

## ASTR 1020: Stars & Galaxies

November 6, 2013

- Reading: Chapter 21, sections 21.1-21.2.
- *MasteringAstronomy* Homework on **Galaxies** is due Nov. 8<sup>th</sup>.
- SBO Extra Credit observing on Thursday, 7:30 pm.



"The history of astronomy is a history of receding horizons."  
Edwin Hubble

## Clicker Question

Why does ongoing star formation lead to a blue-white appearance in spiral galaxies?

- There aren't any red or yellow stars
- Short-lived blue stars outshine others
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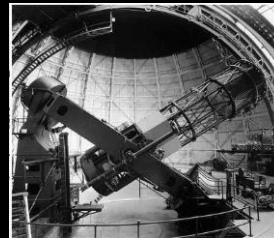
## The Impact of Edwin Hubble

- Hubble's discoveries in 1920's at Mt. Wilson dwarf others in astronomy in 20<sup>th</sup> century.
- He found that the Universe is expanding, leading Einstein to admit his "greatest blunder".
- Hubble's triumphs made him the toast of Hollywood (friends with Charlie Chaplin) in 1930's and 1940's.

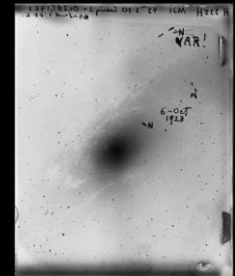


## Hubble: The Early Years

- Majored in science as undergrad at U. Chicago – starred in basketball.
- Rhodes scholar at Oxford, studied law.
- Fought in World War I.
- Returned to grad school at Yerkes Observatory of U. Chicago & studied "nebulae".
- Rival of Harlow Shapley who measured distances in Milky Way using Cepheids but thought Universe was one big galaxy.
- Using Hooker telescope, Hubble discovered Cepheids in Andromeda that is a million light years away.



The Hooker Telescope at Mt. Wilson Observatory, California



Hubble's discovery photograph of Cepheids in Andromeda

Which kind of object is the best  
"standard candle" for measuring the  
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- a) A white dwarf star
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- c) A white dwarf supernova

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## The Hubble Space Telescope

