

# Astro Flyer



**MAY 2022**

## Club News

The AGM will be held this month – **Meeting 7pm 20 May22** – where office holders and the management committee will be elected.

If you wish to nominate for any of the offices – President, vice president, treasurer, secretary, public officer – obtain the forms from Frank Gross (ideally ahead of time, if necessary on the night) and fill in the necessary details.

We require a minimum of 3 general members to be on the management committee – please consider participating in this way.

please advise me by email – [marktown@shoal.net.au](mailto:marktown@shoal.net.au) - if you wish to participate in the management of the association by filling one of these roles.

In the phrase – “*Someone else will do it...*” – “*Someone*” has gone missing in action...

Keep on watching!

Best Regards,  
Mark Town

### Contents

*Among the Stars with Eugene O’connor* by Harry Roberts Page 2

*Out There* Bob Turnbull Page 3

*Astro Events* Frank Gross Pages 4-9

*Mars, Saturn and Venus Conjunction* by Harry Roberts Pages 10

*Photographing Sunspots using a Solar Filtered Digital Camera* by Andrew Wood Pages 11-13

*More Club Information* Page 14



### MOON PHASES



**New Moon** **First Quarter** **Full Moon** **Last Quarter**  
**May 30** **June 8** **start→May16** **May 23**

### Viewing Nights

**VIEWING NIGHTS  
SUSPENDED UNTIL  
FURTHER NOTICE**

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.

*More Club Information  
Including viewing site  
Directions* Page 14

## Eugene O'Connor

### Among the Stars with Eugene O'Connor

by Harry Roberts

The writer has been a keen 'sky watcher' since acquiring a one-inch telescope at the age of eight. The Moon was ardently sketched.

At high-school (early 1960's), with a borrowed four inch reflector and Norton's Star Atlas, I worked some way through its list of southern objects. A revelation!

I had of course no awareness of an older boy gazing at the northern stars through the dormer window of his parents' house in Ireland!

Astronomy has been a constant interest for over sixty years. When it became time to retire from work in Sydney and to move somewhere with darker skies, our paths would eventually cross! A common love of astronomy would make this happen.

Meanwhile the Irish star gazer, as a young man, serves as a teacher in West Africa where he would meet his wife, Penna, also serving there as a nurse. Real danger at times threatened them both. In Africa, I recall, he ground a 4 inch mirror to study the stars there. He then had to convince the local police it was not a *weapon* of some kind!

Decades later, before my move from Sydney, I was invited to speak on the Sun to the "Shoalhaven Astronomers". While mingling after the Talk I was amazed to hear two Shoalhaven members discussing composer Gustav Mahler! Rudely, I interrupted them: they were Eugene O'Connor and Ian Scott! Both became wonderful friends.

**Eugene** was an ardent visual astronomer, with an almost photo-graphic memory for the visual objects of the night sky; their location, brightness, their Messier numbers and so on. He monitored all the planets too, including even Pluto as I recall! As well, he had ground and polished a sixteen inch mirror for a very fine telescope.

He loved spotting planets close to the horizons and delighted in "bagging" the 'youngest' crescents of the New Moon! Daytime views of Venus with the Sun blocked by 'something' were also a huge treat! "Doubles" delighted him! He hardly needed finder charts! The 'closer' the two stars, the more joy in the successful "split"! We had much fun with this 'sport' – 'tick-taking' by text until long after bedtime!

If comets, Eugene's favourite objects, were in the sky, they would be watched into early morning: Panstars, Catalena, Leonard, et al. And on a close approach of Mars we both made nightly logs; I sketched them and we would discuss the landforms seen on my flat-screen over many cups of tea. More than once Martian dust storms cut short our efforts!

Eugene wrote monthly accounts of the current night sky for the Astronomical Society of NSW (he's a Life Member) and the Shoalhaven Astronomers; never missing a month – for many decades!

In more recent days we were deep in discussion of the objects we dubbed the "Southern Canon", i.e. things with no counterparts in the northern hemisphere. Whilst sketching these rarer objects as a record of their visual appearance in a 'scope, I was able to give him a sketch of the "Gem" cluster and of globular cluster "M22", perhaps his most favourite deep sky objects? He was very pleased with these modest tokens.

In addition we shared common interests in literature and music. I have many DVD's of fine music due to his generosity! They are played here often.

What more to say? He will be missed; in the quiet dawn as the planets align or a comet hangs amid the stars, he will be sorely missed!

## OUT THERE BY BOB TURNBULL OBSERVATION OFFICER

### APRIL-MAY

Hi there ! When's the sky going to clear ? So we can get some serious sky viewing ?  
Just look at the amount of rain in this years January to March has exceeded the years entire average for 12 month!  
OK you don't want to hear any more !

It is worth surfing the latest James Webb Telescopes' progress on its progress until it reaches the position of observing into the past of our universe. I watched the open information program for over an hour which was acting as an open question and answer session and is easily found on the Web.  
The continuation of this Q&A will be in a couple of months time, when the Telescope reaches its destination.

### Viewing Hints

**VENUS** close to **NEPTUNE** and **JUPITER** early morning in the East

**MARS** and **SATURN** close

**JUPITER** & **NEPTUNE** very close

See Astronomy 2022 page 41 for a full array of positions through to **URANUS** on page 44 in early morning sky,

On page 49 in May 5th **VENUS** and **JUPITER** very close to the **MOON**

Refer to the NIGHT SKY magazine page 49

### METEOR SHOWER

Eta-aquarids: which are linked to **HALLEY'S COMET** which are visible from the 19th of April to the 28th of May, the best being between the 6th to the 7th morning of May.  
The estimate is 40 or more before Sunrise

I hope you get a chance to see these (or some ) before sunrise.

GOOD VIEWING

Kind Regards  
BOB TURNBULL

## Astro Events from Frank Gross



Hubble Spots the Birth of a Supermassive Black Hole in Outer Space



Vladislav Tchakarov

Posted on April 14, 2022

Astronomers have discovered a “link” between ordinary galaxies and quasars in the young Universe. Judging by the properties, this is the birth of a supermassive black hole that formed when the universe was only 750 million years old.

Studying the formation of supermassive black holes

It is believed that supermassive black holes form over billions of years, merging with other holes and absorbing the surrounding matter. But we find such huge objects in the young Universe. Astronomers have come up with different theories about how the first supermassive holes could have formed in a very short, by astronomical standards, time span. Perhaps this new discovery will help to understand this issue.

*“The discovered object connects two rare populations of celestial objects: dusty star-forming galaxies (DSFGs) and bright quasars. With its help, we will be able to figure out how supermassive black holes could quickly form in the early Universe.”*

What do we know about quasars? Quasars are one of the brightest sources of radio emission in the universe. Using images from Hubble and other powerful telescopes, astronomers have determined that quasars are always at the centers of galaxies.

## Astro Events from Frank Gross

Cont...2

The assumption has been firmly established that quasars are supermassive black holes that actively absorb the surrounding matter. As matter falls into the hole, it heats up due to friction and begins to glow brightly.

Witnessing the birth of a supermassive black hole



The GNz7q object in the Hubble image. Credit: NASA, ESA

At the time of the formation of the GNz7q object, as we see it, the Universe was only 750 million years old. It lies at the center of the galaxy, where stars are born 1,600 times faster than in the Milky Way. The galaxy and the object glow brightly in the infrared and ultraviolet ranges. Such a glow cannot be caused by a single galaxy, but partly coincides with the pattern of radiation from an active black hole.

Typically, the edges of a black hole's accretion disk glow with ultraviolet radiation, while the center glows with X-rays. In the galaxy with the object GNz7q, Hubble detected an ultraviolet glow but did not detect an X-ray. It turns out that the center of the galaxy is still hidden by heated dust, which explains the infrared glow, but the outer regions have already gotten rid of the dust.

GNz7q may be the missing link between these two object classes. This black hole has both aspects of a dusty star-forming galaxy and a quasar. Also, GNz7q lacks various features that are usually observed in typical, very bright quasars, corresponding to the radiation from the accretion disk of a supermassive black hole.

This is most likely due to the fact that the central black hole in GN7q is young. These properties match perfectly with the young transitional quasar predicted by the simulations.

Scientists have already found bright quasars in the young Universe, but it was the first time that such an object was found at the formation stage.

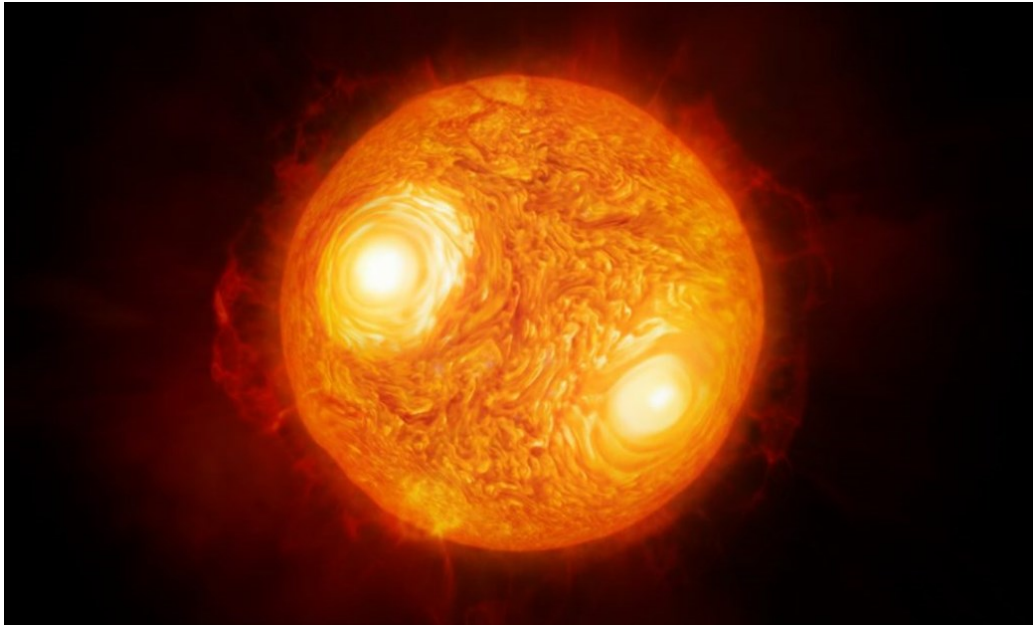
It is curious that the GNz7q object was found in the center of a well-studied piece of the sky, the so-called Hubble GOODS North field. It was possible to notice it thanks to a detailed database in a wide range of wavelengths. Now the team of scientists plans to purposefully search for objects like GNz7q, including using data that will come from the James Webb Space Telescope.

Sources:

- [Dockrill, P.](#) (n.d.). *Predicted 'ancestor' of supermassive black holes found lurking at the dawn of Time*. ScienceAlert.
- [Fujimoto, S., Brammer, G. B., Watson, D., Magdis, G. E., & Kokorev, V.](#) (2022, April 13). *A dusty compact object bridging galaxies and quasars at Cosmic Dawn*. Nature News.
- [Gianopoulos, A.](#) (2022, April 13). *Hubble sheds light on origins of supermassive black holes*. NASA.
- [Phys.org.](#) (2022, April 13). *A dusty, Compact Object Bridging Galaxies and quasars at Cosmic Dawn*.

## Astro Events from Frank Gross

Cont...3



### 14 Things You Probably Didn't Know About Antares, One of the Brightest Stars in the Night Sky



Vladislav Tchakarov

Posted on September 12, 2020

Antares, one of the brightest stars in the night sky, is a subject to endless research. It has been one of the most important stars for mankind from the dawn of humanity to modern days.

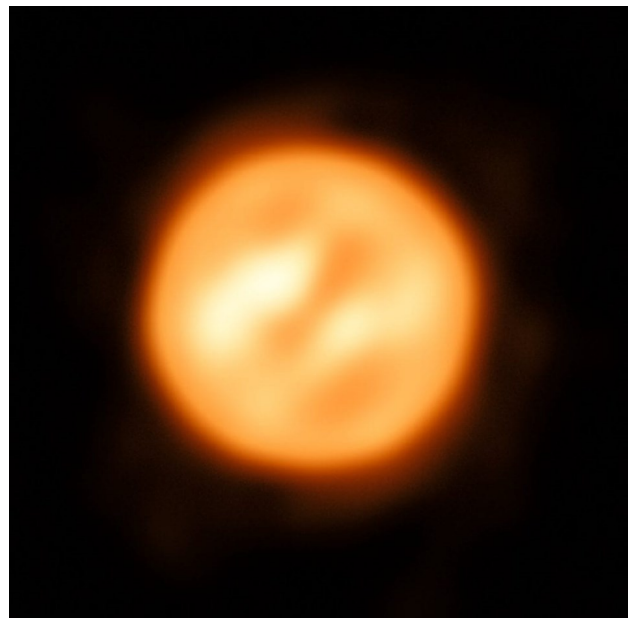
Antares is one of the brightest stars in our sky. More importantly, it has been part of human history, astrology, and astronomy for thousands of years. Although it took thousands of years and modern technology to understand it as we do today, Antares was familiar and extremely important for ancient cultures like the Persians. Let's dive into the facts and learn everything you need to know about Antares.

1. Antares is classified as a red supergiant and is at the last stage of its existence

For now, this is the greatest image of Antares made by ESO's Telescope Interferometer. It is actually the most detailed image of a star ever made, apart from the Sun. Credit: ESO

Antares is a huge and relatively cool red giant star in the last stages of its existence before becoming a supernova. Astronomers consider it to be a typical red supergiant.

These huge dying stars have a mass between 9 and 40 solar masses. When a star becomes a red supergiant, it expands its atmosphere, as a result of which the size and brightness of a star increase, and its density decreases.



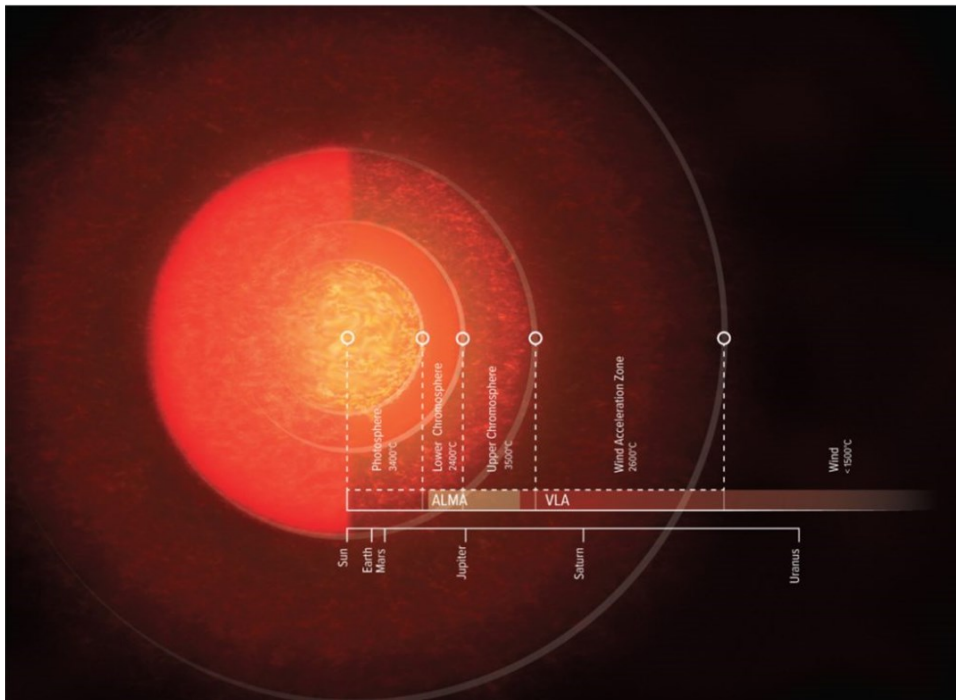
## Astro Events from Frank Gross

Cont...4

2. It is the brightest and largest star in the Scorpius constellation
3. Data varies but Antares is considered either the 15th or 16th brightest star in the night sky  
What this means is that you can see Antares without the need for a telescope. Well, of course, if you want to see anything more than a small red light in the sky, we suggest using a telescope or at least, a pair of binoculars.
4. Antares is around 10 000 times brighter than the Sun
5. Its luminosity is approximately 60 000 times greater than that of the Sun
6. Antares has a mass more than 12 times greater than that of the Sun although it must have had at least 15 times the mass of the Sun at the beginning of its existence

Scientists believe that Antares began its existence with a mass 15 times greater than the Sun but it has lost a lot of mass during the millions of years. There is no explanation about this occurrence yet but most similar stars have seen that loss of mass and scientists still do not understand the reason.

7. Its surface temperature is significantly cooler than that of the Sun



A scheme presenting the atmosphere of Antares in comparison to the Sun. Credit: [NRAO/AUI/NSF, S. Dagnello](#)

8. Antares comes close to the sun every year around the end of November  
The exact date changes yearly but generally, Antares comes closest to the sun in the period between November 30 and December 2. However, the greatest period to observe Antares is late spring around the end of May.
9. Most ancient civilizations knew about Antares and had names for it

10. The ancient Babylonian name for Antares meant “Heart of the Scorpion” as it is located at the center of the constellation
11. Ancient Egyptians symbolized the scorpion goddess Sekret with Antares
12. Antares was one of the four “Royal Stars of Persia”, meaning that it was extremely important for the ancient civilization In Persia, it was considered one of the four royal stars of our galaxy. It was called the “Guardian of the West” because, at 3,000 BC, it coincided with the point of the autumnal equinox. It was associated with the element of water.
13. Antares was the national star of the ancient Chinese Shang dynasty
14. It is part of the 27 stars depicted on the Brazilian flag

## Astro Events from Frank Gross

Cont...5



Using Gravity's Effect on Space-Time as a Gigantic Telescope To Image Distant Alien Worlds



Ivan Petricevic

Posted on May 3, 2022

Researchers have proposed a new, revolutionary way of directly imaging distant alien worlds; using the effect of gravitational lensing -- gravity's effect on space-time. The newly-proposed imaging technique would be "1,000 times more precise than the strongest imaging technology currently in use."

To date, we have discovered more than 5,000 alien worlds in our galaxy alone. There are **thousands** of **solar systems** out there, and thousands of still unconfirmed exoplanets orbiting distant stars. Some of these planets are inhospitable either because they orbit their star too far or too closely, but some of them are like Earth, and revolve around their sun at just the right distance for life as we know it to maybe exist.

When **astronomers** discover new **worlds** and **confirm** their **existence through indirect observations**, we do not really obtain much information about the exoplanets. We can calculate the mass, size, and speed at which they orbit their stars, but not much more than that.

Imaging alien worlds directly is nearly impossible, because we lack the necessary technology and equipment. But what if we could make the "universe" work for "us"?

A new technique

Scientists at Stanford have come up with a revolutionary idea: take advantage of gravity's warping effect on space-time — **a phenomenon called lensing**— and manipulate the phenomenon to take images that are far more advanced than anything we can now.

According to a statement from Stanford, the newly-proposed imaging technique would be "**1,000 times more precise** than the strongest imaging technology currently in use." In the study, the researchers describe a method for imaging planets beyond our solar system by manipulating solar gravitational lensing.

Researchers would take advantage of the sun's gravitational field to magnify light from the exoplanet by aligning a telescope, the sun, and the exoplanet in line with the sun in the middle, "using the universe" as a giant magnifying glass. While a magnifying glass bends light with its curved surface, a gravitational lens bends spacetime to enable the observation of distant objects.



## Astro Events from Frank Gross

Cont...6

“We want to take pictures of planets that are orbiting other stars that are as good as the pictures we can make of planets in our own solar system,” revealed Bruce Macintosh, a physics professor at the School of Humanities and Sciences at Stanford.

“With this technology, we hope to take a picture of a planet **100 light-years** away that has the same impact as **Apollo 8’s picture of Earth.**”

Presently, their proposal requires more advanced space travel than is currently possible. However, in spite of the challenges, the researchers believe the concept is worth considering further and developing since it could reveal information about distant alien planets, which is crucial if we are to discover a world that can support life as we know it.

### Gravitational Lensing

Gravitational Lensing and how to observe distant alien worlds. Image Credit: Alexander Madurowicz – Stanford.

In 1919, a solar eclipse led to the first experimental observation of gravitational lensing. Because the moon obstructed the light from the sun, scientists were able to observe stars near the sun at a different place than their known location.

It was the first observational proof that Einstein’s theory of relativity was correct and that gravity could bend light.

In 1979, astronomers and spacecraft could **exploit the solar gravitational lensing** thanks to a detailed account by Stanford professor Von Eshleman.



(Please Google this as Frank’s video/graphic can’t be copied Ed KJ)

In 2020, the imaging technique was investigated in-depth for observing planets. **Slava Turyshev** of Caltech’s Jet Propulsion Laboratory described the possibility of using rockets to scan around the rays of light coming from a planet to reconstruct a clear picture.

However, using rockets would require a lot of fuel and time.

KIPAC Ph.D. student **Alexander Madurowicz** developed a method to reconstruct a **planet’s surface from a single solar-facing image**, improving on Turyshev’s work.

An algorithm designed by Madurowicz can **undistort the light** coming from the ring of light created by the exoplanet by reversing the bending created by the gravitational lens, which turns the ring back into a planet.

While this sounds promising, the biggest issue with this technique is that, to capture an image of an exoplanet taking advantage of the solar gravitational lensing effect, we would have to place a **telescope at least 14 times farther away from the sun than Pluto**, which means past the very “edge” of our solar system. Given our current technology, this would be a gargantuan undertaking.

“By unbending the light bent by the sun, an image can be created far beyond that of an ordinary telescope,” Madurowicz explained.

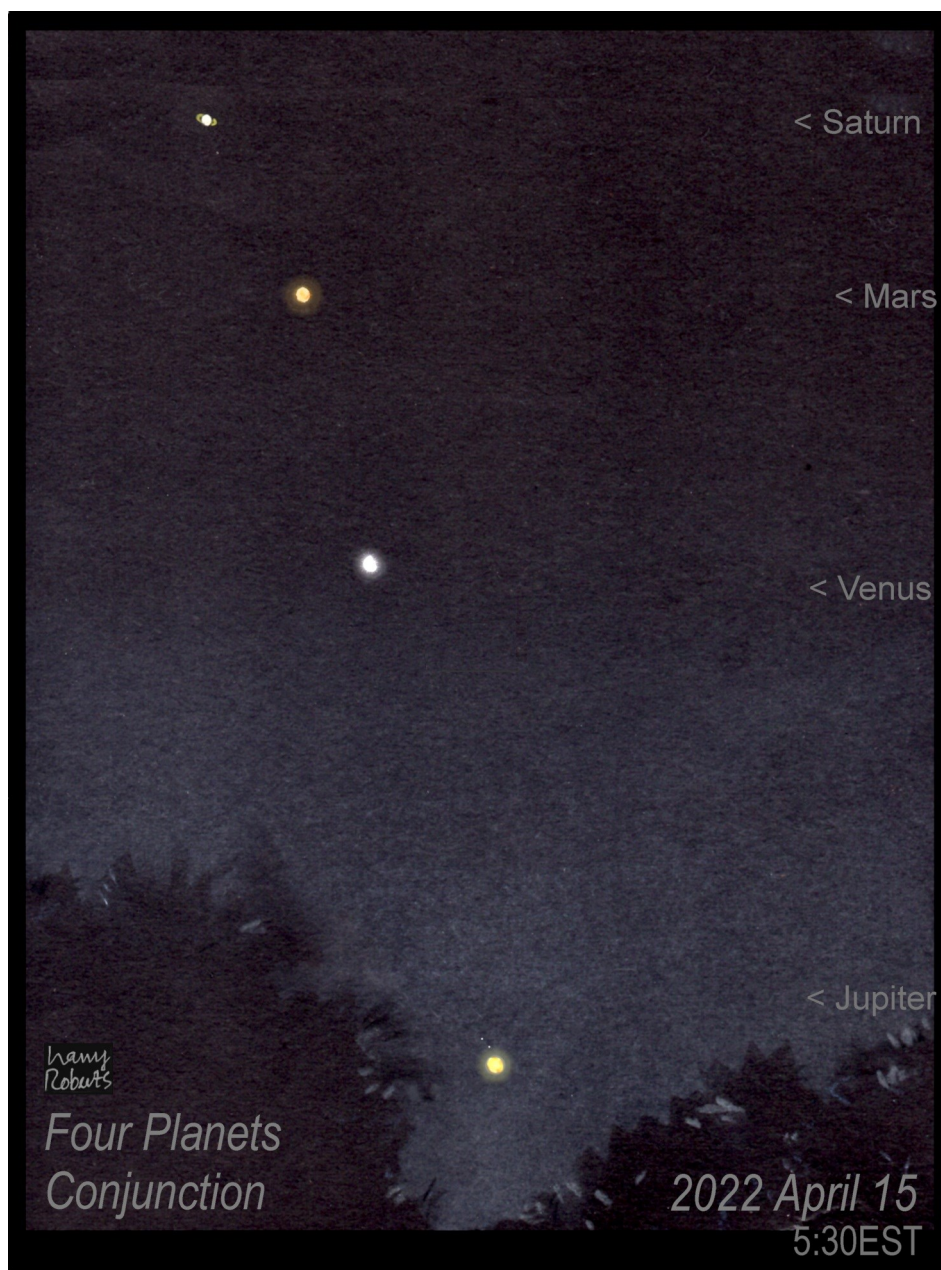
“So, the scientific potential is an untapped mystery because it’s opening this new observing capability that doesn’t yet exist.”

## Four Planet Conjunction: Good Friday 2022 by Harry Roberts

A bedroom window facing East is an asset for astronomy, warning of clear or cloudy conditions. On Good Friday last (Apr. 15) a splendid conjunction of Venus, Mars and Saturn was revealed! Minutes later (~5a.m.), the 3" Mak was showing fine views of those planets with (for here) a rare sight of Jupiter too, below them all in a treeless gap on the low horizon.

A quick sketch with notes was later turned into a drawing on black card, which captured the visual impression fairly well. Each planet was a superb sight in the Mak. Jupiter's four moons were all on the same side of the planet. Venus was a gibbous shape, dazzlingly bright and happy to say, was pure white! Volcanic dust has been making Venus orange most recent dawns.

Mars in the e.p. seemed gibbous too, but a higher mag. was needed to be sure. Saturn's rings showed well. Dawn rapidly ended the spectacular sight as did thoughts of Eugene's passing a few days earlier; it was a sight he would have cherished! A single microbat was the only airborne creature seen.



A brief repast, then the solar 'scope components were lumped outside for a good solar session. A series of strong flares on the solar NE limb were heralding the huge AR12993, 994 complex, that was to host M and X class flares, keeping solar 'scopes busy for some days. But heavily clouded days and rain were soon to return!

Harry Roberts

## Photographing Sunspots using a Solar Filtered Digital Camera by Andrew Wood

At the April meeting of the Shoalhaven Astronomers, members reported and showed images of a new large sunspot group. Sunspots, regions of intensive magnetic activity on the sun's surface which are visible due to their cooler temperature: about 1500°C cooler than the 5,800°C of the photosphere, have been in very low frequency for some years now. This new large group may be a sign that the sun's activity is on the rise. On April 23, the group was clearly visible through 10 x 45 binoculars with filters made from Baader Solar Film. This material is not expensive and can be used in home-made filter housings. **Use it or other commercially made solar filters at the front end [covering the instrument's full aperture] when observing the sun.**

I have also fashioned a filter to fit the front of a Panasonic Lumix FZ300 camera. This camera holds f2.8 out to its telephoto range of 600mm. This makes it very useful for general photography if you don't want or can't buy a DSLR with a range of expensive lenses. The current retail cost of an FZ300 is around \$800.

Putting the camera on a tripod, a little practice and experimentation enabled the recording of clear sunspots. The settings that I have found to work best are:



ISO 100, f2.8, 1/4000<sup>th</sup> sec, focal length 600mm and manual focus, recording a RAW image.

Looking through the camera's electronic viewfinder and holding the shutter button half down, focus the image until the sunspots are visible; then depress the shutter fully.

The magnified image on the camera's screen in review mode will show whether the sunspots are good and sharp. Even so, however, on the computer screen the image is over-exposed. Also, even at a focal length of 600mm, the sun still takes up only a small part of the frame. Using ADOBE Lightroom, I crop the image then lower the exposure until the sunspots appear sharp. The resulting JPEG from the original RAW image of 12 Megapixels is about 100KB in size.

## Photographing Sunspots using a Solar Filtered Digital Camera by Andrew Wood

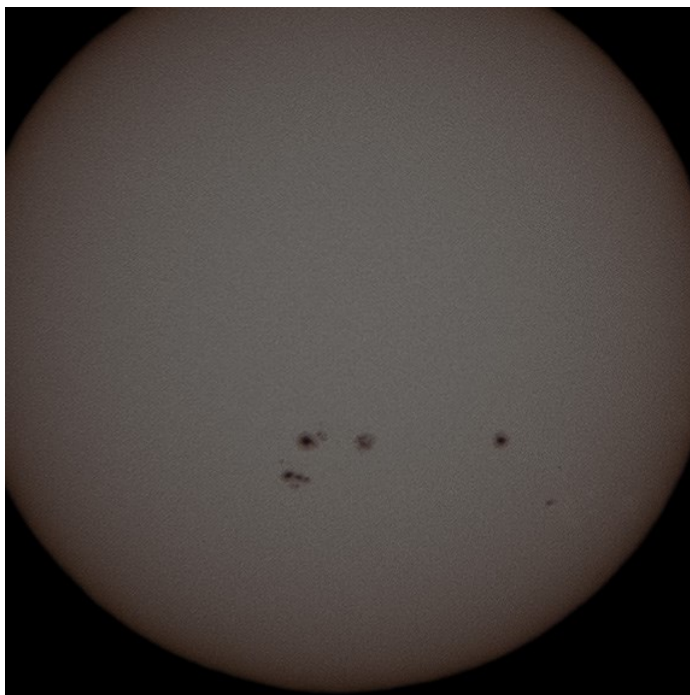
Cont...2

The result from April 23 is shown below. With larger sunspots, it is even possible to crop the image further and view some detail of the umbral and penumbral regions.

Fig 3a



Fig 3b



## Photographing Sunspots using a Solar Filtered Digital Camera by Andrew Wood

Cont...3

On ten days from April 23 to May 5, the weather was clear and further images were recorded. The large group soon rotated out of view, though a few further lone sunspots became visible, such as those seen on April 28 and May 4 (Figure 5). It will be interesting in a couple of weeks to see if the large group has survived a full rotation of the photosphere.

Fig 4



Fig 5

There is a huge range of relatively inexpensive long focal length digital cameras available. Whatever version you may own, you may be able to experiment and see if it is capable of recording sunspots. **Do make sure you use commercially made solar filter material.** To not do so is very hazardous to your eyes.

## More Club News continued from page 1

### Club/Social Viewing Nights

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) .

**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.

Bring your scopes and or binoculars and a small folding chair, a decision on the day planned, depending on viewing conditions, by the club president and his deputy.

Email information if details are changed, to all, or contact Frank for changes.

Solar viewing BBQ lunches (BYO) may be held and these will be advised ahead of these events. Special events such as Comets, eclipses etc. may also warrant members night viewings.

### **The AGM was held at the July 2019 monthly meeting. Elected officials for 2019- 2021**

The 2021 AGM has been postponed due to Covid.

President: Mark Town

Vice President: John Gould

Secretary/Treasurer: Frank Gross

Public Officer; Frank Gross

Observation Officer: Robert Turnbull

Editor: Kaye Johnston

Librarian: Chris O'Hanlon

The Committee: Robert Turnbull, Rudolf Henssen, Robert Spruyt, Chris O'Hanlon, John Gould, Ernest Royston, Anthony Peters

Check out the Astro Flyer on the web site: [www.shoalhavenastronomers.asn.au](http://www.shoalhavenastronomers.asn.au)

Shoalhaven  
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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.