

Mountain Skies

September and October 1999

The days shorten quickly as September begins. The sun's southward motion has been accelerating since the summer solstice and is fastest just at the time of the autumnal equinox.

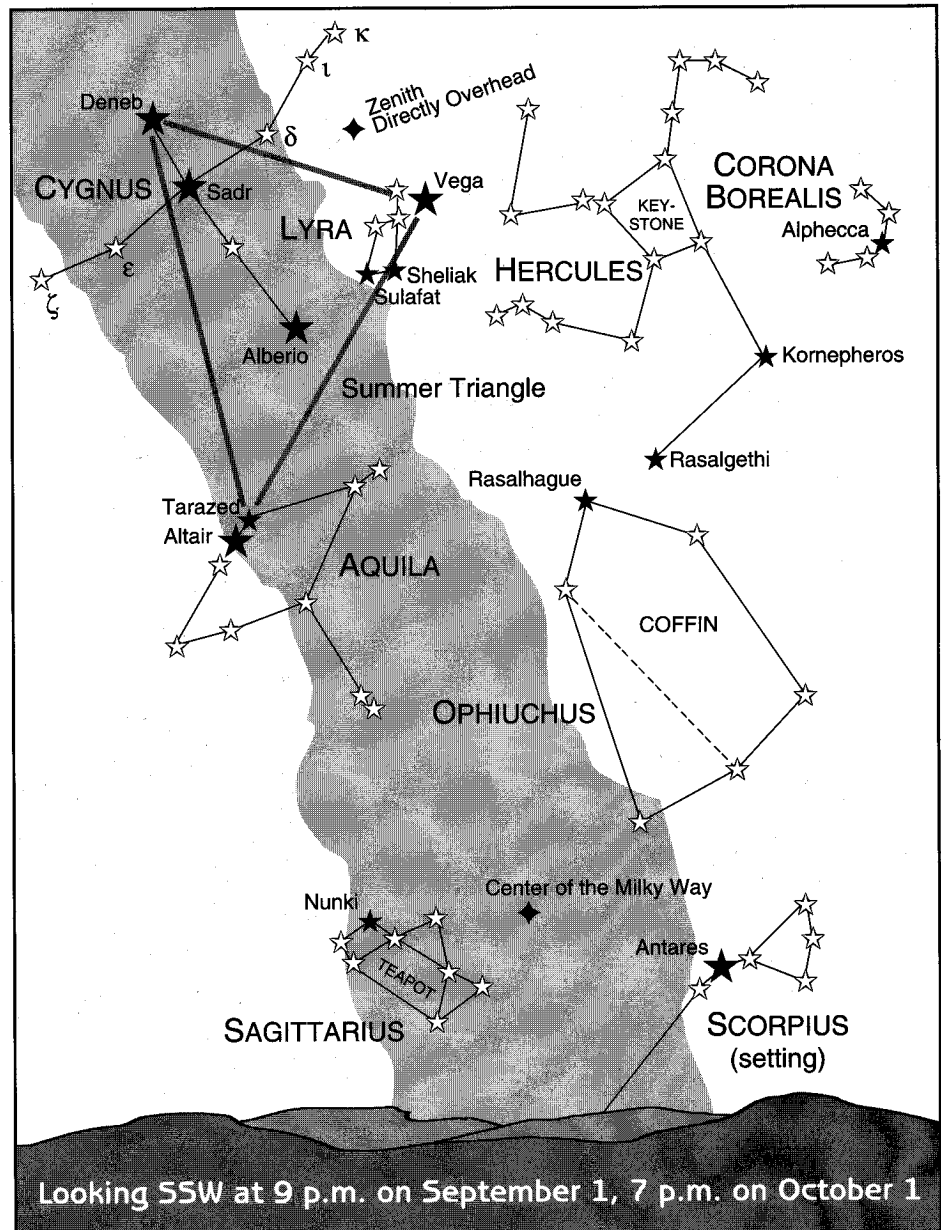
In spite of the fact that autumn is named for the solar event, it is our near neighbor, Luna, that is often thought of as the astronomical "star" of the sky as the Harvest and Hunter's moons of September and October. These full moons are no brighter than those during other parts of the year, but are distinguished by the number of nights on which they seem to rise at sunset. In September and even into October, due to the angle between the ecliptic, the eastward path of the moon, sun and planets across the sky, the moon's 12°/day motion is at a shallow angle with respect to the horizon. This makes it seem to linger there in the autumnal dusk as though savoring the last warmth of summer.

Lingering at dusk above the western horizon, Mars continues on its eastward journey across the stars. From now until June of 2000, Mars will be found about 10° above the horizon at dusk and gradually fades in brightness as the Earth races away from it.

In the east, Jupiter and Saturn have been slowly moving into the evening sky. By September, Earth is catching up to its large neighbors and moving between them and the sun, placing the planets opposite Sol in our sky where they are visible for much of the night. Look for them in the southeastern sky where Jupiter will be the brighter of two very bright objects in an area fairly devoid of bright stars. On September 1, Jupiter rises at about 9:30 p.m. and Saturn rises about an hour later.

The Seven Sisters

Rising just north of Saturn is the bright cluster of stars called the Pleiades (PLEA-a-dees; for an extensive discussion see the Students for the Exploration and Development of Space [SEDS] Web page at <<http://www.seds.org/messier/m/m045.html>>) in western astronomy and Subaru in Japanese. Take a careful



look at the logo on the next Subaru car you see! This glittering cluster is known as the Seven Sisters though most of us see six stars with the unaided eye. With binoculars, dozens of stars are visible and telescopic studies reveal about 500

stars. The Pleiades are mentioned in Homer's *Odyssey* and the Bible and their rising was cited as an agricultural marker as early as 1000 BCE.

Enhancing the beauty of the star cluster and planets of the southeast-

ern sky, the moon will appear with them in both months. On October 23, Jupiter rises with the nearly full Hunter's moon one minute after the sun sets. Jupiter is at opposition and closest to Earth at this time at a distance of about 370 million miles.

This is an excellent opportunity, once the bright moon has passed, to take on the astronomical challenge of viewing the four moons of Jupiter that Galileo discovered. These moons orbit Jupiter, not Earth, as can be seen over the course of one or several nights, as Galileo recorded in 1610. This demonstrated to him that Earth was the astronomical center of nothing more than the orbit of the moon. A good pair of modern binoculars are much better for viewing Jupiter than Galileo's telescope, so on a pleasant moonless night in September or October, take a few moments to imitate the great scientist. The moons will appear as a line of bright objects close to Jupiter on one or both sides roughly pointing at Saturn since their orbits are in Jupiter's equatorial plane. Monthly sky magazines such as *Astronomy* or *Sky and Telescope* feature a monthly map of the moons' orbits, allowing you to identify the moons by name.

Venus, having finally plunged toward and past the sunset horizon as it passed between Earth and the sun on August 20, rises in the morning sky through September and October. On September 7, look for Venus below the waning crescent moon rising at 4:30 a.m., two hours before sunrise. On October 5 and 6, Venus will rise at 3:25 a.m. (EDT) with Regulus in Leo 4° north. On the 6th the waning crescent moon will be 4° below Regulus, making a beautiful celestial trio easily visible in the brightening sky until just before the sun rises at 7:06 a.m.

The Milky Way

The Milky Way continues to glitter in the early evening sky. Scorpius and Sagittarius are still visible through September, and following the Milky Way leads the observer to the Summer Triangle as shown in the diagram. Though it's named for the summer, the darkening evenings will keep the Triangle visible in the evening sky into the beginning of February. The stars marking the triangle are Vega (traditionally VEE-ga with a hard g as in *go*, but more commonly pronounced VAY-ga, as in the movie *Contact*; Vega means "swooping eagle") in the constellation of Lyra (LIE-ra), the Lyre, Deneb (DEN-ebb, meaning tail) in Cygnus (SIG-nus is the most common pronunciation) the Swan, and Altair ("the flying one," where the emphasis is on *tair*, which rhymes with *bear*) in Aquila (ack-will-a), the Eagle. A very bright bluish star, Vega is hot,

with an 11,000 K surface temperature, and close, at a distance of 25 light years. Next in brightness is Altair. The southernmost of the triangle stars, it is the last to rise and the first to set of the three. It and its companion Tarazed (Tar-a-zed, where *tar* rhymes with *star*) form a highly recognizable pair. Deneb is slightly fainter than the other two, but it is only slightly dimmer than Altair, yet it is nearly 100 times more distant. To be as bright as it is at this distance, it must be nearly 100 times the size of the sun and emit 87,000 times more energy!

The other named stars in Lyra are Sheliak (SHELL-yak) and Sulafat (SUE-la-fat), both at the far end of the parallelogram element of the constellation, with Vega at the apex of an attached small triangle. In Cygnus, the stars are named for the parts of the swan, Deneb being the tail, Sadr (pronounced like the English word *sadder*) the belly, and Albireo (AL-BEER-ee-oh) the beak.

Within Cygnus is the asterism of the Northern Cross, made up of the stars from Deneb at the top of the cross to Albireo at the bottom and Sadr at the intersection of the perpendicular beam with ends marked by the stars ϵ (epsilon) and δ (delta). The Greek letter designations of stars is called the Bayer designation since Johann Bayer first formalized them in a catalog published in 1603. The stars marking the ends of the swan's wings are ζ (zeta) to the east and the pair of ι (iota) and κ (kappa) to the west. The swan soars high amidst the rich stellar fields of the Milky Way throughout the summer and fall, at last diving into the western horizon

in winter as though plunging into the sea to feed.

Between the Summer Triangle and the zodiacal constellations of Scorpius and Sagittarius is an area rich in the distant stars of the Milky Way, but rather empty of nearby, bright stars. Most of this area is in the constellation of Ophiuchus (Off-ee-you-kuss), the Serpent Bearer. Within Ophiuchus is the asterism of dark sky known as the Coffin with the relatively bright star Rasalhague (Rass-al-AIG-wee) at its top. In the northwest sky, the handle of the Big Dipper still indicates the arc to Arcturus, the bright star in Boötes featured in the *May/June Adirondack*.

On the line between Arcturus and Vega are two constellations lacking bright stars, but still easily discerned on moonless nights. About one third of the way from Arcturus to Vega is Corona Borealis, the Northern Crown. This small constellation consists of an arc of stars centered on Alphecca (AL-FECK-a). The Keystone of Hercules can be spotted between Alphecca and Vega, and the figure of "the kneeling one" discerned. The great hero of legend kneels on one knee upside-down in our north-up images of the sky. His hips are represented by the Keystone, one arm extends toward Lyra, and the other is raised with a club marked by Kornepheros (CORE-NEFF-OR-oss, where "oss" rhymes with "moss") and Rasalgethi (Rass al-JEE-thee).

—Aileen O'Donoghue

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