

THE NIGHT SKY

SEPTEMBER 2016

Spring is just around the corner, and with it, comes the promise of warmer evenings and clearer skies. And hopefully the opportunity to spend more time looking up!

All 12 constellations of the zodiac are well known. But thanks to a popular '60s song, the most famous is Aquarius, the water-bearer. You can find it high in the eastern sky. Try looking for the stars of Aquarius on a dark night, as moonlight will overpower many of the constellation's fainter stars, but the brightest ones will still shine through.

Almost all major ancient civilizations saw Aquarius as a man or boy carrying a bucket of water. People have always placed special significance on Aquarius and the other constellations of the zodiac because they lie along the ecliptic; the path that the Sun follows through our sky. In fact, that's what "the age of Aquarius" is all about. About 600 years from now, the Sun will appear in Aquarius at the time of the March equinox. But that's about the only significance for Aquarius and the other zodiacal constellations; they're good guideposts to help mark the seasons.

Look up in the early evening, and you'll be greeted by the heart of our Milky Way galaxy almost directly overhead. You'll see the unmistakable form of Scorpius, the Scorpion, and the group of stars that make up the constellation of Sagittarius, the Archer. Look carefully in this area of the sky and you'll notice the misty glow of the countless millions of stars that are too far away for us to see clearly. Their light has journeyed for more than thirty thousand years to reach us.

Look low to the north. A beautiful blue-white star awaits. Vega is one of the closest and brightest stars in the night sky. It was one of the first stars whose distance was measured. The measurement has been refined since the 1800's, and today astronomers know the distance quite precisely: a bit more than 25 light-years. That means the light we see from Vega actually left the star a bit more than 25 years ago.

Look to the right of Vega and locate the stars that make up the constellation of Cygnus, the Swan. This star grouping has been identified with some sort of bird by most civilizations of the ancient world. Sometimes known as an eagle, a hen or a pigeon; the image of a graceful swan in full flight is the one I prefer. The star Deneb represents the tail of the swan, whilst Alberio is the beak.

In real life, Deneb is a star of enormous proportions. It is over 60,000 more luminous than our Sun, and 25 times more massive. If we placed our Sun at the same distance that Deneb is from us (1600 light years), then the Sun would be an insignificant little star barely visible in large amateur telescopes. Alberio is a beautiful double star of blue and gold. A steadily held pair of powerful binoculars should show it as two distinct stars.

Higher in the sky we find Aquila, the Eagle. The brightest star in this constellation is Altair. At a distance from us of only 16 light years, it definitely classifies as a close stellar neighbour. But a bit of a strange character! It is about twice the diameter of our Sun, but spins on its axis in 6 and a half hours (our Sun takes 25 days). As a matter of fact, the spin is so rapid, that the star probably resembles a flattened tomato!

You might expect our closest neighbouring star to be one of the brightest lights in the night sky. Instead, though, it's so faint that it wasn't discovered until a century ago, in September 1915. Now known as Proxima Centauri, it's just four-and-a-quarter light-years away. If all the stars were as bright as the Sun, nearby stars would be easy to find, because they'd shine the brightest. But most stars are red dwarfs, which are so faint that not a single one is visible to the unaided eye.

It turns out that the star is actually a member of the Alpha Centauri system. But it's a bit closer to us than the system's other two stars, hence its name: Proxima Centauri, the closest star to the Sun. And so far, searches for planets around the star have turned up empty. Planet searchers have kept an eye on Proxima Centauri for decades. And there are whispers around that astronomers are getting ready to announce the discovery of a rocky planet orbiting around Proxima Centauri very soon.

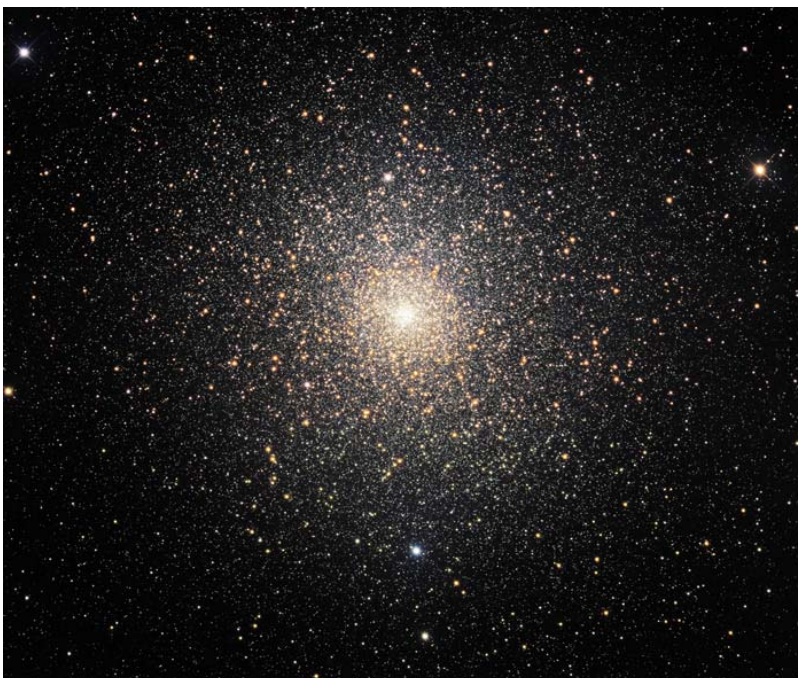
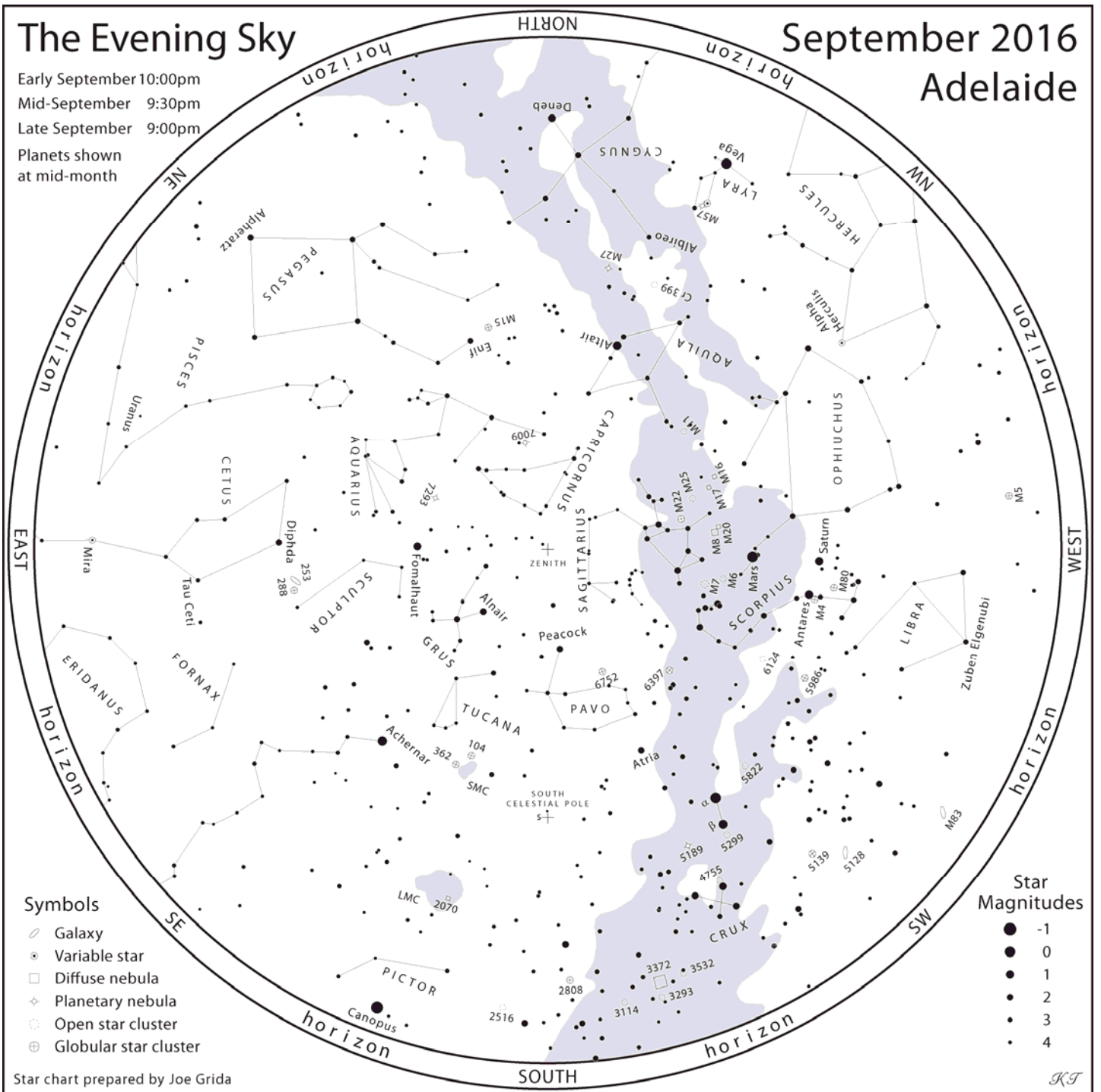
To date, astronomers have discovered more than 3,200 confirmed alien planets, with NASA's Kepler space telescope responsible for about two-thirds of the finds. Kepler's work suggests that, on average, every star in the Milky Way hosts at least one planet.

The Moon is New on September 1st, at First Quarter on the 9th, Full on the 17th and at Last Quarter on September 23rd.

The Evening Sky

September 2016
Adelaide

Early September 10:00pm
Mid-September 9:30pm
Late September 9:00pm
Planets shown at mid-month



Globular Cluster NGC 104

Located in the far southern constellation of Tucana

The concentrated light of one million stars packed into a volume of space 120 light years across makes 47 Tucanae the second brightest globular cluster in the sky, surpassed only by Omega Centauri. If Earth were placed near the centre of 47 Tucanae the collective starlight would create a nighttime as bright as day. Although it is the classic metal rich cluster, its metal abundance is still only 25% that of our sun. Metal abundance appears to have implications regarding a star's suitability to form planets.

A concerted effort was made by the Hubble Space Telescope to search for planets within 47 Tucanae but failed to find any. The lack of planets in this compact star system supports the belief that metal poor stars in general are not conducive to planet formation. Recent work though has astronomers reconsidering this conclusion as there may still be a strong possibility of gas-giant planets located much further out from stars in globular clusters.