

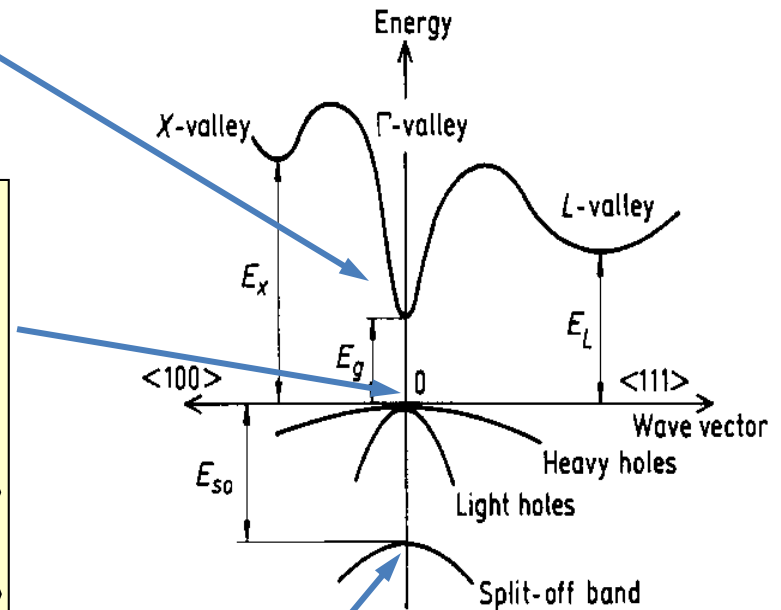
SPIN-ORBIT COUPLING

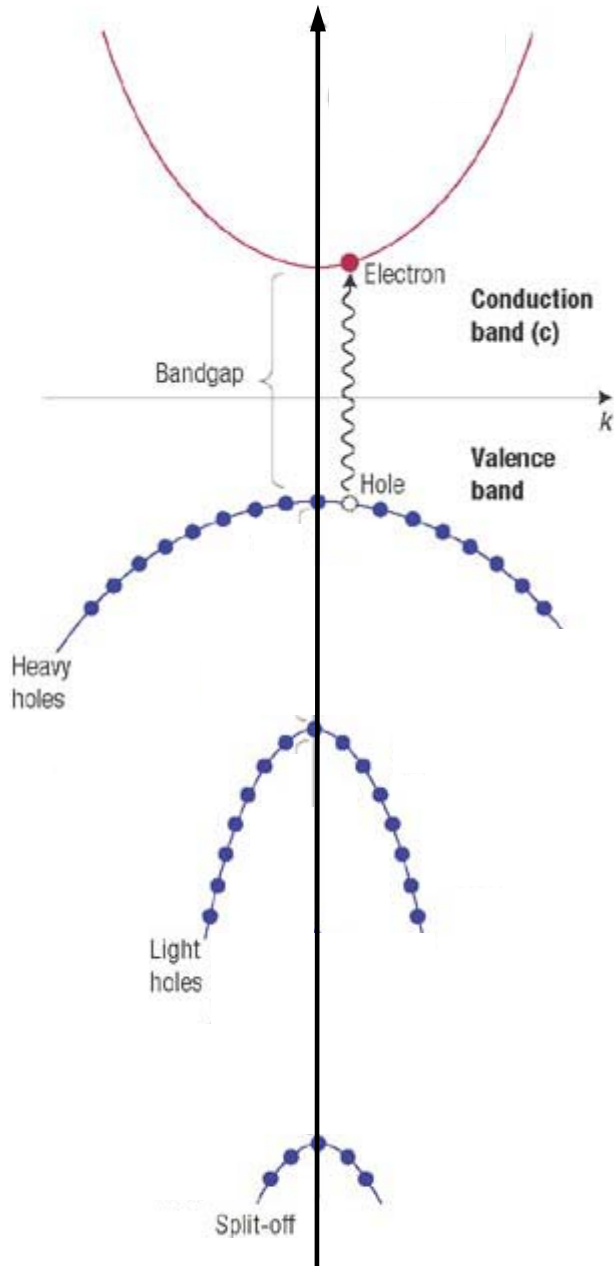
conduction band: $\begin{cases} |1 \uparrow\rangle \equiv | +1/2\rangle \\ |1 \downarrow\rangle \equiv | -1/2\rangle \end{cases}$

'heavy'-hole: $\begin{cases} \frac{1}{\sqrt{2}}|(X+iY)\uparrow\rangle & |J=3/2; m_J=+3/2\rangle \\ \frac{1}{\sqrt{2}}|(X-iY)\downarrow\rangle & |J=3/2; m_J=-3/2\rangle \end{cases}$

'light'-hole: $\begin{cases} \frac{1}{\sqrt{6}}|2Z\downarrow - (X-iY)\uparrow\rangle & |J=3/2; m_J=-1/2\rangle \\ \frac{1}{\sqrt{6}}|2Z\uparrow + (X+iY)\downarrow\rangle & |J=3/2; m_J=+1/2\rangle \end{cases}$

'split-off'-hole: $\begin{cases} \frac{1}{\sqrt{3}}|Z\uparrow - (X+iY)\downarrow\rangle & |J=1/2; m_J=+1/2\rangle \\ \frac{1}{\sqrt{3}}|Z\downarrow + (X-iY)\uparrow\rangle & |J=1/2; m_J=-1/2\rangle \end{cases}$





SPIN-ORBIT COUPLING
+
STRESS
(or quantum confinement)

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EXTERNAL MAGNETIC FIELD

NOTES:

only heavy-hole states are shown for the valence band

$\sigma^{+/-}$ denote circular polarization

Faraday: **B** parallel to [001]

Voigt: **B** perpendicular to [001]

