Electromagnetic Spectrum

Here is a detailed table showing the different regions of the electromagnetic spectrum along with their corresponding wavelength and frequency ranges:

Region	Wavelength Range	Frequency Range
Radio Waves	> 1 mm	< 300 GHz
Microwaves	1 mm to 1 m	300 GHz to 300 MHz
Infrared Radiation	700 nm to 1 mm	430 THz to 300 GHz
Visible Light	400 nm to 700 nm	750 THz to 430 THz
Ultraviolet (UV)	10 nm to 400 nm	30 PHz to 750 THz
X-rays	0.01 nm to 10 nm	30 EHz to 30 PHz
Gamma Rays	< 0.01 nm	> 30 EHz

Description of Each Region:

1. **Radio Waves**:
   - **Wavelength**: > 1 mm
   - **Frequency**: < 300 GHz
   - **Applications**: Communication (radio and TV broadcasts), radar, and navigation.
2. **Microwaves**:
   - **Wavelength**: 1 mm to 1 m
   - **Frequency**: 300 GHz to 300 MHz
   - **Applications**: Microwave ovens, satellite communications, and radar.
3. **Infrared Radiation**:
   - **Wavelength**: 700 nm to 1 mm
   - **Frequency**: 430 THz to 300 GHz
   - **Applications**: Thermal imaging, night-vision devices, remote controls, and heating.
4. **Visible Light**:
   - **Wavelength**: 400 nm to 700 nm
   - **Frequency**: 750 THz to 430 THz
   - **Applications**: Human vision, photography, and illumination.
5. **Ultraviolet (UV)**:
   - **Wavelength**: 10 nm to 400 nm
   - **Frequency**: 30 PHz to 750 THz
   - **Applications**: Sterilization, fluorescent lights, and UV astronomy.
6. **X-rays**:
   - **Wavelength**: 0.01 nm to 10 nm
   - **Frequency**: 30 EHz to 30 PHz
   - **Applications**: Medical imaging, security scanning, and crystallography.
7. **Gamma Rays**:
   - **Wavelength**: < 0.01 nm
   - **Frequency**: > 30 EHz
   - **Applications**: Cancer treatment, sterilization of medical equipment, and astrophysics.

Diagram Representation

Below is a visual representation of the electromagnetic spectrum showing the relative positions of each type of radiation:

```plaintext
  Radio | Microwaves | Infrared | Visible | Ultraviolet | X-rays | Gamma Rays
<--|----|------------|----------|--------|-------------|--------|------------>
  10^3   10^-2       10^-5      0.5x10^-6  10^-8         10^-10   10^-12 (m)

  |                  |          |        |             |        |
  |                  |          |        |             |        |
300 MHz             300
```