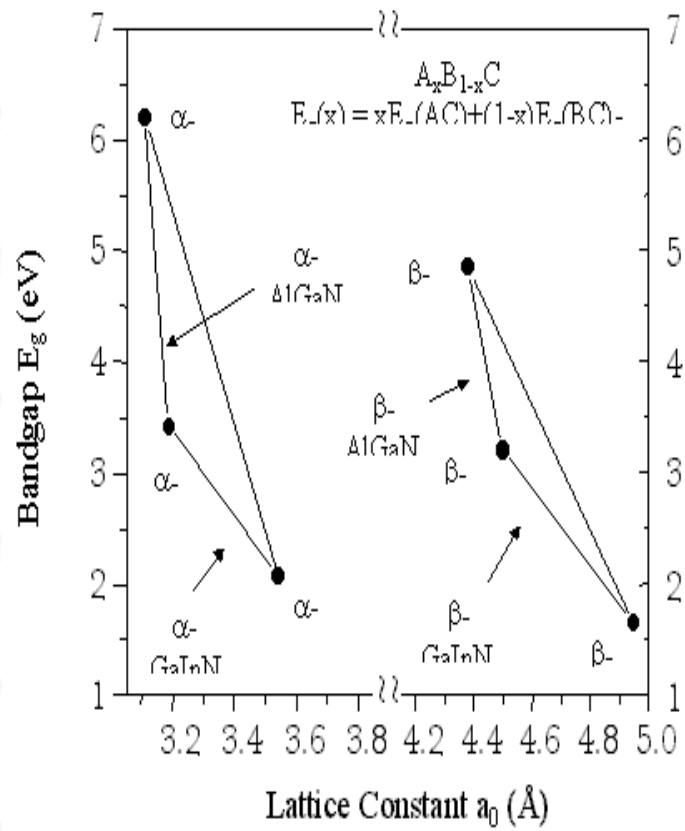


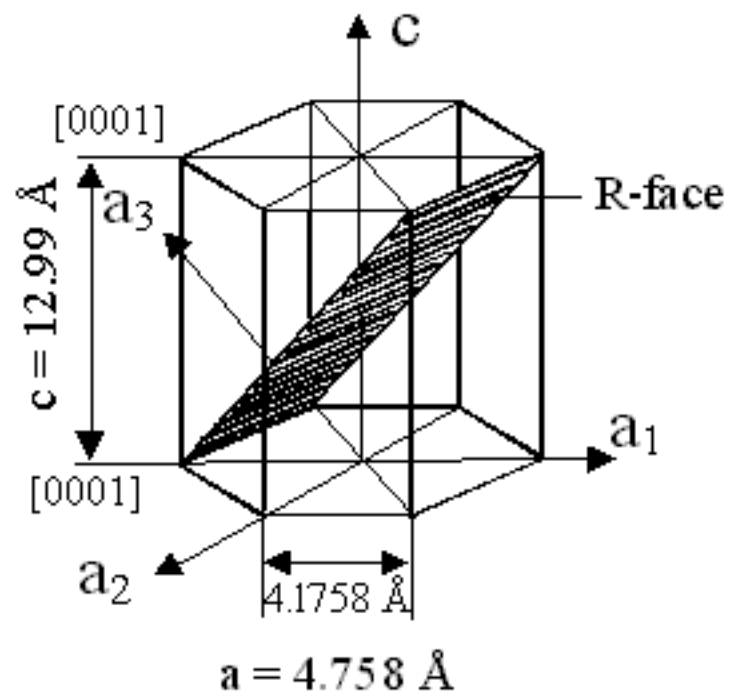
$$E_g(A_xB_{1-x}C) = xE_g(AC) + (1-x)E_g(BC) - x(1-x)b$$

Parameters	GaN	AlN	InN
a (Å) at $T = 300$ K	3.189	3.112	3.545
c (Å) at $T = 300$ K	5.185	4.982	5.703
u (Å) at $T = 300$ K*	0.376	0.38	0.377
E_g (eV) at $T = 0$ K	3.51	6.25	0.78
α (meV/K)	0.909	1.799	0.245
β (K)	830	1462	624



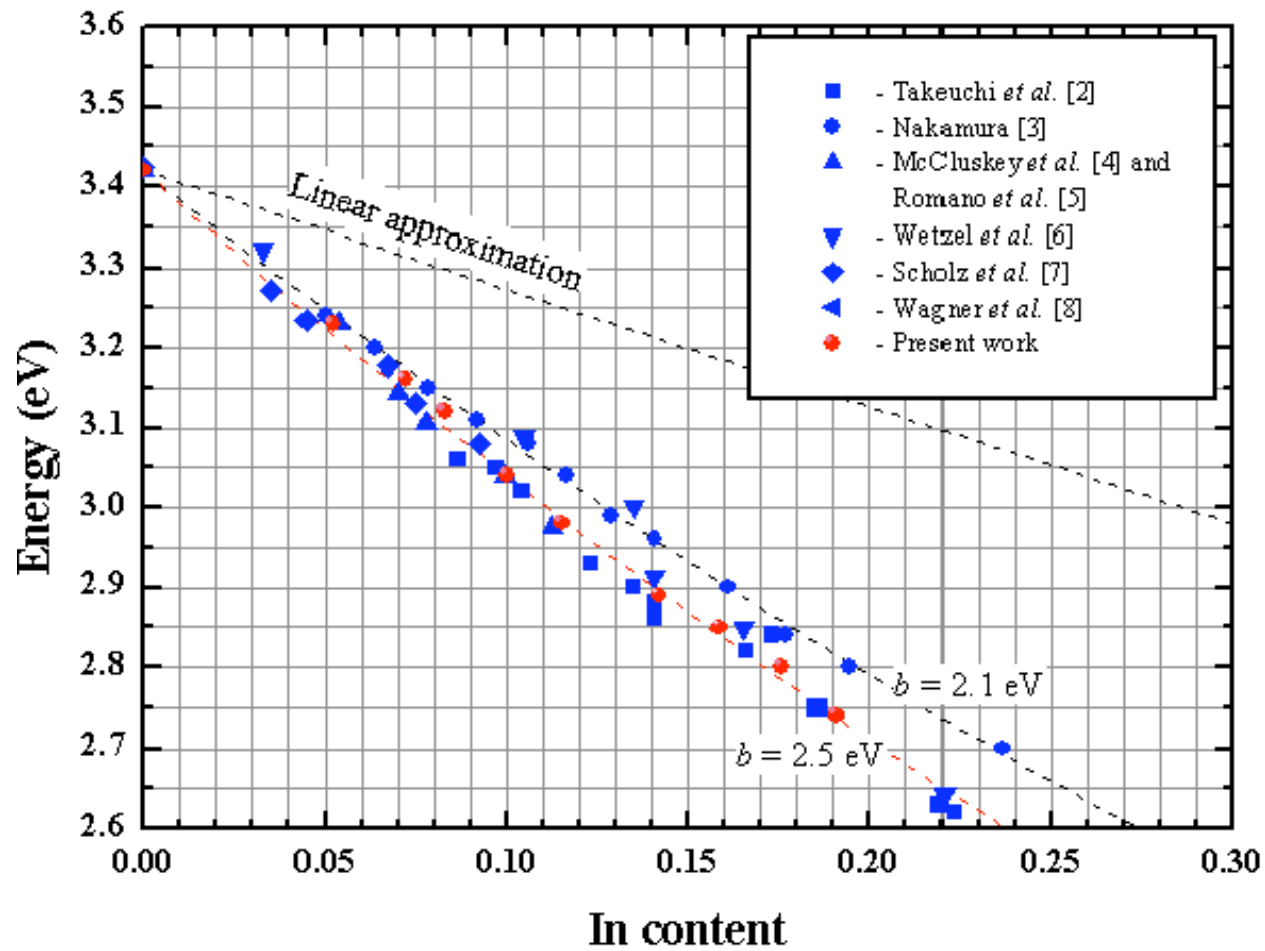
(b)

The hexagonal wurtzite structure of GaN and surface planes. (b) Band gap and bowing parameters of hexagonal (a-phase) and cubic (b-phase) InN, GaN, AlN and their alloys versus lattice constant a_0 .



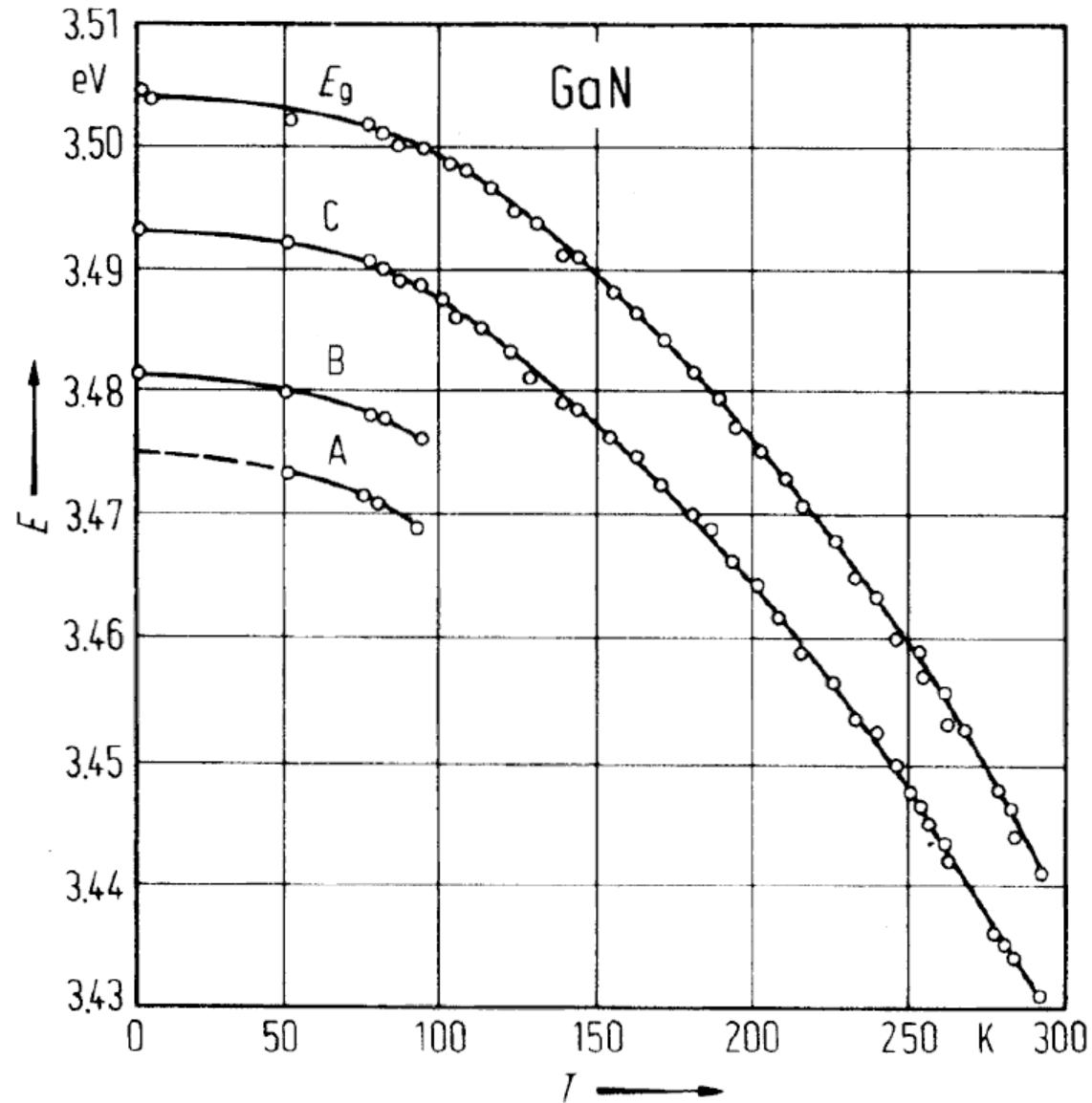
Legge di Vegard

$$E(x) = (1-x)E_{\text{GaN}} + xE_{\text{InN}} - b \cdot x(1-x)$$

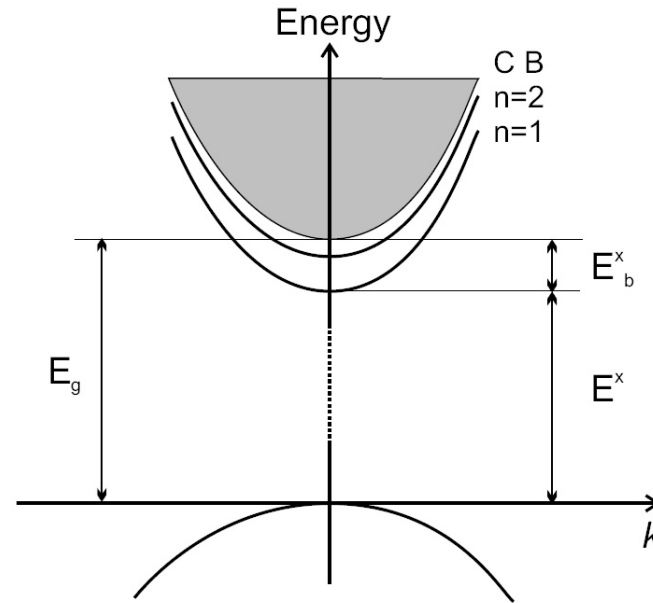
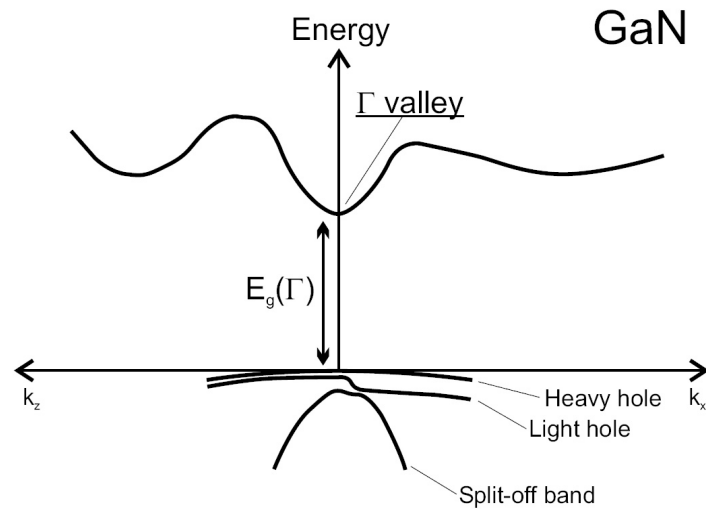


Legge di Varshni

$$E_g = E_g(0) - 9.39 \cdot 10^{-4} \times T^2 / (T + 772)$$



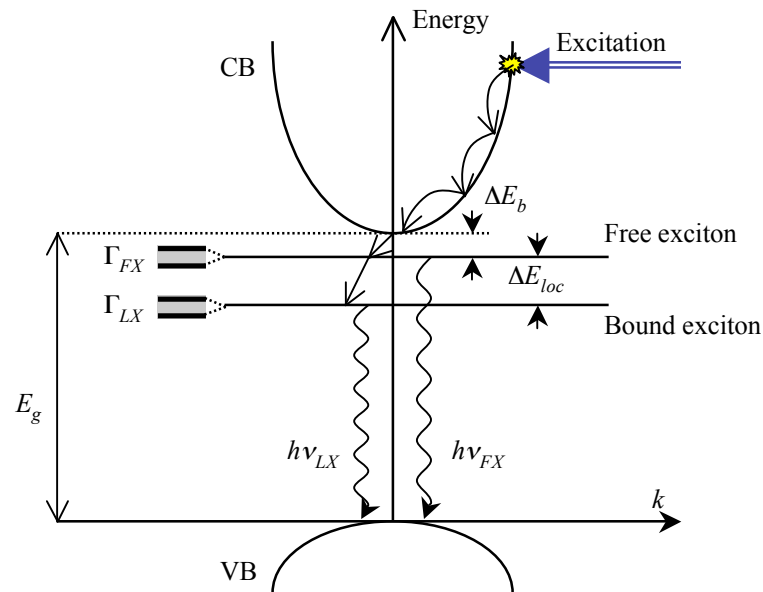
Eccitone:
$$E_B^X = E_g - \left(\frac{1}{\epsilon_r}\right)^2 \frac{\mu}{\mu_H}$$



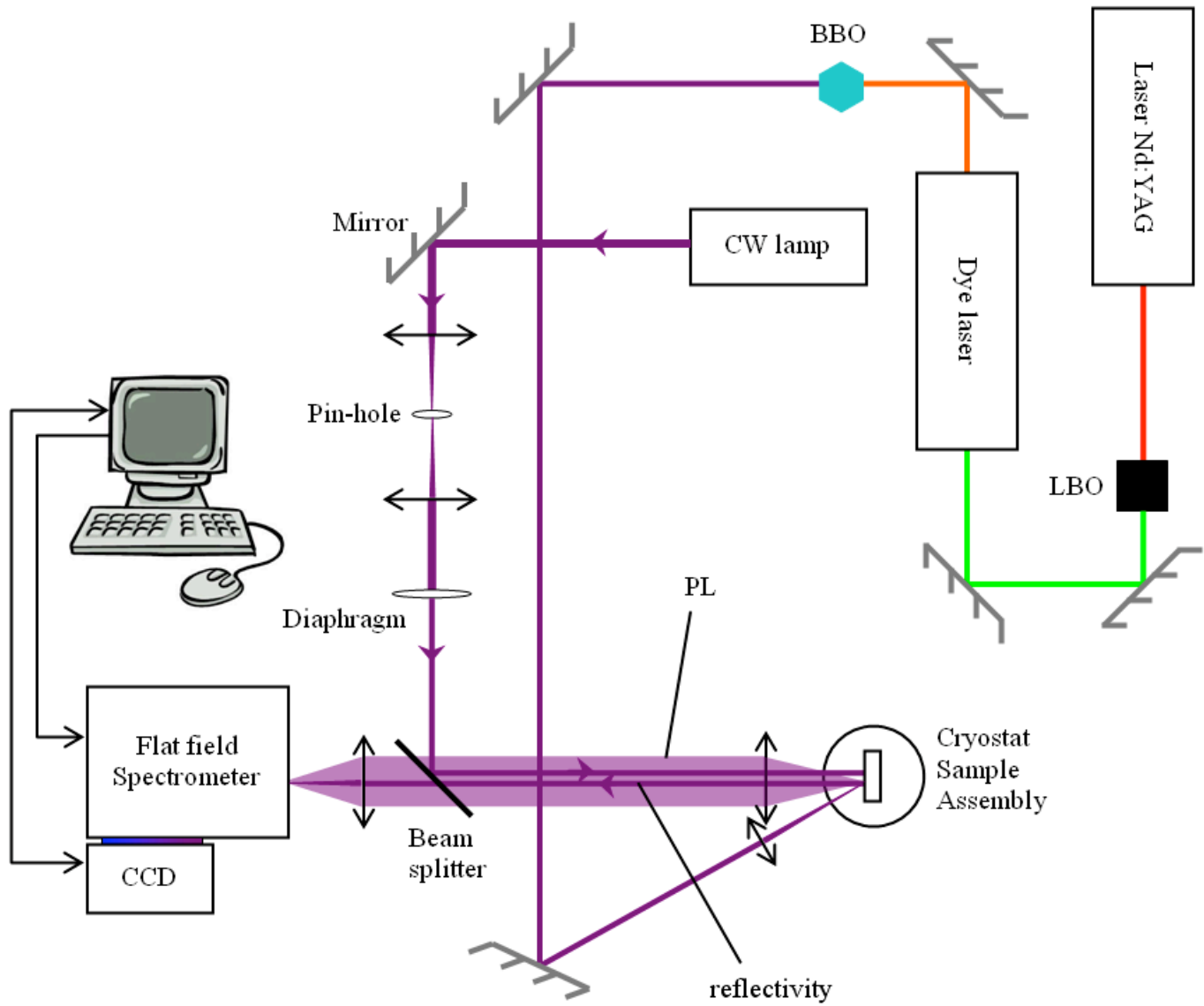
GaN	ZnO	GaAs	CdSe
3.5 eV 25 meV	3.4 eV 60meV	1.5 eV 4meV	3.5 eV 20 meV

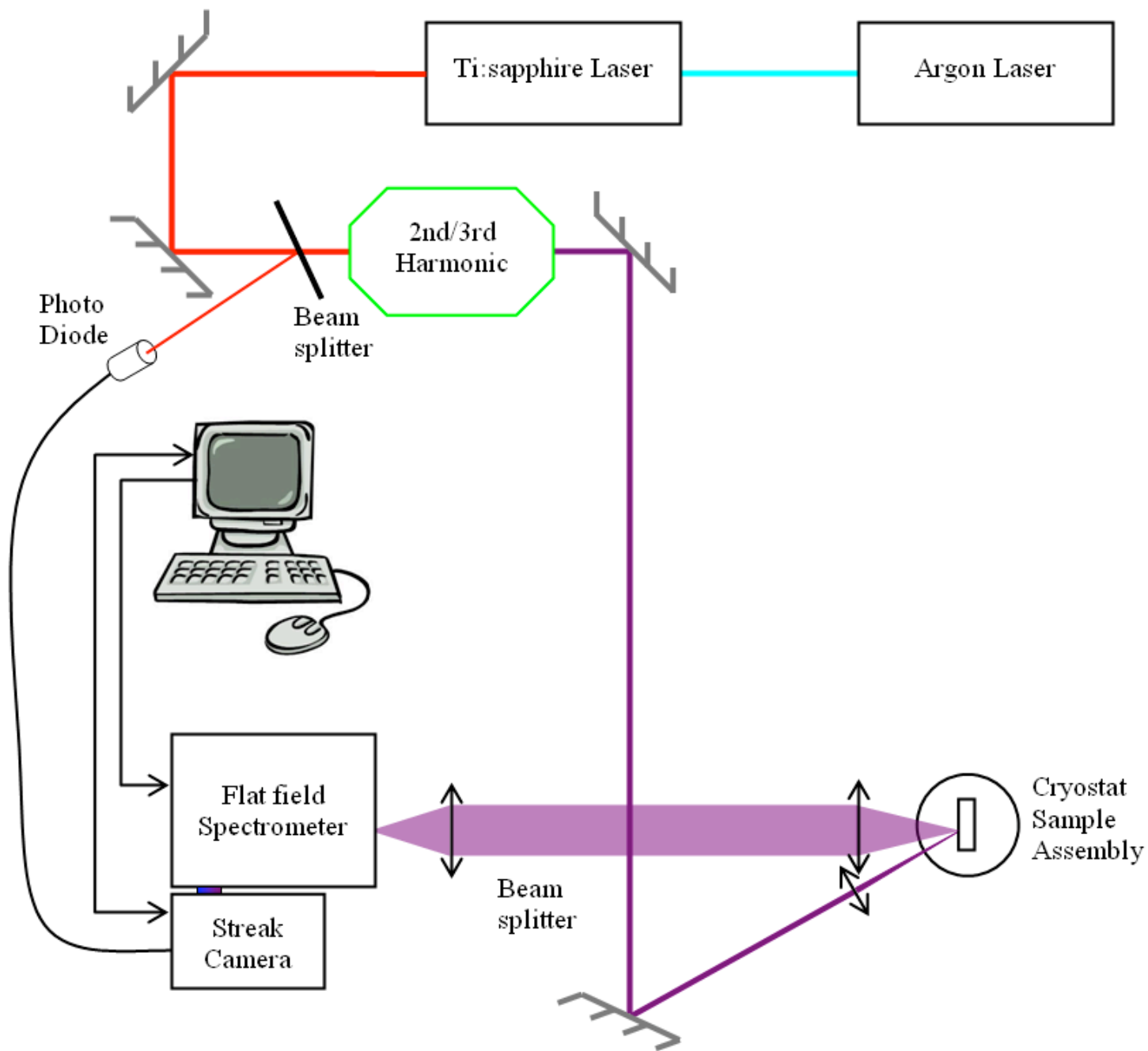
Scale temporali

- Regime coerente (<ps)
- Regime non termico (ps)
- Cariche calde (10-100 ps)
- Regime isoterma (100 ps-ns)



Ric.rad/non rad.





Misure:

- PL e Riflettività vs T
 - Legge Varshni
 - Localizzazione
 - Quenching radiativo
- PL vs P_{exc}
 - Eccitoni localizzati
 - Eccitoni liberi
 - Bieccitoni ?
- TR PL
 - Ric.Rad