

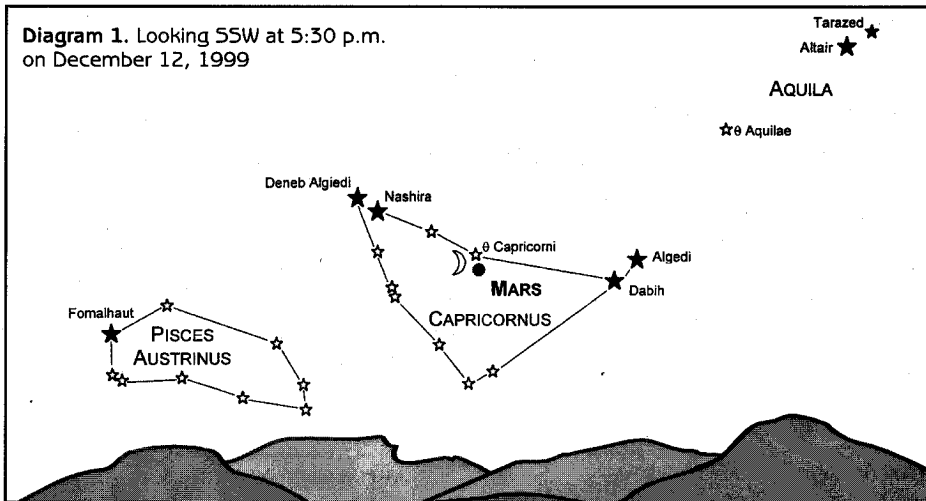
Mountain Skies

November and December 1999

Jupiter and Saturn, bright in the deepening darkness of late autumn, rise to travel with us through the darkening nights of the coming winter. In early November, both giant worlds are in the southeastern sky just after sunset and are visible throughout the night. By late December they will be in the southern sky, halfway between the horizon and zenith, as darkness falls, and set a couple hours after midnight. These two giant planets are by far the brightest objects in the sky and easily found.

In May of 2000, Jupiter will pass Saturn in our sky and the two giants will be separated by a mere degree in the morning sky. Through November and December, though, Jupiter's motion toward Saturn is not yet apparent since both planets have actually been in retrograde motion (westward with respect to the stars) since late August. On December 20, Jupiter will return to the normal, prograde motion to the east

Diagram 1. Looking SSW at 5:30 p.m. on December 12, 1999



with respect to the stars and begin moving noticeably toward Saturn. In the western sky, Mars hangs as

a slowly dimming red lantern. It appears out of the darkening southwestern sky 30 to 45 minutes after sunset, about 15° above the horizon. In the beginning of November, it is in Sagittarius (see Mountain Skies in the September/October 1999 issue), just east of the Teapot asterism. By the beginning of December it has moved into Capricornus, where on December 12 the waxing crescent moon (4.5 days past new moon, so it's a fairly thick crescent) joins it in the middle of Capricornus as shown in Diagram 1. The two nearby worlds will be close enough in the sky to be viewed in the same field of view in 7x50 binoculars. Uranus also fits into that field of view, but is only 0.1° from θ (theta) Capricornus and is quite a bit fainter. It may be discernable with powerful binoculars, however, as a faint elongation of the left side of θ Capricornus. The moonlight may obscure it, so if you'd like to see this planet 19 billion miles away, look during the preceding dark of the moon, the week before December 9.

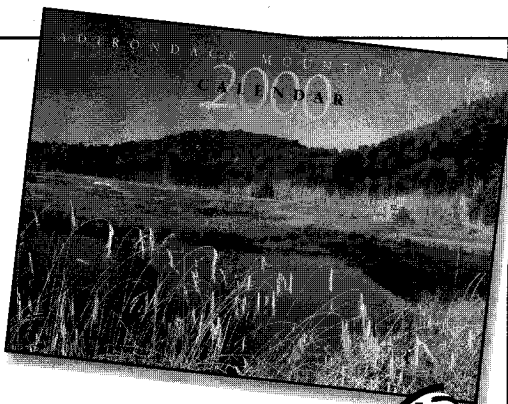
In the morning skies, Venus is high and shining bright throughout November and December. At the beginning of November, it rises well before 4 a.m. and is just below Leo (see Mountain Skies, May/June 1999). Mercury joins it in the morning sky on November 15. By December 1, Venus has moved into Virgo, where it comes within 5° of Spica (SPIKE-a) and rises just before 4 a.m. Mercury rises by 5:30 a.m. and is more than 10° above the southeastern horizon before

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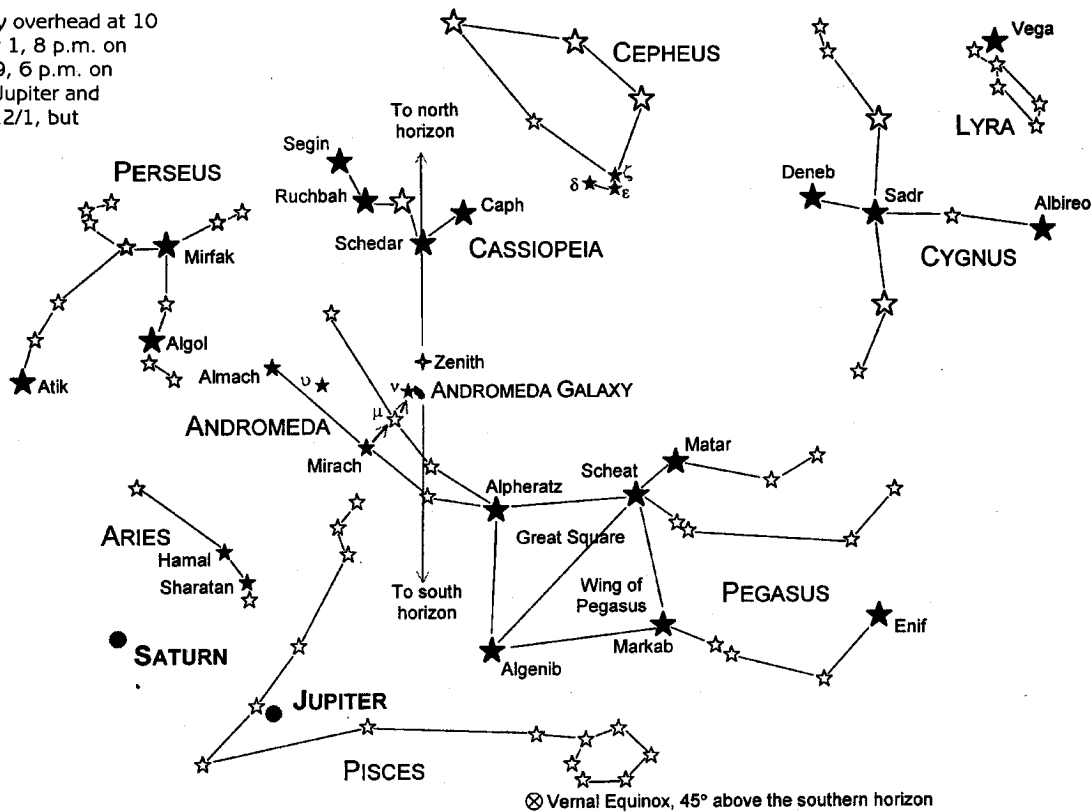
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Diagram 2. Directly overhead at 10 p.m. on November 1, 8 p.m. on December 1, 1999, 6 p.m. on January 1, 2000 (Jupiter and Saturn shown on 12/1, but move very little.)



it is lost in the dawn twilight about 6:45. The waning crescent moon can help you spot this faint, quick planet on the fifth when it will be 5° above it, and on the sixth when it will be 5° left and a little below it. Venus passes through Libra in mid-December, coming to within 2° of Zuben Elgenubi (Zuben el-jen-NEW-bee, the southern claw) on the eighteenth. It will rise just before 5 a.m. to greet the first dawn of the New Year with the waning crescent moon joining it in Libra.

Among the constellations, those of the summer triangle linger in the western sky and the Great Square of Pegasus takes its place as the asterism near the zenith. The square is quite large in the sky, spanning 20° from cor-

ner to corner, large enough to fit your splayed hand within the square when held at arm's length. Four bright stars mark the corners of the square. Only three are in the constellations of Pegasus, the winged horse, and form its wing. These are Scheat (SHEE-at), Markab (MAR-cab), and Algenib (Al-GEE-nib), as shown on Diagram 2. The star Enif (ENN-if) is the horse's nose.

The fourth star in the great square, though its name Alpheratz (Al-FEE-ratz) means "naval of the steed," is actually in the constellation Andromeda. From Alpheratz, Andromeda opens to the north and east like a cornucopia, appropriate for its place high in the sky of our harvest season.

The lower arc of the cornucopia is marked by the bright stars Mirach (My-rack, meaning the loins) and Almach (Al-mach), but the upper arc is much harder to find. It is worth spending the time as there is a great reward for the observer who explores the deeps of Andromeda: the path from Mirach through its companion star in the upper arc (μ or Mu Andromedae) points to the much fainter ν (Nu) Andromedae, which is a mere degree away from the most distant object visible with the unaided human eye: M31, Andromeda Galaxy. Viewed with the naked eye, it appears as a faint smudge, most easily detected by sweeping the area above and left of ν Andromedae to allow the

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