

# Variable Stars & Stellar Populations

Ms. Larsh

# What is a Variable Star?

Variable Stars pulsate in brightness because of the expansion & contractions of their outer layers

The longer the period of pulsation, the greater the luminosity of the star

# What is an RR Lyrae Variable Star?

Stars with periods of pulsation  
between 1.5 hours & 1.2 days on  
average

# What is a Cepheid Variable Star?

Stars with pulsation periods between  
1 - 100 days

The luminosity increases as much as  
100x from dimmest to brightest  
pulsation

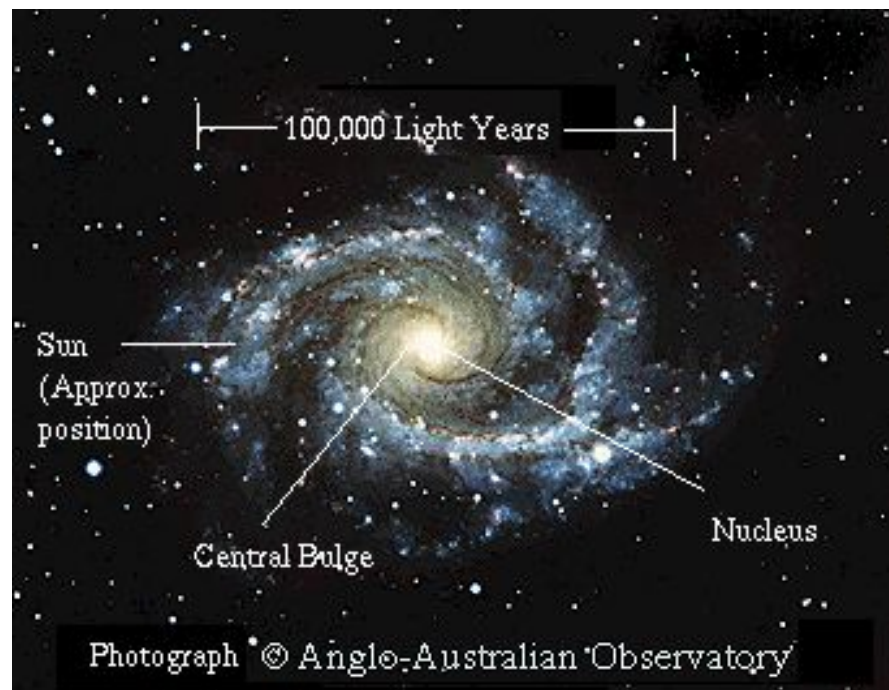
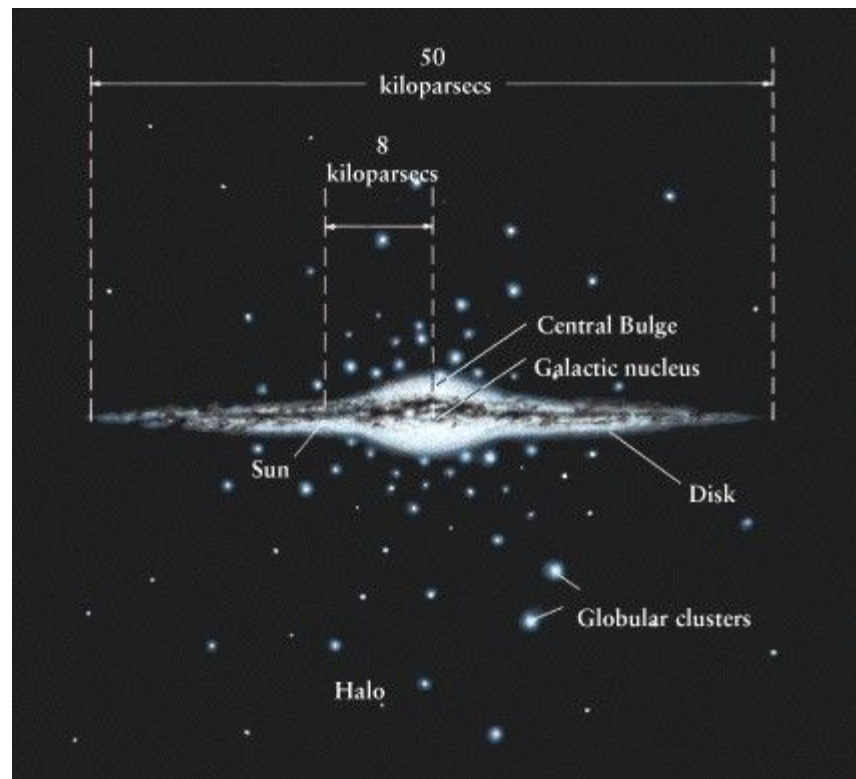
# What are Stellar Populations?

Differences among a star's location, motion, and age that provides information about its galactic history

There are two types of Stellar Populations

# What Population I Stars?

- In the disk & arms
- Have small amounts of heavy elements
- Mostly young stars
- Follow circular orbits
- 98% hydrogen (H) & helium (He)



# What are Population II Stars?

- In the Halo & Nuclear Bulge
- Contain even smaller traces of heavy elements
- Mostly old stars (Globular Clusters)
- 99.9% hydrogen (H) & helium (He)



# Evolution of Spiral Galaxies

Elliptical -> Spiral

or

Elliptical -> Barred Spiral

# Edwin Hubble's Classification Scheme

*Ellipticals*

E0

E3

E5

E7

S0

Sa

Sb

Sc

*Spirals*

SBa

SBb

SBc

