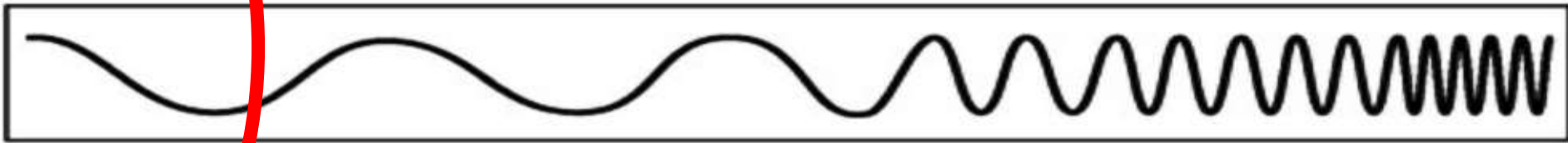
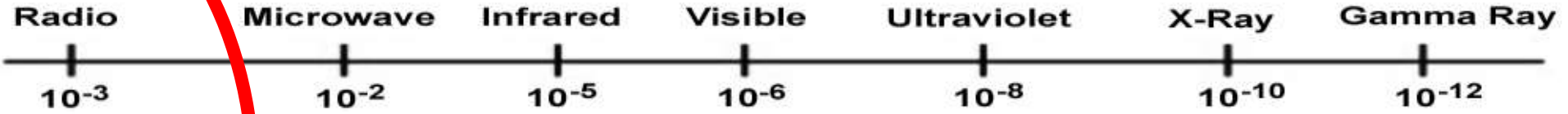




# THE ELECTROMAGNETIC SPECTRUM

Wavelength (meters)



Frequency (Hz)



V I S I B L E   L I G H T



Heinrich Hertz

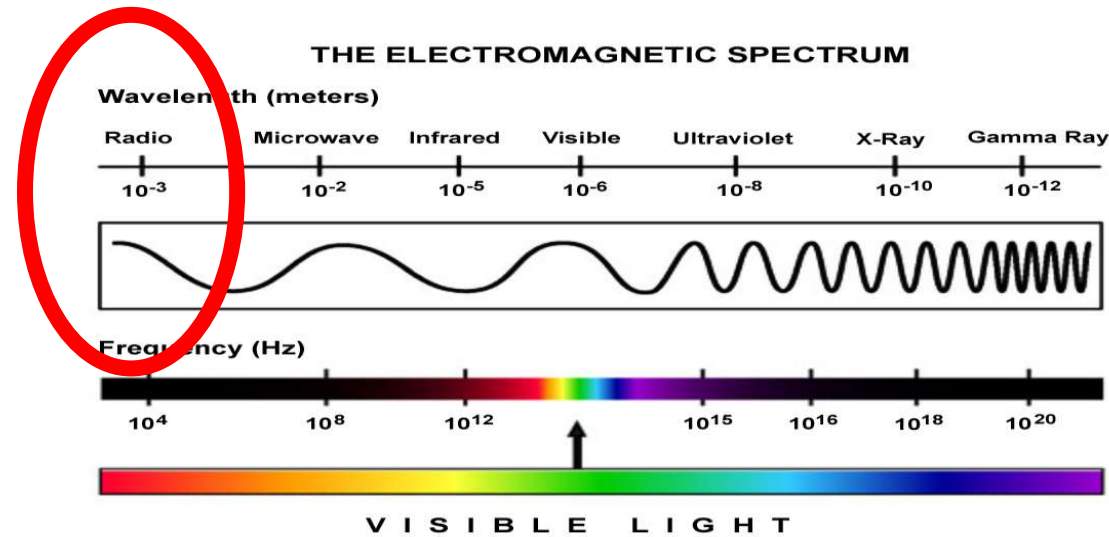


Demonstrated  
radio waves

Late 1800s

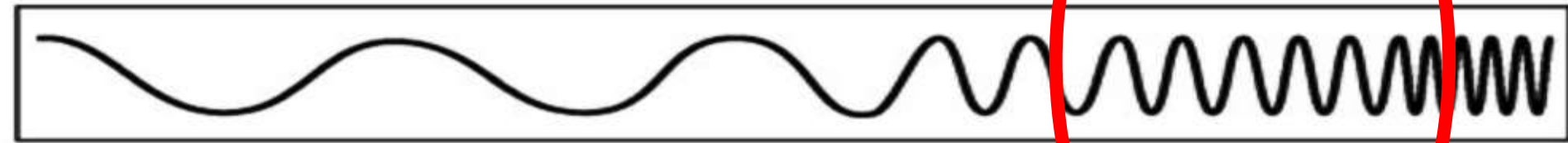
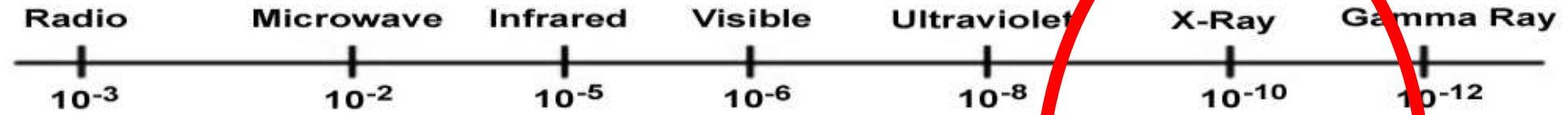
Predicted  
radio waves

James Clerk Maxwell

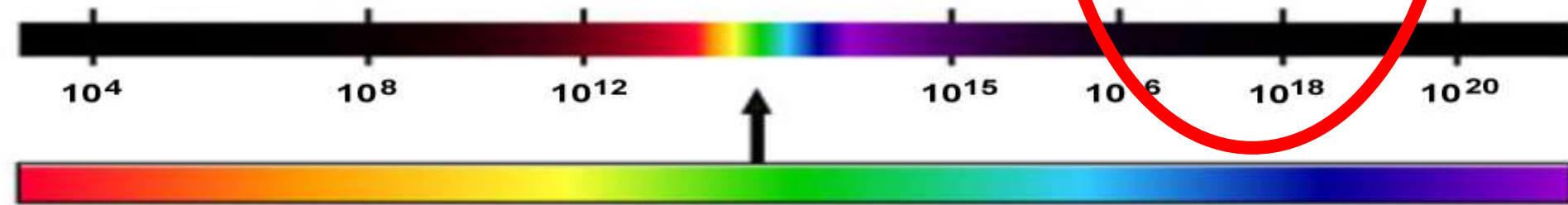


# THE ELECTROMAGNETIC SPECTRUM

Wavelength (meters)



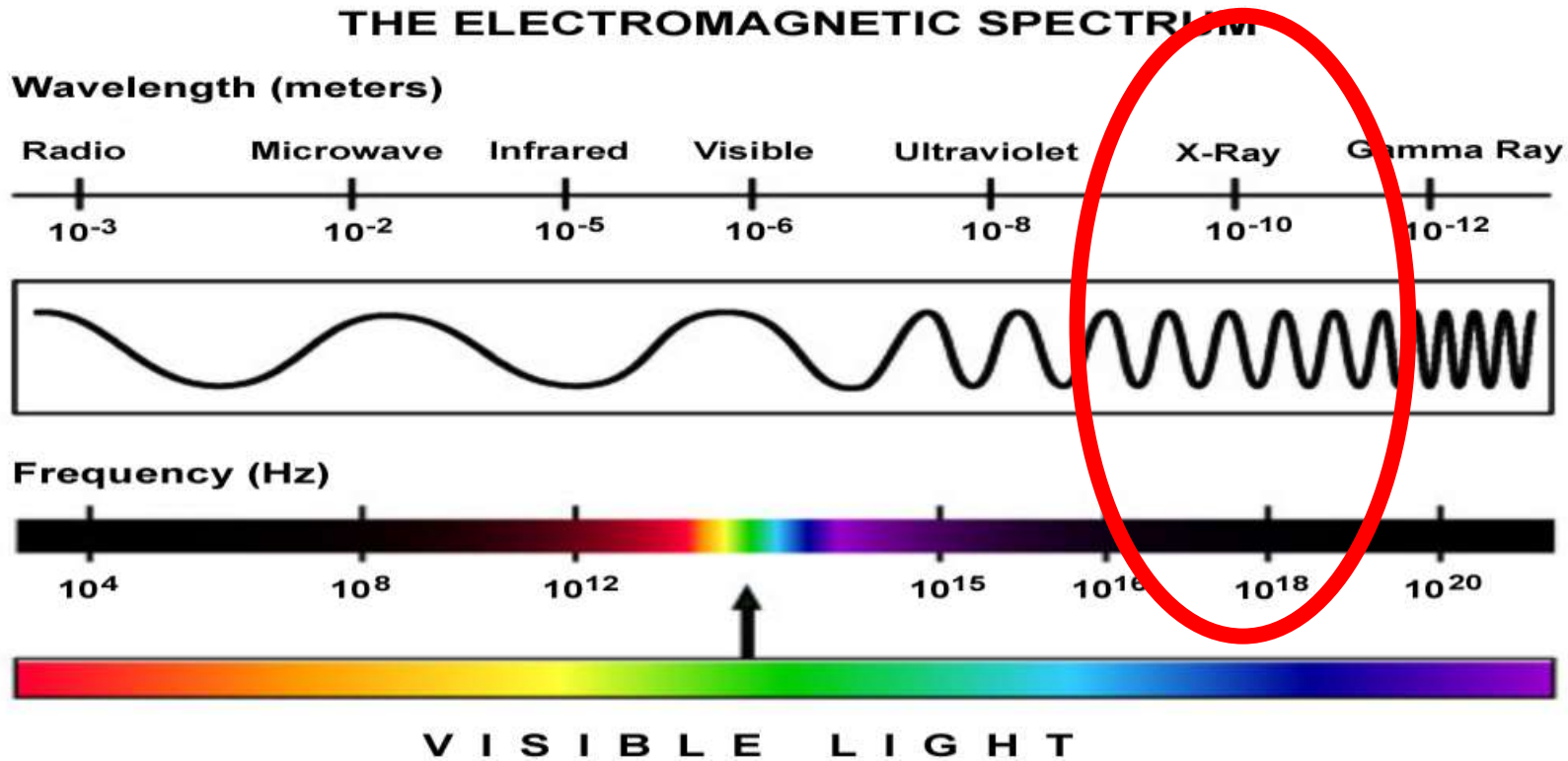
Frequency (Hz)



V I S I B L E   L I G H T

Discovered x-rays

Wilhelm Conrad Röntgen



## Discovery of Radiation

The atoms of certain elements give off (radiate) high-energy particles or waves

Henri Becquerel



Marie Skłodowska Curie



Pierre Curie





McGill

Macdonald Physics Building

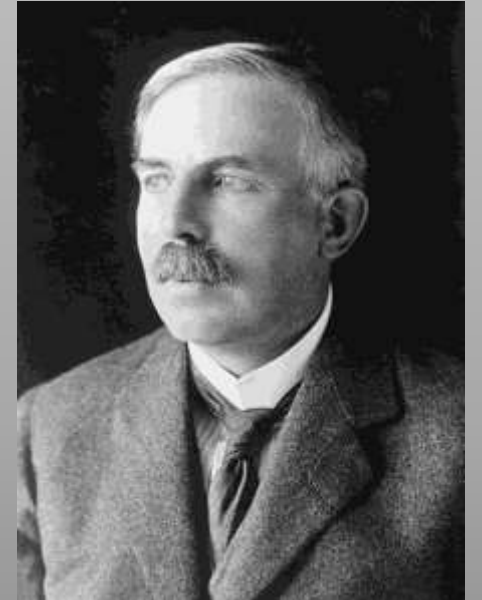


Discovered the concept  
of radioactive half-life

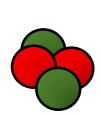
Differentiated and named  
alpha and beta particles

Later named gamma rays

Ernest Rutherford



## Three Types of Radiation



$\alpha$  Alpha particles



Positive charge  
Largest radiation particles  
(2 protons + 2 neutrons; helium nuclei)



$\beta$  Beta particles



Negative charge  
(high energy electrons)



$\gamma$  Gamma rays



Neutral  
(electromagnetic radiation)



# Ability of radiation to penetrate materials

