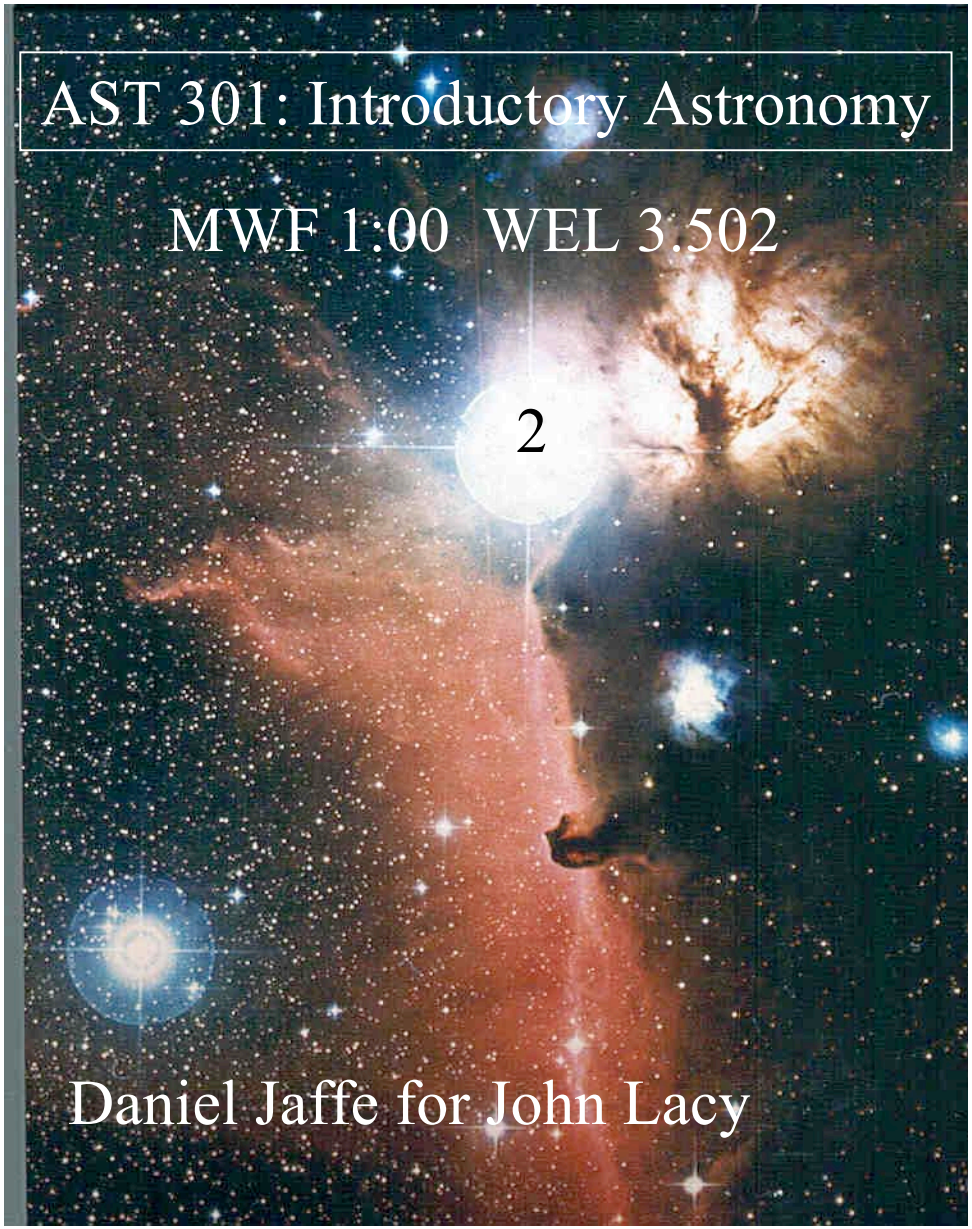

AST 301: Introductory Astronomy
MWF 1:00 WEL 3.502
2
Daniel Jaffe for John Lacy

Reading

- By Now Chapter 1+2
- For Next Week. Chapter 3

Some important scales:

Earth-Sun distance
"Size" of Solar system
Distance to nearest star- typical separation of stars
  How does this compare to the size of a star?
  What does this say about the chances of stars hitting each other?
Size of the Milky Way Galaxy
Distance to Galaxies in the Local Group
Distance to the Virgo Cluster
"Size" of the universe

What is Astronomy? - Your Answers

Study of anything outside the Earth's atmosphere
Study and exploration of the universe and its development
Study of the universe and its relation to humanity
Study of space/cosmos/universe

Study of stars, planets, and galaxies (also black holes, worm holes)
Study of constellations
Study of horoscopes
The future

Exponent Notation

Numbers in astronomy can get very large:

15,000,000,000,000 What's this?

3,000,000,000,000,000,000 How about this?

Wouldn't it be easier to write as:

1.5×10^{13}

3×10^{18} How did we get here?

Addition:

$2.52 \times 10^{12} + 1.3 \times 10^{11} = 25.2 \times 10^{11} + 1.3 \times 10^{11} = 26.5 \times 10^{11} = 2.65 \times 10^{12}$

Multiplication:

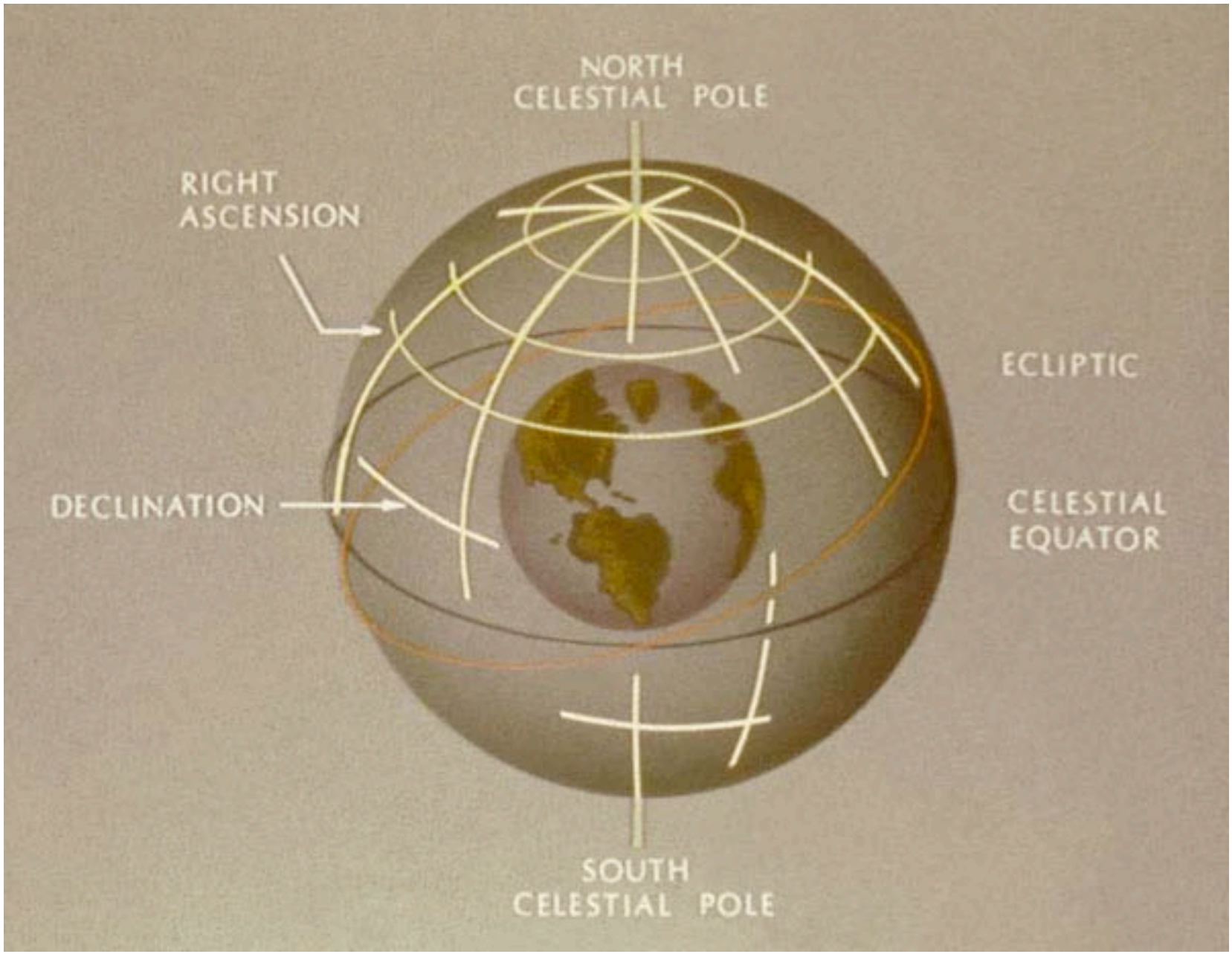
$2 \times 10^{5} \times 1.6 \times 10^{14} = 3.2 \times 10^{(5+14)} = 3.2 \times 10^{19}$

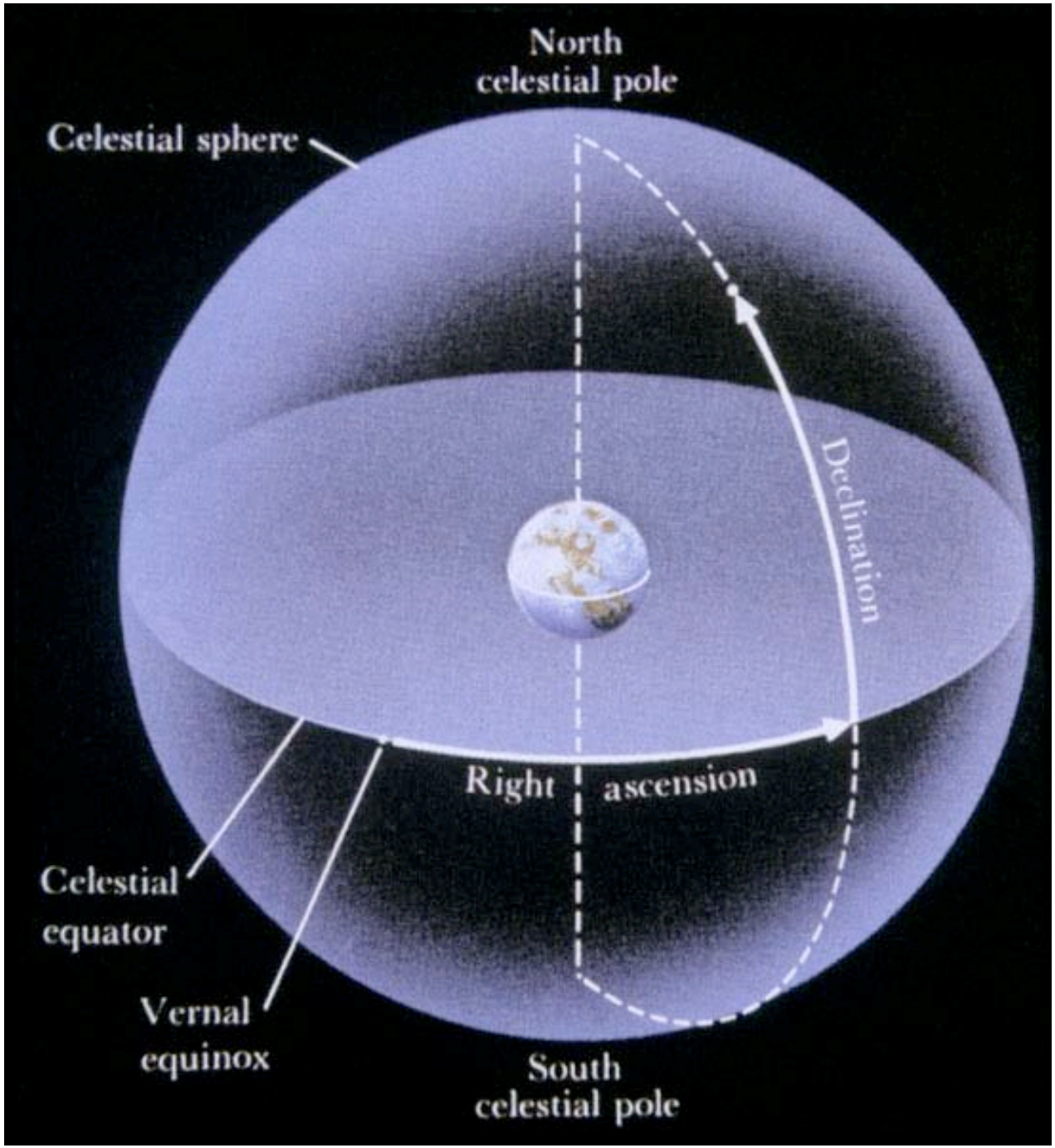
Division:

$8.4 \times 10^{17} / (2 \times 10^{14}) = (8.4/2) \times 10^{(17-14)} = 4.2 \times 10^{3}$

Exponentiation

$(3 \times 10^{4})^{3} = 3^{3} \times (10^{4})^{3} = 81 \times 10^{(4 \times 3)} = 8.1 \times 10^{13}$

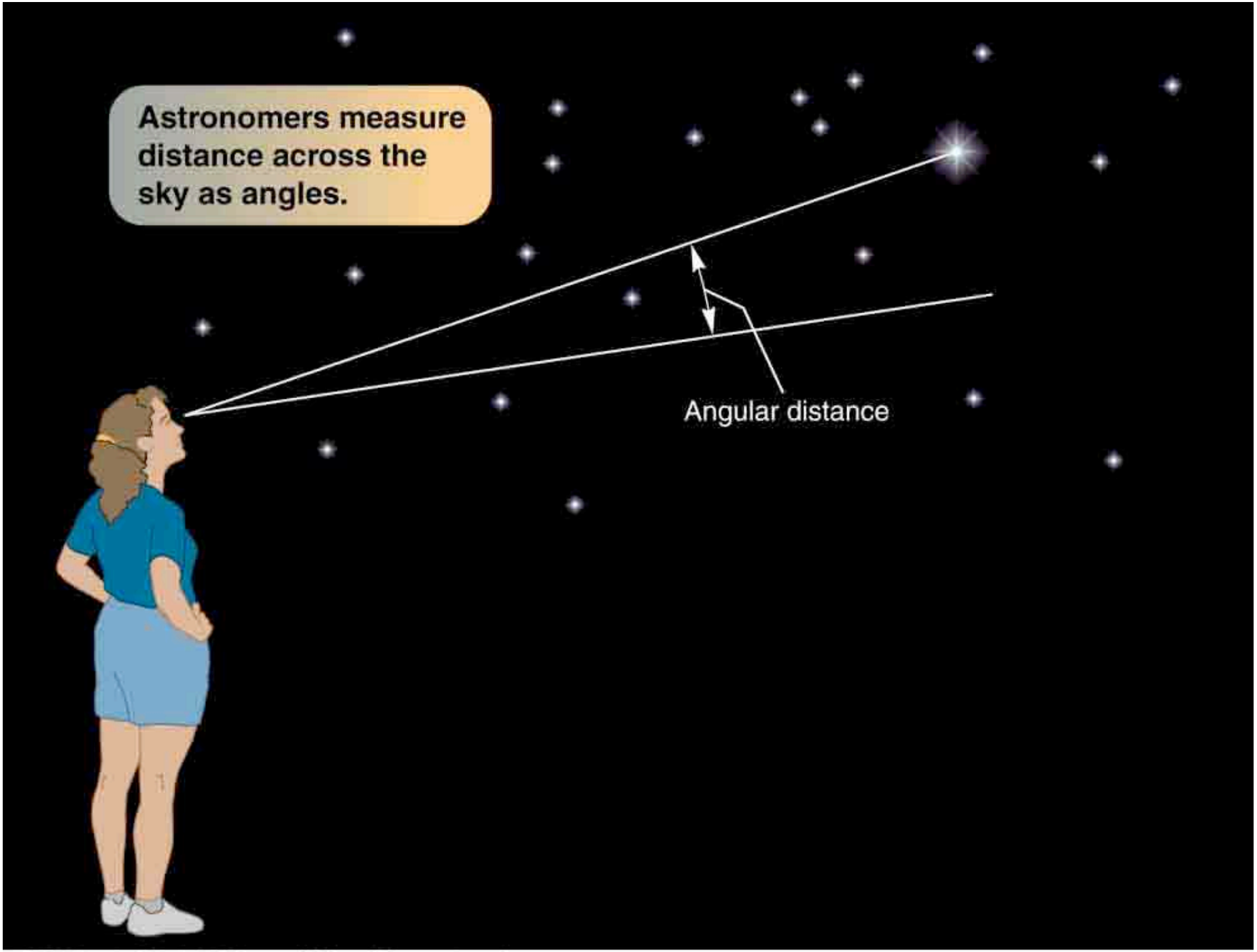

NORTH
CELESTIAL POLE
RIGHT
ASCENSION
ECLIPTIC
DECLINATION
CELESTIAL
EQUATOR
SOUTH
CELESTIAL POLE



Two coordinates
Completely define
Your position on the
Surface of a sphere.

Earth rotates about an
(almost) fixed position
on the sky.

Q: Why don't we
Usually include the 3rd
Dimension when
Discussing locations in
Space?



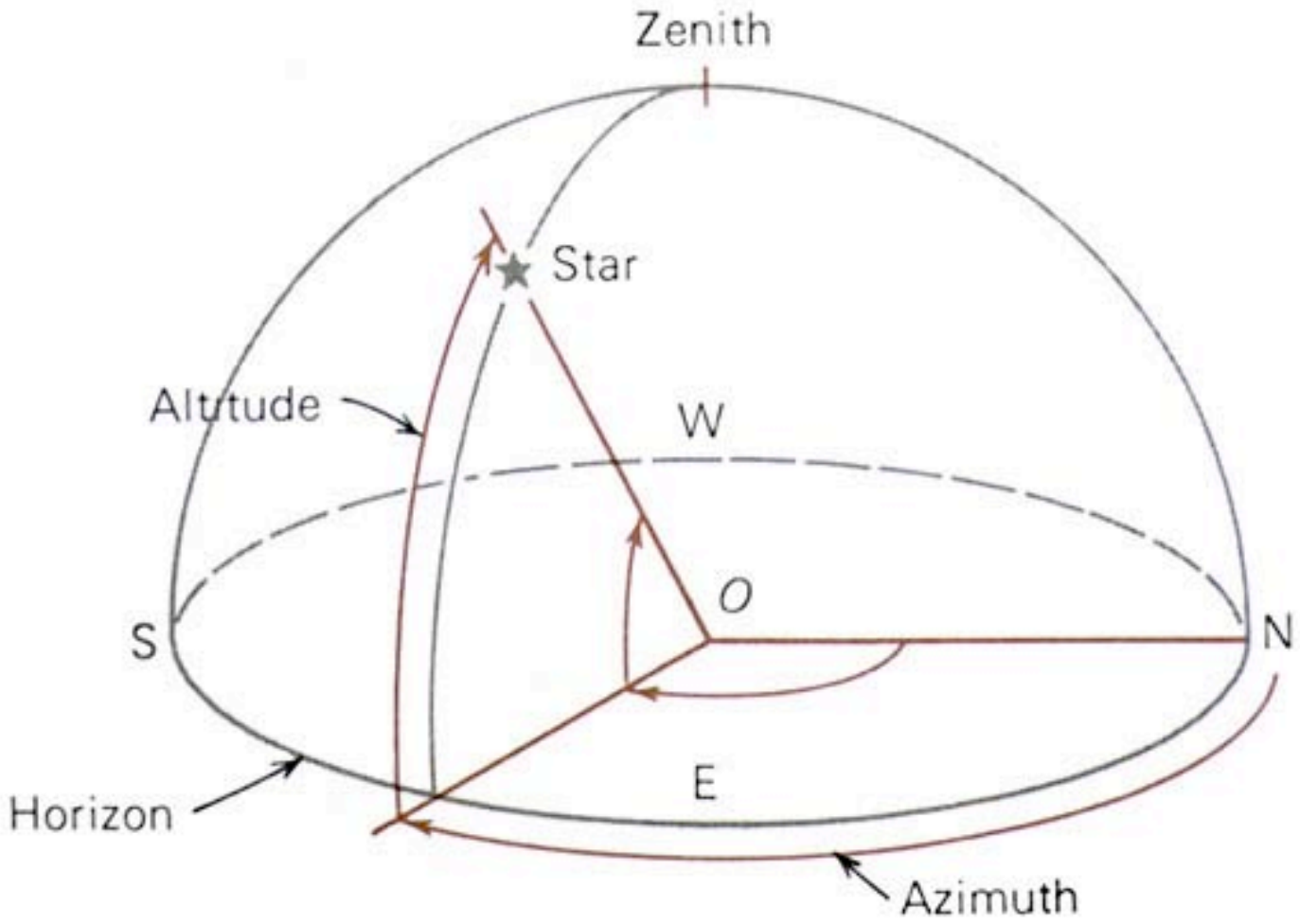


FIG. 5-3 Altitude and azimuth.

Our observing reference frame

Location of our Reference frame On the Earth

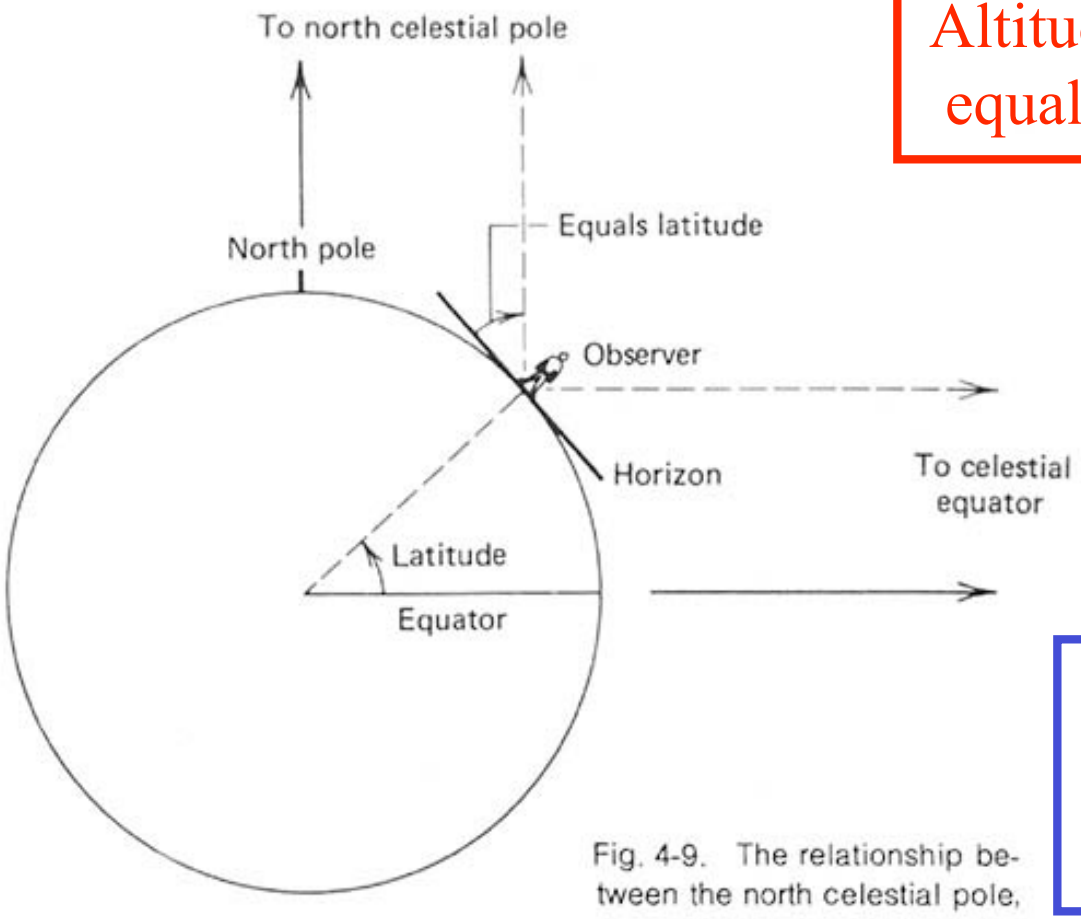


Fig. 4-9. The relationship between the north celestial pole, the terrestrial and the celestial equator, and the latitude of an observer.

Altitude of the north star equals our latitude

Celestial equator maximum altitude and angle at horizon is 90-latitude

Hint: Don't memorize formulas. Stand up and wave your arms