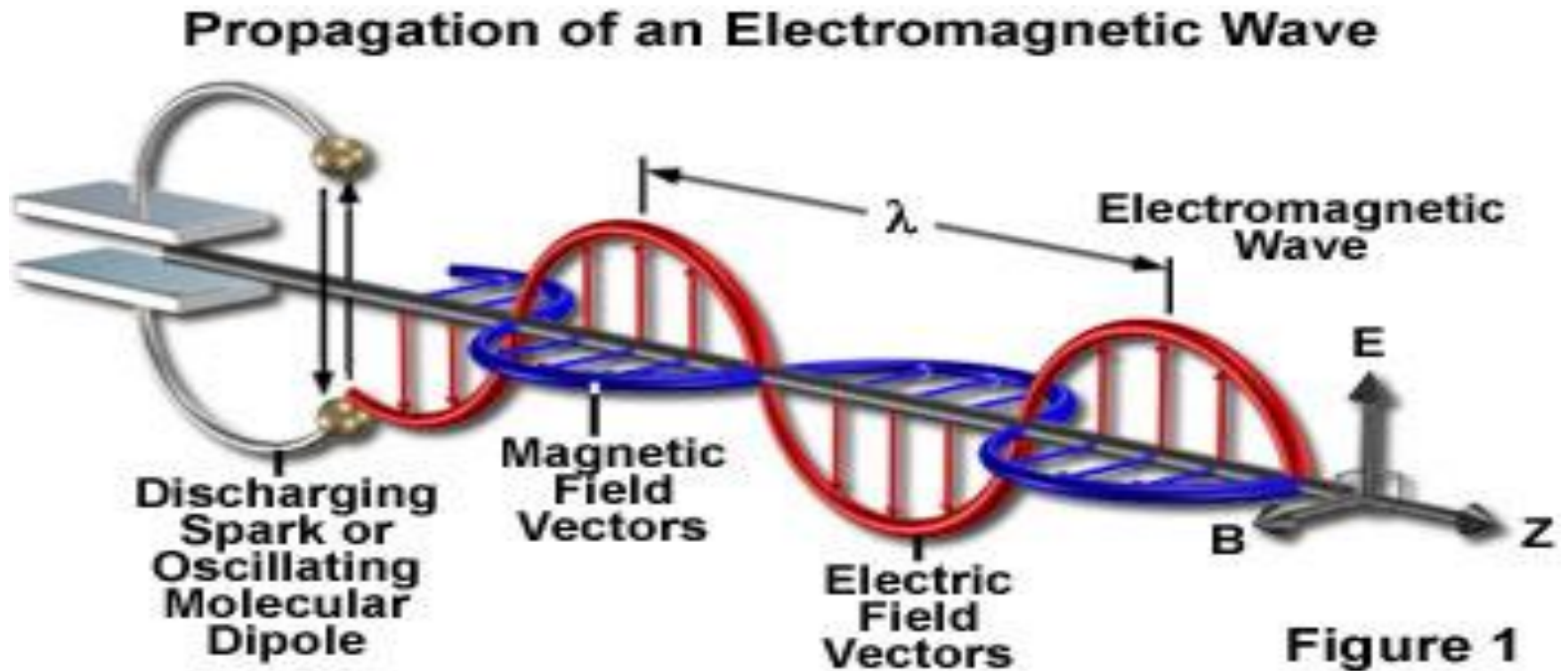


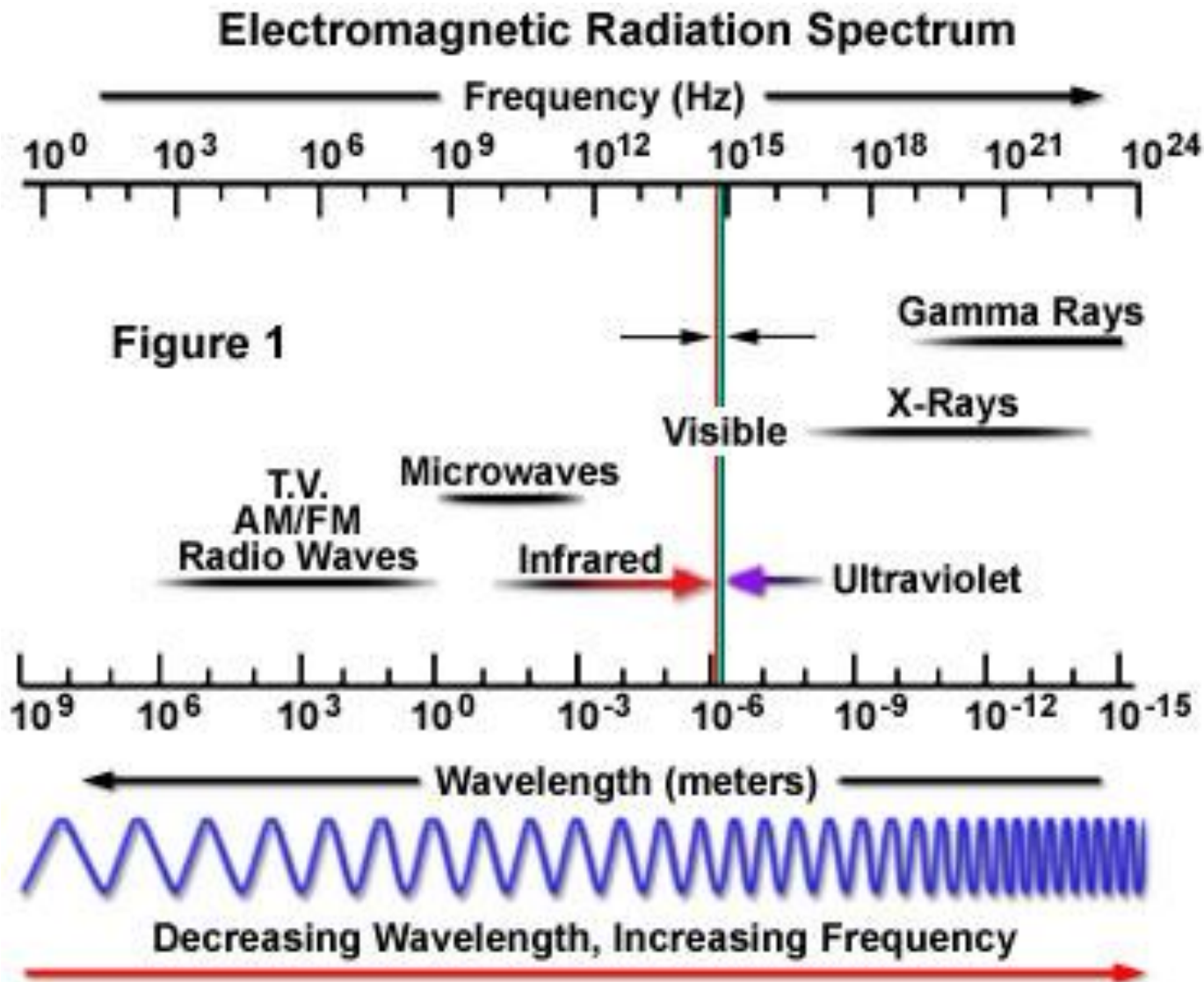
Sketsa gelombang elektromagnetik



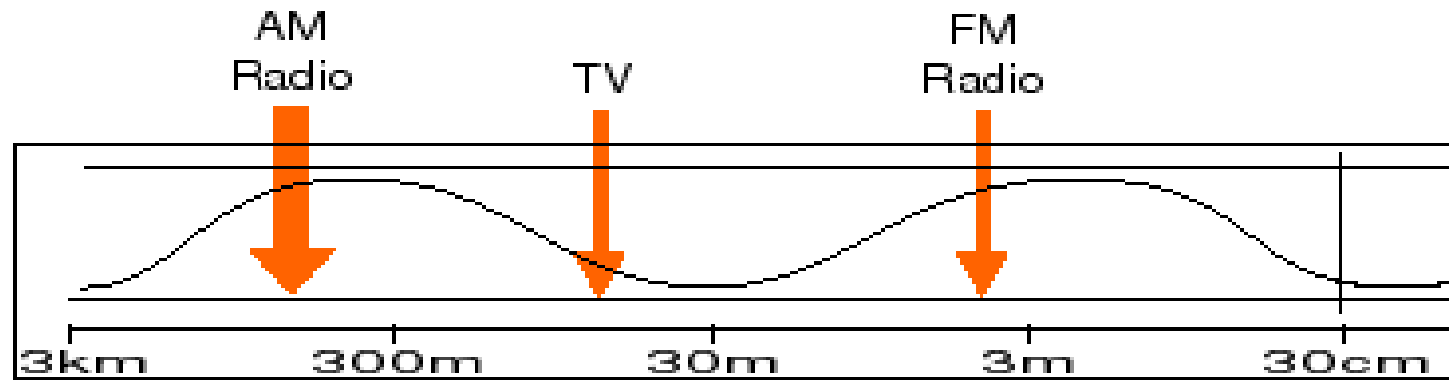
Sifat-sifat gelombang elektromagnetik

- 1. Gelombang elektromagnetik dapat merambat pada ruang tanpa medium**
- 2. merupakan gelombang transversal**
- 3. tidak memiliki muatan listrik sehingga bergerak lurus dalam medan magnet maupun medan listrik**
- 4. dapat mengalami pemantulan (refleksi), pembiasan (refraksi), perpaduan (interferensi), pelenturan (difraksi), pengutuban (polarisasi)**
- 5. Perubahan medan listrik dan medan magnet terjadi secara bersamaan, sehingga medan listrik dan medan magnet sefase dan berbanding lurus**

SPEKTRUM GELOMBANG ELEKTROMAGNETIK



GELOMBANG RADIO

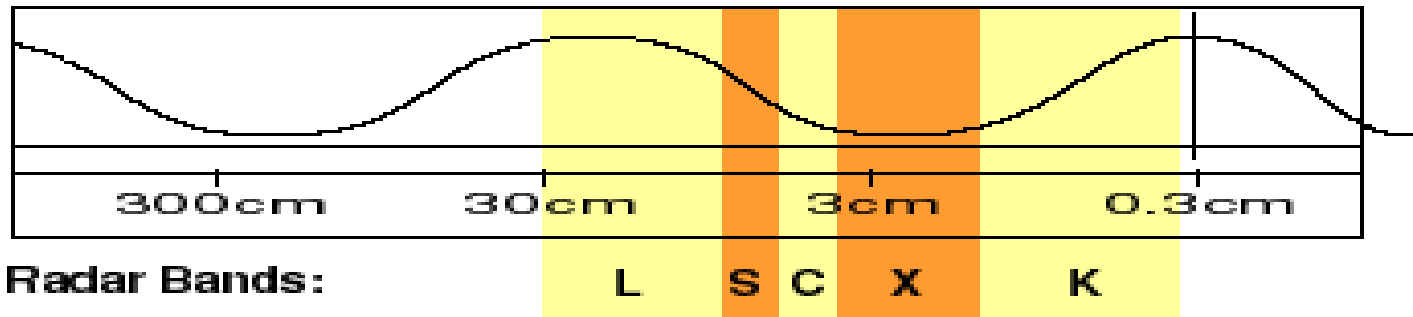


Radio Wave Region of the Electromagnetic Spectrum



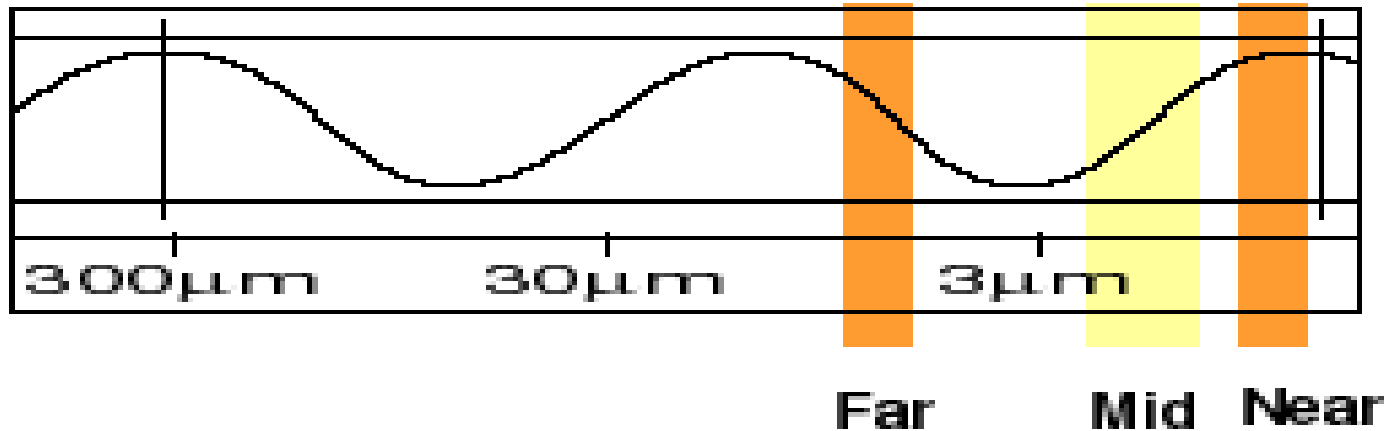
GELOMBANG MIKRO

Microwave region of the Electromagnetic Spectrum



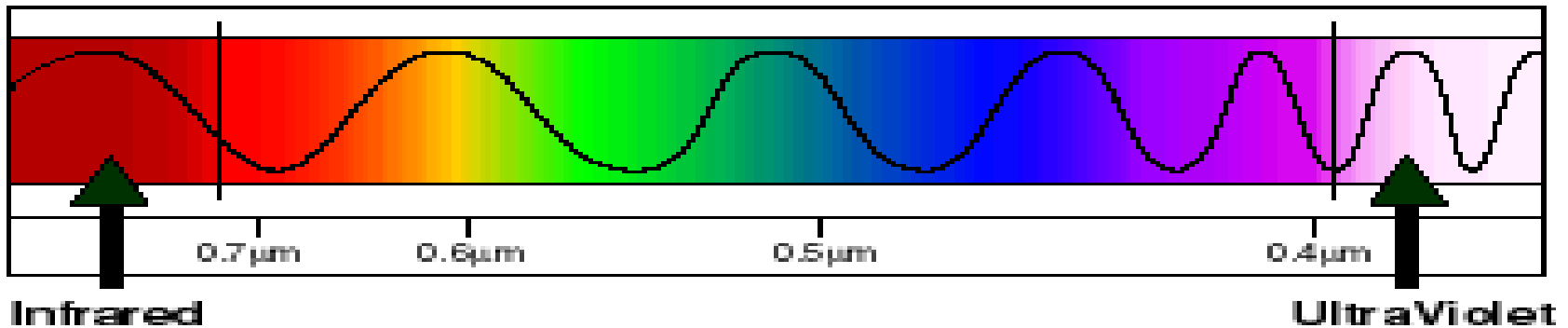
INFRA MERAH

Infrared Region of the Electromagnetic Spectrum

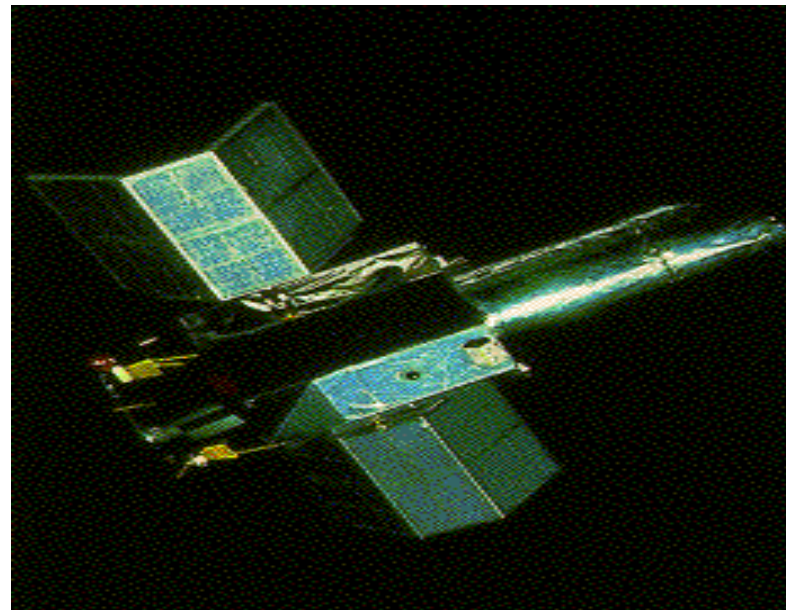
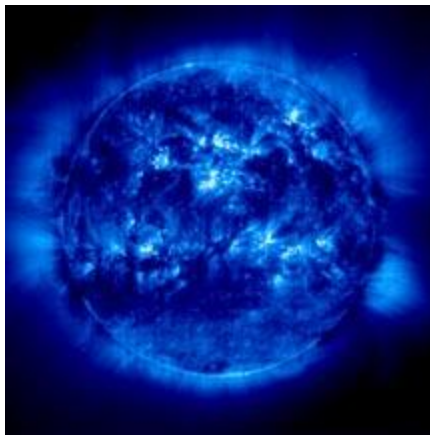
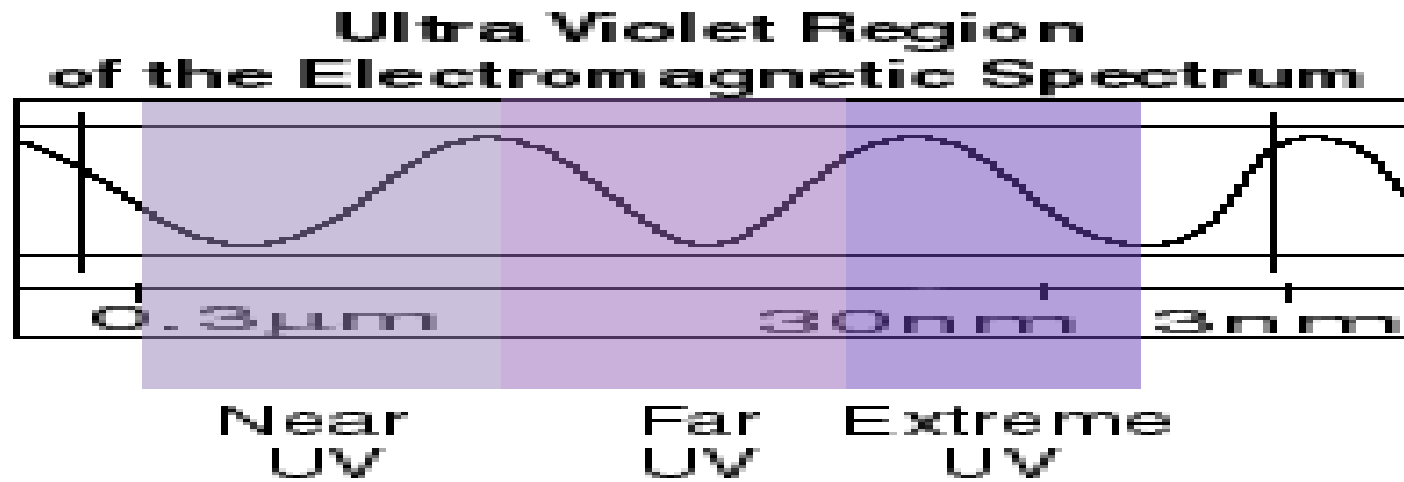


CAHAYA TAMPAK

Visible Light Region of the Electromagnetic Spectrum

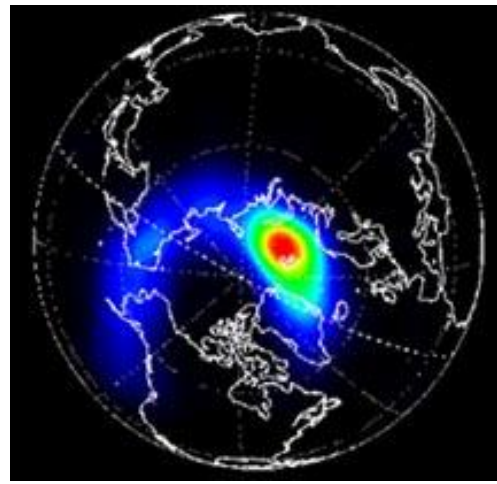
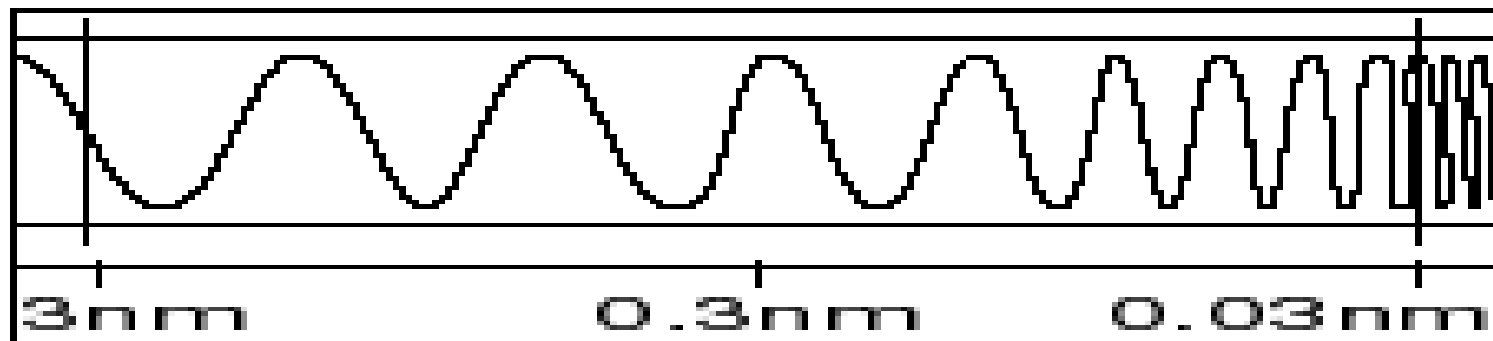


ULTRAVIOLET



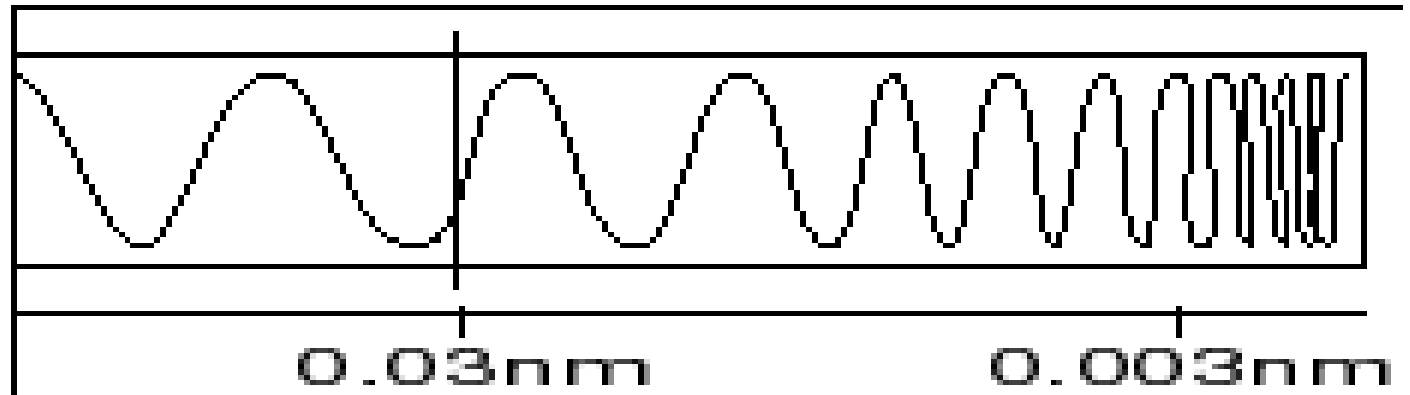
SINAR - X

X-Ray Region of the Electromagnetic Spectrum

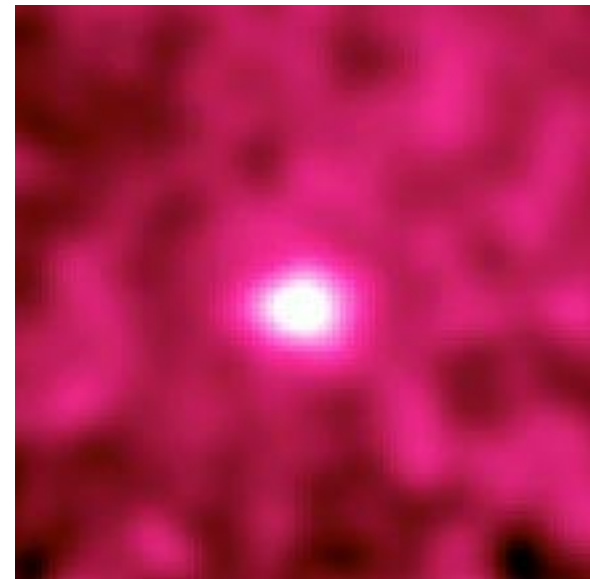
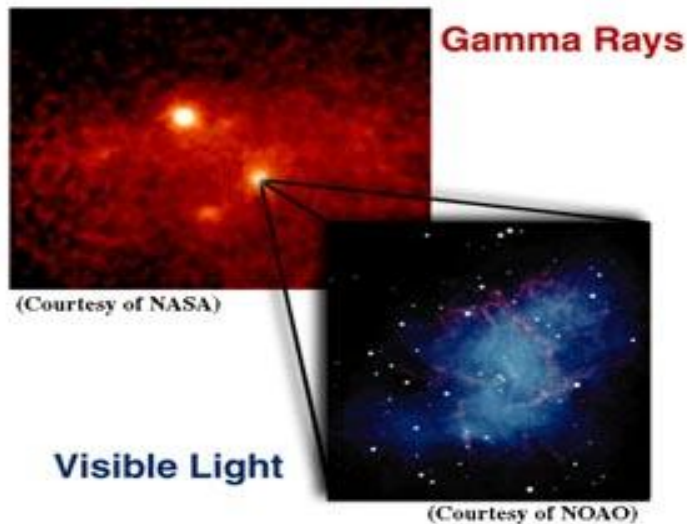


SINAR - GAMMA

Gamma Ray Region of the Electromagnetic Spectrum



The Crab Nebula



PERSAMAAN DASAR MAXWELL

$$\oint_S E_n \, dA = \frac{1}{\epsilon_0} q$$

$$\oint_S B_n \, dA = 0$$

$$\oint_C E \cdot d\ell = -\frac{d}{dt} \int_S B_n \, dA$$

$$\oint_C B \cdot d\ell = \mu_0 I + \mu_0 \epsilon_0 \frac{d}{dt} \int_S E_n \, dA$$

Berdasarkan Persamaan Maxwell dapat diturunkan :

$$c = \frac{1}{\sqrt{\epsilon_0 \mu_0}}$$

$$\frac{\partial E}{\partial x} = - \frac{\partial B}{\partial t}$$

$$\frac{E_m}{B_m} = \frac{E}{B} = c$$

Persamaan-persamaan Turunan yang lain

Rapat energi listrik $u_e = \frac{1}{2} \varepsilon_o E^2$

Rapat energi magnetik $u_m = \frac{B^2}{2\mu_o}$

Laju energi / pointing $S = \frac{1}{\mu_o} E \times B$

$$S = \frac{E^2}{\mu_o c} = \frac{cB^2}{\mu_o}$$

Laju energi rata – rata atau intensitas

$$\bar{S} = \frac{E_m^2}{2\mu_o c} = \frac{cB_m^2}{2\mu_o} = \frac{E_m B_m}{2\mu_o}$$

Rapat energi sesaat $u = \varepsilon_o E^2 = \frac{B^2}{\mu_o}$

$$\bar{S} = c\bar{u}$$