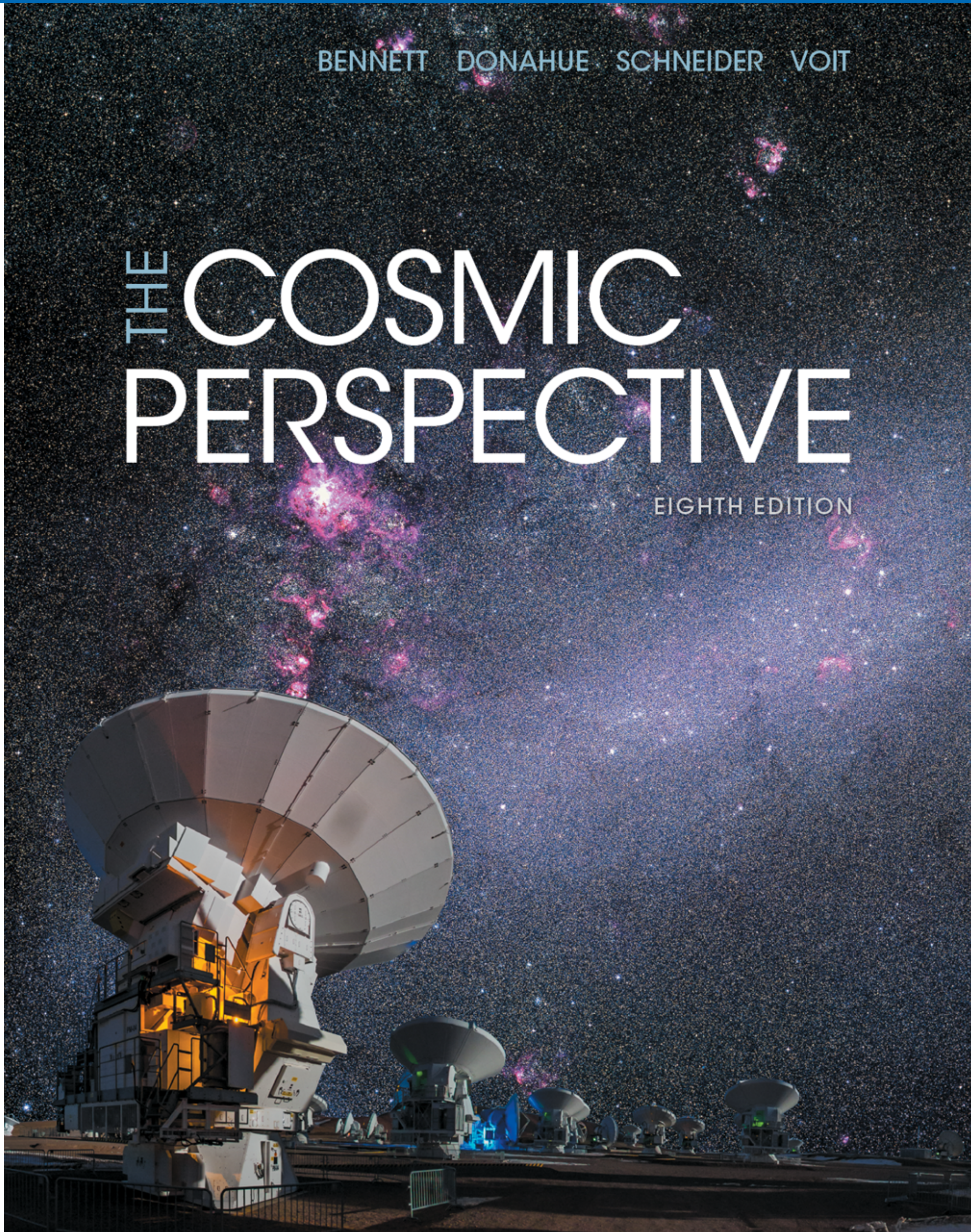
Chapter 13: Other Planetary Systems: The New Science of Distant Worlds



Would it be easy to photograph a planet orbiting around another star?

a) Yes, but with a large telescope because the planet would be faint.
b) No, because the brightness of the star would overwhelm the planet.
c) Yes, but a space telescope would need to be used so that the scattered light from the star would be minimized.

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The orbital period of an unseen planet will be

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b) much longer than the star's.
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The shorter the period of the Doppler curve,

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b) the farther the unseen planet is from the star.
c) the greater the mass of the planet.
d) the smaller the mass of the planet.
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The larger the mass of the unseen planet,

a) the larger the Doppler shift of the star.
b) the smaller the Doppler shift of the star.
c) the faster the period of the star's Doppler shift.
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Suppose you found a star similar to the Sun moving back and forth with a period of 2 years. What could you conclude?

a) It has a planet orbiting at less than 1 AU.
b) It has a planet orbiting at greater than 1 AU.
c) It has a planet orbiting at exactly 1 AU.
d) It has a planet, but we don't know its mass so we can't know its orbital distance for sure.

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Jupiter is about 1/10 the diameter of the Sun. If it transited, how much would the Sun's light dim?

a) about 10% (it would be 90% of its regular brightness)
b) about 1% (it would be about 99% its regular brightness)
c) about 30% (it would be about 70% of its regular brightness)
d) about 50% (it would be about half its regular brightness)

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Our theory of solar system formation predicts that large, gaseous planets form far from their star. How can we explain the extrasolar *hot Jupiters* that are close to their stars?

a) Our theory is wrong.
b) Large planets do form far from their star, but their orbits can change due to gravitational encounters with other objects.
c) Large planets do form far from their star, but waves of material can pull on planets and alter orbits.
d) B and C

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Space missions are currently underway or planned to

a) search for Earth-sized planets transiting stars.
b) search for wobbles in stars caused by planets much less massive than Jupiter.
c) attempt to take direct images of extrasolar planets.
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How can the Doppler shift be used to search for planets around other stars?

a) Astronomers look for a periodic, red-then-blue shift in the spectrum of the planet.
b) Astronomers look for a periodic, red-then-blue shift in the spectrum of the star.
c) Astronomers look to see if the star "wobbles" in the sky, shifting slightly back and forth.

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How do astronomers look for planets whose orbits might cause them to pass in front of a star outside our solar system?

a) They look for a small black dot passing in front of the star.
b) They look to see if the star's position shifts or "wobbles" slightly in the sky.
c) They measure the star's brightness, and look for periodic dimming (transits).

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