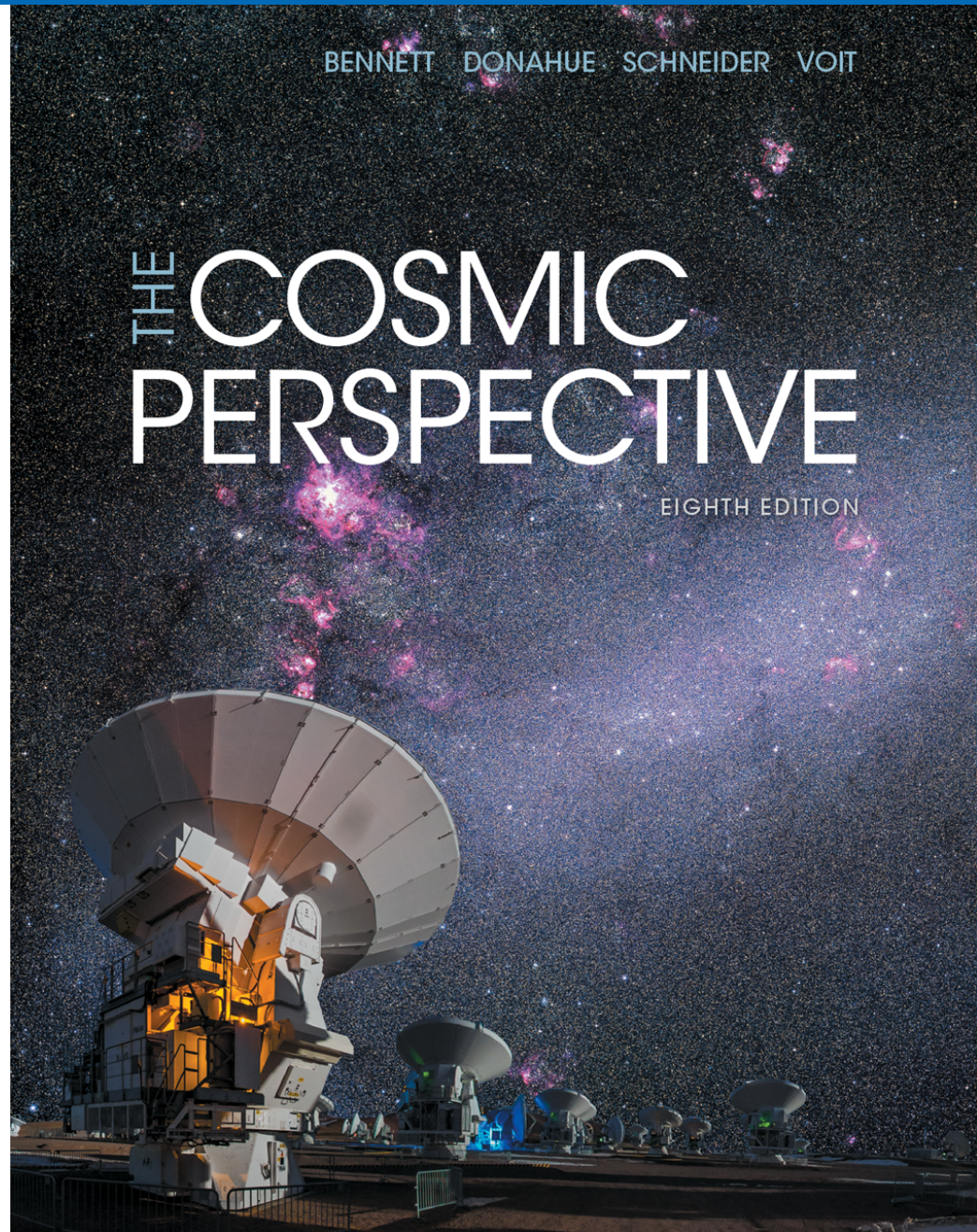


Chapter 2: Discovering the Universe for Yourself



2.1 Patterns in the Night Sky

- What does the universe look like from Earth?
- Why do stars rise and set?
- Why do the constellations we see depend on latitude and time of year?

The ecliptic is

- a) the projection of Earth's equator onto the celestial sphere.
- b) the path of the Sun on the celestial sphere.
- c) the projection of Earth's orbit onto the celestial sphere.
- d) all of the above
- e) B and C

The ecliptic is

- a) the projection of Earth's equator onto the celestial sphere.
- b) the path of the Sun on the celestial sphere.
- c) the projection of Earth's orbit onto the celestial sphere.
- d) all of the above
- e) B and C**

The meridian is

- a) the projection of Earth's equator onto the celestial sphere.
- b) the point in your local sky directly above you.
- c) the boundary between the northern and southern halves of your local sky.
- d) the boundary between the eastern and western halves of your local sky.

The meridian is

- a) the projection of Earth's equator onto the celestial sphere.
- b) the point in your local sky directly above you.
- c) the boundary between the northern and southern halves of your local sky.
- d) the boundary between the eastern and western halves of your local sky.**

All of the following are points on your local sky.
Which one does not move on the celestial
sphere over the course of a day?

- a) the zenith
- b) altitude of 30 degrees, direction due north
- c) the north celestial pole
- d) none of the above

All of the following are points on your local sky.
Which one does not move on the celestial
sphere over the course of a day?

- a) the zenith
- b) altitude of 30 degrees, direction due north
- c) the north celestial pole**
- d) none of the above

If the Sun and a constellation are at the same location in your local sky, then that constellation is

- a) not a constellation that can be observed at night.
- b) only observable from the southern hemisphere.
- c) visible at a different time of year.
- d) part of the zodiac.
- e) C and D

If the Sun and a constellation are at the same location in your local sky, then that constellation is

- a) not a constellation that can be observed at night.
- b) only observable from the southern hemisphere.
- c) visible at a different time of year.
- d) part of the zodiac.
- e) C and D**

A star near the north celestial pole, observed from the northern hemisphere

- a) will never rise or set.
- b) is called a circumpolar star.
- c) is part of the zodiac.
- d) A and B

A star near the north celestial pole, observed from the northern hemisphere

- a) will never rise or set.
- b) is called a circumpolar star.
- c) is part of the zodiac.
- d) A and B**

2.2 The Reason for Seasons

- What causes the seasons?
- How does the orientation of Earth's axis change with time?

On the (northern) spring equinox the Sun

- a) is on the celestial equator.
- b) is moving from the southern part of the celestial sphere to the northern part of the celestial sphere.
- c) is on the ecliptic.
- d) all of the above
- e) none of the above

On the (northern) spring equinox the Sun

- a) is on the celestial equator.
- b) is moving from the southern part of the celestial sphere to the northern part of the celestial sphere.
- c) is on the ecliptic.
- d) all of the above**
- e) none of the above

The Sun is at its most southern position on the celestial sphere

- a) on the winter solstice (December 21).
- b) on the summer solstice (June 21).
- c) on the equinoxes.
- d) The Sun does not move north and south on the celestial sphere.

The Sun is at its most southern position on the celestial sphere

- a) on the winter solstice (December 21).**
- b) on the summer solstice (June 21).
- c) on the equinoxes.
- d) The Sun does not move north and south on the celestial sphere.

If you are at a latitude of 23.5 degrees north, when will the Sun be directly overhead?

- a) never
- b) at noon on the summer solstice (June 21)
- c) at noon on the equinoxes
- d) at noon on the winter solstice (December 21)
- e) every day at noon

If you are at a latitude of 23.5 degrees north, when will the Sun be directly overhead?

a) never

b) at noon on the summer solstice (June 21)

c) at noon on the equinoxes

d) at noon on the winter solstice (December 21)

e) every day at noon

Which lists the various motions of Earth in increasing order of the period (duration) of the motion?

- a) rotation, revolution, precession
- b) revolution, rotation, precession
- c) rotation, precession, revolution
- d) revolution, precession, rotation
- e) precession, rotation, revolution

Which lists the various motions of Earth in increasing order of the period (duration) of the motion?

a) rotation, revolution, precession

b) revolution, rotation, precession

c) rotation, precession, revolution

d) revolution, precession, rotation

e) precession, rotation, revolution

Which of the following is *not* changed by the precession of Earth's axis?

- a) the location of the North Celestial Pole relative to the stars
- b) the location of the North Celestial Pole in your local sky
- c) the location of the celestial equator relative to the stars
- d) A and B

Which of the following is *not* changed by the precession of Earth's axis?

- a) the location of the North Celestial Pole relative to the stars
- b) the location of the North Celestial Pole in your local sky**
- c) the location of the celestial equator relative to the stars
- d) A and B

2.3 The Moon, Our Constant Companion

- Why do we see phases of the Moon?
- What causes eclipses?

When the phase of the Moon is full,

- a) the Moon and Sun are on opposite sides of Earth.
- b) the Moon and Sun are on the same side of Earth.
- c) the Moon and Earth are on opposite sides of the Sun.
- d) the Moon is closer to Earth than normal.
- e) the Moon is further from Earth than normal.

When the phase of the Moon is full,

- a) the Moon and Sun are on opposite sides of Earth.**
- b) the Moon and Sun are on the same side of Earth.
- c) the Moon and Earth are on opposite sides of the Sun.
- d) the Moon is closer to Earth than normal.
- e) the Moon is further from Earth than normal.

When the phase of the Moon is gibbous,

- a) the Moon is closer to Full Moon than to New Moon.
- b) the Moon is closer to New Moon than to Full Moon.
- c) more than half of the visible face of the Moon is illuminated.
- d) A and C
- e) B and C

When the phase of the Moon is gibbous,

- a) the Moon is closer to Full Moon than to New Moon.
- b) the Moon is closer to New Moon than to Full Moon.
- c) more than half of the visible face of the Moon is illuminated.
- d) A and C**
- e) B and C

What time does the first quarter moon rise?

- a) sunrise
- b) noon
- c) sunset
- d) midnight

What time does the first quarter moon rise?

- a) sunrise
- b) noon**
- c) sunset
- d) midnight

When the Moon passes through Earth's shadow, this is called

- a) a lunar eclipse.
- b) a solar eclipse.
- c) either a lunar eclipse or a solar eclipse, depending on the distance between the Moon and Earth.
- d) either a lunar eclipse or a solar eclipse, depending on the phase of the Moon.

When the Moon passes through Earth's shadow, this is called

a) a lunar eclipse.

b) a solar eclipse.

c) either a lunar eclipse or a solar eclipse, depending on the distance between the Moon and Earth.

d) either a lunar eclipse or a solar eclipse, depending on the phase of the Moon.

Which of the following results in an annular solar eclipse?

- a) The Moon passes through Earth's umbra.
- b) Earth passes through the Moon's umbra.
- c) Earth passes through the Moon's penumbra.
- d) Earth passes behind the Moon's umbra.
- e) The Moon passes through Earth's penumbra.

Which of the following results in an annular solar eclipse?

- a) The Moon passes through Earth's umbra.
- b) Earth passes through the Moon's umbra.
- c) Earth passes through the Moon's penumbra.
- d) Earth passes behind the Moon's umbra.**
- e) The Moon passes through Earth's penumbra.

Lunar eclipses do not occur every month because

- a) the orbit of the Moon is tilted relative to Earth's equator.
- b) the orbit of the Moon is tilted relative to the ecliptic.
- c) a lunar eclipse can only occur at the equinoxes.
- d) Lunar eclipses do occur every month.

Lunar eclipses do not occur every month because

- a) the orbit of the Moon is tilted relative to Earth's equator.
- b) the orbit of the Moon is tilted relative to the ecliptic.**
- c) a lunar eclipse can only occur at the equinoxes.
- d) Lunar eclipses do occur every month.

The Saros cycle describes

- a) the 18+ year cycle of lunar and solar eclipses.
- b) the 6 month period between eclipse seasons.
- c) the cycle of retrograde motion of the planets.
- d) the period between total solar eclipses.

The Saros cycle describes

- a) the 18+ year cycle of lunar and solar eclipses.**
- b) the 6 month period between eclipse seasons.
- c) the cycle of retrograde motion of the planets.
- d) the period between total solar eclipses.

2.4 The Ancient Mystery of the Planets

- Why was planetary motion so hard to explain?
- Why did the ancient Greeks reject the real explanation for planetary motion?

What causes the apparent retrograde motion of Mars?

- a) Mars reverses its orbital motion when it is furthest from the Sun.
- b) When Earth passes Mars it appears to change its motion relative to the background stars.
- c) Because Earth orbits faster than Mars, Mars always seems to move in the opposite direction as the Moon and the Sun.
- d) Mars orbits the Sun in the opposite direction as Earth.

What causes the apparent retrograde motion of Mars?

- a) Mars reverses its orbital motion when it is furthest from the Sun.
- b) When Earth passes Mars it appears to change its motion relative to the background stars.**
- c) Because Earth orbits faster than Mars, Mars always seems to move in the opposite direction as the Moon and the Sun.
- d) Mars orbits the Sun in the opposite direction as Earth.

Stellar parallax is

- a) the changing position of stars relative to each other due to their different speeds in the Milky Way.
- b) the changing position of nearby stars compared to background stars as Earth's axis precesses.
- c) the changing position of nearby stars compared to background stars as Earth orbits the Sun.
- d) the changing position of stars relative to each other as the Sun orbits the center of the Milky Way.

Stellar parallax is

- a) the changing position of stars relative to each other due to their different speeds in the Milky Way.
- b) the changing position of nearby stars compared to background stars as Earth's axis precesses.
- c) the changing position of nearby stars compared to background stars as Earth orbits the Sun.**
- d) the changing position of stars relative to each other as the Sun orbits the center of the Milky Way.