



**MATERIALS SCIENCE  
& ENGINEERING**  
TEXAS A&M UNIVERSITY

# Introduction to Materials Science & Engineering

## Optical Emission

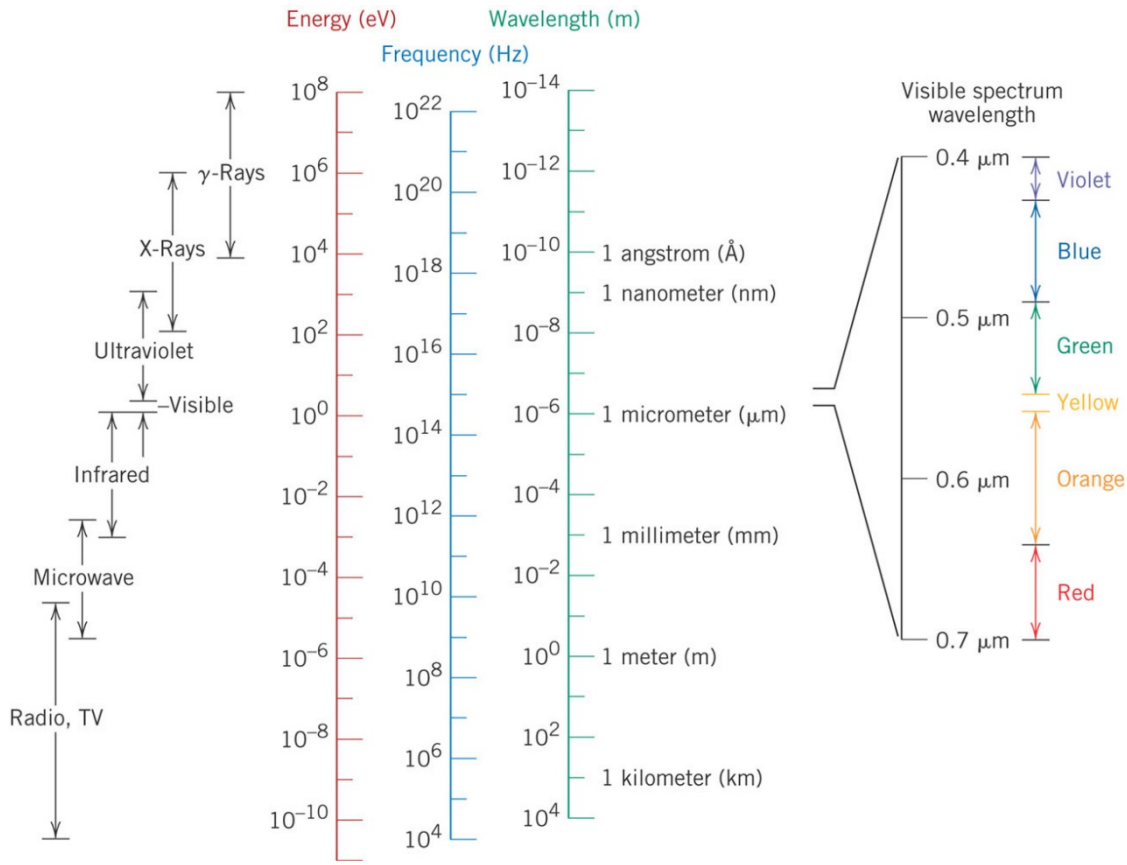
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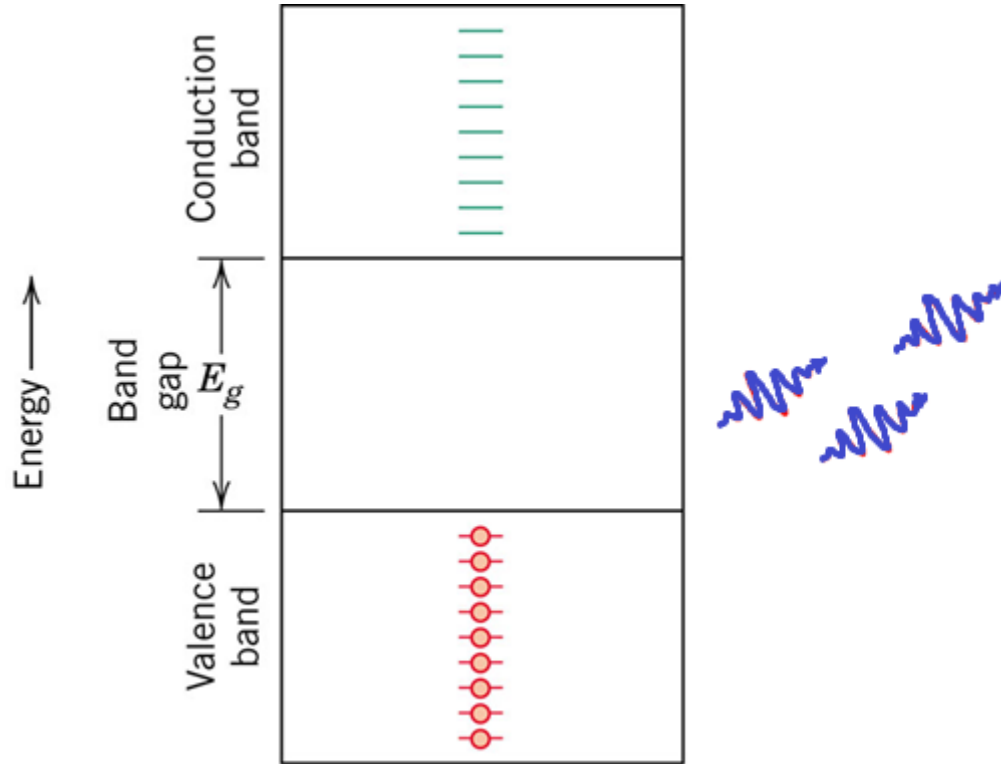


# Light & Matter

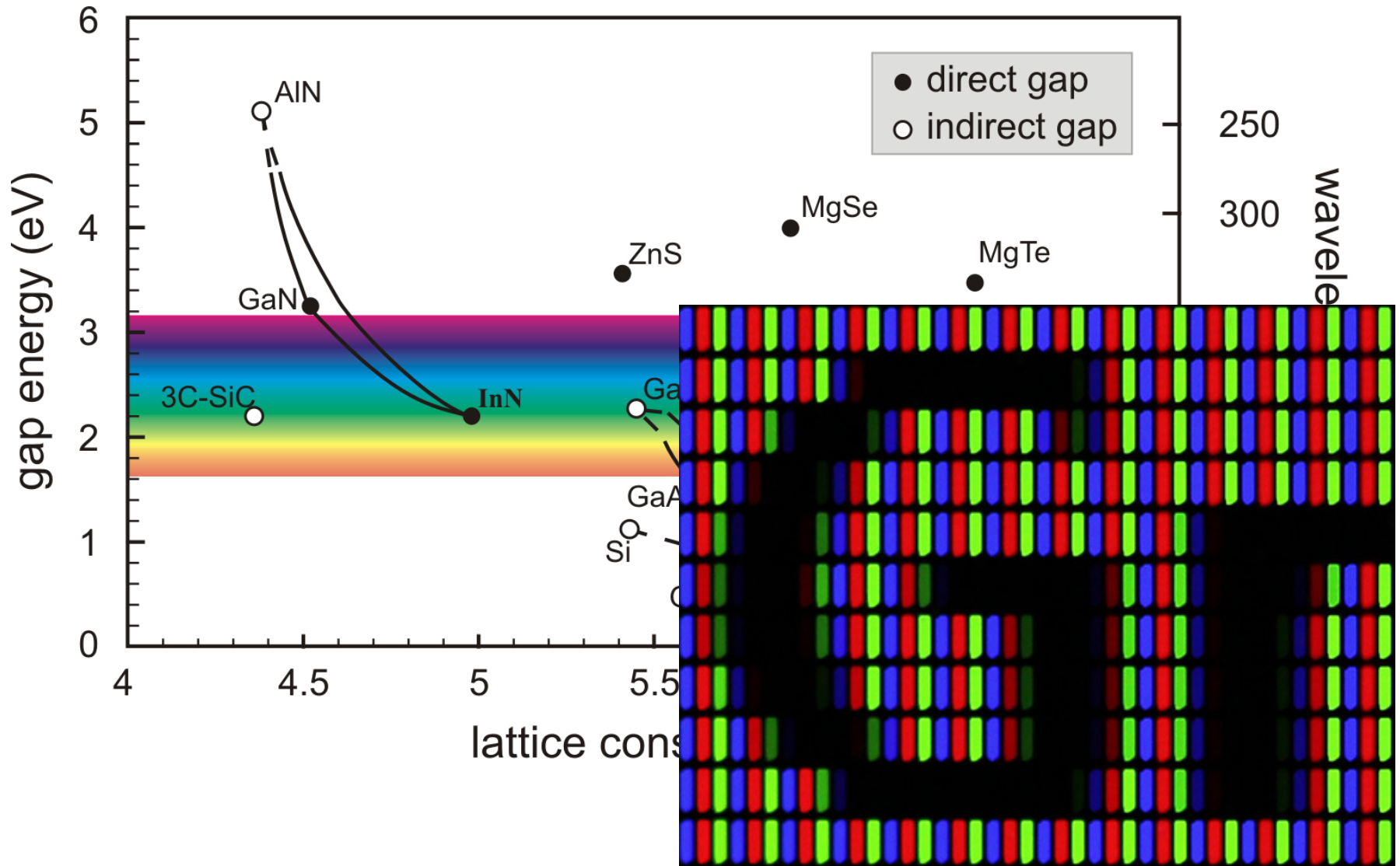


$$E = h\nu = \frac{hc}{\lambda}$$

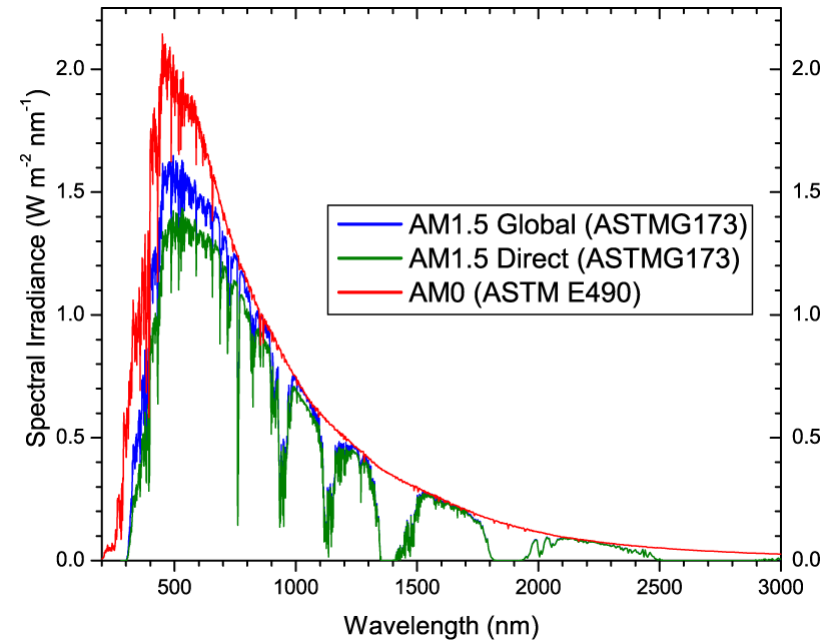
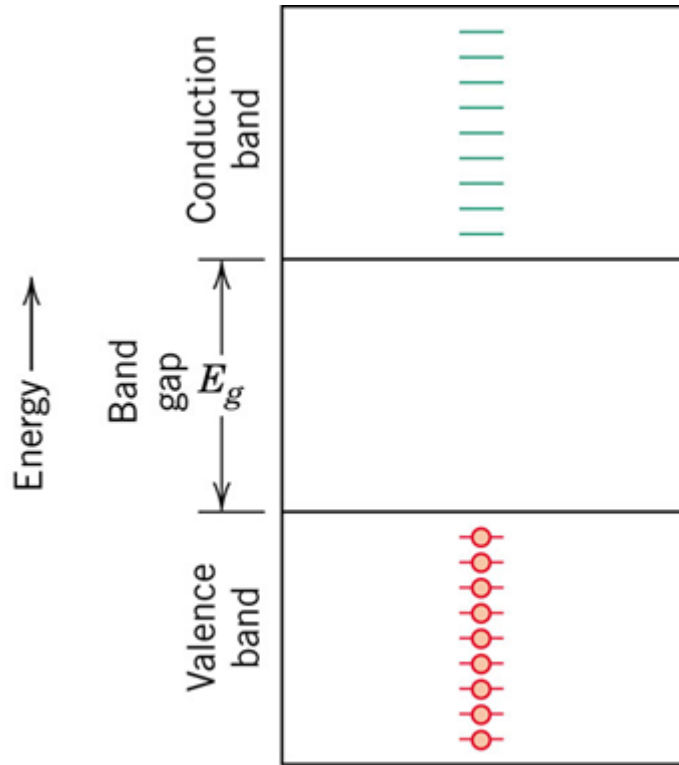
# Optical Emission from Semiconductors



# Optical Emission from Semiconductors



# Optical Absorption by Semiconductors (PV)



# Summary

- Photons of light associated with a specific energy
- Wavelength of light emitted is a function of the bandgap of a material
- Wavelength of light absorbed is a function of the bandgap of a material
- Bandgap “engineering” is the design of materials with specific bandgaps for optical devices