Fisika Kuantum

1) massa ~~atom~~ elektron : $9{,}1 \times 10^{-28}$ g

: elektron → partikel

=) kualitas gelombang partikel

→ efek photolistrik → proses terlepasnya elektron dari baja

→ efek compton

→ difraksi elektron

→ interferensi gelombang

→ prinsip ketidakpastian

efek photolistrik : $K_{max} = hv - W$

compton scattring adalah tumbukan kedua elektron

energy dan frekuensi : $\boxed{E = h.v}$

formula relativitas = $\boxed{E^2 = p^2c^2 + m^2c^4}$

cahaya $E = pc$ dan $c = \lambda v$

$$\boxed{p = \frac{h}{\lambda} = \frac{hv}{c}}$$

$pc = E$ $\quad E = hv$

$hv = pc$ $\quad \lambda = \frac{c}{v}$

$p = \frac{hv}{c}$ $\quad \cancel{c = \frac{\lambda}{v}}$ $\quad \frac{1}{\lambda} = \frac{v}{c}$

$\boxed{p = \frac{h}{\lambda}}$ → kaitan de broglie

Dipindai dengan CamScanner

$$\boxed{p = \frac{h}{\lambda}}$$ → dualisme gelombang partikel

$E = h\omega \quad p = \hbar k \quad \omega = 2\pi\nu$

$k = \frac{2\pi}{\lambda}$

Penjelasan

$p = \frac{h}{\lambda} \Rightarrow \frac{2\pi}{\lambda} = k$

$= \frac{h}{2\pi} \cdot \frac{2\pi}{\lambda} \rightarrow k$

$= \frac{h}{2\pi} k \Rightarrow \frac{h}{2\pi} = \hbar$

$= 2\pi = \hbar \cdot k \Rightarrow p = \hbar k$

$E = h\nu : \omega = 2\pi\nu$

$= \frac{h}{2\pi} \cdot 2\pi\nu \rightarrow \omega$

$\frac{h}{2\pi} \rightarrow \hbar$

$E = \hbar\omega$

⇒ Fisika kuantum → momentum
→ energi
→ posisi
} akan dipelajari

⇒ ketidakpastian prinsip heisenberg

$\Delta x \, \Delta p_x \geq \hbar/2$

$\Delta y \, \Delta p_y \geq \hbar/2$

$\Delta z \, \Delta p_z \geq \hbar/2$

Note } → penjelasan

1) $\Delta x = 0$
$\Delta p_x = \infty$ | $\Delta p_x = \frac{\hbar}{2} \frac{1}{0} = \infty$

2) $\Delta E \cdot \Delta t \geq \hbar/2$

Kesimpulan

=) konsep dasar untuk merumuskan fisika kuantum

$$\boxed{E = h\nu \qquad p = \frac{h}{\lambda}}$$ → relasi broglie.