Date / * Ware Pantile Duality: 11 is well known ]
That can exhibit the phenomenon of interference, diffraction, and polarisation which can only be
diffraction, and polarisation which can only be
explained by the wave nature of light or
electromagnetic radiation. These phenomenon prove
explained by the wave nature of light or electromagnetic radiation. These phenomenon prove that light is of wave nature
C 1 1
electromagnetic wave is absorbed or emitted in
electromagnetic wave is absorbed or emitted in
distrete quanto or photons which move with relocity
of light.
The two specific phenomenon. The photoelectric effect, and The compton effect give evidence That The photon be haves like particle.
The que specific preferences, ore processes that the
al- ha haves like nachicle
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O Roalia Manalanalli Accordina to De-Rosalie
its nature, have wave properties associated with it.
its nature, have were properties associated with it.
The wavelength I associated with any thirty
purhicle of mars in and velocity to is given,
by a second of the second of t
$J = \frac{1}{n \omega} - 0 \Rightarrow b = \frac{h}{n}$
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and kinetetic energy of the particle is
$\rho^2$
$\cancel{E} = \frac{1}{2} m u^2 = \frac{\rho^2}{2m} - 2$
(f = mu)
Thus equation () becomes: h
Thus equation ( ) becomes:
$T_{i}$ $I = \frac{1}{\sqrt{2nE}} - 3$
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If a charged particle carrying charge q is some / -/-  accelerated through a potential difference of Y volts. Then De-Broglie wantenight.  I =	
Lineth energy at absolute temperature T  E: fm \( \frac{1}{2} \text{mu}^2 := \frac{3}{2} \text{kT}  Thus equation (3) becomes  \[ \frac{h}{1} \text{mu}^2 := \frac{3}{2} \text{kT}  \]  Thus equation (3) becomes  \[ \frac{h}{1} \text{mones} \text{mones} \\ \frac{h}{1} \text{mones} \text{mones} \\ \frac{1}{3mkT} \text{constant.}  \]  * Properties of 19atter waves:  O The De-Broglie wavelength of a wave associated with moving lightpriss greater. Then that of heavier particles.	If a charged particle carrying charge 9 is Date_1_1_
Lineth energy at absolute temperature T  E: fm \( \frac{1}{2} \text{mu}^2 := \frac{3}{2} \text{kT}  Thus equation (3) becomes  \[ \frac{h}{1} \text{mu}^2 := \frac{3}{2} \text{kT}  \]  Thus equation (3) becomes  \[ \frac{h}{1} \text{mones} \text{mones} \\ \frac{h}{1} \text{mones} \text{mones} \\ \frac{1}{3mkT} \text{constant.}  \]  * Properties of 19atter waves:  O The De-Broglie wavelength of a wave associated with moving lightpriss greater. Then that of heavier particles.	accelerated through a potential difference of
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Linetic energy at absolute temperature T  E: fm \( \frac{1}{2} \text{ m u}^2 := \frac{3}{2} \text{ kT}  Thus equation (3) becomes  \[ \frac{h}{1} \frac{\text{ p- Boltz mann}}{\text{constant}}  \[ \frac{1}{3mkT} \text{ constant}  \]  * fropenhes of 19atter wants:  (0) The De-Broglie wantle ugh of a wave associated with moving lightprins greater than that of heavier particles.	
Linetic energy at absolute temperature T  E: fm \( \frac{1}{2} \text{ m u}^2 := \frac{3}{2} \text{ kT}  Thus equation (3) becomes  \[ \frac{h}{1} \frac{\text{ p- Boltz mann}}{\text{constant}}  \[ \frac{1}{3mkT} \text{ constant}  \]  * fropenhes of 19atter wants:  (0) The De-Broglie wantle ugh of a wave associated with moving lightprins greater than that of heavier particles.	$I = \frac{1}{\sqrt{29mV}} - \frac{4}{\sqrt{4}}$
E: for 1 mu² = 3 kT  Thus equation (3) becomes  \[ \frac{h}{1 = \frac{1}{13mkT}} \text{ wants.}  \[ \text{* fingerhes of 19atter wants:}  O The De-Broglie wantle ugh of a want associated with moving lightpoths greater Than That of heavier par hicles.	
E: for 1 mu² = 3 kT  Thus equation (3) becomes  \[ \frac{h}{1 = \frac{1}{13mkT}} \text{ wants.}  \[ \text{* fingerhes of 19atter wants:}  O The De-Broglie wantle ugh of a want associated with moving lightpoths greater Than That of heavier par hicles.	Kinetic evergy at absolute temperature T
Thus equation (3) becomes  h k- Boltzmann  1 = \overline{13mkT}  * Properties of 19atter wants:  (1) The De-Broglie wante ugh of a want associated with moving lightparties greater than that of heavier particles.	
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* Properhes of 19atter wants:  1 The De-Broglie wavelength of a wave associated with moving lightpaths greater Than That of heavier particles.	Thus equation (3) Locamos
* Properhes of Matter wants:  1) The De-Broglie wavelength of a wave associated with moving lightpaths greater Than That of heavier particles.	h Rolfzmann
* Properhes of Matter wants:  1) The De-Broglie wavelength of a wave associated with moving lightpaths greater Than That of heavier particles.	1 = Tambet considerat.
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1) The De-Broglie wavelength of a wave associated with moving lightparties greater. Thom That of heavier particles.	* Properties of 19atter waves:
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	(1) the De-Broglie wavelength of a wave associated
	heavier on hicles de greater. Thom that of
De-Broglie wave length of wome associated with a Slow moving particle is greater Dan The wavelength associated with fast moving particle.	
with a slow moving particle is greater Man The wavelength associated with fast moving particle	2 De-Broglie wave length of wome associated
The wavelength associated with fast moving particle	with a Slow moving particle is greater Ran
$\overline{W}$	The wavelength associated with fast moving parti
$\Psi$	
$\Psi$	
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Date of rest, i.e. v=0, The
De-Broglie wavelength becomes infinite and if $v=\infty$ Then $t=0$ . Thus the matter waves are generated only when the material particle is motion.
v=00 Then 1=00. Thus the matter waves
are generated only when the material particle in
motion.
(4): The expression dor De-Broglie wantlength 1= mo
is independent of charge of the painticle
Therefore matter wave are generated by maving
(4): The expression for De-Broglie wavelength 1= h us independent of charge and The particle.  Therefore matter wave are generated by maving charge particles
greater Than The velocity of The electromagnetic wave, i.e The velocity of light. It may be shown as
greater Than The welocity of the electromagnetic
wave, i.e The velocity of light It may
be shown as
E = hv - O
Everyy of particle mass m,
E = MC2 - (2)
Δ
$\mathcal{L} = mc^2 - 2$ $-hv = mc^2 = v = mc^2$
h
wave relacity. W= N/ /= h/mie
- mc2
$\cdots \qquad \cdots \qquad$
W- Inv
[2/]
$\left[\omega=\frac{c^2}{\omega}\right]$
As the particle relocity v is always less than
the velocity of light, it dollows that velocity
I of propagation of associated matter wave is greater
As the particle velocity v is always less than the velocity of light, it follows that velocity of propagation of associated matter wave is grafer than the convelocity of light.