

# Methods for Determining Stellar Properties

## **Distance**

- ❖ Parallax
  - Distances less than ~750 light years
- ❖ Standard-Candle Method
  - Uses apparent brightness and known luminosity

## **Temperature**

- ❖ Wein's Law
  - Color-temperature relation
- ❖ Spectral Class
  - O hot, M cool

## **Luminosity**

- ❖ Inverse-Square Law
  - Uses apparent brightness and known distance
- ❖ Luminosity Class
  - I, II, III, IV, V

## **Composition**

- ❖ Spectra
  - Observe known lines

## **Radius**

- ❖ Stefan-Boltzmann Law
  - Measure luminosity & temperature
  - Solve for radius
- ❖ Interferometer
  - Triangulation
    - Uses angular size & distance
- ❖ Eclipsing Binary
  - Light curve

## **Mass**

- ❖ Binary Stars
  - Modified form of Kepler's third law
- ❖ Mass-Luminosity Relation
  - Brighter main sequence stars are more massive

## **Radial Velocity**

- ❖ Doppler Shift
  - Shifted spectral lines