

# Welcome to Intro. Astronomy SPS 1010-01 *Spring 2013*

## Astronomy and the Universe

1

Oingo Boingo: "Weird Science"



**Dr. Terry Oswalt**  
**Room 146, M,T,R,F 11am-12noon**  
**Phys. Sci. Bldg. (in PSS office)**  
**[toswalt@fit.edu](mailto:toswalt@fit.edu)**



# What this Course is About

**Roots: Astrology**  
**Scientific Method**  
**Applied Physics/Math**  
**Scale of Things**  
**Stellar Evolution**  
**Structure of the Galaxy**  
**Structure of the Universe**  
**Life in the Universe**



# General Comments on this Course

Zoom through Chaps 1-8

Skip Chaps. 9-15 this semester

Focus on Chaps. 16-28

Homework policy (late: -10%/day)

Term project option (see syllabus)

Colloquia, SAS, SPS, SEDS, AIAA

“Check-book math”



# Assignments

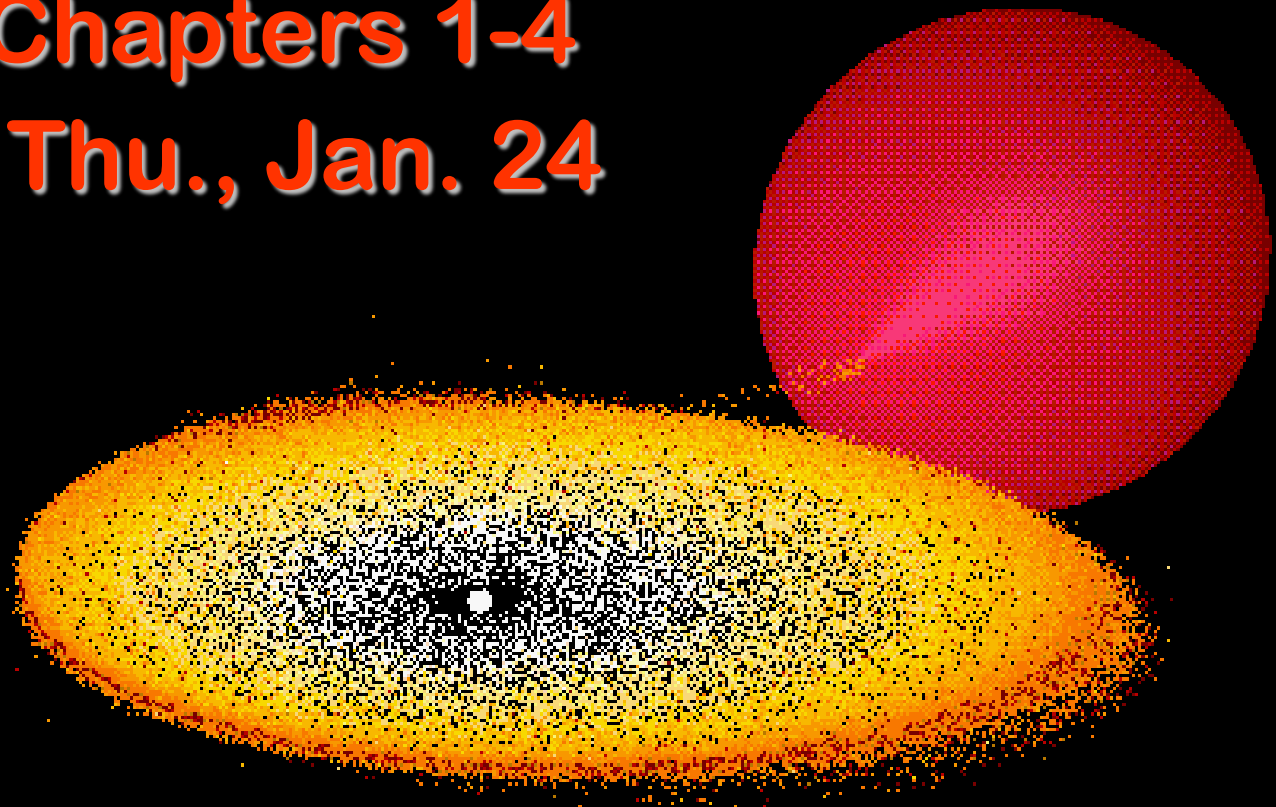
**SIGN THE ROSTER!**

**Follow moon's motion this month**

**Get out at dusk and look for Jupiter!**

**Read FGK, Chapters 1-4**

**HW #1: due Thu., Jan. 24**





Freedman • Geller • Kaufmann

# *Universe*

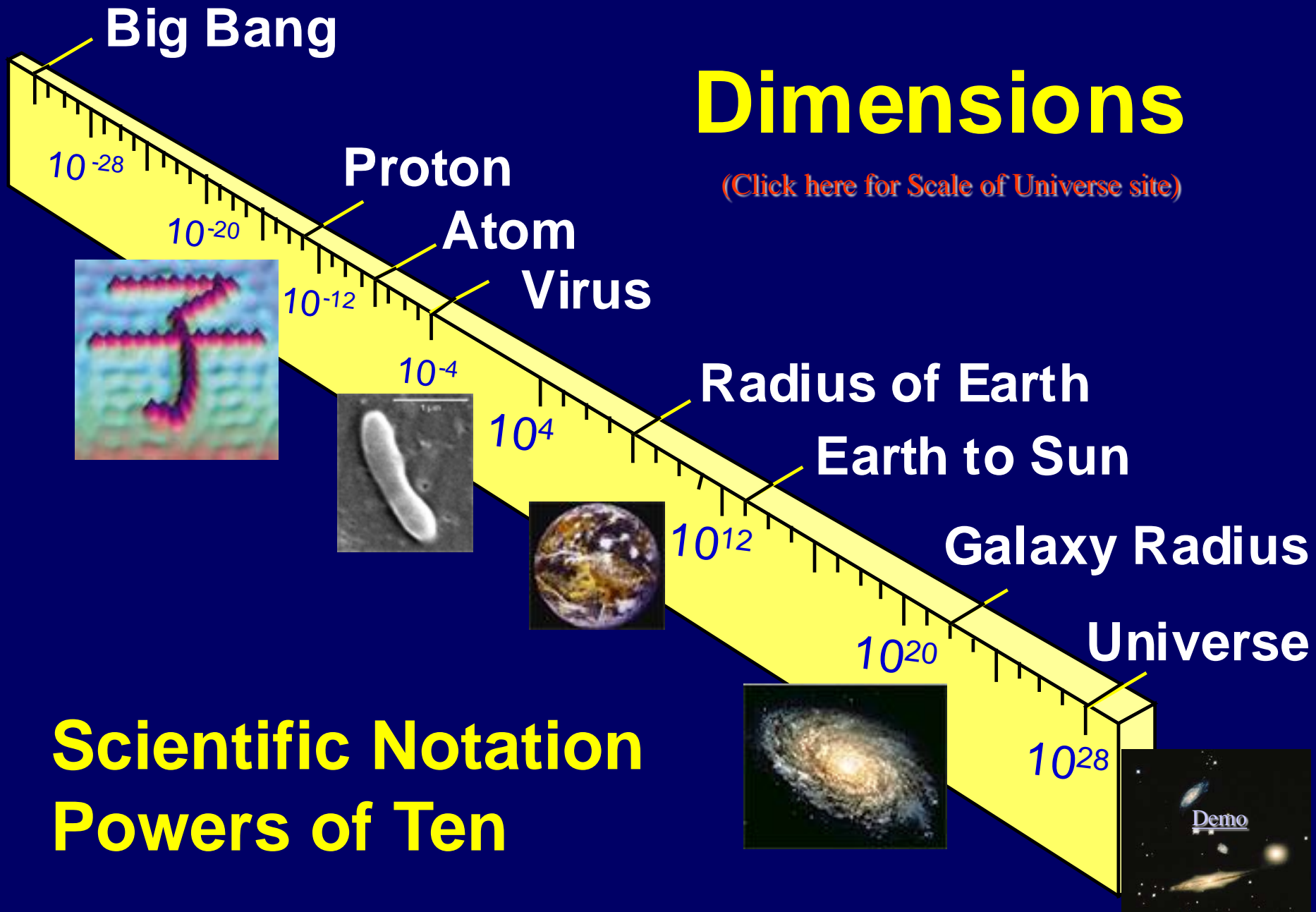
9th Edition

## CHAPTER 1

### Astronomy and the Universe

# Dimensions

(Click here for Scale of Universe site)

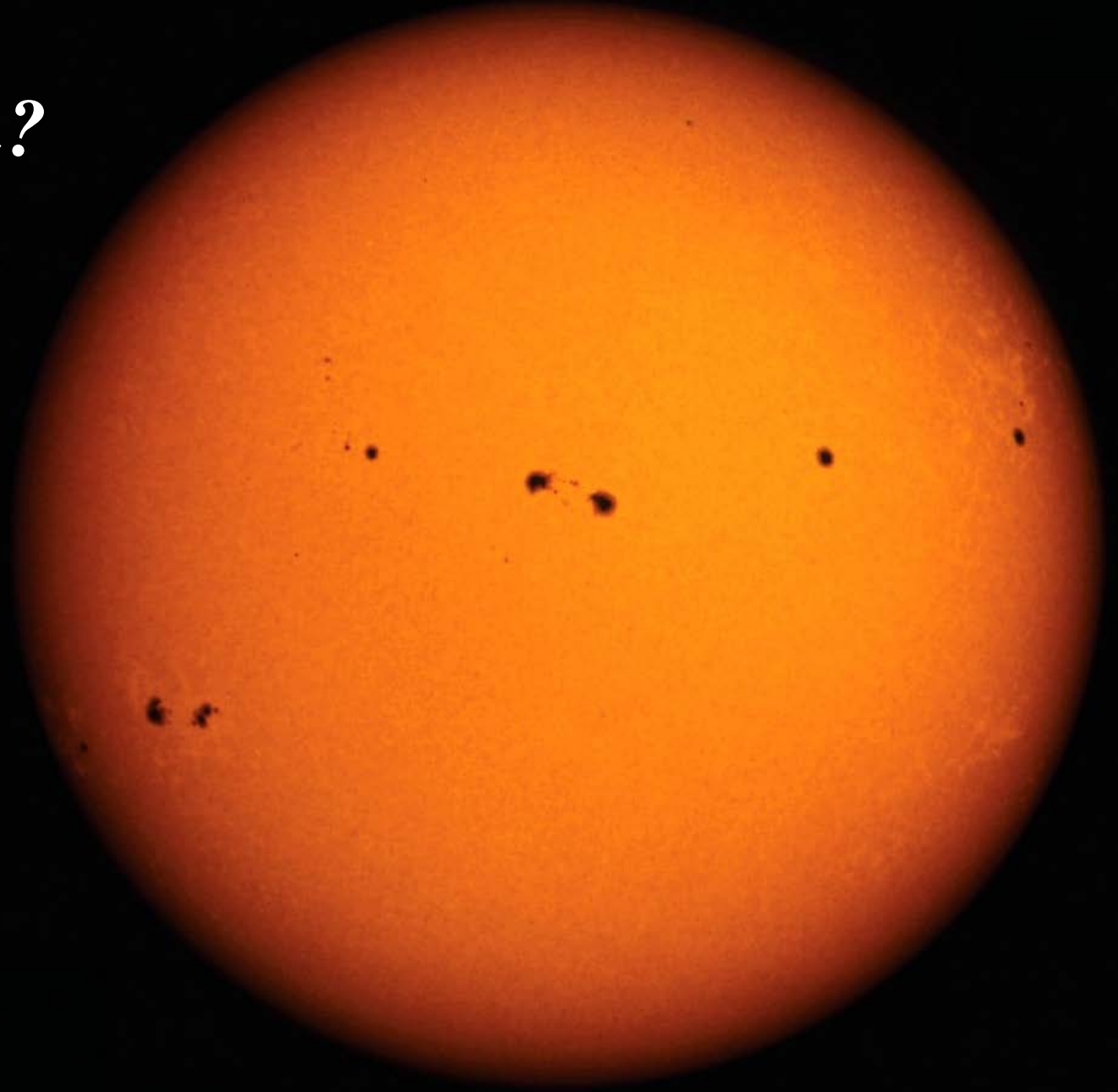


## Scientific Notation Powers of Ten

Demo



*How big is the Sun, compared to:  
Earth?  
Solar System?  
Other Stars?*





*How far away are the Sun's neighbors?*





*How big is the Milky Way galaxy?*







**Our place in the Galaxy (tour)**



*Similar looking, vastly different distances!\**

A black and white astronomical photograph of a starry sky. Two bright, point-like sources of light are the primary focus. The one on the left is labeled 'Star' and the one on the right is labeled 'Quasar'. Both labels are in white, bold, sans-serif font, with a short white line pointing to their respective objects. The star and quasar both exhibit prominent diffraction spikes, appearing as four-pointed stars. The background is dark and filled with numerous smaller, fainter stars and some diffuse nebulae.

**Star**

**Quasar**

*\*How do we know?*

**Moon**

The angular diameter of the full moon in the sky is about  $\frac{1}{2}^\circ$ .

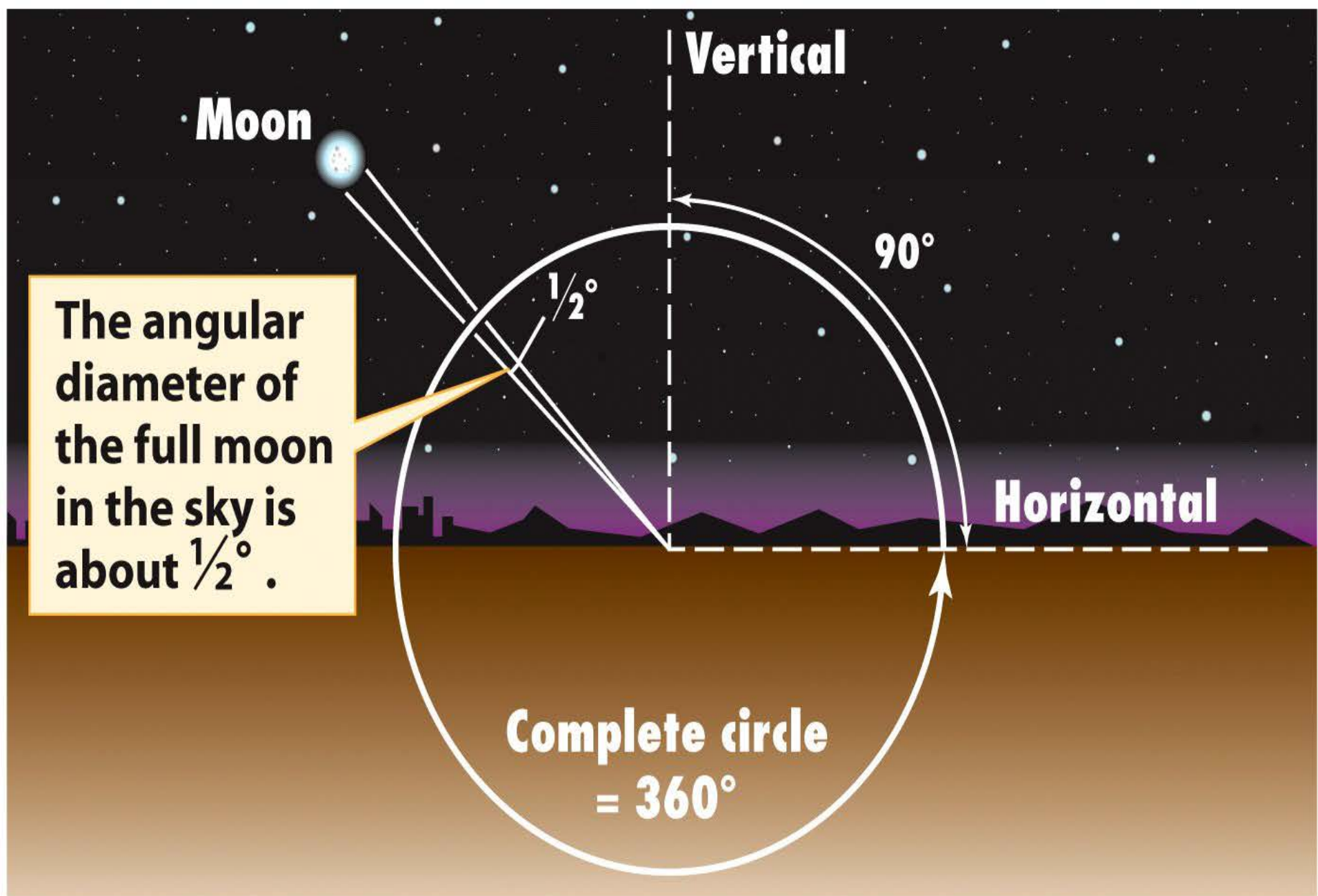
**Vertical**

$90^\circ$

**Horizontal**

**Complete circle  
=  $360^\circ$**

**Measuring angles in the sky**





The angular distance between the two pointer stars at the front of the Big Dipper is about  $5^\circ$ , roughly 10 times the angular diameter of the Moon.

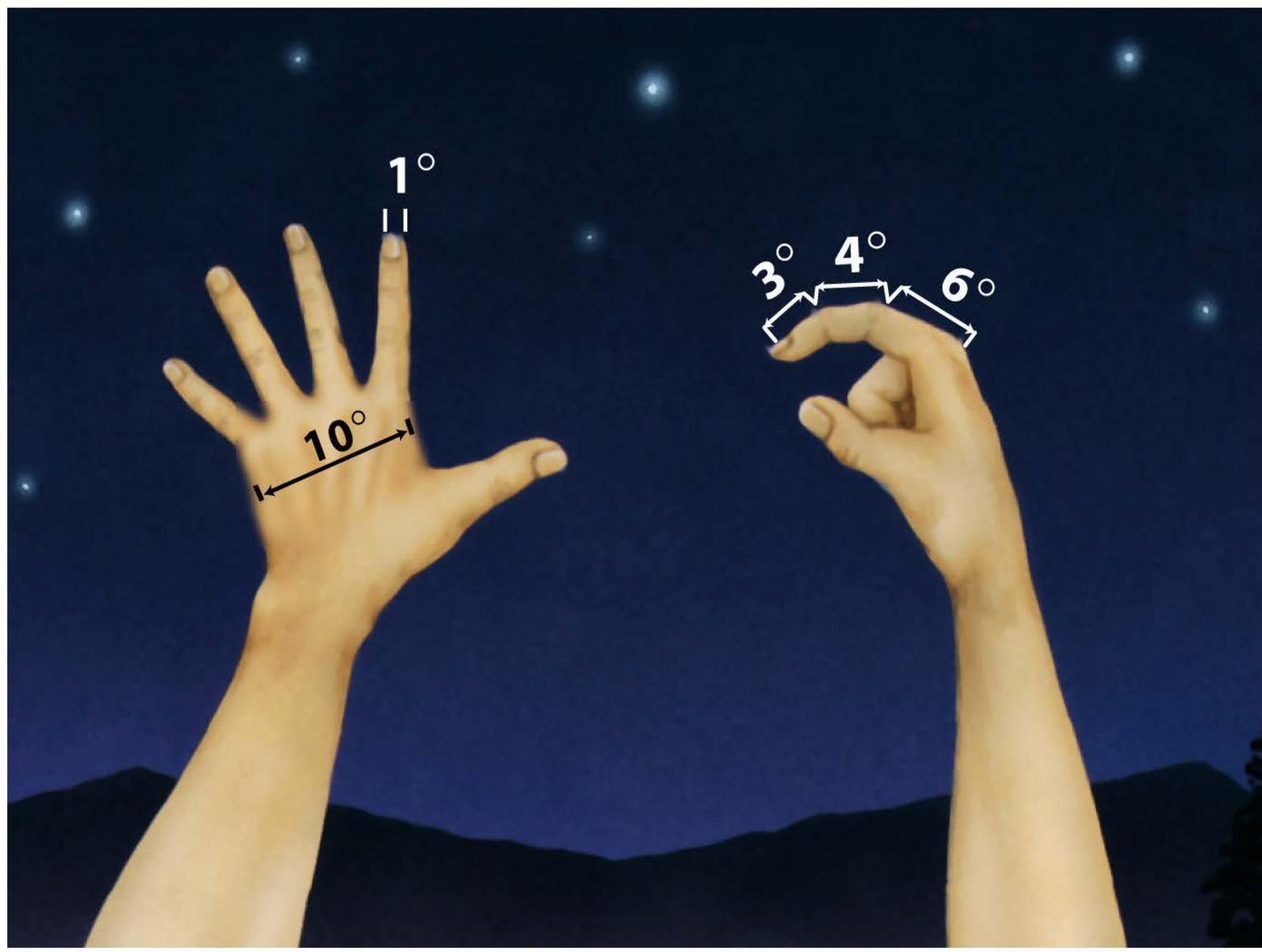
$5^\circ$

**(b) Angular distances in the northern hemisphere**

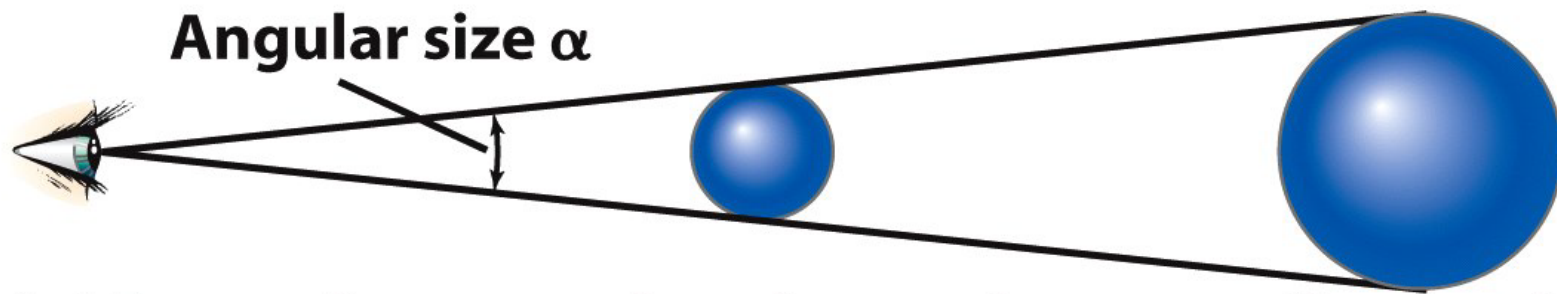
The angular distance between the stars at the top and bottom of the Southern Cross is about  $6^\circ$ .

$6^\circ$

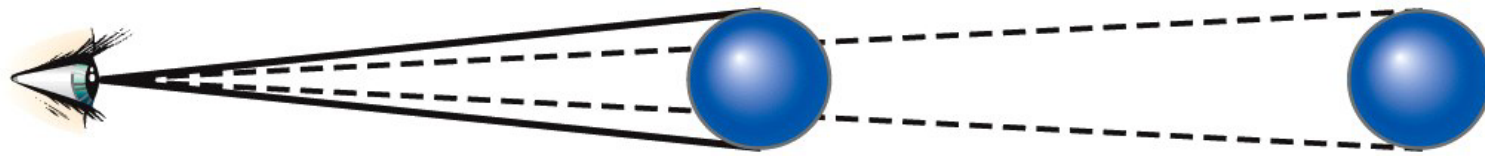
**(c) Angular distances in the southern hemisphere**



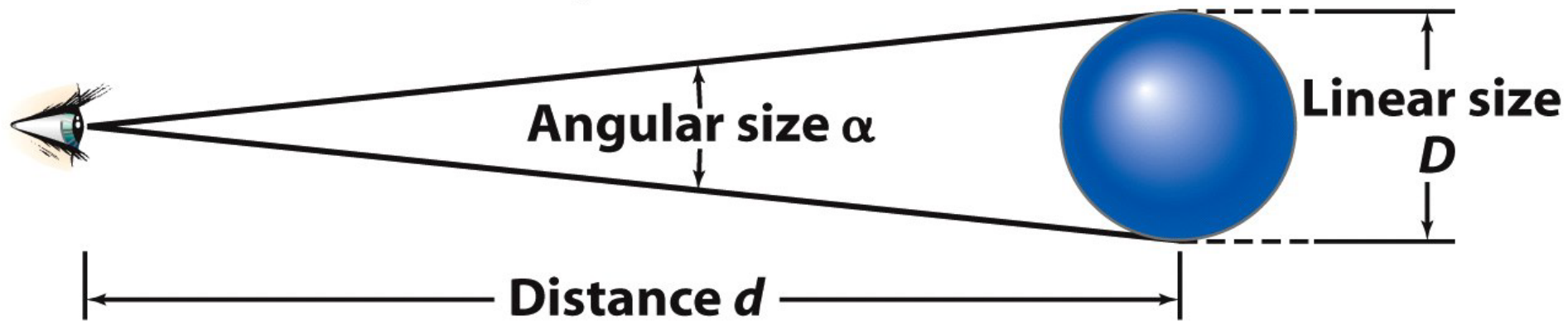




**(a) For a given angular size  $\alpha$ , the more distant the object, the greater its actual (linear) size**



**(b) For a given linear size, the more distant the object, the smaller its angular size**



**(c) Relating an object's linear size  $D$ , angular size  $\alpha$ , and distance  $d$**

A deep space photograph showing a vast field of stars against a black background. Two prominent bright stars with four-pointed diffraction patterns are visible in the foreground, one in the top right and one in the bottom left. The rest of the frame is filled with numerous smaller, distant stars of varying brightness and colors.

Let's begin...