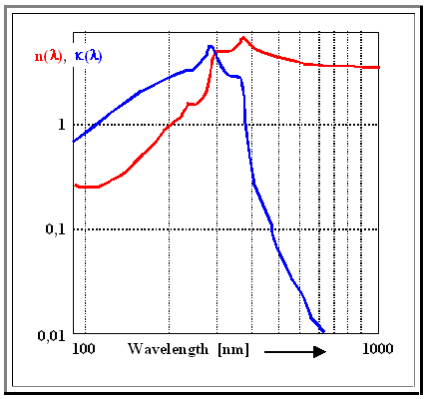
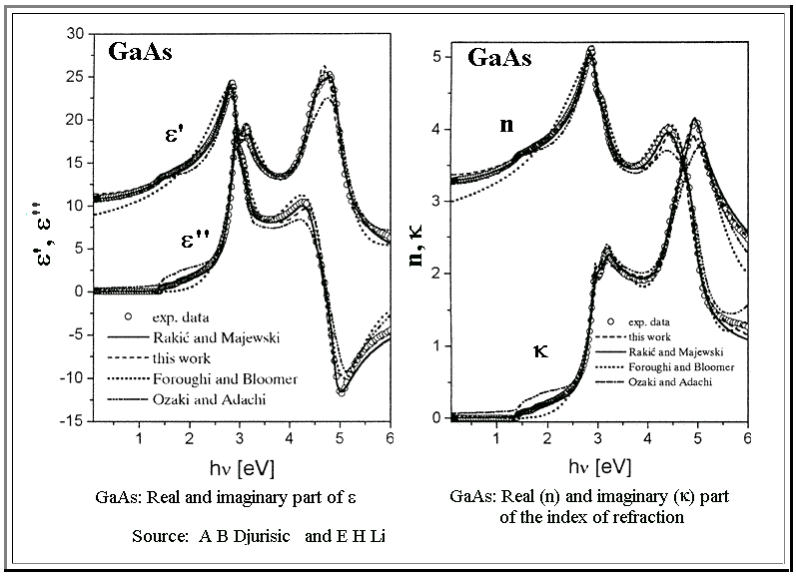
Complex Index of Refraction of Silicon and GaAs

Illustration

- Here is the complex index of referaction of *Silicon* (from Handbook of Optical Constants of Solids (E.D. Palik))



  - Note that the imaginary part κ increases as soon as the wavelength is small enough for band-to-band absorption processes; i.e. $\mathbf{h \cdot \nu > E_G}$ applied (with $\boldsymbol{E_G}$ = band gap).
- Here is the dielectric function and the complex index of refraction for GaAs.
  - Note that several groups actually *calculated* those curves and that they match rather nicely with the measured values.



GaAs: Real and imaginary part of ε

GaAs: Real (n) and imaginary (κ) part of the index of refraction

Source: A B Djurisic and E H Li