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# Efficient Conversion of Heat to Light

(Photonic Crystal: Light from Heated Metal Films)

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# ThermoPhotovoltaics

- Direct conversion of heat into electricity via photons
  - Thermal emitter
  - Solar cell

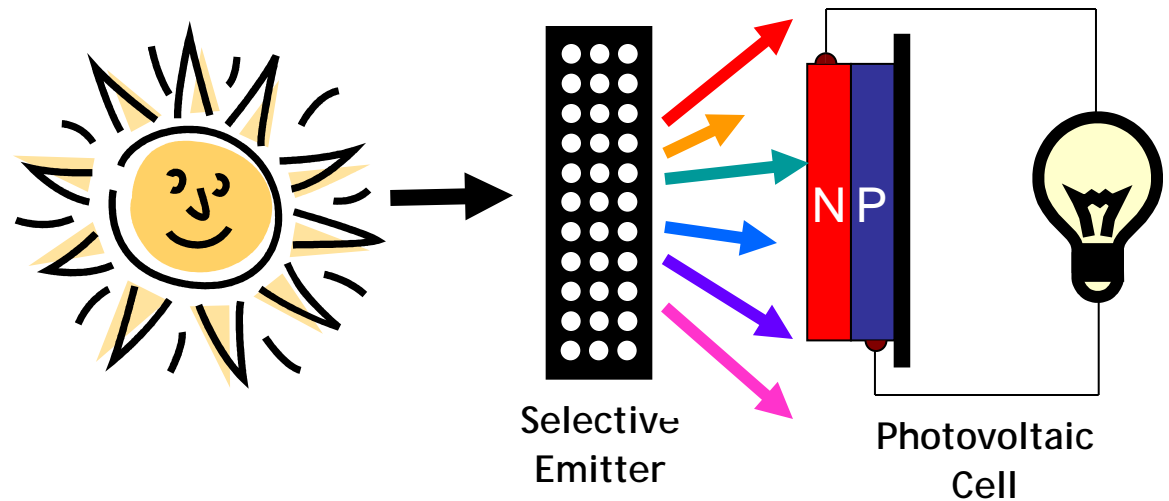


**Need for more efficient thermal emitters that better match the absorption characteristics of the solar cell**



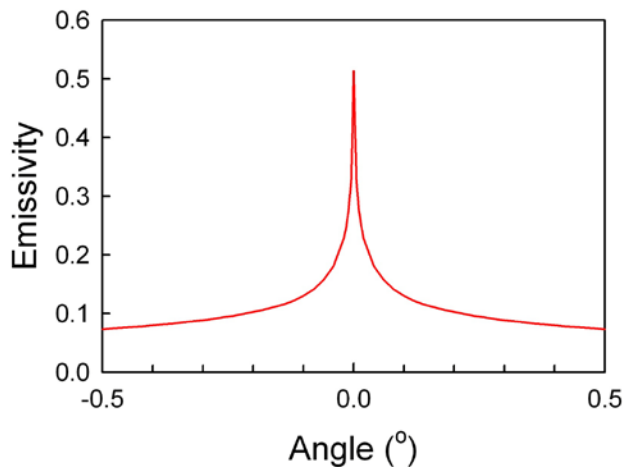
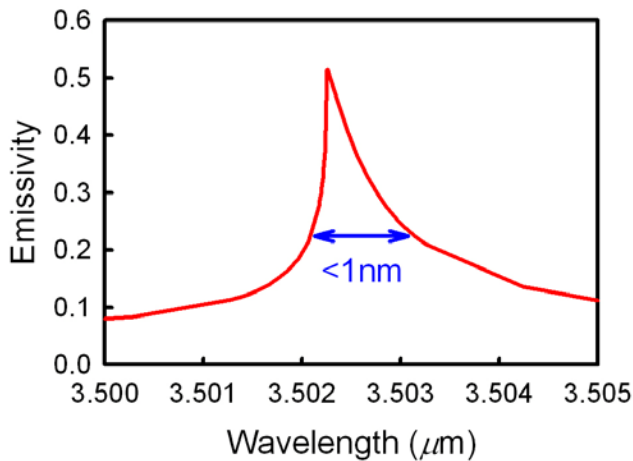
# Shortcomings Of Current Emitters

- Broad emission spectrum
  - Wavelength
- Multi-direction emission
  - Angular





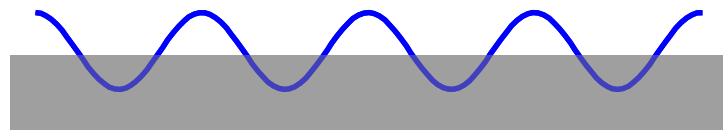
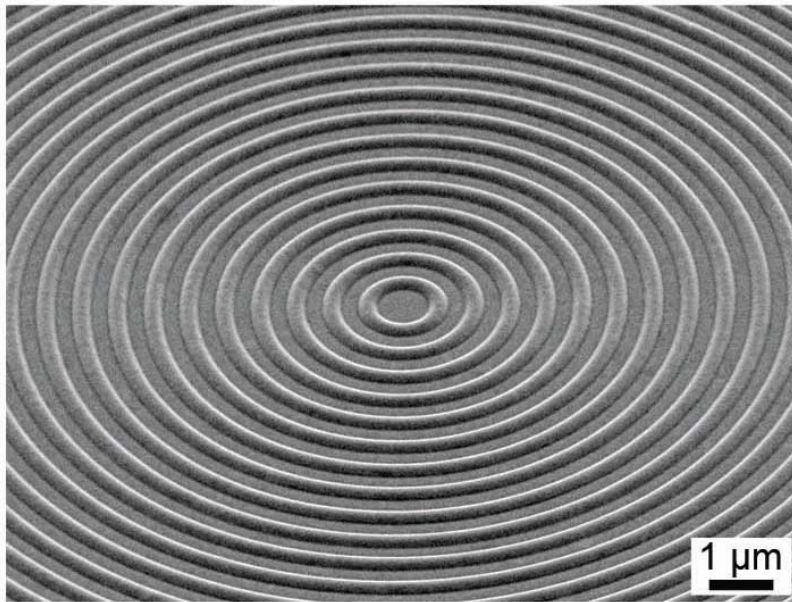
# Improved Thermal Emitter



- Narrow wavelength output
- Laser-like beam
- Low power input
- Simple architecture
- Easy to manufacture



# Photonic Crystal - Bull's Eye



Surface Plasmons

- Patterned refractory metal film
  - Tungsten, Silver, Tantalum
- Converts heat into light
  - Or light into heat
- Tunable - emission wavelength



# Platform Technology

- Other Potential Applications for Bull's Eye
  - Wireless Temperature Sensors
  - Chemical Sensing
  - Monochromatic Light Source
- Different patterns = new applications



# IP Licensing

- IP Status - Provisional applications filed
- Development next steps
  - Optimize design and materials
  - Demonstrate applications
  - Find development partners



# Contact Information

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