

# Star watching on Waiheke

Our monthly star watching column highlights celestial objects accessible for naked eye or small binocular viewing. Nalayini Davies will shine a spotlight on a different celestial object each month and explain terminology to improve our enjoyment of astronomy.



Though September signals the start of spring from a calendar perspective, astronomically speaking, we are still experiencing a winter night sky with its interesting seasonal celestial objects. Astronomical spring occurs this year at 8.02am on Saturday 23 September. It is referred to as the Equinox and is discussed below as the spotlight for the month.

### The best time for viewing

Clear, moonless nights are always the best nights to see the stars. From 13 - 21 September the moon rises after midnight and sets before astronomical twilight, so from 7.30 pm to midnight it will be dark and free of moonlight. This will offer the very best viewing of the night sky though you will still be able to clearly view most celestial objects before and after this period.

**Star chart** The Star Chart shows the celestial objects easily visible mid-month around 8pm (9pm at the start of the month and 8 pm at the end of the month). When you go outside, raise this page over your head with North pointing to the north (i.e. with North at the lower edge) and you will find the chart points to the correct directions. The size of the stars indicates their relative brightness.

**Planets** Rising in the west, Jupiter remains the brightest object in the sky but its stay is short – from soon after sunset to around 9pm mid-month. Saturn (close to the hook-shaped constellation Scorpius close to the zenith i.e. directly overhead) is also bright and in the sky until around 1am. The moons of Jupiter and the rings of Saturn are easily seen through small telescopes and large binoculars and are very memorable sights.

**Constellations (and asterisms)** The prominent and familiar constellations Crux (the Southern Cross), Scorpius (hook-shaped and, in Maori legend, the fish-hook of Maui) and Sagittarius (teapot-shaped) are still high in the September sky. They are embedded within the Milky Way along with asterisms (i.e. recognisable star patterns but not actual constellations which are the 88 official divisions of the entire sky), the Diamond Cross, the False Cross and The Pointers, which are all circumpolar (i.e. they circle the South Celestial Pole (SCP) and are therefore always visible in the night sky).

**Bright stars** Vega (in the constellation Lyra) is the bright star high in the north, Canopus (in the constellation Carina) is the bright star low in the south and Arcturus (in the constellation Boötes) is the bright star on the north-west skyline. As they are all low in the sky and seen through a lot of atmosphere, they twinkle with colour. Spica (part of the constellation of Virgo) is the bright star close to Jupiter while Antares (in the constellation Scorpius) is the bright

star close to Saturn. The ever-present Alpha Centauri and Beta Centauri (The Pointers, in the constellation Centaurus), Achernar (in the constellation of Eridani and visible northeast of Canopus) and Altair (northeast of Saturn and in the constellation of Aquila) complete the list of prominent bright stars.

**Galaxies** The Milky Way still dominates the sky with the Large Magellanic Cloud (LMC) and Small Magellanic Cloud (SMC) visible on a dark night as unmoving fuzzy clouds in the south, north of Canopus and west of Achernar.

**September spotlight – Southern Hemisphere spring equinox** Equinoxes occur when Earth's orbit shows the Sun's path along the ecliptic (Sun's motion against the background of distance stars) crossing the celestial equator (an imagined line in the sky extended from Earth's equator) as shown in Figure 1. The day of this event is referred to as the equinox which means 'equal night' (and therefore equal day).

The change of seasons we experience on Earth is due to Earth's

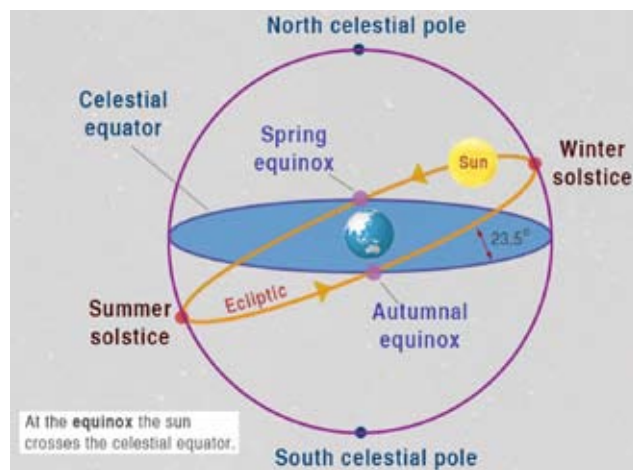
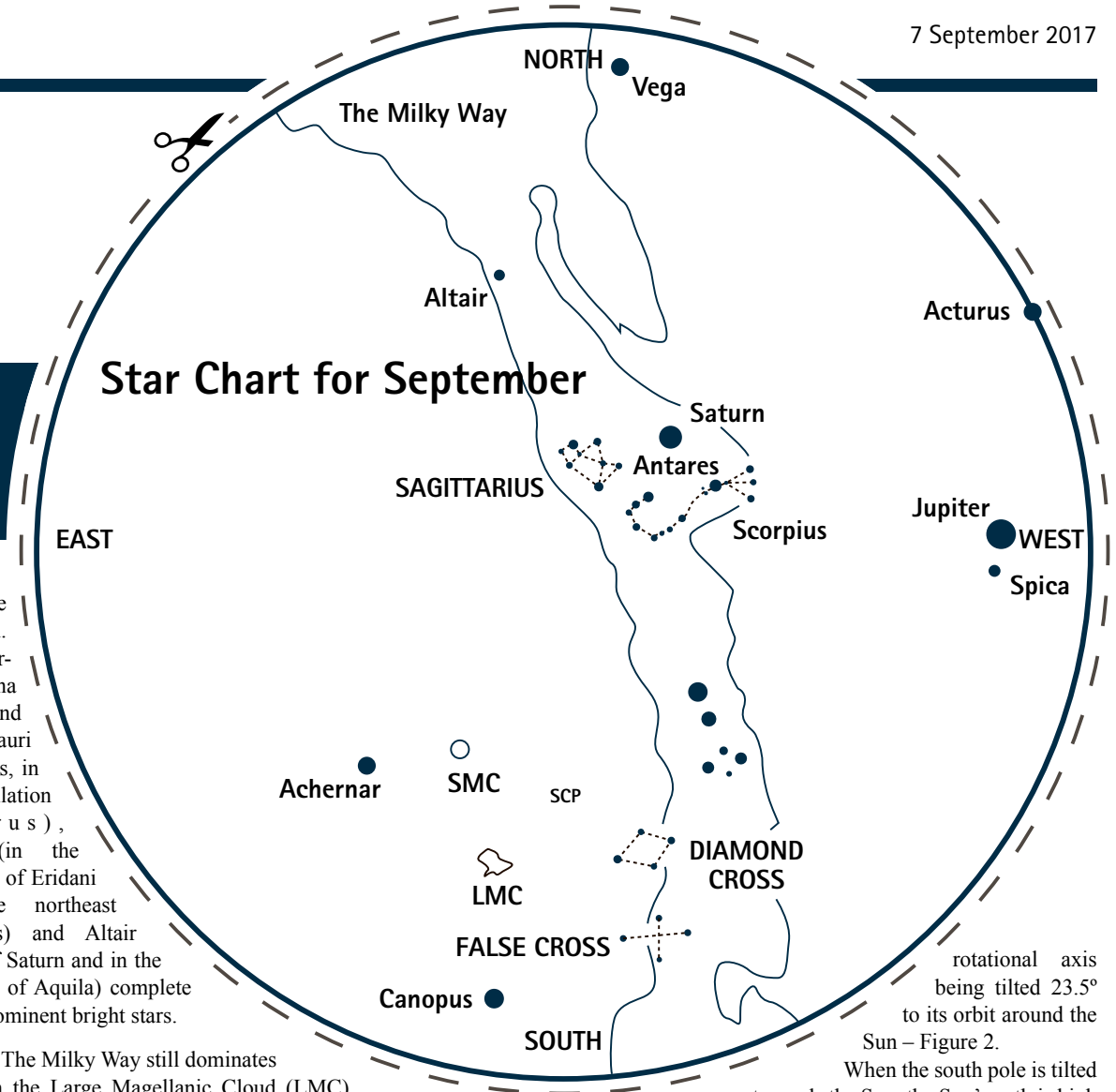


Figure 1: Equinoxes and Solstices along the Sun's annual path as seen from Earth.

Credit: Theconversation.com



## Star Chart for September

rotational axis being tilted 23.5° to its orbit around the Sun – Figure 2.

When the south pole is tilted towards the Sun, the Sun's path is high

in the sky and it is summer. Six months later, when the south pole is tilted away from the Sun, the Sun's path is low and it is winter – Figure 3.

At the times of the equinox, the Sun rises due east and sets due west and its path is midway to the summer and winter paths which peak at the times of the solstices.

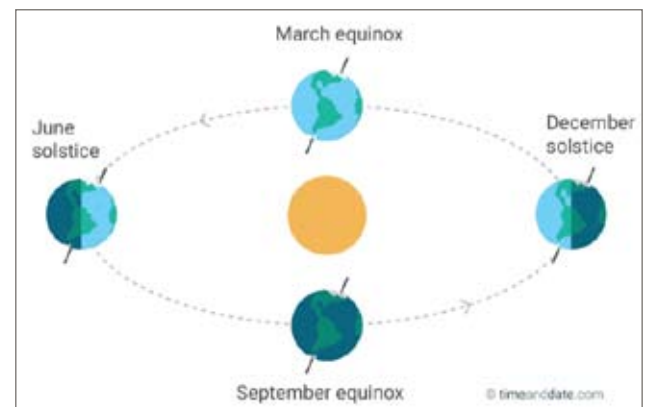


Figure 2: Earth's annual orbit around the Sun. Credit: Timeanddate.com

Our access to the night sky gets delayed as daylight saving begins on 24 September and slowly but certainly in the very near future the winter constellations will give way to spring constellations. So, let's all enjoy the last of our rich winter skies before Earth's journey around the Sun moves us inevitably onward.

Clear Skies! ■

Nalayini is a member of the Royal New Zealand Astronomical Society and the Auckland Astronomical Society. She is Chairperson of Astronz, which was established to make astronomy more accessible to New Zealanders. Nalayini is an advocate of the Dark-Sky movement, a campaign to preserve sky quality and increase the visibility of stars through reducing light pollution. Nalayini has had a home in Rocky Bay for 30 years and continues to enjoy the dark skies on Waiheke.

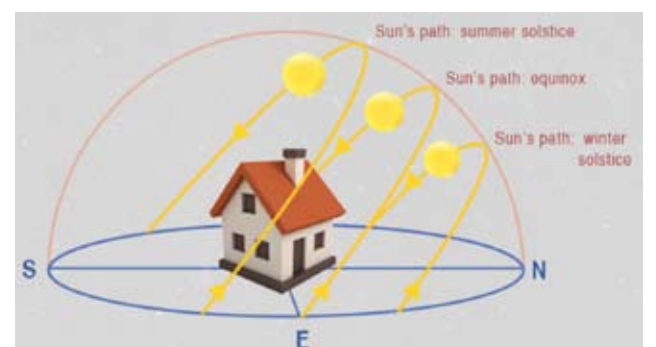


Figure 3: Sun's daily path as viewed from Earth at times of Equinoxes and Solstices.

Credit: Theconversation.com

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