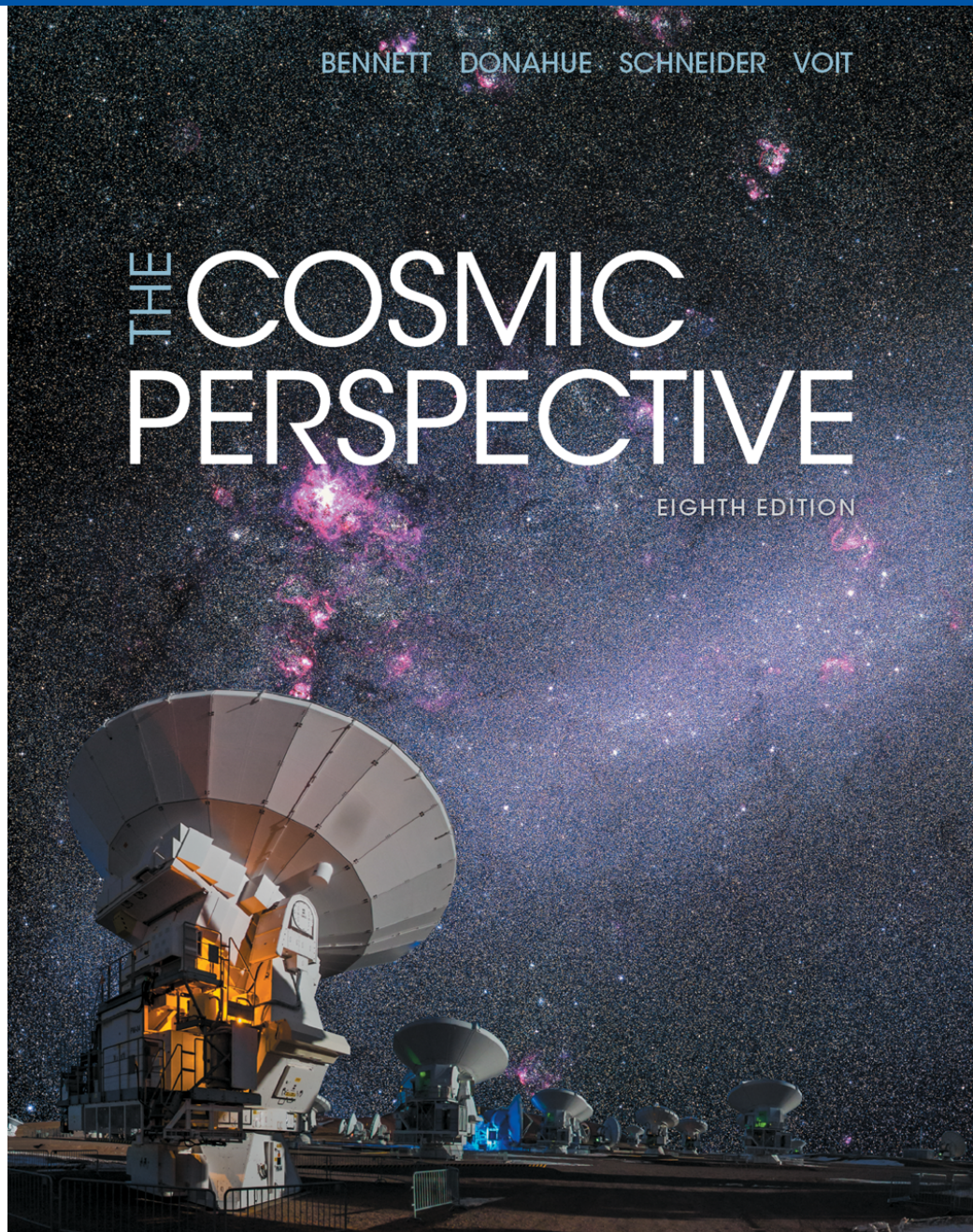
Review Clickers

Chapter 2: Discovering the Universe for Yourself



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a) degrees.
b) tropics.
c) constellations.
d) signs.

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c) the celestial sphere.
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Locations of objects on the celestial sphere are measured in units of

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NOTE: with the exception of the right ascension

The angular size of your fist, held at arm's length, is about

a) 1 degree.
b) 10 degrees.
c) 5 inches.
d) 10 inches.

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b) 5 degrees.
c) 10 degrees.
d) a mile.
e) 2000 miles (1/4 Earth's diameter).

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When an astronomer describes the altitude of something in the local sky, he or she means

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c) the direction toward something–north, south, east, or west.

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c) the direction toward something–north, south, east, or west, on the local horizon.

Directly above Earth's north pole on the celestial sphere is

a) the Big Dipper.
b) the Zenith.
c) the brightest star in the sky.
d) a star called Polaris.
e) C and D

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As seen from North America, stars near Polaris in the sky

a) are in the Big Dipper.
b) are seen only in winter.
c) are seen only in summer.
d) never set.
e) A and D

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How long was this exposure?

a) A few minutes
b) About two hours
c) About 7–8 hours
d) About 12 hours
e) About 24 hours

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What makes Polaris a special star?

a) It is the brightest star in the sky.
b) It is always directly overhead, no matter where you are.
c) It is near the axis about which the sky turns.
d) Its azimuth (direction) is always due north.
e) C and D

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Why are different stars seen in different seasons?

a) because of Earth's axis tilt
b) because stars move during the year
c) because as Earth orbits the Sun, we see the Sun in front of different parts of the celestial sphere
d) because of precession

Why are different stars seen in different seasons?

a) because of Earth's axis tilt
b) because stars move during the year
c) because as Earth orbits the Sun, we see the Sun in front of different parts of the celestial sphere
d) because of precession

During the year, the Sun appears in front of different groups of stars. What are these called?

a) circumpolar stars
b) circumsolar stars
c) the constellations of the zodiac
d) the tropical constellations
e) solstice stars

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Why are the Moon and planets seen only in the constellations of the zodiac?

a) the planets all revolve in the same direction around the Sun
b) the planets all orbit in nearly the same plane, and the zodiacal constellations are in that plane
c) the constellations in the zodiac are the oldest, and the planets have been known from ancient times
d) none of the above

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When is the Sun directly overhead at noon here?

a) March 21
b) June 21
c) July 21
d) never

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When it is summer in the United States, in Australia it is

a) winter.
b) summer.
c) spring.
d) fall.

When it is summer in the United States, in Australia it is

a) **winter.**
b) summer.
c) spring.
d) fall.

In summer, in the northern hemisphere, what is the Sun's daily motion?

a) rises in the east, sets in the west
b) rises north of east, sets south of west
c) rises north of east, sets north of west

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What causes the seasons?

a) In summer, the entire Earth is closer to the Sun.
b) In summer, the tilt of Earth's axis means that one part of Earth is closer to the Sun.
c) In summer, the Sun is up for more hours.
d) In summer, the Sun climbs higher in the sky so its rays hit the ground more directly.
e) C and D

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If the tilt of Earth's axis to its orbital plane were 40 degrees, instead of 23 ½, but its distance from the Sun remained the same, what would happen to the seasons?

a) They wouldn't change much.
b) They would become less extreme–winter and summer would be more alike.
c) They would become more extreme–winter colder and summer warmer.
d) All of Earth would get colder.
e) All of Earth would get warmer.

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b) sunset.
c) sunrise.
d) 9 p.m.
e) It rises at different times during the year.

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If you were on the Moon, Earth would

a) show no phases.
b) show phases the same as the Moon (when it is full Moon it is full Earth, etc.).
c) show phases opposite to the Moon (when it is full Moon it is new Earth, etc.).

– *Make a sketch to decide!*

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Suppose that the Moon was a cube, but everything else was the same–it kept one side facing Earth as it orbited. What would its phases be like?

a) It would not have phases.
b) The phases would be just like now.
c) The same as now, except square: crescent square, half-square, full square, etc.
d) It would only show "new" and "full" phases.

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Why have more people seen an eclipse of the Moon than an eclipse of the Sun?

a) Eclipses of the Sun are much rarer than eclipses of the Moon.
b) The shadow of the Moon is smaller than the shadow of Earth.
c) Anyone on the night side of Earth can see a total eclipse of the Moon.
d) Anyone on the day side of Earth can see a total solar eclipse.
e) B and C

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The observation of retrograde motion

a) proved that the heliocentric (sun-centered) model is correct.
b) proved that the geocentric model is correct.
c) could be explained by the heliocentric model and one geocentric model, that of Ptolemy

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Why didn't the Greek astronomer Hipparchos observe the parallax of stars?

a) He believed that Earth didn't move, so there was no parallax.
b) He did; he just didn't know what it meant.
c) It couldn't be detected without a telescope.
d) Not all stars show parallax.
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What makes the North Star special?

a) It was the first star to be cataloged by ancient astronomers.
b) It practically coincides with the north celestial pole and is therefore very useful for navigation.
c) It is the brightest star in the entire sky.
d) It is the brightest star in the northern sky.
e) It is visible from both the northern and southern hemispheres.

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If you had a very fast spaceship, you could travel to the celestial sphere in about a month.

a) Yes, and the Voyager spacecraft has already done so.
b) Yes, but once such a spacecraft crosses the celestial sphere it can never return.
c) No, the celestial sphere is so far away that, even moving at close to the speed of light, it would take tens of thousands of years to reach.
d) No, the celestial sphere moves away from us at the speed of light so we can never catch up with it.
e) This statement doesn't make sense because the celestial sphere is not a physical object.

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I live in the United States, and during my first trip to Argentina I saw many constellations that I'd never seen before.

a) Yes, the skies in Argentina are notable for their clarity, therefore you can see many more stars there than in the U.S.

b) Yes, Argentina's southern location affords us a different view of the night sky from what is visible in the U.S.

c) No, the skies are exactly the same in both Argentina and the U.S.

d) No, the constellations are upside down so they appear different but they are actually the same.

e) This might be true if the visit occurred in the winter when different constellations are visible than in the summer.

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Last night I saw Mars move westward through the sky in its apparent retrograde motion.

a) Yes, this occurs during certain times of the year when Earth overtakes Mars in its orbit.
b) Yes, this is a well studied phenomenon and its explanation proved a challenge to ancient astronomers.
c) All planets (and stars) move westward because of Earth's rotation, so this is not unusual.
d) No, apparent retrograde motion is only noticeable over many nights, not a single night.
e) No, because Mars lies further from the Sun than Earth, it does not undergo retrograde motion.

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If Earth's orbit were a perfect circle, we would not have seasons.

a) True, because Earth would be at the same distance from the Sun throughout its orbit, there would be no summer or winter.

b) True, it is the deviations from a circular orbit that create the seasons.

c) False, the seasons are due to the tilt of Earth's axis, not its distance from the Sun.

d) False, the poles would still be cooler than the equator and seasonal variations would therefore still exist.

e) False, whether circular or not, the seasons depend on the precession of Earth's axis as it orbits the Sun.

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Because of precession, someday it will be summer everywhere on Earth at the same time.

a) Yes, precession will naturally circularize Earth's orbit.
b) Yes, precession will eventually reduce Earth's axis tilt.
c) Yes, precession will make summers occur at the same time, but in what is now the northern spring and southern fall.
d) Yes, but it would take tens of thousands of years, longer than current human history, for this to occur.
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