

Fig. 2.15. (a) Energy paraboloid for free electrons ($E \sim k^2$) above the k -plane for the two-dimensional hexagonal point lattice. Energy paraboloid and k -plane are divided into Brillouin zones (or parts of zones) in accordance with Fig. 2.14. (b) Reduction of the paraboloid to the first Brillouin zone.

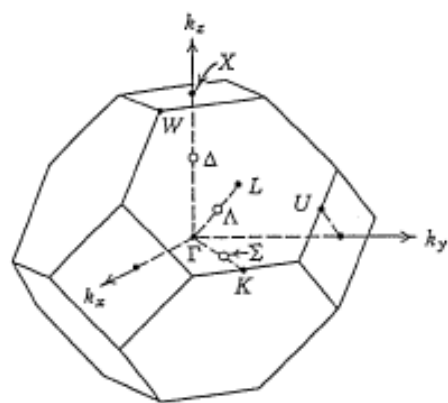


FIG. 7. The Brillouin zone of the face-centered cubic lattice showing the symmetry points and axes.

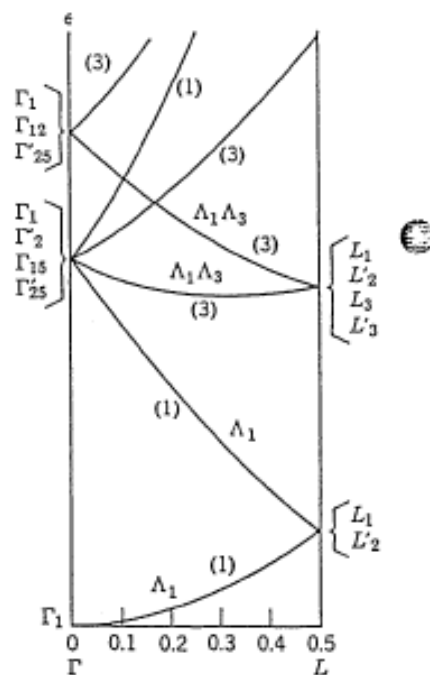


FIG. 8. Free particle energy bands for a face-centered cubic lattice.

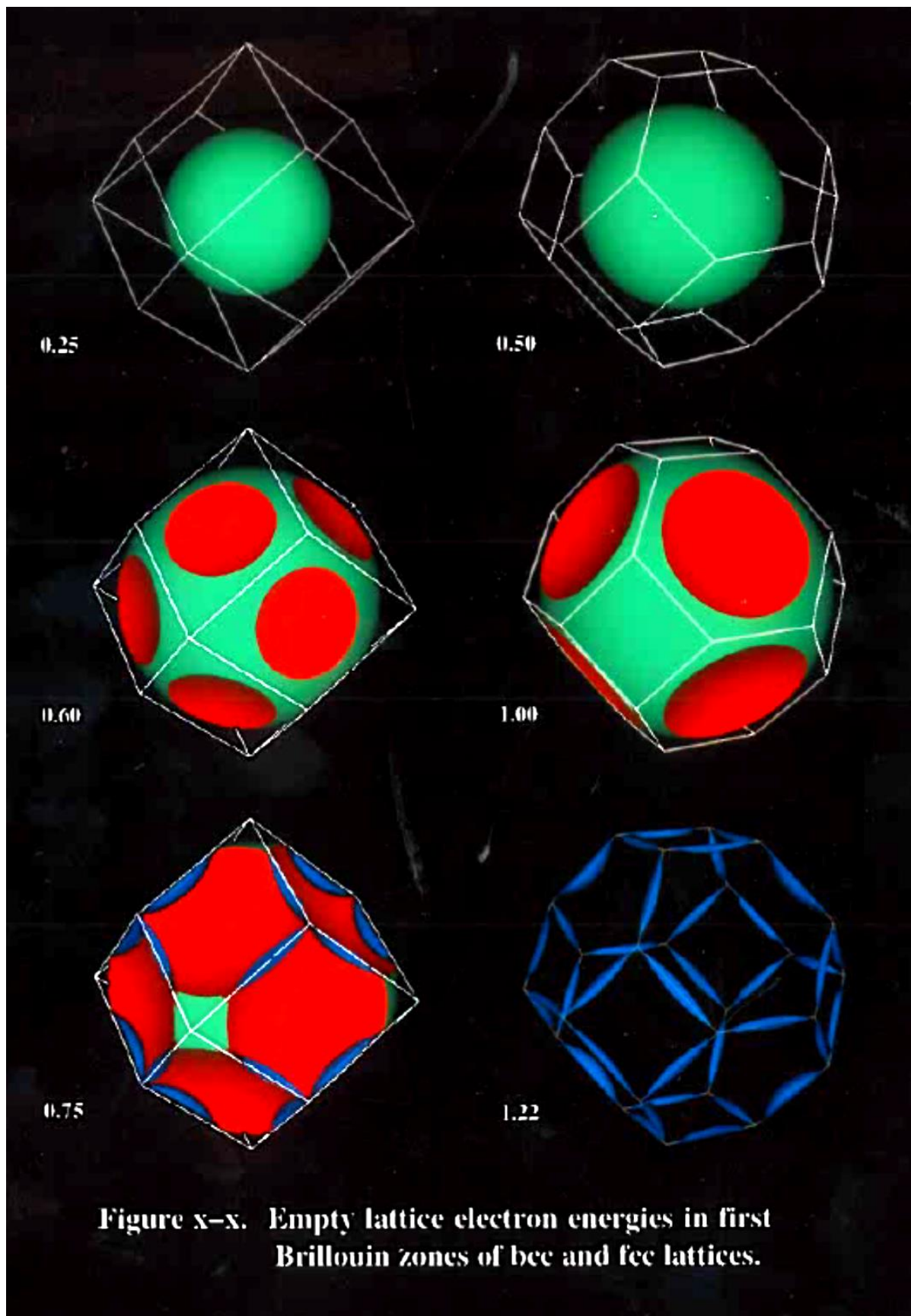
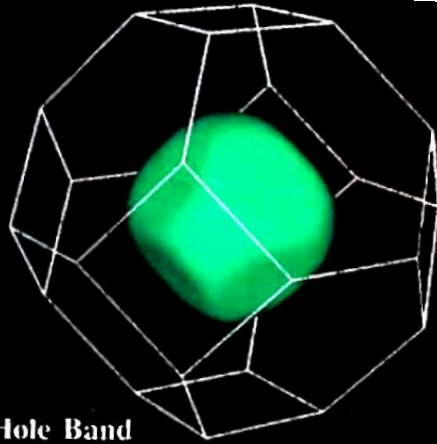
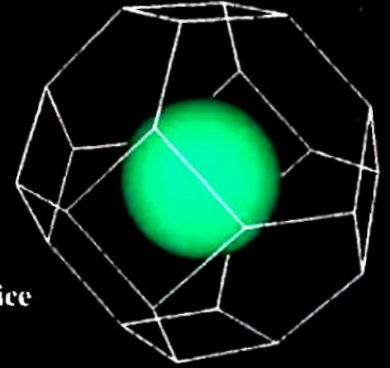


Figure x-x. Empty lattice electron energies in first Brillouin zones of bcc and fcc lattices.

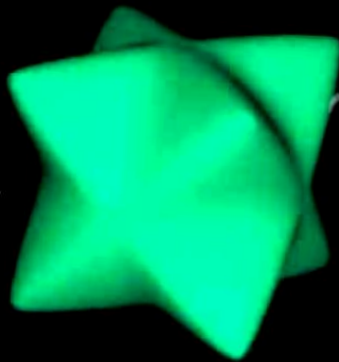
Silicon
Split-Off Hole Band



Empty Lattice
Band 1



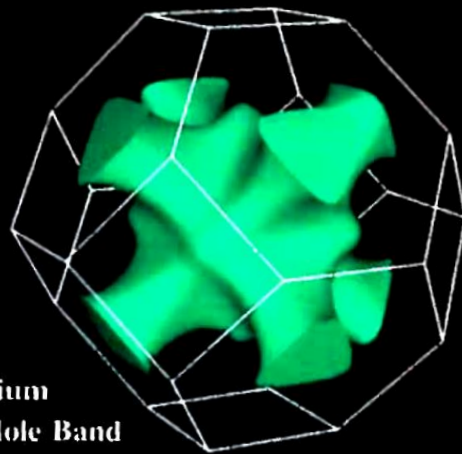
Silicon
Light Hole Band



Empty Lattice
Band 3



Germanium
Heavy Hole Band



Empty Lattice
Band 3

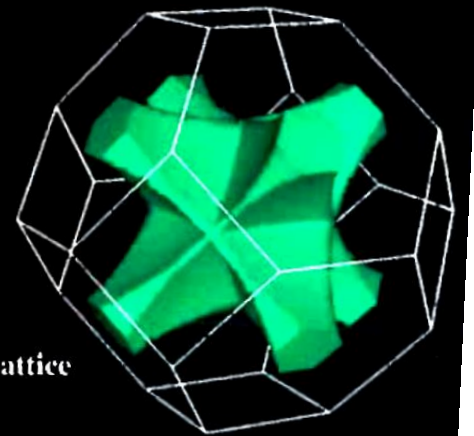


Figure 4-5. Comparison of semiconductor bands to empty lattice bands.