Shoalhaven Astronomers Inc.
www.shoalhavenastronomers.asn.au

Volume 18
Issue 9

Astro Flyer

SEPTEMBER 2018

Club News

Hello All,

A Harvest Moon will make its presence known at the end of this month. Be on the lookout. I might try a little lunar photography on the night. Also there will be a couple of comets in the sky before the end of the year. The last time I did any comet photography was during comet Hale-Bopp. I was fairly successful at the time in getting images of it.

Hope to see a lot of you at the September meeting where Harry Roberts and John Gould will be showing us how to collimate a telescope.

Frank Gross, president.

Next monthly meeting will be held at the Shoalhaven Campus of the Uni of W'Gong, George Evans Road off Yawal Road, West Nowra, September 21st, 6.30 for 7.00 start. See you there.

Contents

MOON PHASES

New Moon	First Quarter	Full Moon	Last Quarter
9 Oct	17 Oct	25 Sept	2 Oct

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 6 Oct (back-up night Sun 7 Oct) at the new viewing site. Go to the university on George Evans Road and go straight ahead through the second turning circle to the new viewing site.

More viewing nights Page 13

OUT THERE
Bob Turnbull OBSERVATION OFFICER

OUT THERE SEPTEMBER-OCTOBER

We appear to be moving into a more stable viewing season with the arrival of Spring, even though we encountered some strong gusts at the last viewing at the last Club Viewing at the new site in Nowra Campus, where we had only 3 members present, however the sky was mostly very clear, with Venus, Jupiter and Mars, plus some of the largest nebulae showed pleasant viewing.

The National droughts have generated much dust and smoke at times, which has discouraged viewing, with the large dust storm on Mars spoiling good viewing of Mars at its closest position to Earth. But when we looked on the 9th of September, I think the seeing was clearer, although smaller than before when it was at closest to Earth.

PLANETS

VENUS
As mentioned in my last "OUT THERE" Venus will become its greatest apparent size on September to October, and at its brightest on the 21st of September. When this planet continues to increase in size the brightness decreases, due to the crescent becoming smaller as it wanes. By its clouds and thick atmosphere, Venus has not been the favourite object to view but still has a following.
It will be closest to Spica at 1.2 degrees distance.

MARS
In September it will be in Capricornus, high in the Northern sky about 9pm and still at a reasonable size for astronomical viewing. The South polar cap is rapidly receding, however the dust storms have almost gone, and that's good for astronomers.

JUPITER
Sets around 10:30pm midmonth in the Western sky but is still worth observing for the ever changing surface details and the movement of its moons, when we viewed it with the last club viewing.

SATURN
Is in Sagittarius high in the North Western sky before Astronomical twilight. It appears stationary on the 6th September (which has passed) as it comes to the end of five months of retrograde motion. Then moves West to East across Sagittarius towards M22.On the 26th of September it will show maximum shadow of the planet on the back of its rings. The Moon near it in October.

URANUS
Rises mid evening in September, in the Eastern sky and stays in Aries near Pisces and can been resolved into a small disc in most small telescopes.

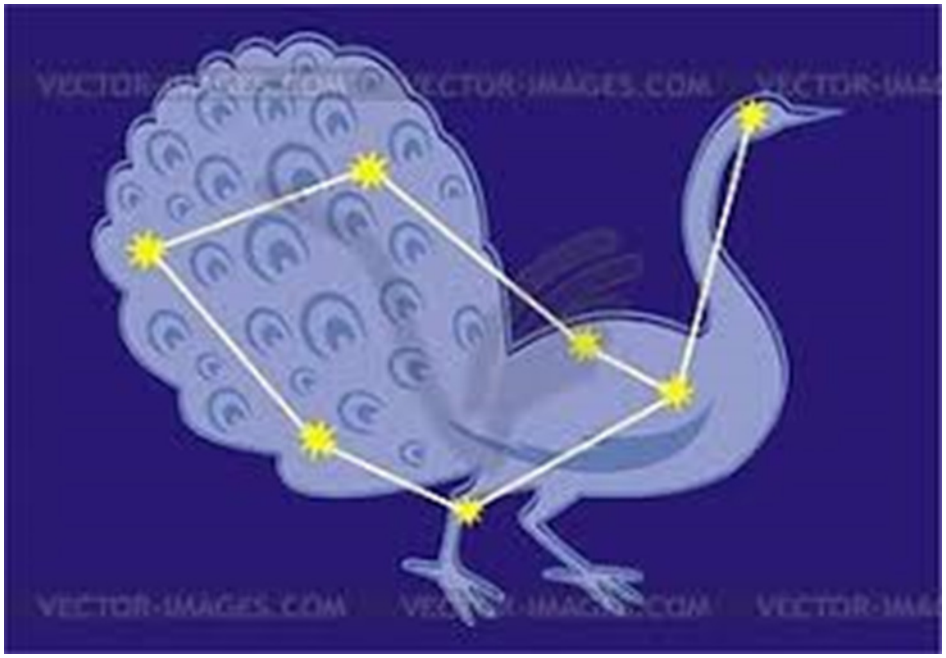
NEPTUNE
Is at opposition on the 8th of September (now passed) in Aquarius and was in this constellation when the German astronomer, Galle, discovered it in 1846.This planet needs at least 100mm a telescope and eye piece to give 200 magnification to see this small bluish disc.

COMET
Comet 21P/ Giacobini- Zinner can be seen in September in the morning sky in Auriga and this 7th magnitude comet moves through Gemini and Orion before finishing in Monoceros.

GOOD VIEWING
BOB TURNBULL

A Search for Southern Doubles

Episode 19: Pavo: The Peacock



Pavo, The Peacock is another fairly obscure constellation of recent designation and perhaps most famous for its delicate naked eye Globular Cluster, NGC 6752.

It sits high in our SE sky after dark in the coming months and contains several interesting double stars and especially a fine double associated with its best gc, NGC 6752, mentioned above.

It may take some time to become familiar with the key stars in this constellation, but I have found binoculars and a small prominent cluster of evenly matched stars are a big help.

Finding Pavo: *At the onset of dark in mid- September, if the observer looks steadily southward, two facts become obvious:*

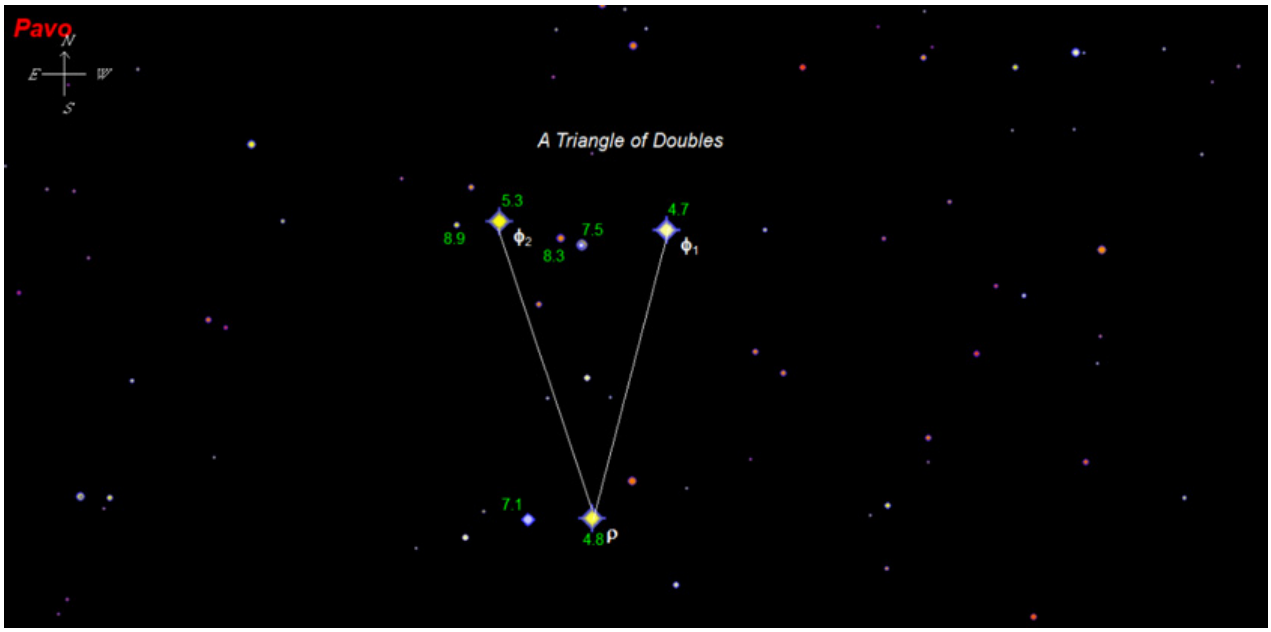
1 The Milky Way, The Pointers and the Southern Cross stretch almost north to south overhead.

2 On the left side of the southern Milky Way and high in the southern sky three prominent first magnitude stars stand out as a wide row separated from each other by about 18°of sky. They are in order of brightness and from the viewer's point of view moving left to right and in descending order of brightness: Fomalhaut (mag 1.2). Alnair (mag 1.7) and Alpha Pavonis (mag 1.9). These three stars belong respectively to the constellations of Pisces Austrinus, Grus and Pavo. Sadly, the Peacock's brightest star has no fancy Arabic name and is merely designated Alpha!

Cont...2

Because Pavo is circumpolar from where we are located, it tends to change orientation rapidly from hour to hour. That is why we need one more anchor post to see the perspective of its starfield. This anchor point is a small triangular asterism of mag 4.5 stars, comprising Phi 1, Phi 2 and Rho Pav. These stand out in binoculars and finderscope and are halfway between Alpha and Beta Pav, which lie 9°apart. Having discovered this segment of Pavo, the remainder of the stars in this group fall into place.

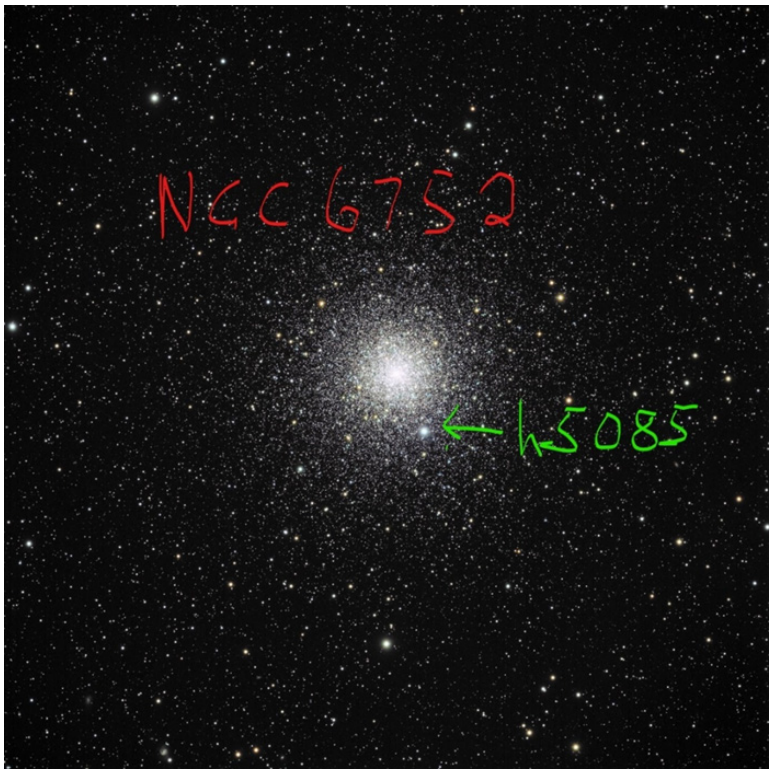
1. **Alpha Pavo**: RA 20.25; Dec -56.44. mag1.9/9.1/9.2. (sep.9.1"/10.5)
This wide triple forms a very neat and colourful group. The primary is white and the almost equal companions forming a triangle are pink and blue. An easy small telescope object.
2. **Beta Pavo**: RA 33.8; Dec. -66.8. mag 9.2. (sep. 6'33") This is a wide pair and easy in the finder. The yellow primary contrasts with the pink companion and a wider fainter blue star forms a line with the first two.
3. The **Phi $_{1,2}$ and Rho** group (Phi$_1$ RA 20.37; Dec -60.31): Returning to this binocular field you will discover that both Phi $_2$ and Rho have travelling companions easily spotted at low power. At mag 7.5 Phi $_2$ has a wide companion of mag 8.9 at a wide 16' and a closer dimmer secondary at mag 8.9. Rho at mag 4.8 has a finder scope visible companion of mag 7.1 a wide 11" directly east in the field. A rich field at low power (*see diag. 1 below; magnitudes are in green*).
4. **Zeta Pav(ζ)** Now head high SW in the constellation (see map below) to find this elusive double: PA 18.23; Dec -61.30. mag 4.4/8.1; sep.3.4".
The closeness and contrast in brightness make this a difficult object. However, I split it comfortably in 10" Dob at X150. The colour are deep yellow and white.
5. **H5085 Pavo**. RA 19.10;Dec -60.03;mag7.6/9.1;Sep2.7. I have kept the best till last. This neat but tight double sits on the edge of Dunlop's best discovery, NGC 6752. The bright globular cluster is easily spotted in the finderscope – many have seen it as a haze with the naked eye and the bright star just off its southern edge is our double.



(*Diagram 1 shows asterism between Alpha and Beta Pav. Mags in green*)

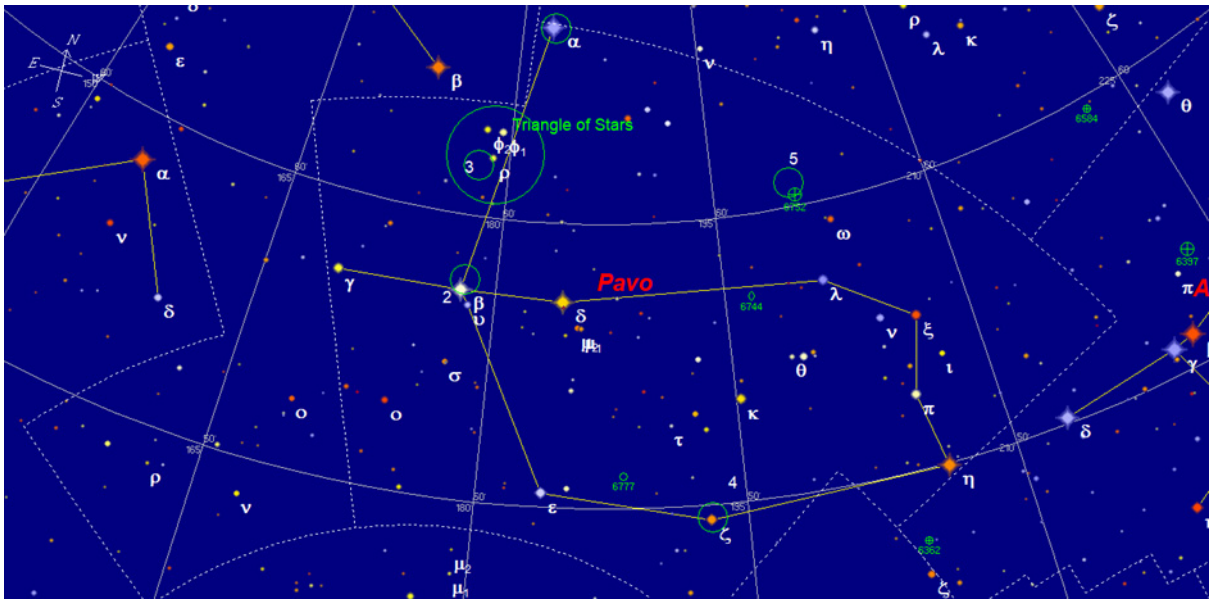
After several attempts it finally split on a clear night at X300. Not easy but the rich and unique-shaped gc make the search worthwhile. I have noticed a slight difference in the colours but difficult to access.

Cont...3



(Diag 2 *An overexposed picture of NGC 6752 showing the double star h5085; South is bottom of the map)*

Bonus Double Double. I stumbled upon a delightful field between the asterism and the gc 6752. See if you can hunt it down at low power. It contains two neat double stars flanking a single star. It is indicated as two faint nameless stars on the map below.



(Map showing Pavo, and the asterism (triangle of stars) between Alpha and Beta. Numbers and green circles indicate listed doubles.)

Next month will be Episode 20 and the final in the series, spanning two years of observing doubles all over the sky. I intend to list my pick of the 10 best from the 100 doubles observed.

Astro Events from Frank Gross

See Two Bright-Green Comets in 2018's Night Sky: How, Where and When to Look

By Hanneke Weitering, Space.com Staff Writer | September 6, 2018 04:28pm ET

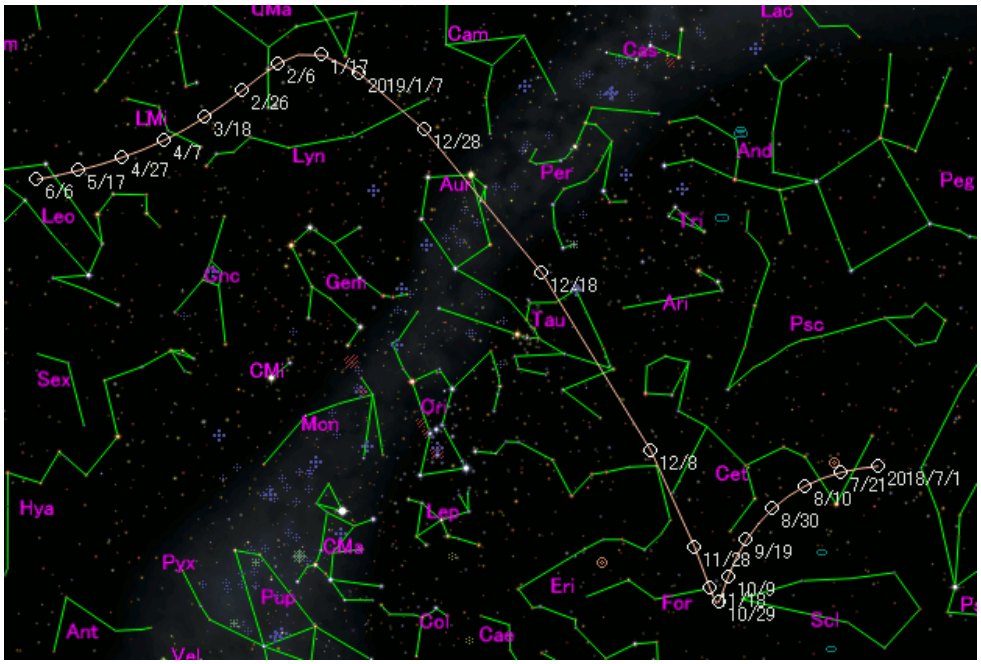
Comet 21P/Giacobini-Zinner is now visible with binoculars and telescopes. An even more spectacular naked-eye comet will follow in December.
Credit: Alexander Vasenin/Wikimedia Commons CC BY-SA 4.0

A bright-green comet is making an appearance in the night sky this month. Comet 21P/Giacobini-Zinner is now visible with binoculars and telescopes. Meanwhile, an even brighter comet is heading our way and will become visible to the naked eye in December.

Comet 21P/Giacobini-Zinner, or simply "21P," will make its closest approach to Earth on Sept. 10 as it makes its way around the sun. A good pair of binoculars or a small telescope is needed to spot this bright-green comet, but the next comet, 46P/Wirtanen.

Sometimes called the "dirty snowballs" of space, comets are icy bodies that move around the sun in a highly elliptical orbit, leaving a trail of dust and gas in their wake. Comet 21P orbits the sun about once every 6.6 years. Every year in October, Earth passes through the trail of "crumbs" left behind by Comet 21P, treating skywatchers to the annual Draconid meteor shower. A relatively modest meteor shower that occasionally displays spectacular outbursts, the Draconid meteor shower is expected to produce only five to eight "shooting stars" per hour in 2018, NASA meteor expert Bill Cooke told Space.com. [Amazing Photos: The Comets 21P/Giacobini-Zinner and 46P/Wirtanen of 2018]

Before our planet plows through Comet 21P's debris, skywatchers can watch the comet as it slowly approaches the sun this week. The bright-green comet "is expected to reach a visual magnitude of 6.5 to 7," according to the skywatching website EarthSky.org. "That means it will not be visible to the eye … but nearly."



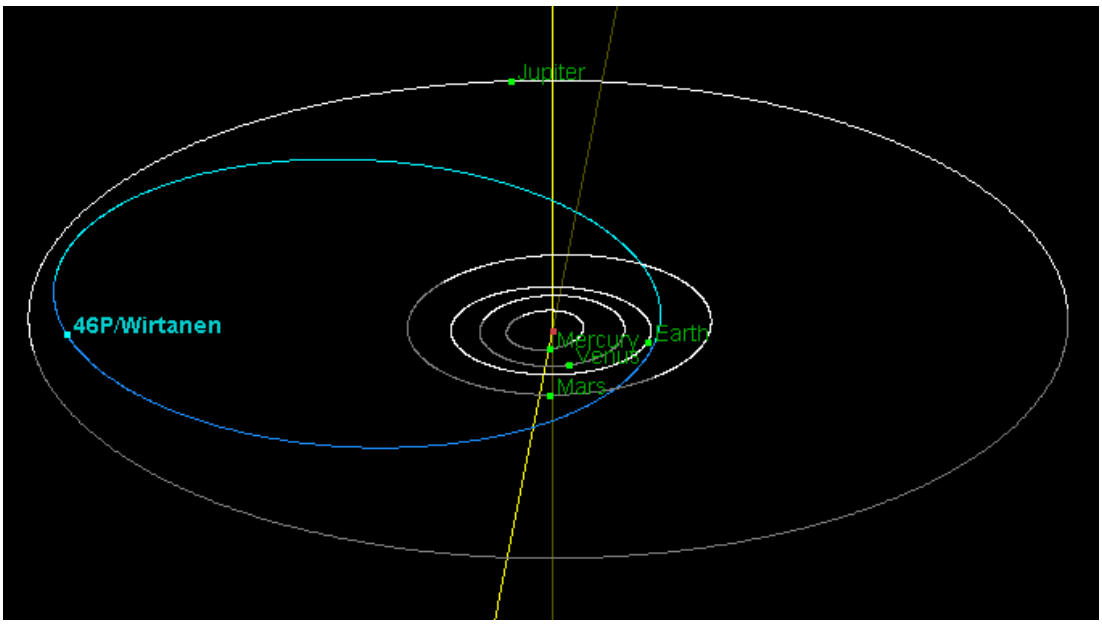
Depending on how dark and clear the sky is in your location, the faintest stars and other celestial objects we can see without the aid of telescopes or binoculars have an apparent magnitude up to about 6 or 6.5. In light-polluted areas like New York City, for example, skywatchers may see stars up to a magnitude of only 4.0.

Cont...2

This sky map shows the approximate location of Comet 21P/Giacobini-Zinner during its closest approach to Earth on Sept. 10, 2018 at 2:27 a.m. EDT (0627 GMT), as seen from New York City.
To spot Comet 21P at its brightest, point your gaze eastward to the modern constellation Auriga — home of Capella, the "Goat Star" — after midnight and before dawn. The comet will officially reach perihelion, or its closest point to the sun, around 2:40 a.m. EDT (0640 GMT) on Sept. 10. You can still spot the comet for several nights before and after this close approach, but how long it will stay in sight depends on how powerful your skywatching equipment is. To pinpoint Comet 21P's exact coordinates when observed from any given location or time, check out NASA's ephemeris calculator.

Next up: Comet 46P/Wirtanen

If you don't get a chance to check out Comet 21P or don't have access to the binoculars or telescopes you need to see it, don't fret. Another comet encounter is right around the corner, and this time, you won't need anything but your own eyes to see it in the night sky (provided that you have good vision or sport corrective eyewear).



On Dec. 16, Comet 46P/Wirtanen will make its closest approach to the sun, and it will be visible just after dusk, according to In-The-Sky.org. The periodic comet, which orbits the sun once every 5.4 years, was discovered in 1948. Its last close approach to Earth was in 2013, when it was 564 million miles (907 million kilometers) from Earth. While it was "not really an awe-inspiring sight" last time, this year Wirtanen will come much closer, Joe Rao, Space.com skywatching columnist and FiOS 1 News meteorologist, told Space.com. When it swings by again on Dec. 16, Comet 46P will be only 7.3 million miles (11.7 million km) away.

Comet 46P/Wirtanen is "one of these little diddly comets" and tends to be visible only with a good telescope or a good pair of binoculars, Rao said. But this year, "it's going to be so much brighter than it usually is," he added. "It will become as bright as third magnitude, which is about as bright as the faintest star in the Big Dipper. So, if you know where to look in the sky, it will be against the winter constellations of Taurus the bull, near the Pleiades and Hyades star clusters."

Astro Events from Frank Gross

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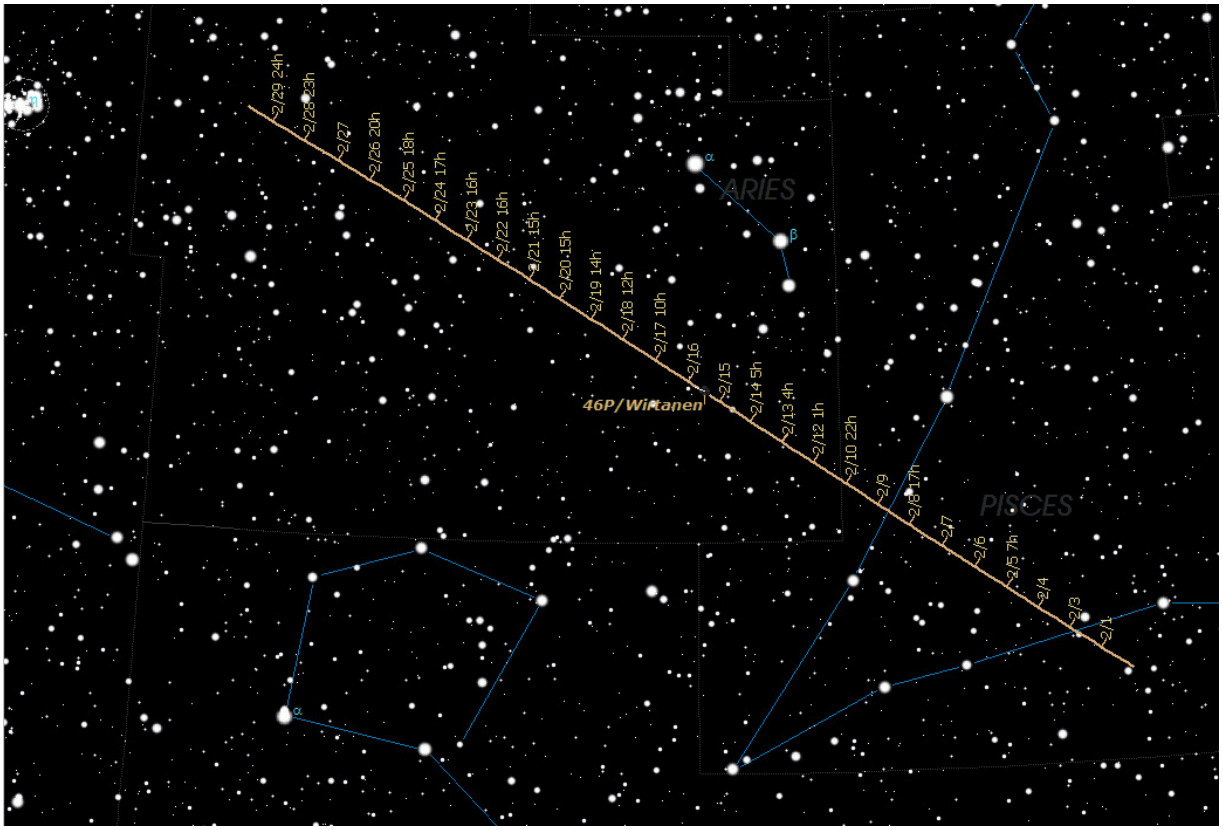

Comet 46P/Wirtanen will be closest to Earth on Dec. 16, 2018. Look for it above the eastern horizon after dusk all month long! It will be bright enough to see with the naked eye, and will look even more spectacular with binoculars and telescopes.

September Full Moon 2018: When to See the 'Harvest Moon'

By Jesse Emspak, Space.com Contributor | September 6, 2018 07:00am ET

The full moon of September, called the Harvest Moon, will grace the skies Sept. 24, just two days after the autumn/spring equinox.

The moon becomes officially full on Sept. 24 at 10:52 p.m. EDT (0252 GMT on Sept. 25), according to NASA's SkyCal.

For New York City observers, the nearly full moon will rise on that day at 7:01 p.m. and set the next morning at 7:03 a.m., according to the U.S. Naval Observatory (USNO).

Astro Events from Frank Gross

Cont...4

The moon will be entering the constellation Aries, and will rise about 12 minutes after sunset (which happens at 6:49 p.m., in New York, per the USNO). [The Moon: 10 Surprising Facts]

On the opposite side of the sky, Venus will be just visible over the horizon, as the planet is getting closer to the sun from Earth's vantage point. Venus will be hard to spot, though. At sunset, the planet will be only about 9 degrees above the horizon, and the planet will set at 7:43 p.m. in New York, according to calculations from heavens-above.com. As bright as Venus is, the sky won't be dark enough to see the planet until just before it sets, so a flat horizon and a keen eye will be necessary.

Mercury will be just emerging from superior conjunction (which will be on Sept. 20). That's the point where the planet is behind the sun from the point of view on Earth. Mercury will be basically invisible; even though at sunset it will be east of the sun and will slowly make its way into the evening sky, it will be only a degree and a half above the horizon at sunset. (It is important to note that the inner planets' proximity to the sun makes looking for them a bit dangerous. Never point binoculars or a camera lens at the sun without proper filters, and wait until the sun sets before trying to track the planets.)

New York City area observers will see Mars rise at 4:37 p.m. on Sept. 24 and will set at 1:40 a.m. the next morning, so when the full moon rises, it will be about 20 degrees above the eastern horizon, in the constellation Capricornus. Capricornus is a relatively faint constellation, so Mars will stand out because of its brightness and distinct reddish color. As observers turn their gaze westward, they will see Saturn, which by 7 p.m. will have just passed the meridian, the highest point in the sky it will reach. Saturn will be about 26 degrees up and nearly due south, in the constellation Sagittarius.

Jupiter will be in the western half of the sky, about as high as Mars is after sunset, but in the opposite direction. So, both planets will "frame" Saturn. The planet will set at 10:38 p.m. local time in New York City. Sagittarius will be a bit brighter than Libra or Capricornus, and Saturn can be spotted by looking for the steadier light in Sagittarius' "teapot" shape; generally, stars twinkle, but planets do not.

The full moon tends to overwhelm the fainter stars. But in the late-September sky, there are still constellations that can be seen despite the brightness of both the moon and city lights. For example, as the moon gets higher, the brighter winter constellations, such as Taurus and Orion, will appear in the eastern sky; by midnight, those two will have risen in the east and cleared most buildings.

The September full moon is often called the Harvest Moon, according to the Old Farmer's Almanac, because that was when the corn harvests traditionally started. Sometimes, such as in 2017, the September moon is further away from the autumn equinox than the October full moon is, and in those situations, it is called the Corn Moon. This year, though, the September full moon is closer to the equinox.

Besides being a marker for North American harvests, the full moon of September marks the Jewish holiday of Sukkoth, also called the Feast of Tabernacles. Observant Jews will construct a sukkah, a small structure with a roof of natural material, in order to spend time inside and commemorate the time in the wilderness after the exodus from Egypt described in the Torah.

The Ojibwe, who live near the Great Lakes, referred to the ninth moon of the year as the Falling Leaves Moon. The Cree of Ontario called the September full moon the Rutting Moon because it was when many animals started mating (notably, deer). In the Pacific Northwest, the Haida called it the Cedar Bark Moon (Kíit'aas Kungáay), according to the Tlingit Moon and Tide Teaching Resource published by the University of Alaska in Fairbanks.

In China, the eighth lunar month (which, in 2018, is September; it shifts year to year) is called Guìyuè, or Osmanthus Month, for when the eponymous flowers bloom, and the full moon occurs on the 15th day, halfway through. The day of the full moon in the eighth month is called Mid-Autumn Day and is an important festival in China, according to travelchinaguide.com.

Astro Events from Frank Gross

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In the Southern Hemisphere, September marks the beginning of springtime, with the days getting warmer and longer. The Māori of New Zealand called the lunar months of August and September "Mahuru," meaning "The Earth has now acquired warmth, as well as vegetation and trees," according to the Encyclopedia of New Zealand.

NASA's New Horizons Makes First Detection of Kuiper Belt Flyby Target

NASA's New Horizons spacecraft has made its first detection of its next flyby target, the Kuiper Belt object nicknamed Ultima Thule, more than four months ahead of its New Year's 2019 close encounter.

Ultima Thule

The figure on the left is a composite image produced by adding 48 different exposures from the News Horizons Long Range Reconnaissance Imager (LORRI), each with an exposure time of 29.967 seconds, taken on Aug. 16, 2018. The predicted position of the Kuiper Belt object nicknamed Ultima Thule is at the center of the yellow box, and is indicated by the yellow crosshairs, just above and left of a nearby star that is approximately 17 times brighter than Ultima.

At right is a magnified view of the region in the yellow box, after subtraction of a background star field "template" taken by LORRI in September 2017 before it could detect the object itself. Ultima is clearly detected in this star-subtracted image and is very close to where scientists predicted, indicating to the team that New Horizons is being targeted in the right direction. The many artifacts in the star-subtracted image are caused either by small mis-registrations between the new LORRI images and the template, or by intrinsic brightness variations of the stars. At the time of these observations, Ultima Thule was 107 million miles (172 million kilometers) from the New Horizons spacecraft and 4 billion miles (6.5 billion kilometers) from the Sun.

Astro Events from Frank Gross

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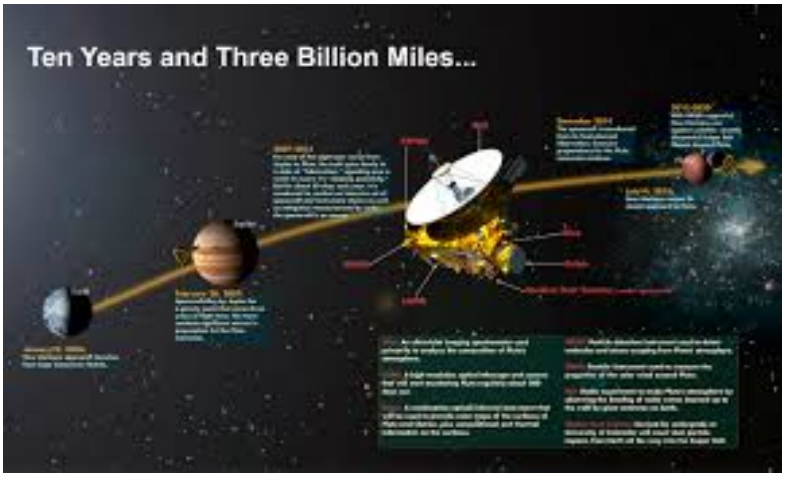
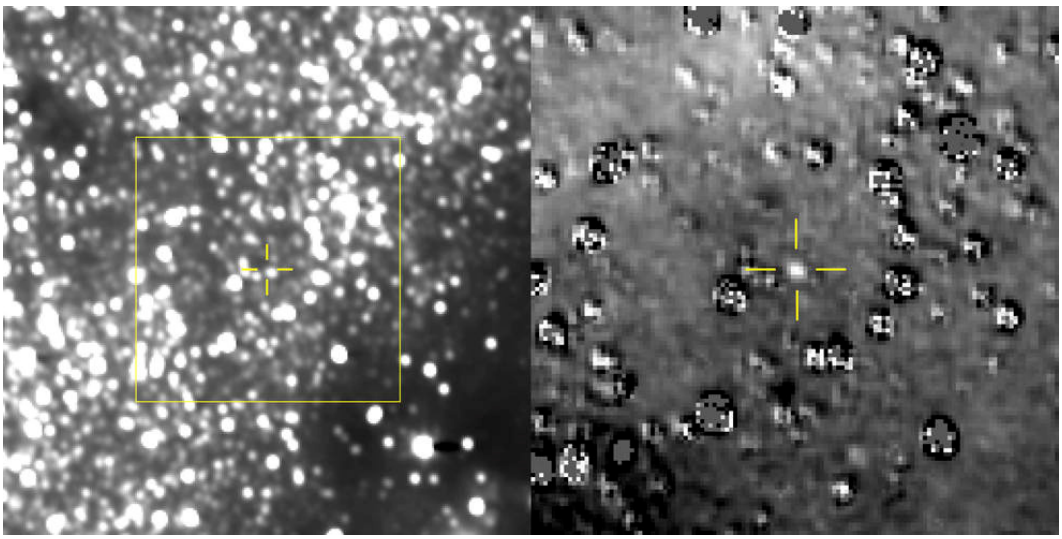


Mission team members were thrilled – if not a little surprised – that New Horizons' telescopic Long Range Reconnaissance Imager (LORRI) was able to see the small, dim object while still more than 100 million miles away, and against a dense background of stars.

Taken Aug. 16 and transmitted home through NASA's Deep Space Network over the following days, the set of 48 images marked the team's first attempt to find Ultima with the spacecraft's own cameras.



"The image field is extremely rich with background stars, which makes it difficult to detect faint objects," said Hal Weaver, New Horizons project scientist and LORRI principal investigator from the Johns Hopkins Applied Physics Laboratory in Laurel, Maryland. "It really is like finding a needle in a haystack. In these first images, Ultima appears only as a bump on the side of a background star that's roughly 17 times brighter, but Ultima will be getting brighter – and easier to see – as the spacecraft gets closer."

This first detection is important because the observations New Horizons makes of Ultima over the next four months will help the mission team refine the spacecraft's course toward a closest approach to Ultima, at 12:33 a.m. EST on Jan. 1, 2019. That Ultima was where mission scientists expected it to be – in precisely the spot they predicted, using data gathered by the Hubble Space Telescope – indicates the team already has a good idea of Ultima's orbit.

Astro Events from Frank Gross

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The Ultima flyby will be the first-ever close-up exploration of a small Kuiper Belt object and the farthest exploration of any planetary body in history, shattering the record New Horizons itself set at Pluto in July 2015 by about 1 billion miles. These images are also the most distant from the Sun ever taken, breaking the record set by Voyager 1's "Pale Blue Dot" image of Earth taken in 1990. (New Horizons set the record for the most distant image from Earth in December 2017.)

"Our team worked hard to determine if Ultima was detected by LORRI at such a great distance, and the result is a clear yes," said New Horizons Principal Investigator Alan Stern, of the Southwest Research Institute in Boulder, Colorado. "We now have Ultima in our sights from much farther out than once thought possible. We are on Ultima's doorstep, and an amazing exploration awaits!"

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).

University Viewing site. On the way to the university on George Evans Road go straight ahead through the second turning circle to the new viewing site.

Dates for Club/Social Viewing Nights for 2018 On Saturday Nights As Follows:

Oct-6, Nov-10, Dec-8

More Monthly Meeting Information

The AGM was held at the July 2018 monthly meeting. Elected officials for 2018 - 2019

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.