

PHYS 111

1ST semester 1439-1440

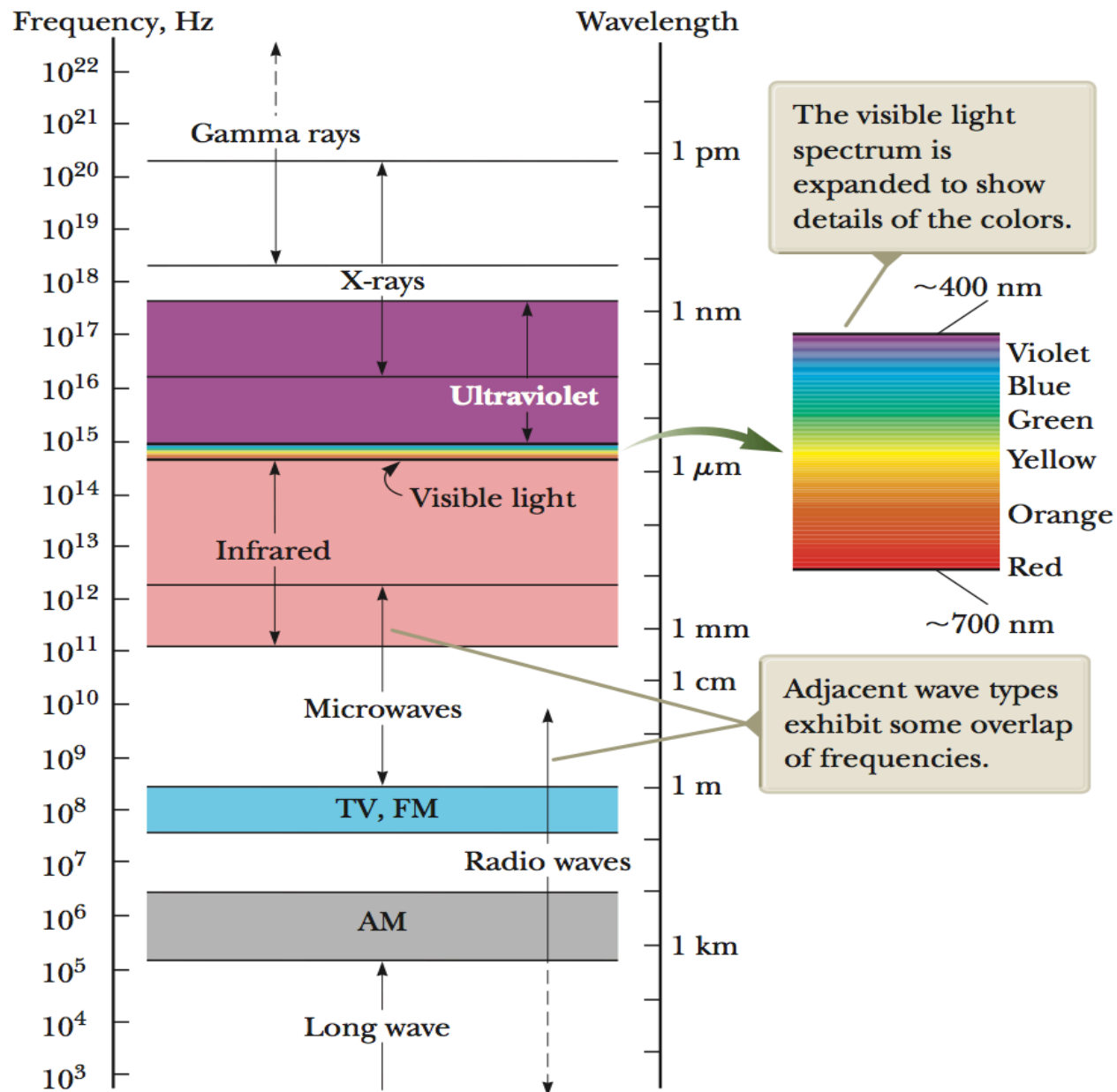
Dr. Nadyah Alanazi

Lecture 24

Chapter 35

The Nature of Light and the principles of ray Optics

35.5 Analysis Model: Wave Under Refraction

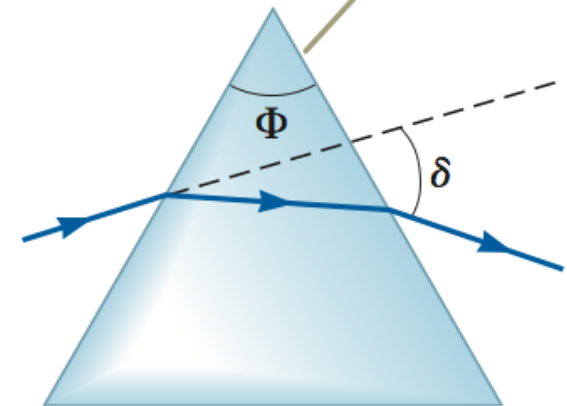


The electromagnetic spectrum

The prism

- A ray of single-wavelength light incident on the **prism** from the left emerges at angle δ from its original direction of travel.
- This angle d is called the **angle of deviation**.
- The **apex angle** Φ of the prism, is defined as the angle between the surface at which the light enters the prism and the second surface that the light encounters.

The apex angle Φ is the angle between the sides of the prism through which the light enters and leaves.



The index of refraction of the prism material

- The minimum angle of deviation δ_{\min} for a prism occurs when the angle of incidence θ_1 is such that the refracted ray inside the prism makes the same angle with the normal to the two prism faces.
- The index of refraction of the prism material in terms of the minimum angle of deviation δ_{\min} and the apex angle Φ .

$$n = \frac{\sin\left(\frac{\Phi + \delta_{\min}}{2}\right)}{\sin(\Phi/2)}$$

