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Astro Flyer

SEPTEMBER 2017

Club News

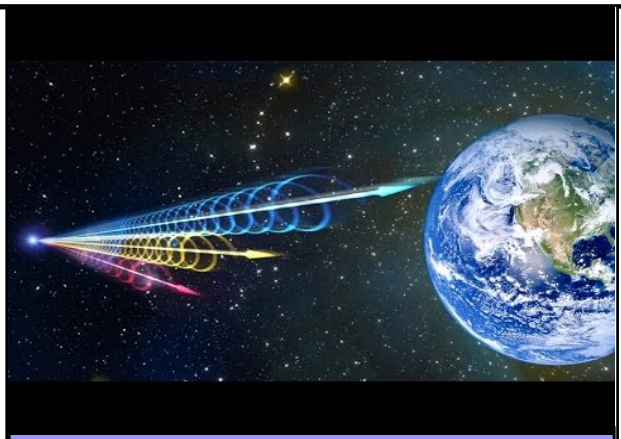
Hi all,
It's hot here in Los Angeles. We are having a heat wave. Daily temps about 38 degrees C. I am holed up in my brother's condo with a fan going all day. No air conditioning here. I took lots of pics and video of the Total Solar Eclipse from near Rexburg, Idaho on August 21st. You'll see it when I get back - possibly at the October meeting. What a trip! It was easy getting there, it was all planned. Getting back to Lava Hot Springs, Utah AFTER the eclipse was another story. The distance was about 220 kilometres but the drive took close to nine hours in bumper to bumper traffic. It seems at least 20 million people from all over America had stationed themselves along the path of Totality and when it was finished they all decided to go home at the same time.

Frank Gross President

Club Meetings and News from Committee

The next Club Meeting is to be held on Friday September 15th 2017 at 6.30 pm for 7pm start at Shoalhaven Campus, University of Wollongong. Nowra. To see the names of elected officials at the AGM in July see page 15.

Contents



MOON PHASES

New Moon	First Quarter	Full Moon	Last Quarter
Sep 20 th	Sep 28th	Oct 6th	Start → Sep 14

Viewing Nights

Club viewing nights are selected to provide viewers with the best possible conditions for good viewing. They are held on specific Saturdays at different locations around Nowra.

The next club viewing night will be on Saturday Sep 16th (back-up night Sun Sep 17th) at **Woncur Road**, South Nowra.

Head South down The Princes Highway, turn right at BTU Road, Woncur Road is the first street on the left).

More viewing nights page 17

OUT THERE
Bob Turnbull OBSERVATION OFFICER

OUT THERE September/October

Having read the lead article in the Astronomy 2017 for October about constellations having names which don't appear to us in the Southern Hemisphere, to look like their names imply, is something we all discover early in our viewing experience through a telescope or even just scanning the night sky with the naked eye.

Our minds look for meaning and a way to find at least some constellations that we can recognise with practise and a little imagination. These will act as sign posts through the seasons, so here are a few for novice viewers.

1 THE CRUX (Southern Cross) which is usually the first we'll find, since it is so well recognised.
2 SCORPIO (The Scorpion) a great and easy marker in the middle of the viewing year.
3 PEGASUS (The winged horse) with it's Great Square.
4 ORION (Sometimes called the saucepan) with the associated four stars trapezium (six @ HP)
5 SMALL AND LARGE MEGELLANIC CLOUDS.
6 SAGGITARIUS (the teapot)
7 TAURIS (The Bull)

Make up your list and share it with others, who may still be struggling with the basics of Stella navigation, or speak to other experienced viewers to guide you.
The use of the major planets in our solar system are usually seen with a few exceptions.
There are a few periods in the year when none are visible during normal viewing hours.

PLANETS

MARS Study the details supplied in the Astronomy 2017 p. 65, Probing the Solar System (Part 1). It is an excellent summary of the latest status of various explorations of this planet with good references to the various web sites on present and the future "Insight" Seismic
Studies, for Launch in May 2018. But Mars viewing of quality will have to wait a few months

MERCURY Can be seen in the evening of the last week of October a couple of degrees above the horizon at the end of civil dusk.

VENUS Will still be visible in the Eastern morning sky, also it's near Mars at 0.2 degrees on the 6th near the waning Moon on the 28th(see Sky Map P. 64)

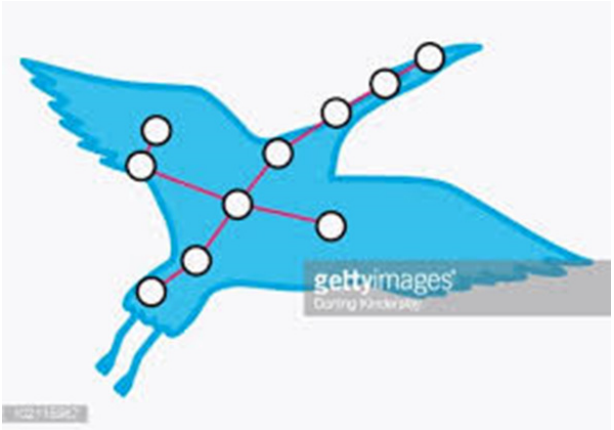
JUPITER Will only be visible at the beginning of October low on the western horizon in Virgo. Look for it's reappearance in in November in the dawn sky.

SATURN Setting about 11pm, mid month in Ophiuchus, near Sagittarius. October will be the last chance to view at good altitude, this month.

METEOR SHOWERS
Moon free (dark) for the epsilon-Geminids from 14th -27th with maximum on 18th.
The rate estimated per hour is low at circ. 3 per hour.
However the Orionids from late evening to early dawn have a much higher rate of 13 to 34 per hour on 2nd October to 7th November. (from the direction of Orion)

CLEAR SKIES
BOB TURNBULL

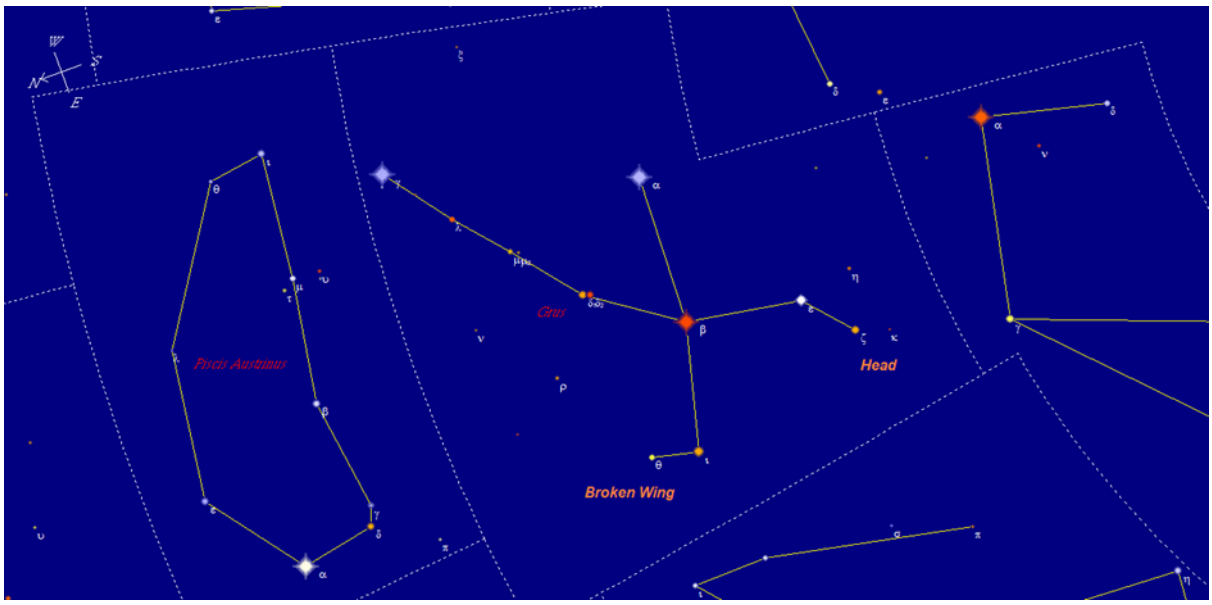
A Search for Southern Doubles



Episode 8: Grus, The Crane

Rising in the far SE sky after dark is a group of stars with both a distinctive shape and an unusual display of visual double stars. This group was once part of Piscis Austrinus, or the Southern Fish and was first defined as a separate constellation by the Dutch astronomer Petrus Plancius, who created twelve new constellations based on the observations of the southern sky by the Dutch explorers Pieter Dirkszoon Keyser and Frederick de Houtman. The new group appeared on celestial globes and charts from 1598.

From our vantage, the rising group appears in the SE sky after dark like this:



In the map extract above I have indicated both the head of the Crane and the two stars that some maps indicate as a broken wing, This and the rising first mag star Fomalhaut of Pisces Austranis, the Southern Fish, should help in orientation.

Binocular Doubles

All doubles this month are binocular objects. Most can be spotted in the finderscope but certainly 10X50 binoculars in dark skies reveal all. Several are naked eye doubles.

Cont….2

1 Delta 1,2. RA 22.30; Dec -43.24, mag 3.9/4.1 sep 16.06'.This wide visual double is easily spotted when the entire bird outline in seen. It lies as the first double heading westwards from the neck of the bird in the direction of the body. I see them in binoculars as two well separated orange and yellow stars with a fainter bluish star north in the same field. An attractive triple.

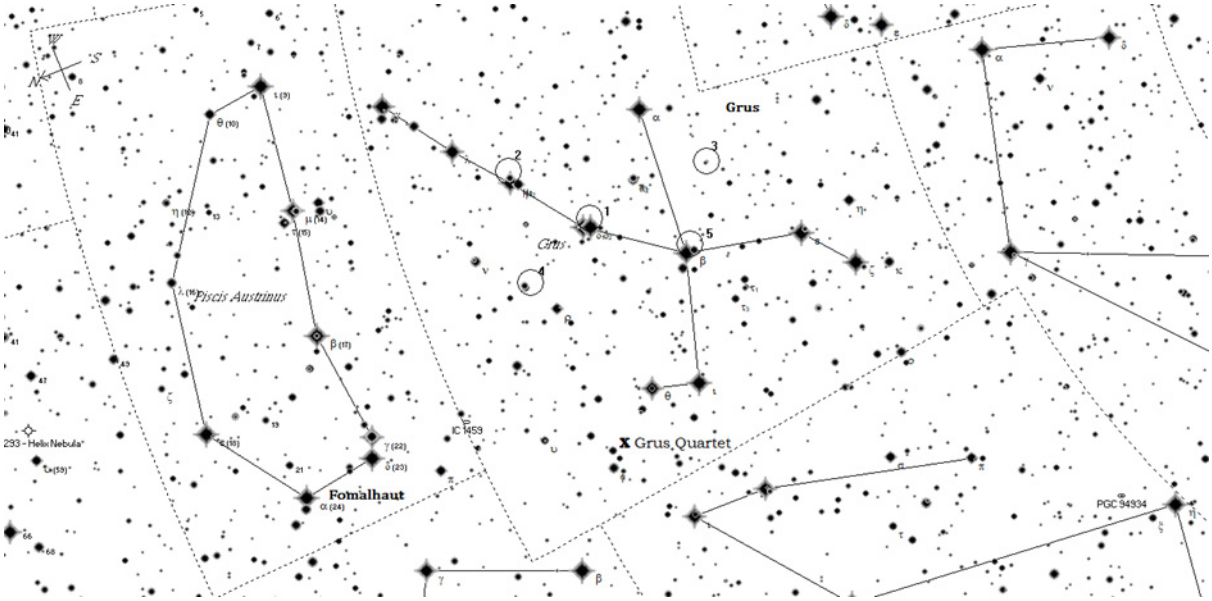
2 Mu 1,2. RA 22.16;Dec -41.15, mag 4,8/5.1 sep 19.45". Continue a few degrees westward on the crane's body for another visual double. Again, we see three binoc stars in the system. All are a yellowish colour and form a neat triangle.

3 Pi 1,2. RA 22.7; Dec -45.57. mag 5.8/6.6 sep 240". Half way between Alpha and Delta Grus(see map below) sits yet another couplet, Pi 1 and Pi 2 easily spotted in binoculars. Well separated and running east west, these gems are a rose coloured and blue contrasting pair.

4 Sigma 1,2, RA 22.38; Dec -40.29; mag 5.9/6.3 sep 5.6" .I can just spot this pair in the finderscope by using them to form the NE apex of a triangle with the base line Delta and Mu Grus(see number 4 in the map below.) I see these as a pink and red pair requiring your best pair of binox for maximum effect.

5 Beta Grus: RA 22.43; Dec -46.47. Our final number is the second brightest star of Grus, namely Beta.(see map below). This is a beautiful deep yellow star of mag.2. In binoculars it sits in the NE quadrant of an interesting trapezium of stars of mag 5,6.5 and 6.9. A rich field with many faint stars in the field.

In the map below I have inserted an X to mark the area of the Grus Quartet of galaxies about which Harry will soon give details.



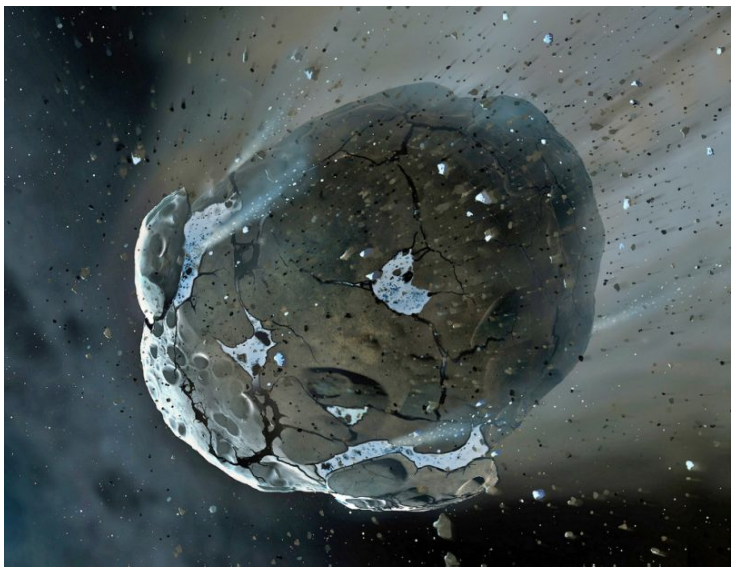
Footnote: I finally split Antares this winter. The secret:

1 Twilight, where Antares was set high in a dim blue sky late evening which reduced glare.
2 Best collimation in a 10" dob. Concentric rings around stars.
3 Excellent seeing conditions.
4 V.high magnification. I used a 9mm eyepiece and a 2X Barlow.
5 A 4" offset mask over the front of the scope.
Result: the primary in a 4" glass was very sharp with 3 concentric rings and its companion looked dim, grey and followed its primary very speedily across the field.

Astro Events from Frank Gross

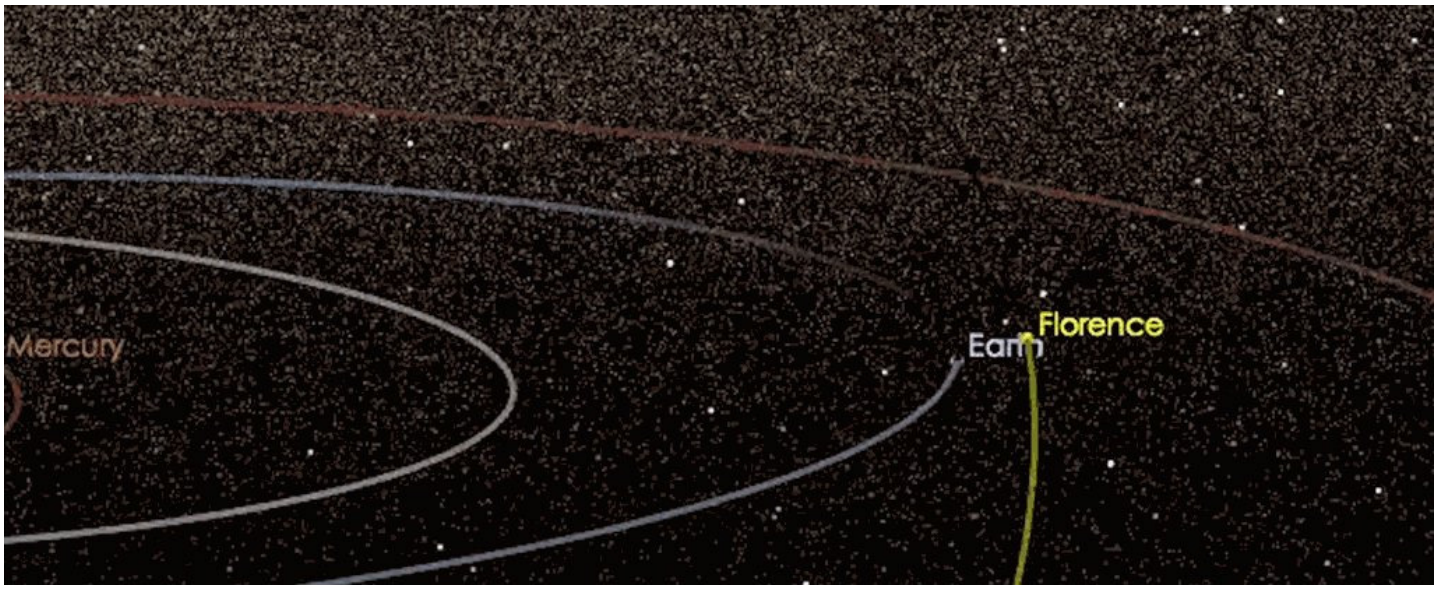
This Absolutely Ginormous Asteroid Is Passing Close by Earth on Friday, September 1st, 2017, Los Angeles time

On 1 September, a mammoth 4.4 kilometre (2.7 mile) chunk of rock will pass within an astronomical whisker of our planet – the largest near-Earth object to come this close since NASA set up its Near Earth Observations program in 1998.



Don't bother unlocking the old bomb shelter, though. At 18 times the distance between Earth and the Moon this asteroid poses no threat our own delicate space rock, but it will still be a great opportunity for astronomers to study this orbiting space mountain up close.

We have Schelte "Bobby" Bus at Siding Spring Observatory in Australia to thank for noticing this space boulder back in 1981, and for naming it after the famous 19th century nurse, Florence Nightingale.



In spite of her size, we have nothing to fear from the lovely Florence.

The asteroid isn't expected to come any closer than 7 million kilometres (4.4 million miles). She hasn't been this close since 1890, and we shouldn't expect another brush until 2500. To get a sense of scale, check out the image below. Earlier this year a rock with the less glamorous name 2017 AG13 really did give us a close shave, coming within just half of the distance between Earth and the Moon.

It was a measly 15 to 34 metres (50 and 111 feet) in size, though, putting it into the same ballpark as the 20-odd metre asteroid that caused a stir in 2013 by exploding over Chelyabinsk in Russia.

Cont...2

A similar sized one named 2012 TC4 will come even closer in October, at nearly 50,000 kilometres overhead of about 13 percent of the distance between here and the Moon. Much larger than those two and the energy released starts to rival nuclear bombs.

Of all the asteroids to come so far into our neighbourhood, however, Florence is the largest.
"While many known asteroids have passed by closer to Earth than Florence will on September 1, all of those were estimated to be smaller.

"Florence is the largest asteroid to pass by our planet this close since the NASA program to detect and track near-Earth asteroids began."
If by some stroke of abysmally poor luck the asteroid did slam into our planet, it would almost certainly be a climate changing event capable of wiping out an area the size of a small state. While it's not viewed as a threat, it will be seen as an opportunity to use radar imaging technology such as the one at Arecibo Observatory in Puerto Rico to study the asteroid's surface, which could reveal details as small as just 10 metres (30 feet) in size.

Knowing more about Florence's shape, size, and composition could reveal more information about her orbital path, or provide important information on its structure that can help us fine-tune future strategies in avoiding catastrophic strikes. There are currently 1,825 potentially hazardous near-Earth objects being tracked by NASA.

These are chunks of space rock that have a minimum orbit intersection distance of 0.05 astronomical units, or about 7.5 million kilometres (4.6 million miles) and are bigger than 140 metres (about 500 feet) in size, making Florence one of a select crowd.

While we can thank NASA for looking out for new additions to this list and keeping track of their movements, we still don't have the faintest idea what we'd do if an asteroid like this one was on a collision course.

The White House does have a plan of sorts on how to prepare for such events, there is no technology right now that could feasibly prevent an object the size of Florence from making contact with our planet.
Until somebody comes up with a genius idea, we'd best keep our eyes on the sky and learn as much as we can about the rocks that occupy our corner of the Solar System.

Astro Events from Frank Gross

Cont...3

Fully reusable Spacex Rockets would be lower cost than Skylon spaceplanes

Ashley Dove-Jay, PhD researcher in Aerospace Engineering, University of Bristol, analyzed the launch costs of fully reusable Spacex rockets against the also in development Skylon spaceplanes.

Ashley used a reference document from Reaction Engines. The document is no longer available online.
Skylon remains uncompetitive when compared with even the partially reusable (let alone the fully reusable) Falcon rockets:

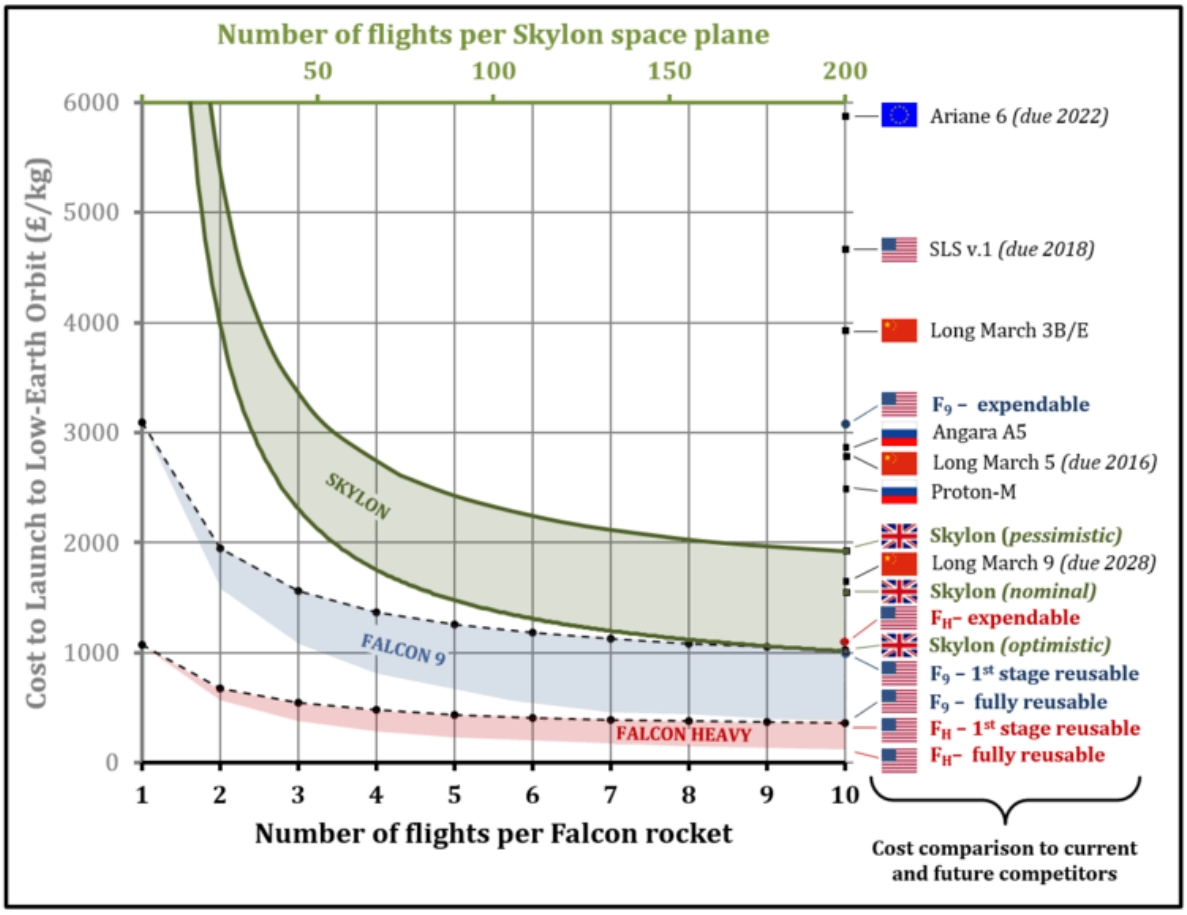
* Skylon costs about 30 times more than a Falcon 9 and 20 times more than a Falcon Heavy. While it is hypothetically more reliable (though I question this), such an enormous difference has a significant impact on insurance costs, which drives up operating costs further.

* Using an exotic and relatively expensive combination of jet and rocket propellants, it costs about six times more to refuel Skylon than a Falcon 9, and twice as much as a Falcon Heavy.

Astro Events from Frank Gross

Cont...4
Skylon still needs a decade of development and testing – and £14 billion in investment. Reaction Engines is gaining the support of the US Air Force. Reaction Engines could be a way to achieve hypersonic fighter jets and spyplanes.
Even here though, low cost access to space could enable networks of low earth orbit satellites to have constant high resolution observation of the Earth by the early to mid-2020s.

Stratospheric balloons and drones will also enable close up and high resolution observation of the Earth.
The main application then for Reaction Engines would be billion dollar a piece hypersonic fighter jets.



Perhaps later generation hypersonic planes would not be as costly and could be made reliable and low cost enough for hypersonic commercial passenger jets.

Spacex reusable rockets and any reusable spaceplanes need high volume applications
Elon Musk is trying to make hundreds of flights per year economic by launching and maintaining a network of 4000-20,000 internet satellites.

There were 92 space launches worldwide in 2014.
Supporting a global network of 20,000 or more internet satellites (with 10-30 in each launch) would end up being a few hundred flights per year to space on a sustained maintenance basis and one to two thousand during the main deployment phase.

Full reusability of all stages could be technically proven in two years and a standard part of Spacex launches within five years.

Astro Events from Frank Gross

Cont...5

By 2022, the buildout of the internet satellite network should be in full swing and the cost to low earth orbit per person could drop to $200,000 to $400,000 based upon the following chart of costs and launch frequency.

The truly lower costs from reusable vehicles are only fully realized from a high number of reuses and high number of flights per year. You can think of how costly a commercial jet would be if it only could fly a few times per year.

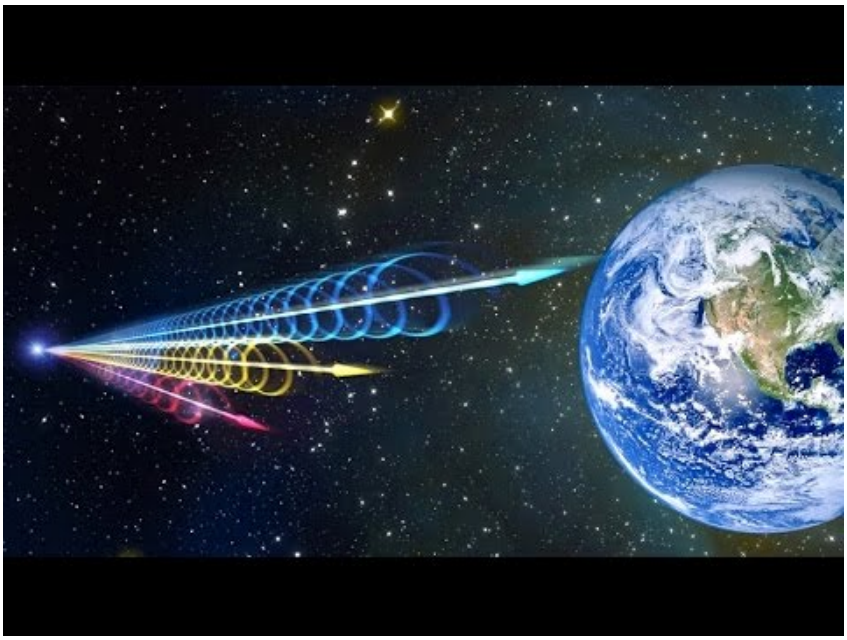
FRBs: Repeating Radio Signals Coming from Distant Galaxy Detected by Astronomers

Repeating radio signals from a mysterious source in a dwarf galaxy 3 billion light-years away have been detected by astronomers. Using the Green Bank Telescope in West Virginia, scientists with the Breakthrough Listen initiative—a massive project dedicated to finding signs of intelligent alien life—recorded 15 repeating fast radio bursts (FRBs) on August 26. The discovery was announced as an Astronomer's Telegram and will be described in further detail in a forthcoming scientific article, according to a statement from Breakthrough Listen.

FRBs last just a few milliseconds and appear to be coming from deep space. Because FRBs have an extremely short duration, and because scientists usually find them in data only after the event has taken place, pinpointing their origin has not been possible.

Astro Events from Frank Gross

Cont...6



Since their discovery over 15 years ago, almost two dozen FRBs have been recorded. Most often, they are one-off events, but in 2016 scientists announced in the journal Nature that they had found a repeating radio signal—FRB 121102. By monitoring and tracking this repeating burst, they were able to trace it back to a dwarf galaxy 3 billion light-years away. Still, the source remained elusive. Nothing that we know of in that region of space could be producing these signals.

Now the Breakthrough Listen team has detected 15 more busts coming from FRB 121102. Vishal Gajjar, a postdoctoral researcher at the University of California, Berkeley, where Breakthrough Listen is based, observed the new bursts during a monitoring effort run. Over five hours of observation, he and his colleagues collected 400 terabytes of data over the 4 to 8 GHz frequency band, or C-band, which is mostly used for satellite communications transmissions.

A colorful deep space image captured by the Hubble Space Telescope, as seen in a NASA handout from June 3, 2014

Analysis of the data revealed the new repeating pulses and showed that the source is in a "heightened activity state," the Astronomers' Telegram said. "Follow-on observations are encouraged, particularly at higher radio frequencies," the team added.
Initial results indicate that FRBs emit at higher frequencies than previously observed. This discovery that should help scientists determine the source producing the bursts.

Several explanations for FRBs have been suggested. One is a cataclysmic event, such as a neutron star collapsing into a black hole. But such an event would produce only one burst and therefore does not explain the repeating pattern of FRB 121102.

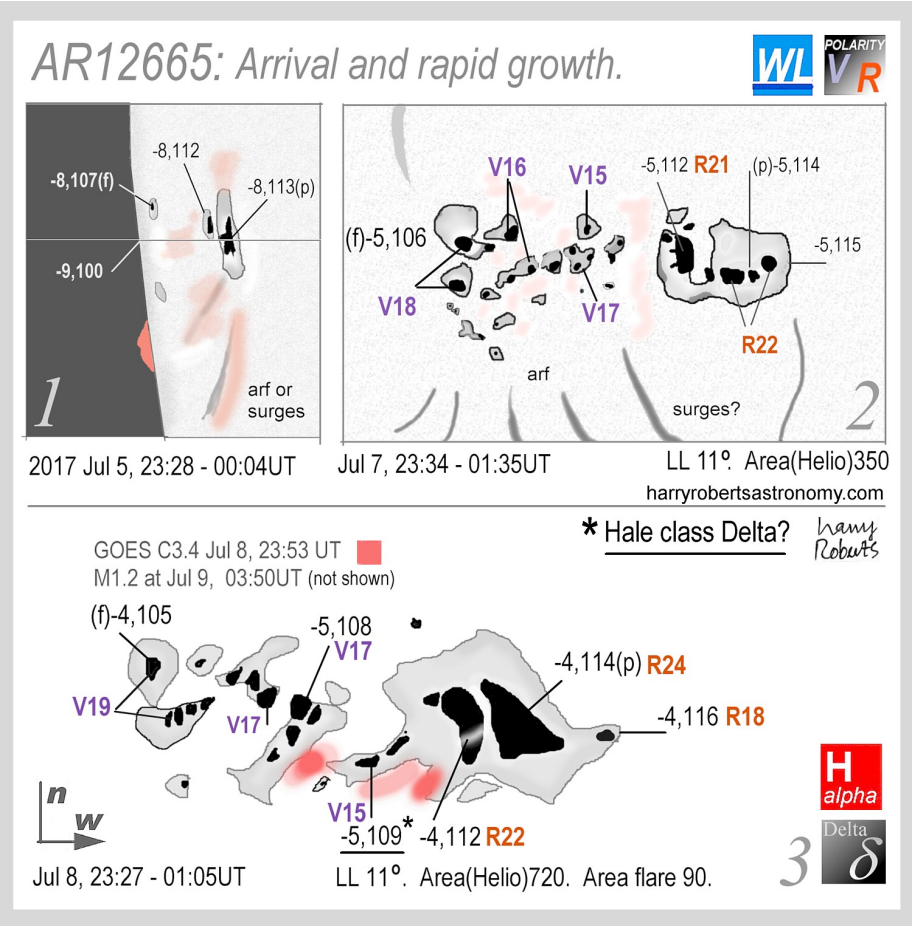
Another possible explanation is that they are coming from a young, highly magnetized neutron star, but so far nothing like this has been detected in this region of space.

Despite widespread speculation, the possibility of the signals coming from an advanced alien civilization has been largely ruled out.

AR12665: 'Unlikely Hero!"

Great sunspots seldom trumpet their arrival; most fade away after a short career. Yet some lead a hero's life! Such was AR12665.

This group first rounded the Sun's east limb on 2017 July 5: at first glance a moderate size single spot. A closer look showed the main spot had some small patches of penumbra and two tiny spots in company (Fig1). "Helio" freeware sited the main or preceding (p) one at -8,113 (i.e. 8°S, long. 113°) with a small follower (f) at -8,107. As the limb longitude was 100°, the (p) spot was 13deg from the limb. No H-alpha activity of note happened this session. Yet a more complex group was a welcome sight –the Sun had been very quiet.

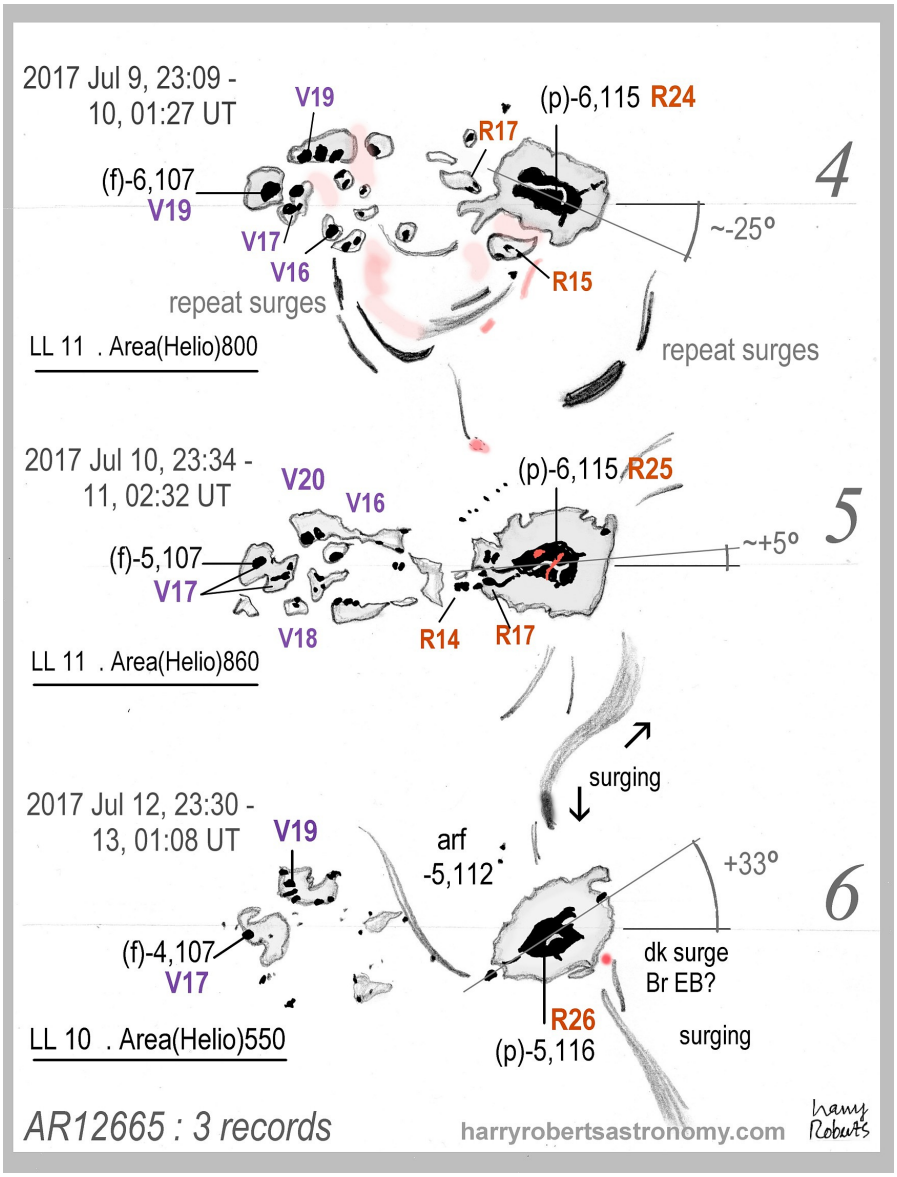


When next viewed on July 7 the modest group had grown from, say, 100 units to 350, with 22 spots in it: huge growth in a short time! Note that the (p) spot now lay between long. 115 and 112, the (f) spot still at 107, with the whole 8 deg° region between densely packed with spots and penumbrae (PU); a remarkable transformation! Clearly, new spots were rapidly emerging.

If the group had trebled in area since first seen – it now doubled between Jul 7 and 8, when it reached 720 units (Figs 2 and 3). On July 9 at 03:18 UT it hosted a GOES M1.2 flare. Such flares have not been common this year, though one did occur on July 1 at the west limb. A 'big' sunspot is one that reaches 1000units: by Jul 9 it exceeded 800 units. Such growth is a sure sign of solar flaring and the GOES X-ray plot showed rising activity between Jul 9 and 10.

Cont...2

Magnetic Flux. Most activity on the sun is driven by emerging stronger magnetic field. The Mt Wilson logs showed a flux of R22 (i.e. red polarity with flux of 2200Gauss) rising to R24 in the (p) spots between July 7 and 8 (Figs 2 and 3). Magnetic class Delta is defined as two spot umbrae of opposite sign (+ or -) in one spot penumbra. As Fig 3 (*) shows, the worker at MtW's venerable 150 foot telescope recorded such a mix on Jul 8. Was this a slip of the pencil? When its Hale class was recorded, Beta Gamma was noted; not Delta. Was AR12665 briefly class Delta? We may never know.



From Jul 9 on, the MtW. logs showed increasing flux in the big (p) spot of the group. It hosted remarkable light bridges, LB, in the main umbra as well as regular occlusions by ribbons of H-alpha. The daily logs showed a steady rise in the power of (p) spot fields from R24 on 9th (Fig4) to R25 on the 10th (Fig5) and then, seldom seen, R26 on the 12th (Fig6)! This flux matches the strongest seen in this solar cycle, SC24, and with a technical correction (publ. 2006) equates to 3000G.

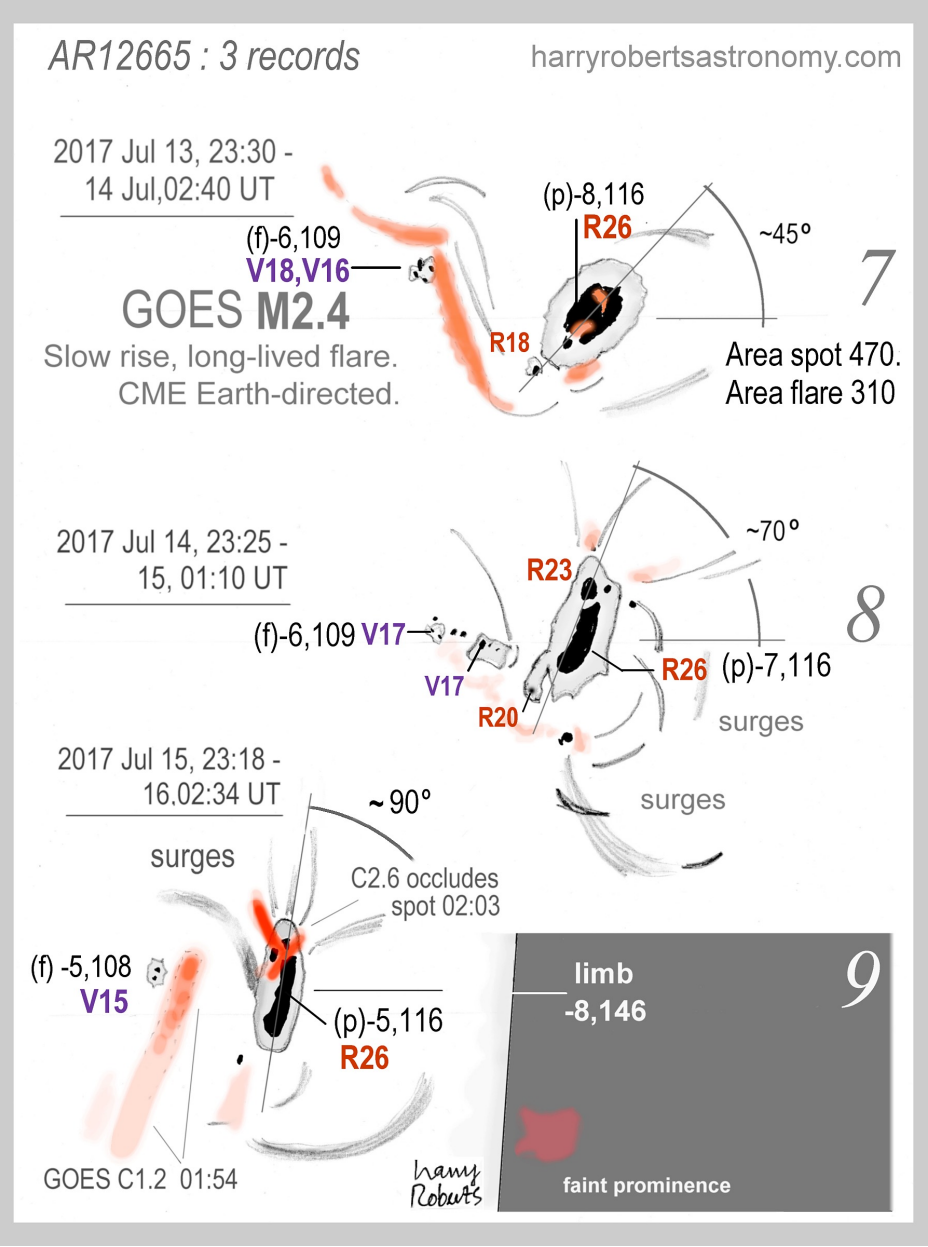
Figs 4 through 6. These show significant events. The first, noted earlier, is the steady rise in power of the (p) umbral fields (24 to 26G), while at the same time the cluster of violet following (f) spots diminishes; growth in area ends (Fig6). Meanwhile, ever stronger surging occurs from the PU of the now huge (p) spot.

Several were noted out-flowing from the (p) to points over 50Mm away. Some were seen in back-flow, when their light was strongly Doppler shifted. A filter with wide tuning range helps to show such motions.

Cont...3

Spot Rotation. In addition, strangely, the big (p) spot began to *ROTATE!* Figs 2 and 3 show the (p) spot to lie E-W. In fig 4 the much altered and elongated (p) seems tilted downward, to the S. Next day (Fig5), the spot lies E-W again. Then, Fig 6 shows a tilt upward, to the north! This will be an increasing trend through Figs 6 to 9! By log 9, the (p) spot is aligned N-S! Why this unusual rotation through >90°?

Coronal fields. The (p) spot's rotation coincided with the emergence of two minor spot groups in the Sun's northern hemisphere. The first to emerge on Jul9 was an anonymous pair sited at +10, 149 that lasted < 24h and got no AR# at the time. That group lay 32° west of AR12665 and ~20° to the north. It's tempting to think that coronal loops re-connecting the two active regions caused the 12665 (p) spot rotation – though SDO EUV images seem not to support this.



However such an effect is seen on SDO images of Jul14. By Jul 12 (Fig6) a strong counter clockwise rotation of the dominant (p) is recorded. At the same time the 'anon' AR is again visible and named AR12667 on Jul 15! As well a new group, AR12666, emerges at +9, 102, 15° north of AR12665 and some 8° E of the group. SDO evidence suggests that preceding coronal fields of 12665 reconnected with the 12666 group, influenced by a persistent coronal hole beside 12665 on its NW side. Likely 12667 had some role in this too. This may well explain the 90° rotation of the AR12665 main (p) spot seen in Figs 6 through 9.

Solar Snippets by Harry Roberts

Cont...4

M2.4 flare. The highlight of the Figs 6 to 9 period is a magnificent GOES M2.4 flare that erupted at the start of Jul 14 (fig7). The last 3hr of Jul 13 saw three brief bursts of flaring at the 12665 site, none very bright, in the following parts of the group. At the time of the big flare, earlier group 12667 was again active on the disc, sited at +15, 153, with a tiny spot, bright plage and a dark filament.

Filament ejection. On Jul 14, 00:11 to 00:30UT a thin brilliant filament ejected from the W limb above the point -3,173 (not shown in Figs) reaching a length of 120Mm, then rapidly fading. This likely triggered the ensuing M2.4 flare though, seemingly, the flare site lay 60° to the east. At 00:47, 17mins later, a chain of bright 'points' beside a dark N-S filament, at -8,111, began to coalesce; GOES stood at C1.2. This was the beginning of an unusually slow rise to a flare peak of M2.4, almost an hour and a half later (02:09UT)! That flare peak would then take about 24hr to fade to background levels: an unusually prolonged flare. The writer logged it as visual class 1N, and its area was 310 units.

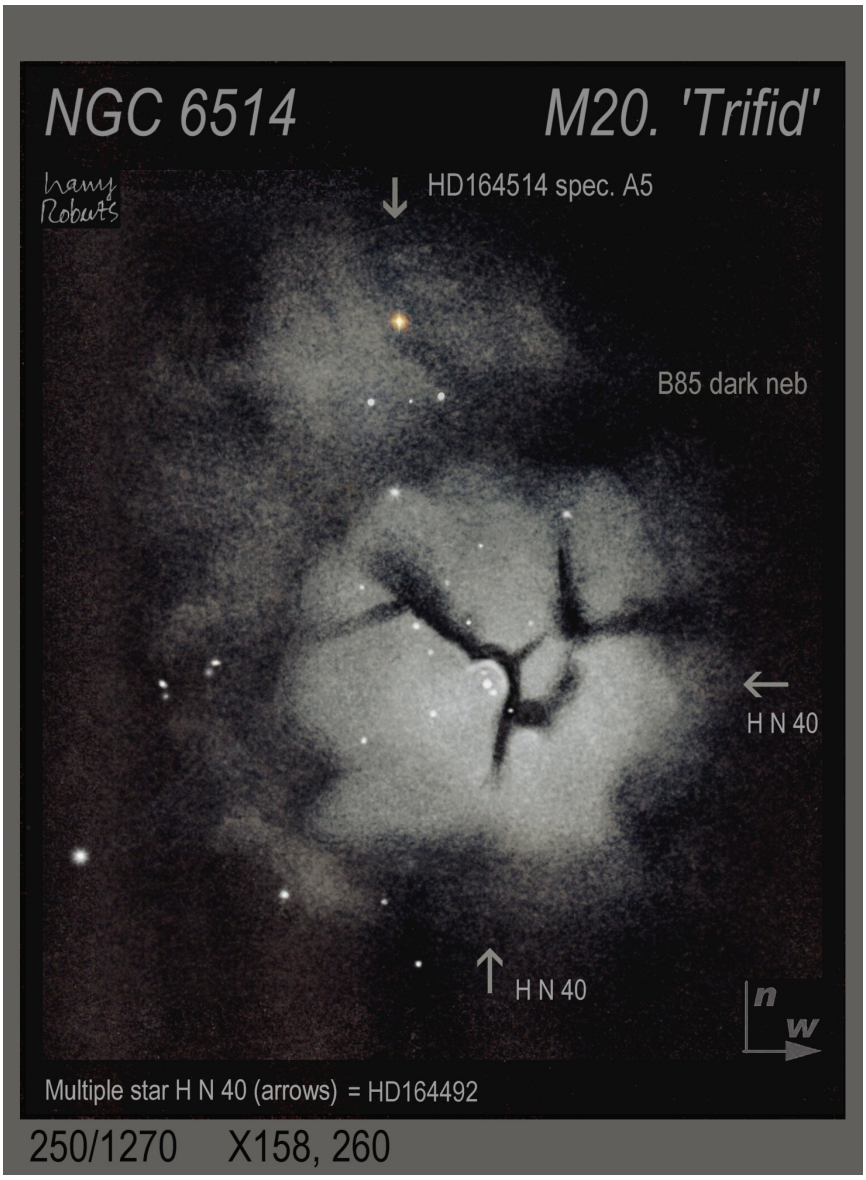
Surges. Over the period covered in Figs 7 to 9, with the 'tail' of (f) spots much faded, conditions seemed to promote surges at the (p) spot. Surging there was almost continuous; mostly from the edge of the (p) spot's penumbra, though a likely inversion line running N-S of the point -5,112 (centre of the original group) also hosted many.

Return. While still active, group 12665 passed behind the west limb about Jul17; yet it did not disappear. An impressive array of bright surges, loops and small ejections at the E limb at -2,116, on Jul 31, showed it had survived far-side transit. No spot was seen then, but the WL scope was kept on the site during the day, and on Aug 1, 04:50UT, the returning spot was seen at its old site -6,118, with a couple of others for company. In all, AR12665 had been one of the most interesting groups of SC24. Renamed 12670, we may follow its career in a future piece; but the impressive activity of its first transit, its Hero's life, was ended!

M20 The Trifid Nebula NGC6514

In south eastern Australia winter provides the best conditions for astronomy. The nights are cool to cold; it's the dry season and strong westerly winds clear away dust and humidity. Summer's insects are absent. The Central Milky Way bridges the whole sky from North to South and the naked eye sees bright star fields silhouetting dark lanes of enormous size. With binoculars some emission nebulae may be seen, strung along the galactic plane: some bright and some faint. All are the product of hot, massive, type O stars within.

The **Trifid Nebula**, Messier 20, is faint when compared to nearby M8, the 'Lagoon', or M17 the 'Omega' Nebula. M20 and M8 seem to be nebular 'hot spots' sited near the edge of the vast Sagittarius cloud of ancient yellow stars – but they have a darker background richly scattered with young blue stars: a wonderful part of the Milky Way (see Astronomy Australia 2017, Map 8). Point your 'scope at bright M8 which is seen with the unaided eye – then nudge it due south, about one degree, and the Trifid will appear.



In a 4 inch 'scope the Trifid nebula is plain enough: roundish, with three or four dark radial 'spokes'. Yet the 'spokes' can be hard to see with direct vision; bigger 'scopes and higher powers offer the best views. In fact, the whole M20 site is surrounded by fainter nebulosity with dark regions superimposed: it's a nebula 'hotspot' in the Scutum Arm of the Milky Way Galaxy (MWG).

Several sketches of the Trifid were made with a ten inch 'scope over the years, but the complexity of the thing requires work. The 'spokes' are contorted and take some unravelling. They were first tackled in 2009 and again in 2015 during a windy winter's night when contrast was optimal; more detail was added during July 2017. The nebula was then traced onto black paper and sketched in pastel.

M20 The Trifid Nebula. NGC6514 by Harry Roberts

Cont...3

Emission nebula. What is the Trifid? Its main part is best defined as a Strömgren Sphere: an ionization shell generated (mostly) by type O stars where the relationship between the luminosity and temperature of the 'exciting' (i.e. ionising) star and the density of the surrounding gas, mainly hydrogen, is quantified. From Strömgren's formula the diameter of the resulting photo-ionised region being can be found. The hotter the star the larger the resulting sphere. The Trifid's star is a powerful O-type, type O7e, known as HD164492A, part of a multistar group to be discussed elsewhere, and its bright emission sphere is some 40Ly diameter.

As well as the bright emission sphere, we see several dark lanes or tubular structures superimposed – presumably in the foreground. Interestingly, we may also see, close to the multistar, the nearest edge of the dark lane is illuminated by reflection of light from star HD164492A. This fact suggests that some of the dark lanes must lie near the ionisation sphere's centre, where the star must be. Puzzling!

Reflection nebula. However, on the northern edge of the Trifid sphere is a different kind of nebula: a reflection nebula caused, it's claimed, by the obviously yellow star within it. This is a bit hard to believe, but the authorities all agree! The star is HD164514 and it is spectral type A: white, like Sirius. Maybe we see it through a dusty dark lane (there is one involved) that 'yellows' the A-type along our line-of-sight. Several bright blue type-B stars, the best type for causing reflection nebulae, lie nearby out of the fov of the sketch (top) – maybe they illuminate the reflection nebula too.

Dark Nebulae. The Trifid gets its name from the three or four radial dark nebulae superimposed on the bright emission sphere. As well, a dark 'wedge' divides the emission sphere from the reflection nebula to the north. This is captioned B85 in Uranometria. Yet SkyCat2000 vol2 lists B85 as "dark regions in the Trifid nebula" suggesting the 'spokes' and 'wedge' share the B85 caption. Maybe. Ronald Stoyan (*Atlas of the Messier Objects.* Cambridge Uni Press. 2008) sees more complex dark structures on the south margins of the Trifid, using a 20inch 'scope. They are well out of my reach.

The Trifid is a wonderfully complex nebula worth careful examination. It is ~5000Ly distant and about 40Ly in diameter, and just under half a degree in apparent diameter. It has a strong response in H-beta as well as OIII etc. Enjoy the Trifid!

More Club News continued from page 1

Club/Social Viewing Nights are on Saturday evenings "just" Before Sunset. Viewing nights are for members and invited guests. The contingency plan for poor weather on the proposed viewing night is to meet the next night (a Sunday night) but consult Jack first on Landline: 44232255, Mobile:0407 018 982

Woncur Road, South Nowra (Head South down The Princes Highway, turn right at BTU Road, Woncur Road is the street first on the left).

Dates for Club/Social Viewing Nights for 2017 On Saturday Nights As Follows:

Sept-16, Oct14, Nov-11, Dec-9

More Monthly Meeting Information

The AGM was held at the July monthly meeting. Elected officials for 2017 - 2018

President: Frank Gross
Vice President: John Gould
Secretary/Treasurer: Tracey Newcombe
Public Officer; Frank Gross
Observation Officer: Robert Turnbull
Editor: Kaye Johnston
Librarian: Chris O'Hanlon

The Committee: Robert Turnbull, Rudolf Henssen, Robert Spruyt, Jack Apfelbaum, Chris O'Hanlon, John Gould

Check out the Astro Flyer on the web site: www.shoalhavenastronomers.asn.au

Shoalhaven Astronomers PO BOX 1053 Nowra NSW 2541	The deadline for Articles for the Astro Flyer is The First Friday of the Month. Editor Kaye Johnston

Club Video Projector Rental

The Video Projector is available for club members for a small rental fee. If a club member would like to project a football game, cricket game onto a wall for a party this is the way to go. You will get up to a 100 inch diagonal picture on a light coloured wall with the Epson video projector. The projector has an inbuilt speaker but you can add your own speaker units if necessary. The unit s very easy to use and instruction would be given before the borrowing (2 days) occurs. The rental price is set at present at $15 for two days.