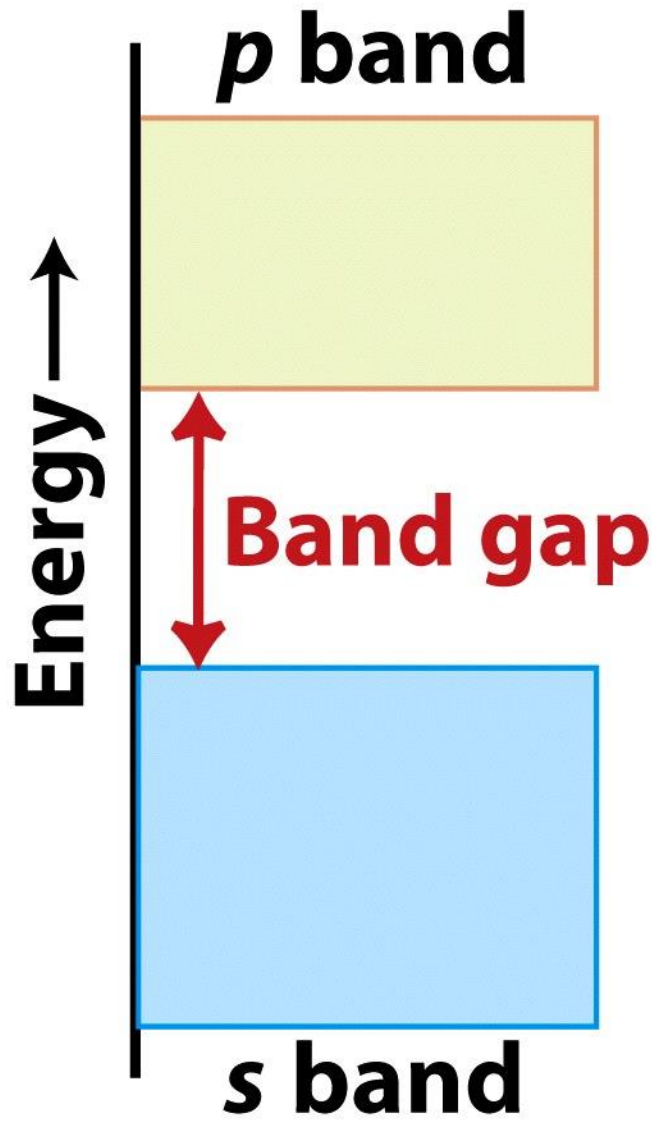
## Banda p

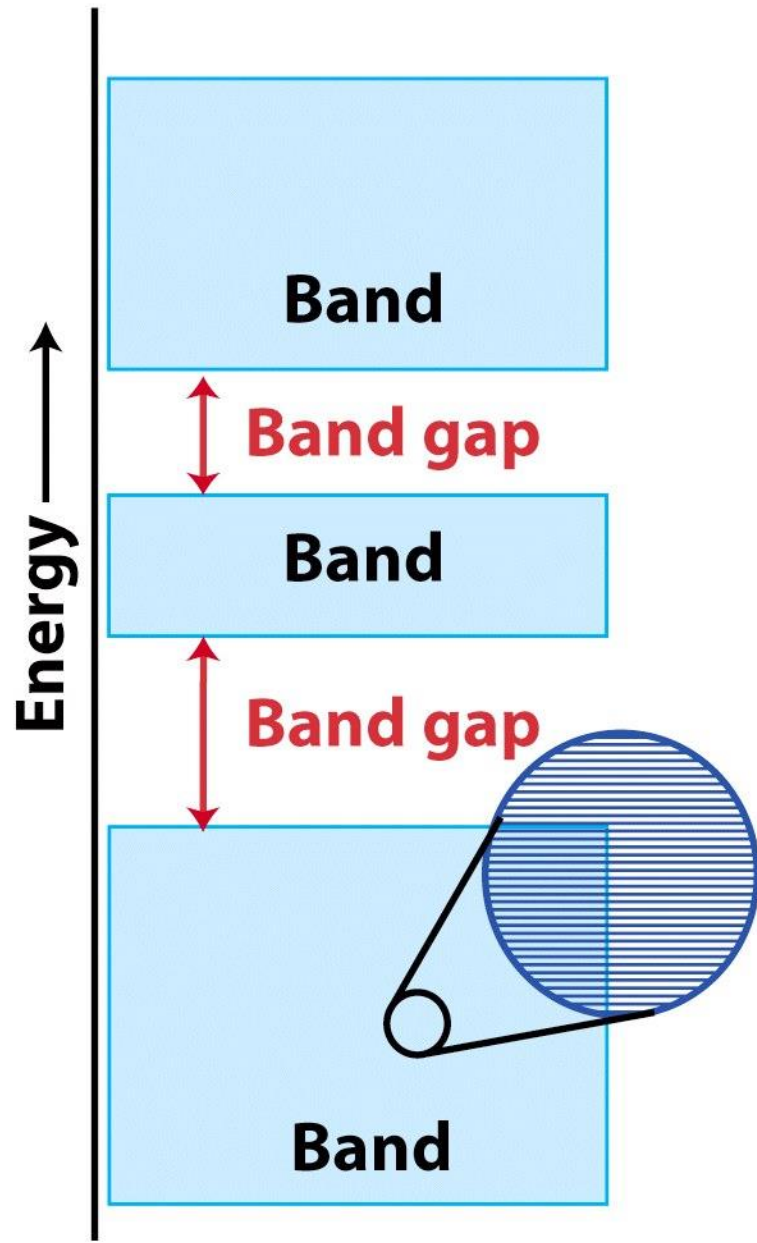
**Most antibonding**



**Intermediate orbitals**

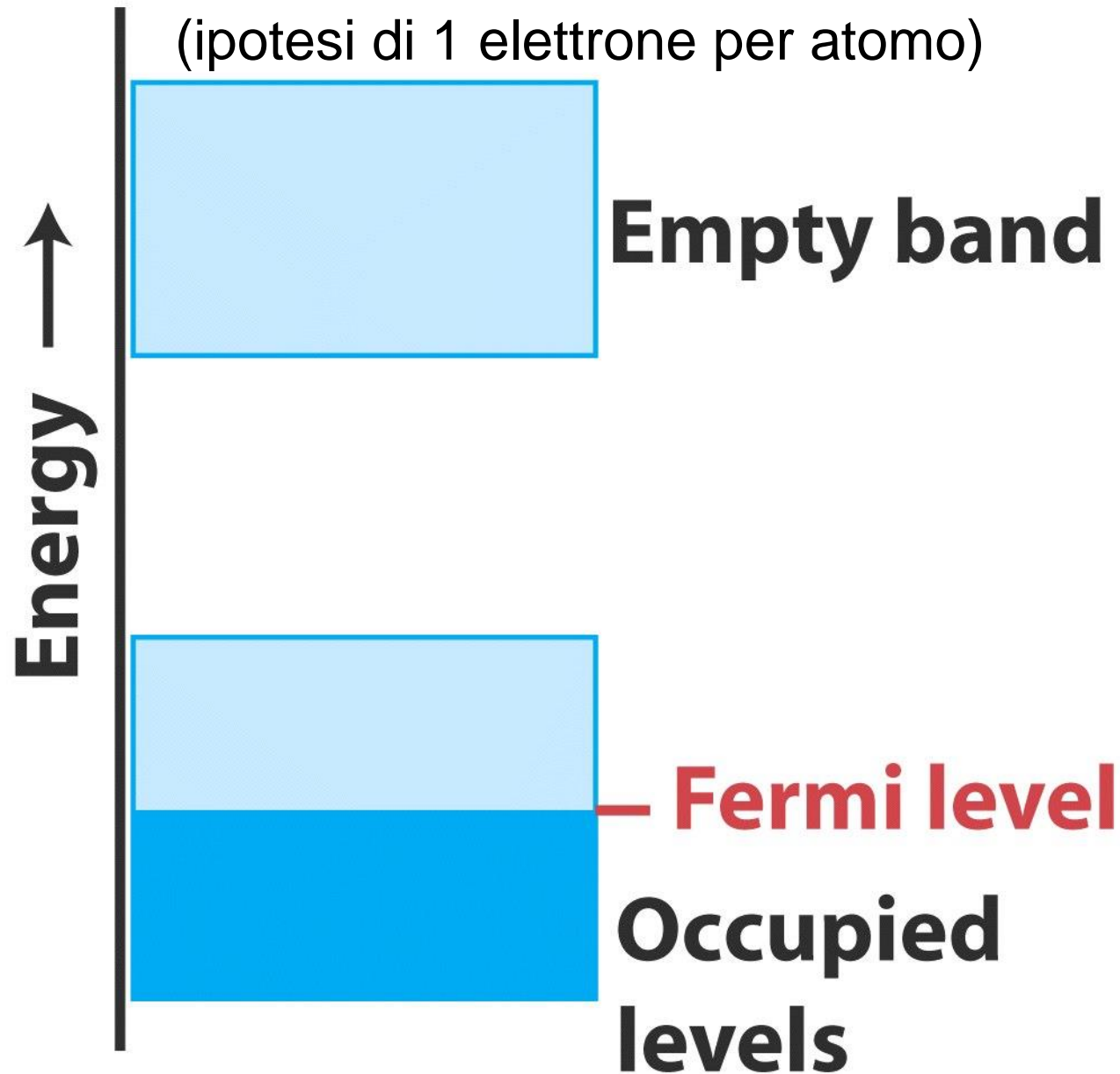
**Most bonding**





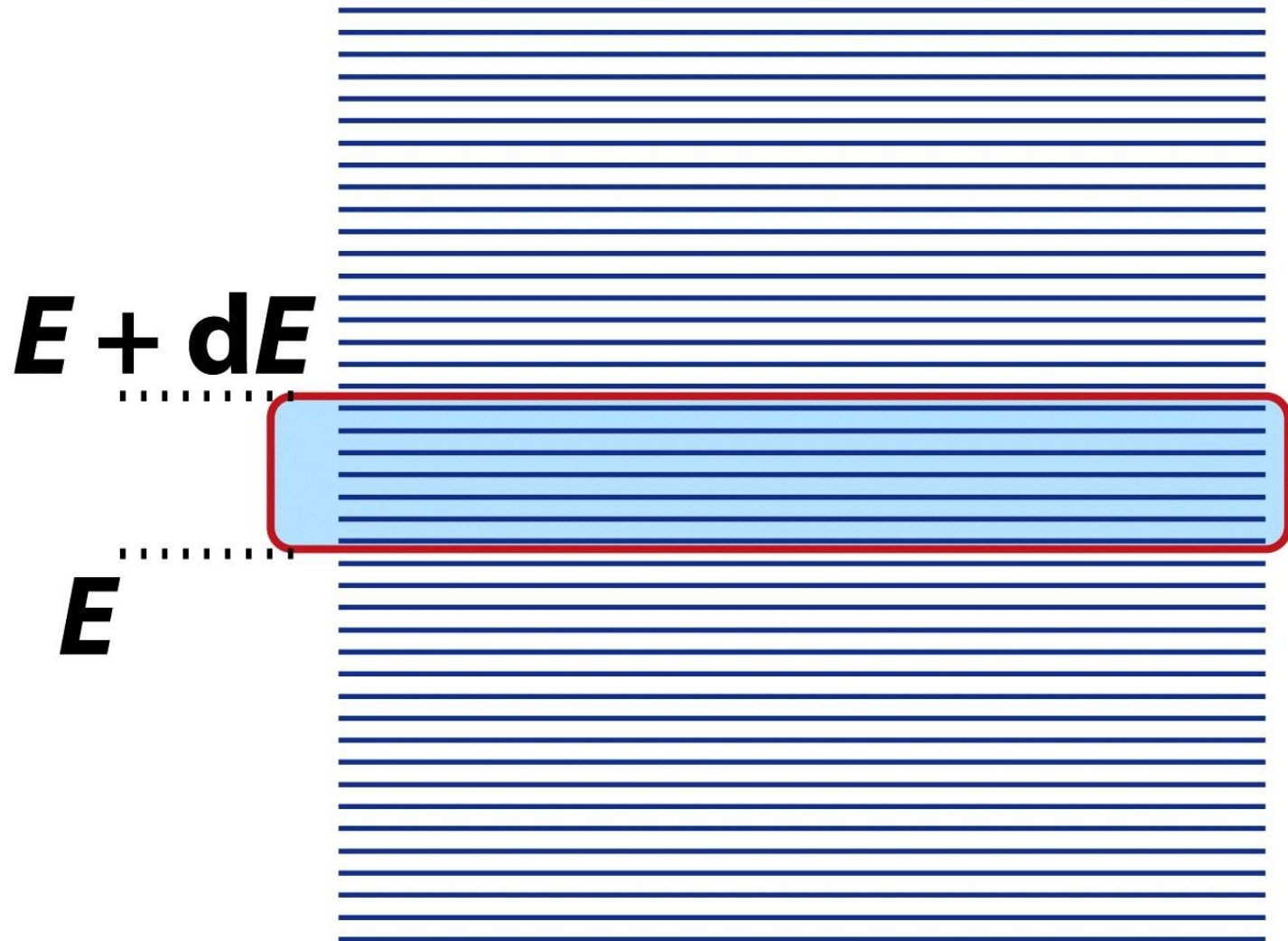
# Solido conduttore metallico

(ipotesi di 1 elettrone per atomo)

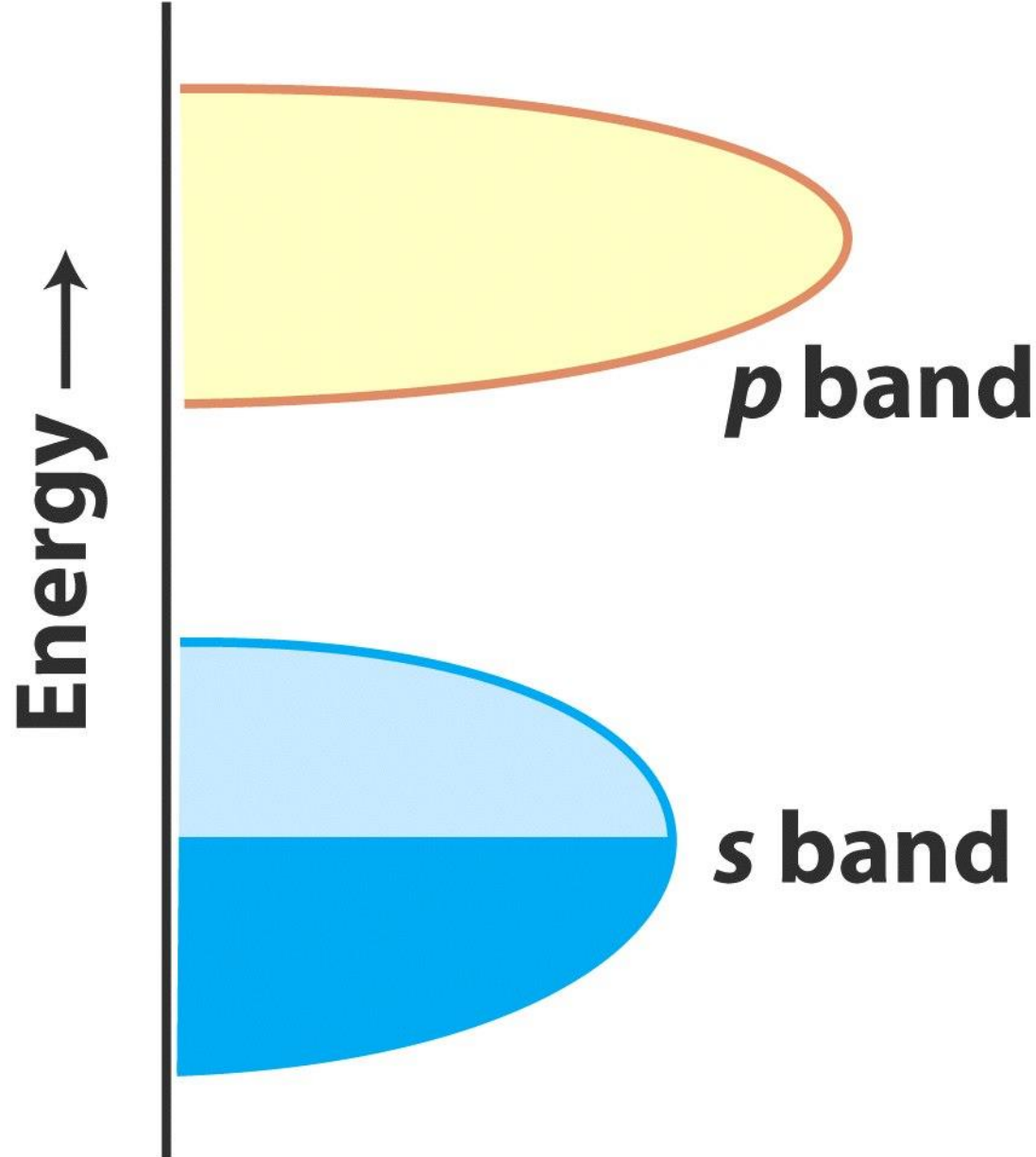




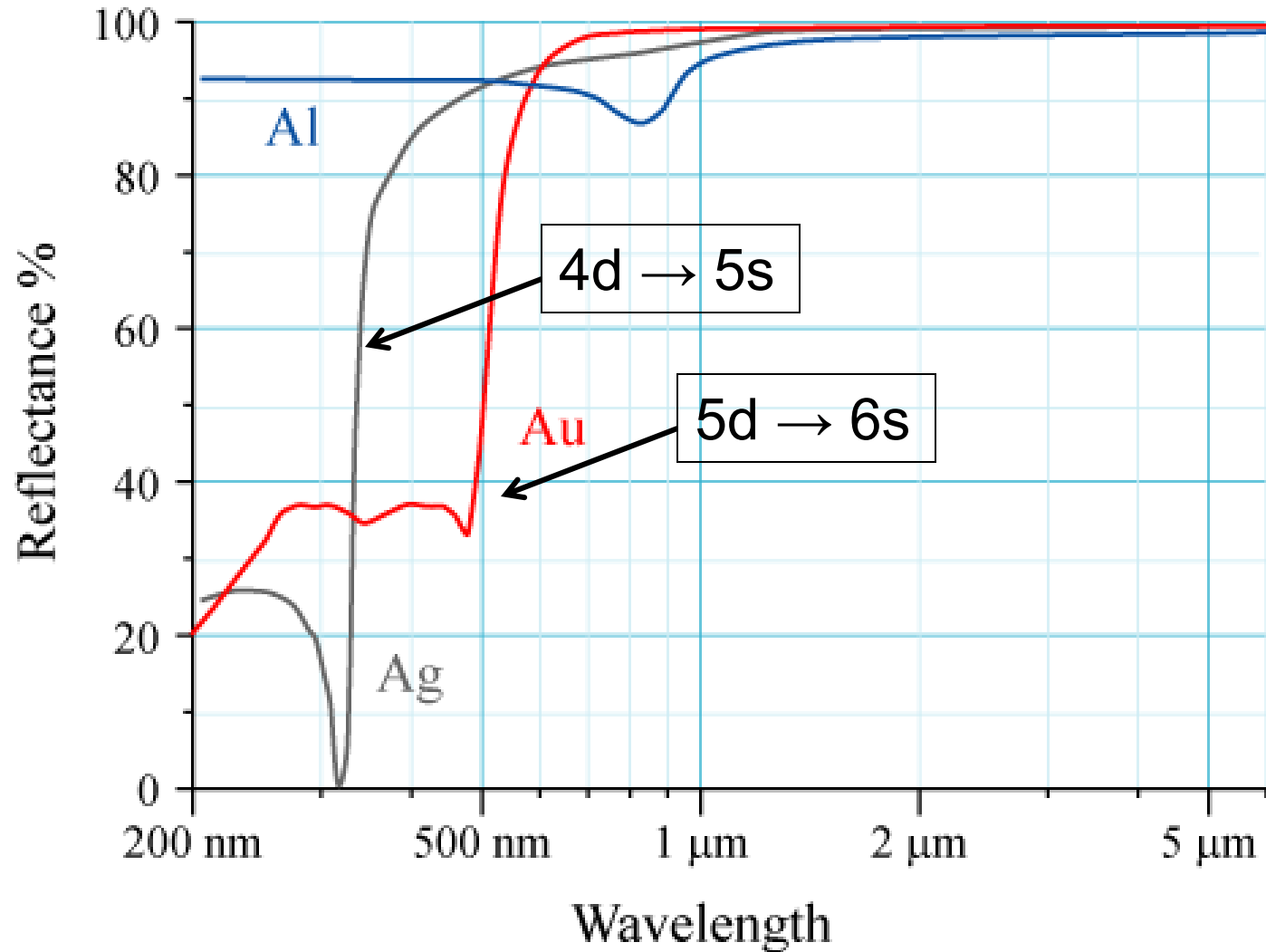
# Densità degli stati elettronici



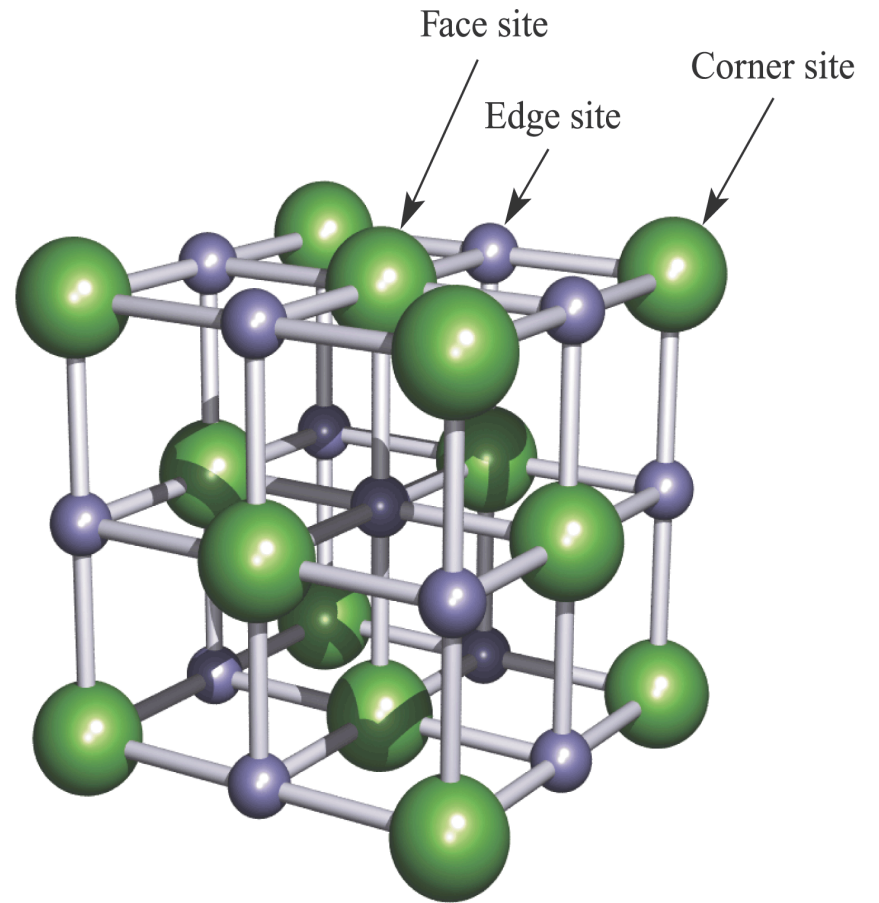
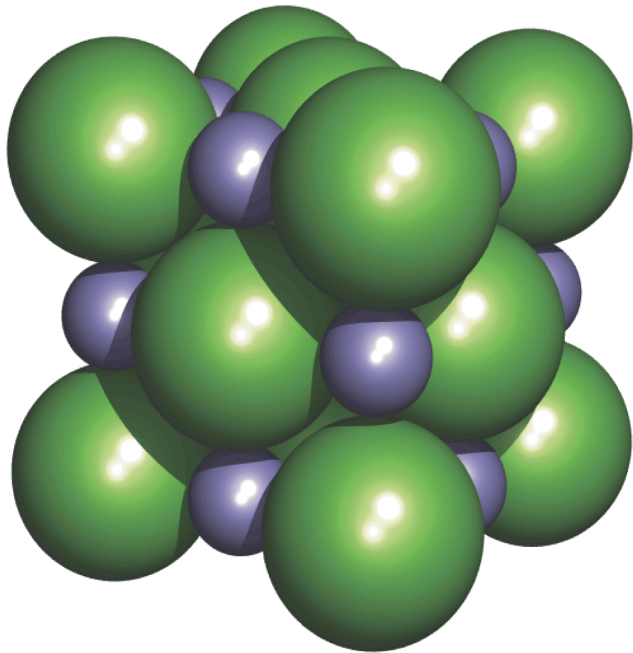
# Tipiche densità di stati in un metallo



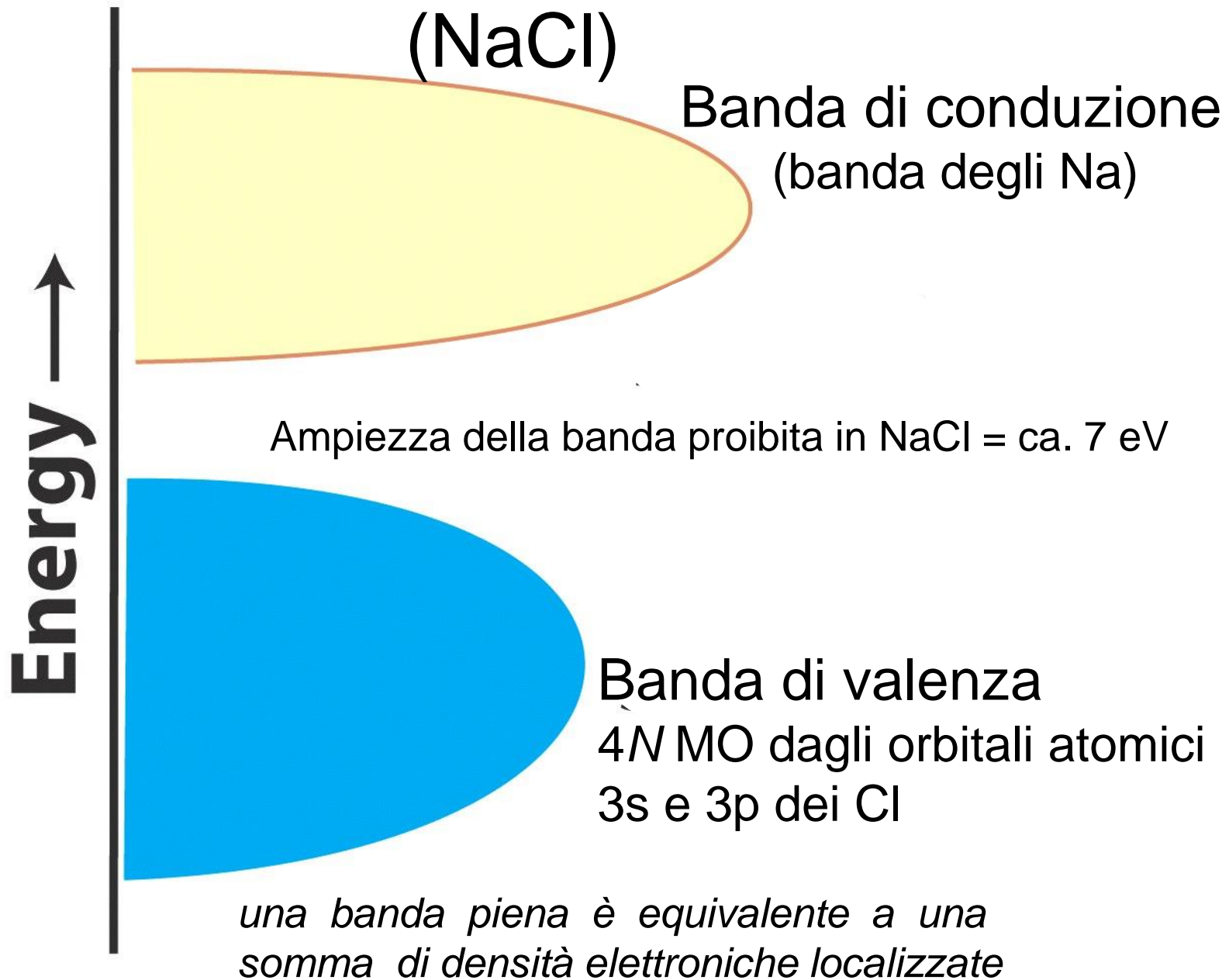
# Effetti relativistici e colore dell'oro



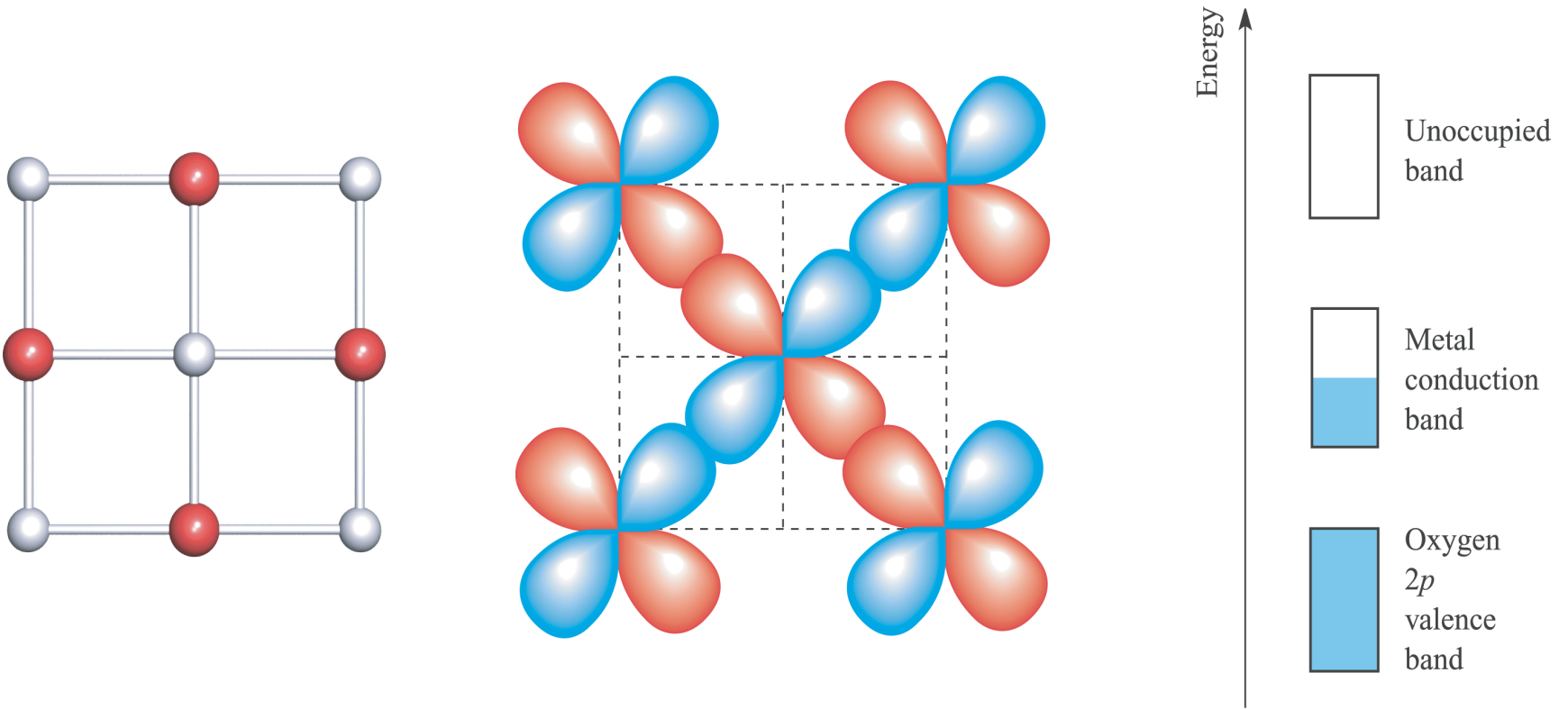
# NaCl



# Tipiche densità di stati in un isolante



# TiO, un ossido metallico conduttore

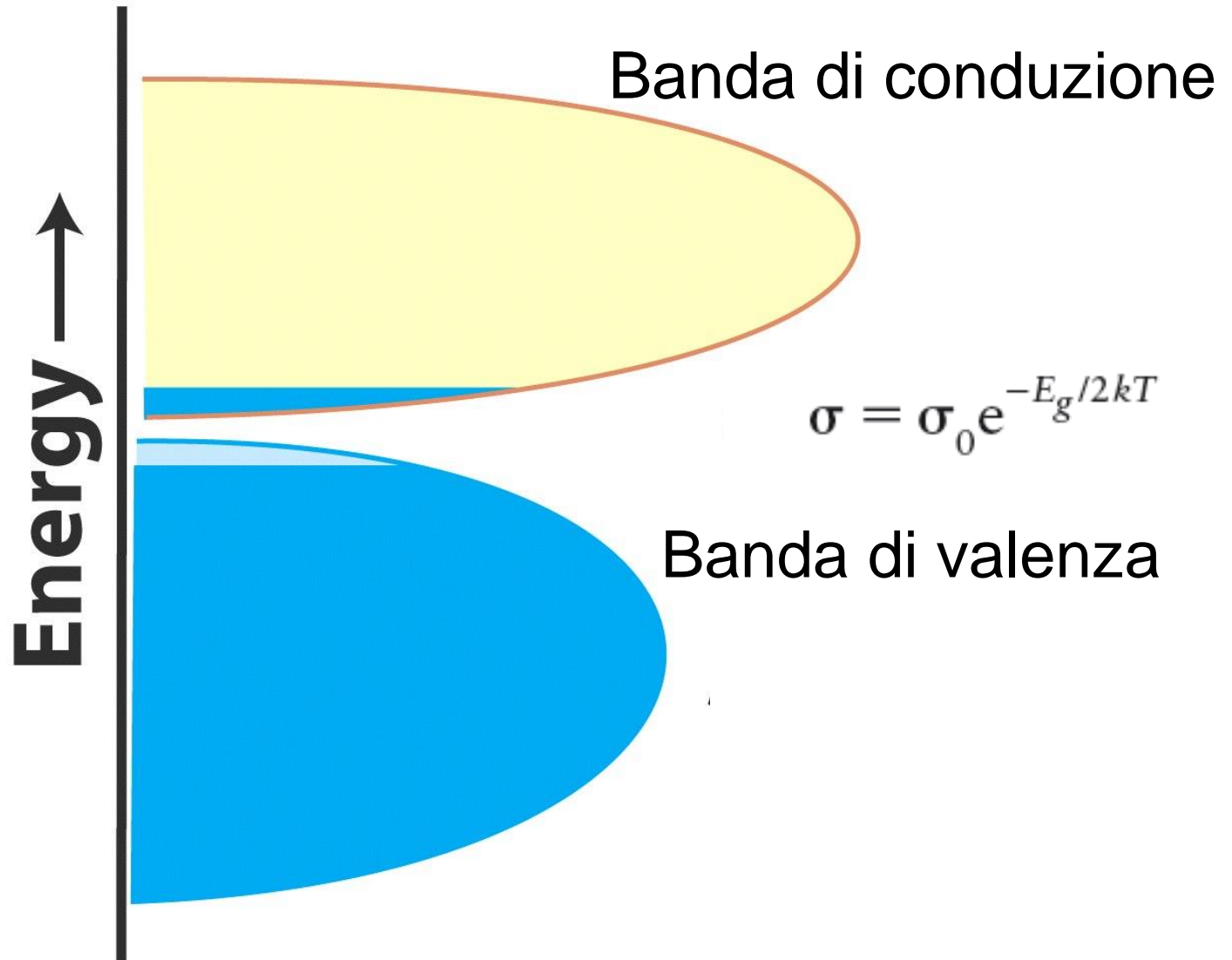


# Alcune ampiezze di bande proibite

Material	$E_g$ /eV
Carbon (diamond)	5.47
Silicon carbide	3.00
Silicon	1.11
Germanium	0.66
Gallium arsenide	1.35
Indium arsenide	0.36

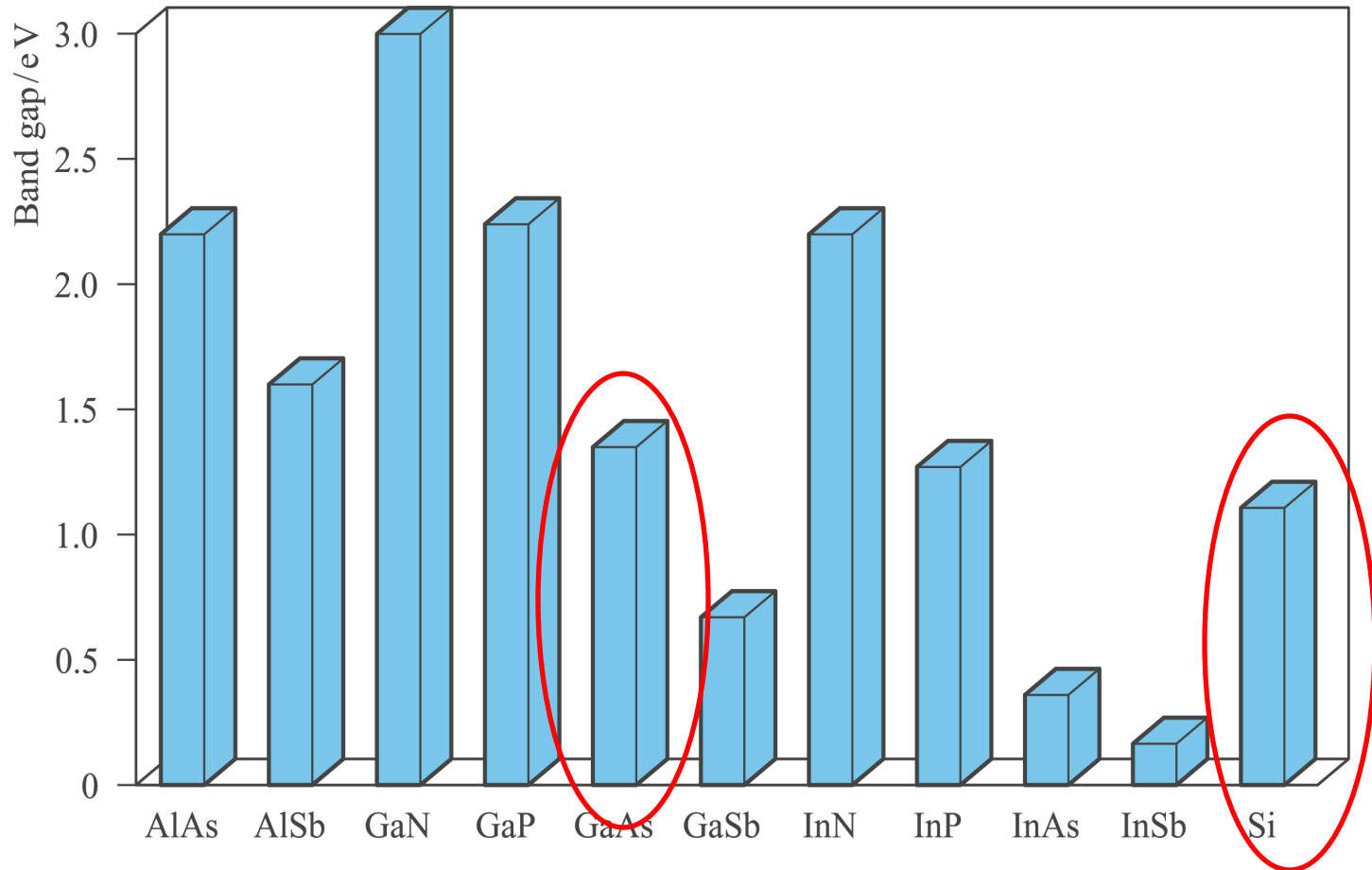
# Semiconduttore intrinseco

*andamento di tipo Arrhenius della conducibilità con la temperatura*

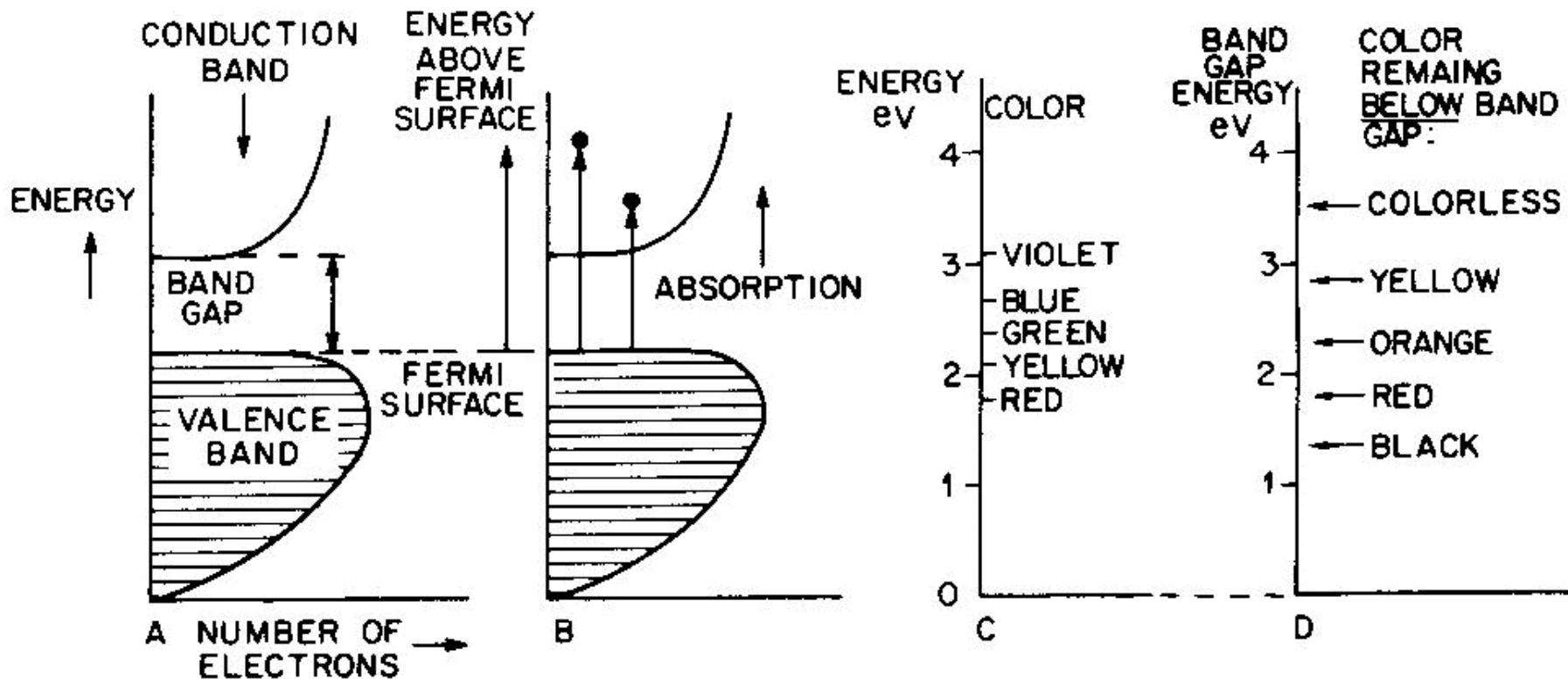




# Bande proibite in tipici semiconduttori III-V e Si



# Ampiezza della bande proibita e colore dei semiconduttori



*e.g. la galena,  $PbS$ , è grigio-nera poiché il band gap è solo 0.4 eV, cioè assorbe tutto il range della luce visibile.*

# Luce emessa dai LED in funzione della composizione

$x$ in $\text{GaAs}_{1-x}\text{P}_x$	Substrate	$\lambda$ / nm	Observed colour or region of spectrum
0.10	GaAs	780	Infrared
0.39	GaAs	660	Red
0.55	GaP	650	Red
0.65	GaP	630	Orange
0.75	GaP	610	Orange
0.85	GaP	590	Yellow

# Semiconduttori estrinseci

(drogaggio sostitutivo)

e.g. Si drogato con As

e.g. Si drogato con Ga

