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DERIVING THE DE BROGLIE WAVELENGTH

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- **Management** – the process of planning, organising, leading, and controlling the organisation's resources to achieve its purpose and objectives.
- **Management Functions** – the activities that managers perform to achieve the organisation's purpose and objectives.
- **Management Levels** – the hierarchy of management positions within an organisation, ranging from top management to first-line management.

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- **1. Introduction**
- **2. The Role of the Teacher**
- **3. The Role of the Student**

Fig. 4. Multiple regression analysis of the effect of the amount of time spent in the water on the amount of time spent in the water.

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Keywords: *Rehabilitation, Strength, Performance, Test, Vertical Jump, Time, Measurement, Strength, Weight, and Health, Self-Test*

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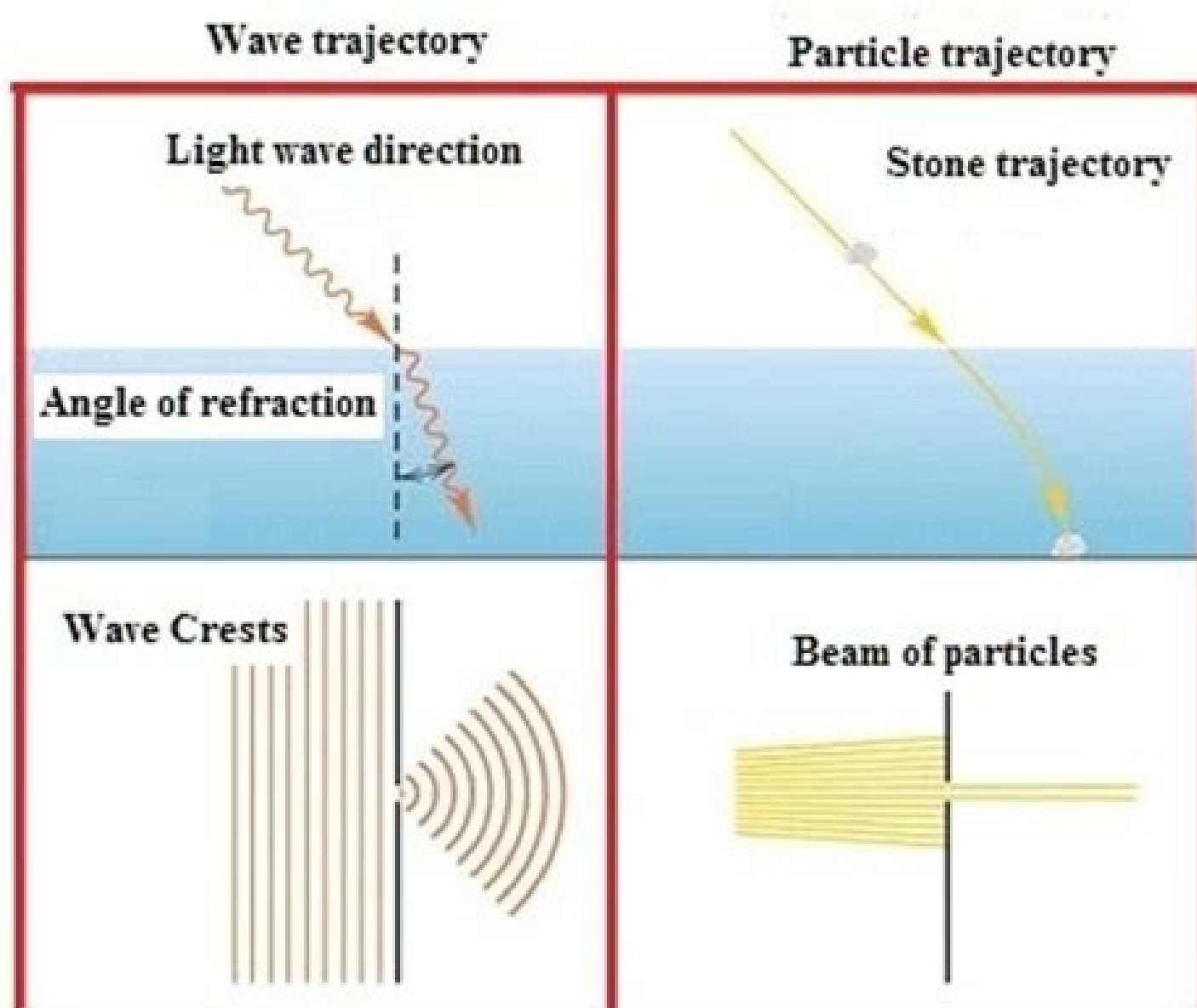
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1. *Journal of Management Studies*, 1997, 34, 1, 1-14.

$$f_{\text{max}} = \frac{\pi}{2} \left(\frac{1}{T_0} + \frac{v}{L} \right) \quad (1)$$



Magnetic Field 2

A magnetic field is caused by a moving charge

m kg s C

$$B = \frac{\mu_0}{4\pi} \frac{qvB \sin\theta}{r^2} \quad \text{where } \mu_0 = 4\pi \times 10^{-7} \frac{\text{Wb}}{\text{A.m}}$$

$$\Rightarrow \left[\frac{\text{Wb}}{\text{A} \cdot \text{m}} \right] \left[\frac{\text{C} \cdot \text{m}}{\text{s} \cdot \text{m}^2} \right] = \left[\frac{\text{T} \cdot \text{m}^2 \cdot \text{C}}{\text{A} \cdot \text{s} \cdot \text{m}^2} \right] = \left[\frac{\text{N} \cdot \text{m}^2 \cdot \text{C}}{\text{A}^2 \cdot \text{m} \cdot \text{s} \cdot \text{m}^2} \right]$$

$$= \left[\frac{\text{kg} \cdot \text{m} \cdot \text{s}^2 \cdot \text{C}}{\text{s}^2 \cdot \text{C}^2 \cdot \text{m} \cdot \text{s}} \right] = \left[\frac{\text{kg}}{\text{s} \cdot \text{C}} \right]$$

$$\Rightarrow \left[\frac{\text{Wb}}{\text{A}\cdot\text{m}} \right] = \left[\frac{\text{T}\cdot\text{m}^2}{\text{A}\cdot\text{m}} \right] = \left[\frac{\text{N}\cdot\text{m}^2}{\text{A}^2\cdot\text{m}} \right] = \left[\frac{\text{kg}\cdot\text{s}^2}{\text{m}\cdot\text{s}\cdot\text{C}^2} \right] = \left[\frac{\text{kg}\cdot\text{s}}{\text{m}\cdot\text{C}^2} \right]$$

Verification of de Broglie's hypothesis by electron diffraction from graphite

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LUMS School of Science and Engineering

29 September, 2015
Version 2015-2

1 Introduction

Is light a particle or a wave? The answer depends on how we choose to look at it. Some outcomes are explained with the particle or the photon model and some with the wave model. For example, light that is capable of knocking out electrons from a metal can also diffract from a grating. These complementary aspects are generally referred to as 'particle' and 'wave' aspects. We now accept that the true nature of light can not be described by a single picture and that both the models complement each other [1].

The current experiment is designed to verify de Broglie's hypothesis through diffraction of electrons from polycrystalline graphite. The main emphasis is on image processing using digital photography and ultimately students will be able to determine the inter-planar spacing of the graphite crystal.

KEYWORDS de Broglie relationship · Bragg's law · electron diffraction · Fluorescent material · Thermionic emission · crystal structure ·

2 Conceptual Objectives

In this experiment we will

1. learn about the wave-particle duality of matter in particular, electrons
2. understand and verify de Broglie's relationship,
3. get familiar with Bragg's law and learn about its implications,
4. learn about the functional principle of electron tubes,



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