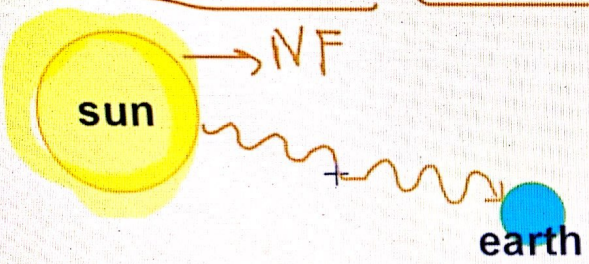
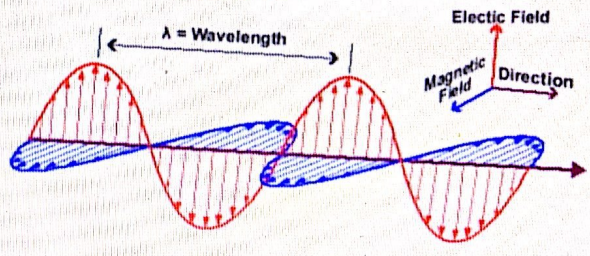
ELECTROMAGNETIC RADIATION (EMR)

electric field **magnetic field** **energy**





it is a form of energy which propagates with oscillating electric field and magnetic field.

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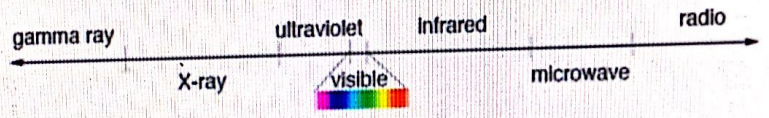
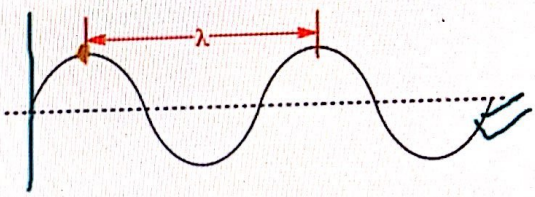
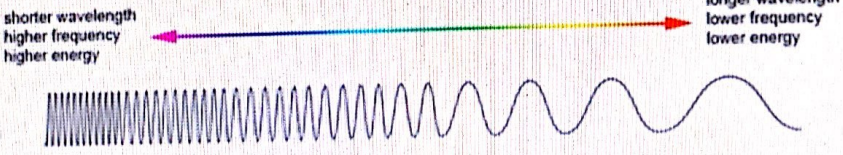
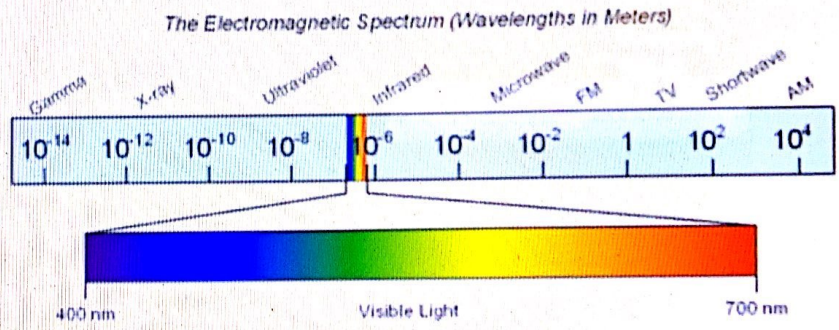
ELECTROMAGNETIC SPECTRUM







eg - Sun light



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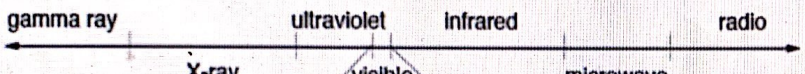
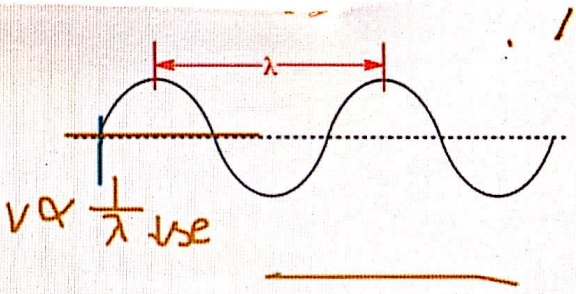
ELECTROMAGNETIC SPECTRUM

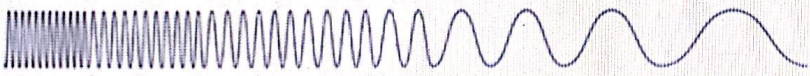




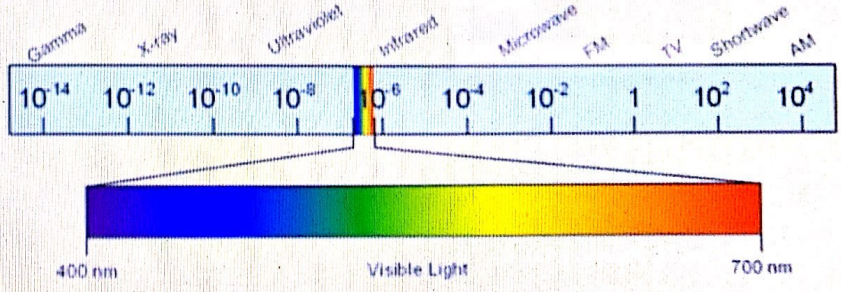
$v \propto \frac{1}{\lambda}$ use

shorter wavelength
higher frequency
higher energy

longer wavelength
lower frequency
lower energy



The Electromagnetic Spectrum (Wavelengths in Meters)



eg - Sun light

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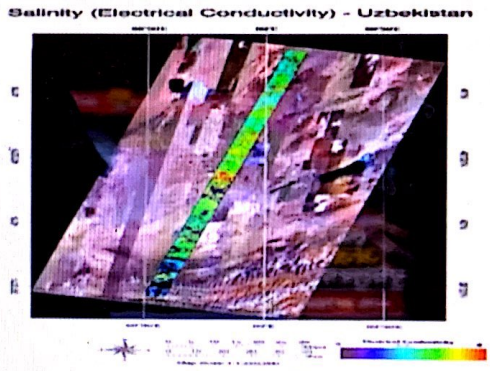
Remote Sensing Application

- Agriculture
- Forestry
- Geology
- Hydrology
- Sea ice
- Land cover and Land use
- Oceans & Coastal Monitoring
- Atmosphere monitoring
- Meteorological parameters measured by remote sensing
- Developing online mapping services



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Agriculture

- crop type classification
- crop condition assessment
- crop yield estimation
- mapping of soil characteristics
- mapping of soil management practices

Forestry

- forest cover
- type of forest
- vegetation density
- deforestation
- forest fires
- biomass estimation

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Geology

- bedrock mapping
- lithological mapping
- structural mapping
- mineral exploration
- hydrocarbon exploration
- environmental geology
- geobotany
- sedimentation mapping and monitoring
- event mapping and monitoring
- geo-hazard mapping

Hydrology

- wetlands mapping and monitoring
- soil moisture estimation,
- measuring snow thickness,
- determining snow-water equivalent,
- river and lake ice monitoring,
- flood mapping and monitoring,
- glacier dynamics monitoring
- river /delta change detection
- drainage basin mapping and watershed modeling irrigation canal leakage detection

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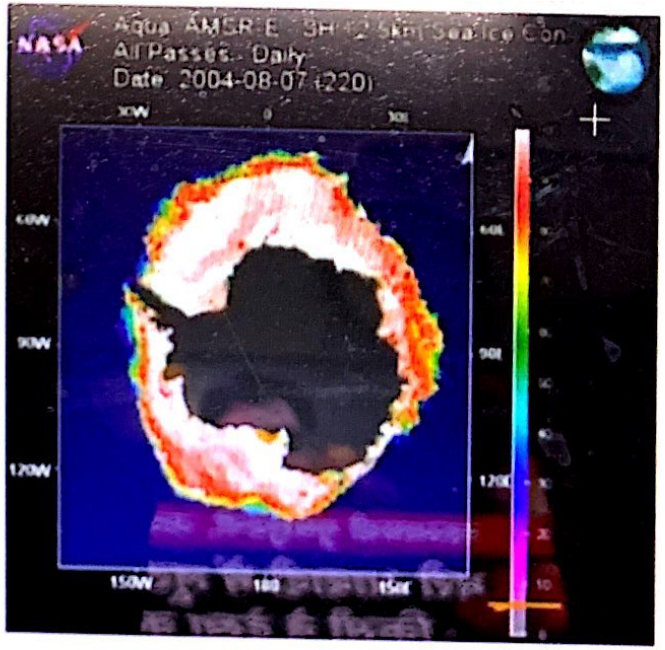
sea ice

- ice concentration
- ice type / age /motion
- iceberg detection and tracking
- surface topography
- tactical identification of leads: navigation: safe shipping routes/rescue
- historical ice and iceberg conditions and dynamics for planning purposes
- ice condition (state of decay)
- wildlife habitat



Antarctic sea ice concentration, ranging from 0 percent (purple) to 100 percent (white) on 07 August 2004. Antarctica is shown in grey, and the unfrozen ocean is shown in dark blue. Sea ice concentration was calculated from data measured by the Advanced Microwave Scanning Radiometer

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Oceans & Coastal Monitoring

- Ocean pattern identification: currents, regional circulation patterns
- Fish stock and marine mammal assessment water temperature monitoring water quality
- tidal and storm effects
- coastal vegetation mapping
- human activity / impact
- ocean salinity

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