

Astro Flyer

NOVEMBER 2019

Club News

To the SA Members

This month we will be voting to adopt or reject the proposed constitution and objectives changes. Please come to the November meeting or provide your proxy by email to a colleague who is attending or to Frank Gross in his capacity as Association Secretary.

Each of you will have received an email from the SA website inviting you to login and set a password. This will give you access to an additional menu of members only material including the presentations we have each month.

Frank has arranged for our Christmas dinner to be held at the Bomaderry bowling Club. Details have been provided by email. I hope to see you and your friends and family there.

Cheers and
Best regards,

Mark Town President Shoalhaven Astronomers

Next monthly meeting will be held at the Shoalhaven Campus of the Uni of W'Gong, George Evans Road off Yawal Road, West Nowra, November 15th 6.30 pm for 7pm start.

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MOON PHASES



New Moon
27 NOV



First Quarter
4 DEC



Full Moon
12 NOV



Last Quarter
20 NOV

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 **DEC Saturday 14 (back-up night DEC Sun 15)** at Woncur Rd. (see page 3 for directions).

*More Club Information
Page 14*

OUT THERE

Bob Turnbull OBSERVATION OFFICER

OCTOBER – NOVEMBER

Hello to the Spring Summer Season, with great sites to see and warmer hopefully clear skies. (With rain in the daytime to help the farmers stay viable and those with declining water supplies fulfilled)
I just checked my rain gauge and it said 15 mm and previously 80mm after returning home from Floriade, for two days, romping round the spectacular Tulips and great exhibits with the family.

PLANETS

JUPITER and SATURN decline in apparent size from 34.6" in October, to 32.7 in November and 16.4" in October to 15.7 for Saturn SATURN Close encounter with the MOON
MERCURY at its best evening spotting. MERCURY is increasing in apparent diameter from 30th October at 8.2" to 8.6" on 1st of November but by 28th November it is back to 6.8"

VENUS, SPICA and ALPHA LIBRAE in close with URANUS, at opposition on the 28th of October
Also this month The MOON, VENUS and MERCURY get together. (see page 65 Astronomy 2019) evening sky for three good illustrations of what's going on ! (Pictures speak louder than words)
MARS, (p) 70 to see the dawn sky Nov 10th to the 24th at 2.9 degrees from Spica.

VENUS On the 15th of October has increased from 10.3" to 11.1 on the 15th of November!

CONSTELLATIONS

In October evening Pic. (p 65) shows the Teapot in Sagittarius, near Saturn and Scorpio towards the West, with Jupiter between Scorpius and Serpens.

COMETS

C/2017 T2 (PANSTARRS) early in October in Taurus near the second magnitude Beta Tauri after which into Auriga, during the first week, predicted to be brightest to 11th magnitude by month's end.
Peak viewing of this comet overhead just before dawn.

CLEAR SKIES AND COMFORTABLE VIEWING !
BOB TURNBULL

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.

SHOALHAVEN ASTRONOMERS SUGGESTED VIEWING NIGHTS

JUNE to DECEMBER 2019

DECEMBER

TO BE ARRANGED AS REQUIRED (OPTIONAL)

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.

Bob Turnbull
OBSERVATION OFFICER

The Visual Astronomer

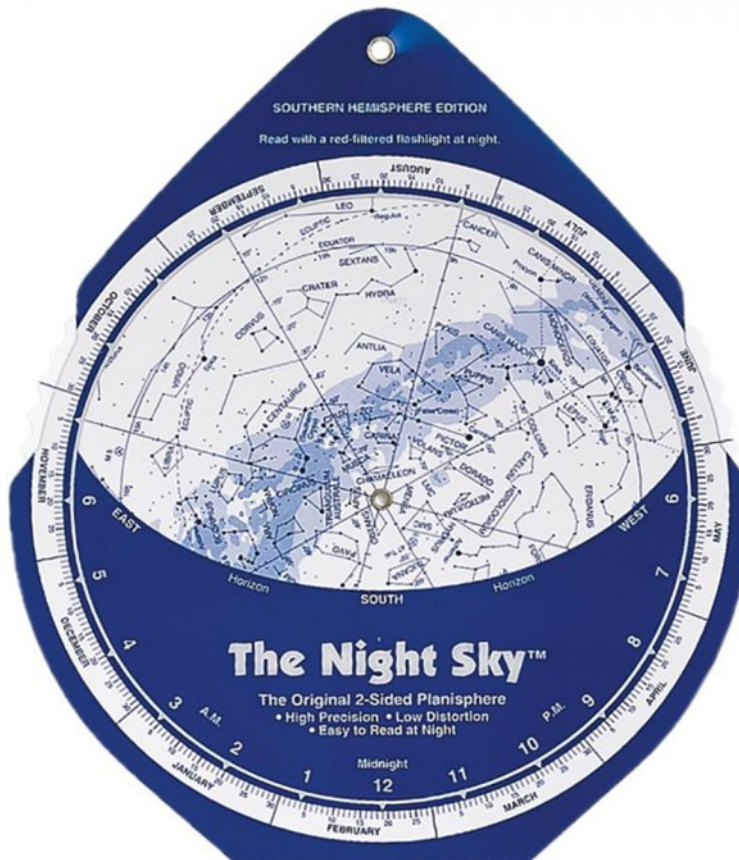
Part 12

Eugene O'Connor

The Tools of The Trade

In the final part in this series, I would like to summarize what I think are the important tools needed by the visual observer of the ever-changing night sky.

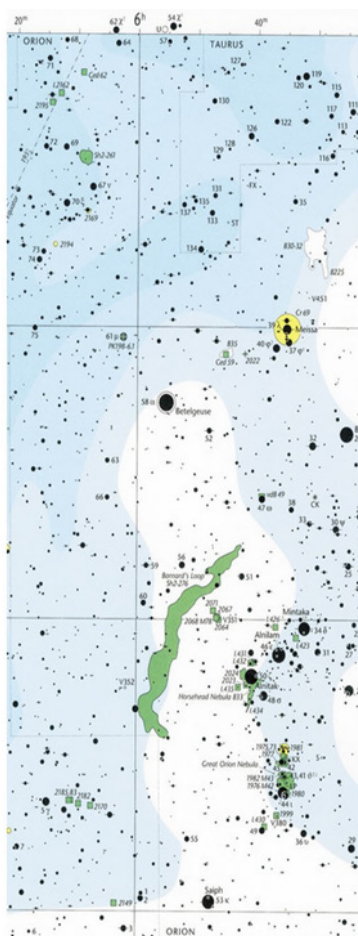
1. The Star Wheel or Planisphere.



The essence of this device is that it shows immediately for time and date of the year what star groups are above the horizon or when they rise or set. Available from a variety of outlets for about \$30.

Cont...2

2. A good set of sky maps or atlas. If you are serious about finding objects in the sky you need an atlas of the constellations in your sky down to about mag. 8 - 10.



A section of Sky Atlas 2000. A mid-range atlas to Mag. 8.5 (large folded pages a disadvantage in the field.)

There is a great variety of star atlases on the market, some presented as individual laminated sheets of black stars on a white background or white on a black background. The selection is a matter of taste and need. I have come to favour the computer printed star atlases, many available free on the net.

3. A handbook, listing interesting objects available in each constellation is useful, especially listing details of size, magnitude and features. I really like the last century detailed three-part series: *Burnham's Celestial Handbook*, now out of print, or Hartung's: *Astronomical Objects for Southern Telescopes*. I often use a three-part series called: *The Night Sky Observers' Guide* by Kepple and Sanner which is especially good for telescopes of 8" and above. Many of these manuals often come up on the net or at Astronomy Forum sites, such as "Ice in Space."

Cont...3

4 Binoculars and Telescopes



Best Binoculars: The popular choice for many amateurs is a quality brand of 7X50 binos. I find 8X42 are lighter and used every viewing night. Large binoculars require a suitable mount, as weight becomes a serious factor.

BINTEL AD!



Choosing a Telescope: This is the most difficult decision facing the amateur and is determined by what use you will put the telescope to.

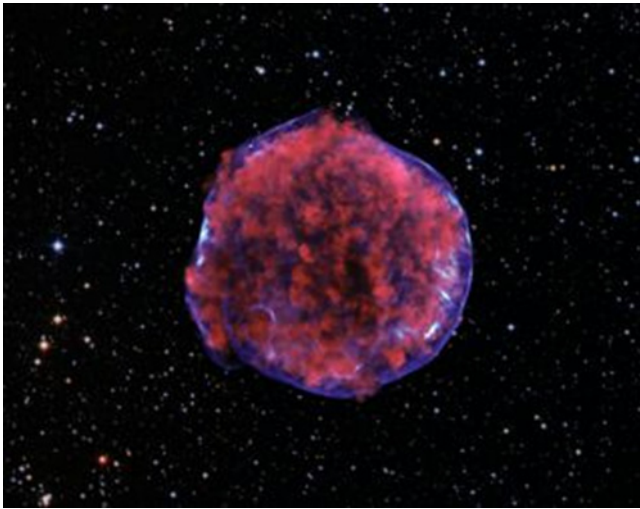
If you are a serious visual observer select a telescope that you can set-up and put away in a short time.

Final Thoughts: It is a good idea to start small and see how much time you manage to regularly spend at the telescope and what aspect of astronomy appeals to you as time goes by. The saddest astronomical story is the common one of the enthusiast who rushes into buying a big machine, discovers though time, poor viewing location or evaporating interest that he/she then needs to sell barely used equipment at a fraction of the cost price. My advice to beginners is always, "Buy a good pair of binoculars," next join a group of amateurs and within six months you will know what telescope to buy. If you lose interest, you own a good pair of binoculars!

Why Dead Stars Go Boom: Scientists Eye Mechanism Behind Supernova Explosions

By Mike Wall Science & Astronomy

The mechanism is similar to one that drives detonations here on Earth.



The Tycho Type IA supernova remnant, as imaged by NASA's Chandra X-ray Observatory. Low-energy X-rays (red) in the image show expanding debris from the supernova explosion and high energy X-rays (blue) show the blast wave, a shell of extremely energetic electrons. (Image: © Credit: X-ray: NASA/CXC/Rutgers/K. Eriksen et al.; Optical: DSS)

The secret hearts of exploding stars are being dragged out into the light.

Type IA supernovae, which occur when superdense stellar corpses known as white dwarfs go boom after siphoning material from a companion star, are some of the most dramatic events in the universe.

These explosions are incredibly important to astronomers as well; because they feature a relatively fixed inherent luminosity, scientists use Type IA supernovae as "standard candles" to determine cosmic distances.

Indeed, two decades ago, observations of Type IA supernovae revealed that the universe's expansion is accelerating, a surprising find that earned three researchers the 2011 Nobel Prize in Physics and led to the postulation of a mysterious repulsive force called dark energy.

But such work has used Type IA supernovae as tools. Delving into the inner workings of these deep-space blasts has proved more difficult.

"Ironically, given that wealth of observational data, we don't understand how they work," said Alexei Poludnenko, an associate professor of mechanical engineering at the University of Connecticut, told Space.com. "And the theorists sort of have stagnated over the past couple of decades."

Part of the reason for this stagnation, he added, is that the Type IA supernova detonation process remains shrouded in mystery. Specifically, it's unclear what spurs the transition from "deflagration" (a flame moving at less than the speed of sound) to "detonation" (a much more powerful event driven by a supersonic shock).

But the new study, which Poludnenko led, could help clear things up considerably.

Astro Events from Frank Gross

Cont...2

He and his colleagues simulated the critical deflagration-to-detonation transition (DDT) using a newly devised model and performed laboratory experiments with chemical flames to check those results and validate the model.

The researchers found that the DDT in Type IA supernovae occurs spontaneously if flame-generated turbulence is high enough.

"We defined the critical criteria where we can drive a flame to self-generate its own turbulence, spontaneously accelerate, and transition into detonation," study co-author Kareem Ahmed, an assistant professor of mechanical and aerospace engineering at the University of Central Florida, said in a statement. "We're using the turbulence to enhance the mixing of the reactions to the point where it transitions into this violent reaction and essentially leads to supernovas."

The team also determined that this process is not unique to otherworldly thermonuclear blasts. (The new study does not deal with Type II supernovae, which occur when massive stars die and collapse.)

"This is the same mechanism that also occurs in chemical systems, like hydrogen-air or methane-air, for example," Poludnenko told Space.com. "Therefore, there's sort of a unifying story behind all of this."

The team also worked out the conditions that will cause a white dwarf to go supernova. It's all about density: "DDT is almost inevitable at densities of 10^7 to 10^8 grams per cubic centimeter," Poludnenko and his colleagues wrote in the new study, which was published online today (Oct. 31) in the journal Science.

That is incredibly dense, which isn't surprising, considering that white dwarfs cram about half the mass of our sun into a sphere only slightly larger than Earth. (For perspective, Earth's density is 5.5 grams per cubic centimeter.)

Poludnenko hopes the new study helps open up Type IA supernovae to greater study. The next step, he said, involves applying the team's model to different explosion scenarios, to start nailing down the DDT details.

Such work could have far-reaching applications across cosmology and astrophysics. For example, though Type IA supernovae have similar intrinsic brightnesses, there is some variation here and there, Poludnenko said. And these slight differences might introduce biases into astronomers' calculations.

"These biases are critical, because they would affect the accuracy of how we calibrate distances in the universe and how we measure the properties of dark energy," Poludnenko said.

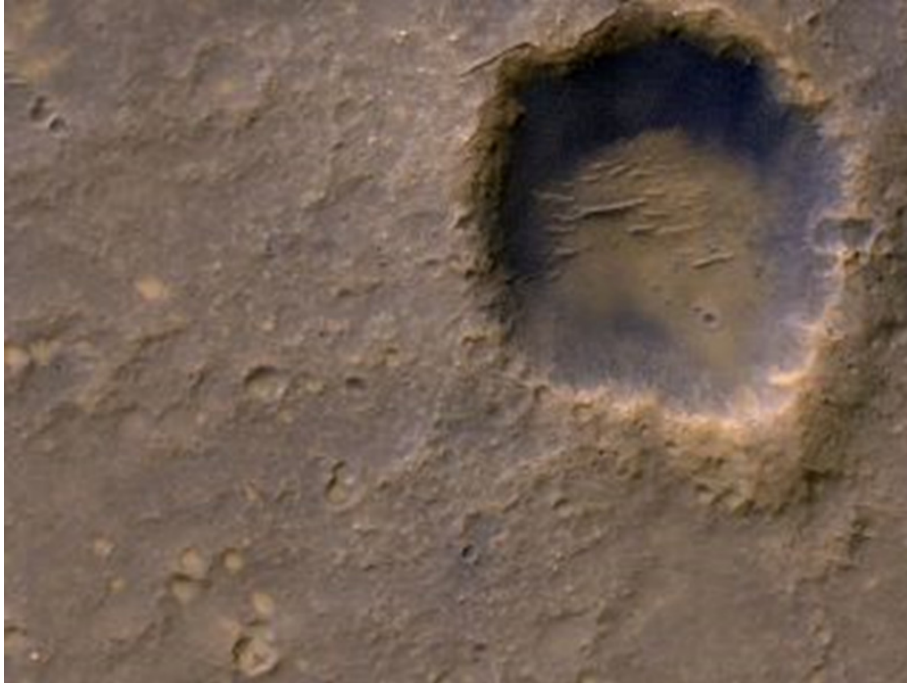
"Now, if we know how these things work, we can try to discover these biases," he added. As an example, he cited the possibility that Type IA supernovae that formed in older galaxies might have different brightness's than their counterparts from young galaxies.

The new study could also have some applications here on Earth, potentially leading to improved propulsion systems for aircraft and spacecraft and more efficient power generation, team members said.

Cont...3

Dead Spacecraft on Mars Spotted in New Photos

By Space.com Staff February 09, 2012



Near the lower left corner of this view is the three-petal landing platform that NASA's Mars Exploration Rover Spirit drove off in January 2004. The lander is still bright, but with a reddish color, probably due to accumulation of Martian dust. The High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter recorded this view on Jan. 29, 2012, providing the first image from orbit to show Spirit's lander platform in color. (Image: © NASA/JPL-Caltech/Univ. of Arizona)

A NASA probe orbiting Mars has captured new photos of two dead spacecraft frozen in place at their Red Planet graves.

The photos were taken by NASA's powerful Mars Reconnaissance Orbiter (MRO), which has been circling the planet since 2006.

The spacecraft first spied NASA's dead Phoenix Mars Lander in the Martian arctic on Jan. 26 in a color photo that reveals the lander and its frigid surroundings as they appeared following Phoenix's second winter on the planet. The Phoenix spacecraft landed successfully on Mars in 2008.

In a separate photo, MRO also spotted the three-petal landing platform that delivered NASA's Mars rover Spirit to the surface of the Red Planet in January 2004. The platform used parachutes and airbags to bounce to a stop on Gusev crater so the Spirit rover could begin its mission.

Spirit drove off the lander platform in January 2004 and spent most of its six-year working life in a range of hills roughly two miles (3.2 kilometers) to the east, NASA officials said in a statement. The rover went silent in 2010 and NASA officially declared it dead last year.

In the MRO image, which was taken on Jan. 29, Spirit's lander platform appears as a bright feature at the bottom left, southwest of Bonneville Crater.

Astro Events from Frank Gross

Cont...4

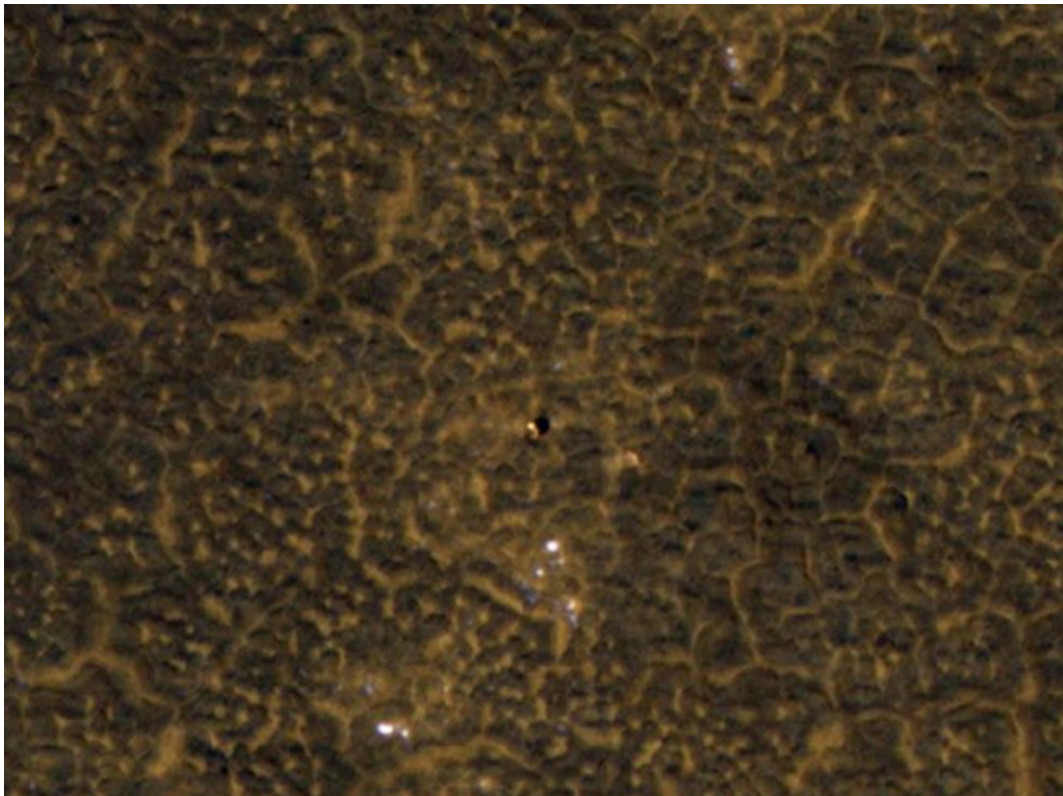
MRO's High Resolution Imaging Science Experiment (HiRISE) camera has recorded color images of the Spirit rover itself before, but all previous photos of the lander platform were in black and white, according to NASA officials.

Dead rover on Mars

Spirit and its twin rover Opportunity were originally designed for three-month missions to look for signs of past water activity on Mars. Both rovers far outlived their warranty, however, and the missions delivered evidence that the Red Planet was once a much wetter, warmer place.

Spirit stopped driving when it became mired in sand in May 2009. Mission scientists then converted the rover into a stationary observatory, and Spirit continued to send back data from its trapped location. But, 10 months later, the rover fell silent after being unable to capture enough sunlight on its solar panels over the course of the Martian winter.

Still, Opportunity remains alive and well on Mars, and last month celebrated a remarkable eight years on the surface of the Red Planet. After a three-year trek, the intrepid rover arrived at the 14-mile-wide (22-kilometer) Endeavour Crater in August 2011. The rover recently uncovered what researchers say is the best evidence yet for liquid water on ancient Mars.



This image, taken Jan. 26, 2012, shows NASA's no-longer-active Phoenix Mars Lander spacecraft after its second Martian arctic winter. The lander has the same appearance as it did after its first winter, as seen in an image from May 2010. This view is from monitoring frost patterns at the Phoenix landing site in far-northern Mars, using the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter.

(Image credit: NASA/JPL-Caltech/Univ. of Arizona)

Astro Events from Frank Gross

Cont...5

Phoenix rises no more

The Phoenix Mars Lander landed in May 2008 on a mission to search and dig for evidence of water in the Vastitas Borealis plains in the Martian arctic. During its nearly six-month mission, the \$475 million lander confirmed the presence of subsurface water ice and made valuable characterizations of Martian dirt.

The Phoenix mission ended in November 2008 when the spacecraft could no longer receive adequate power due to a combination of dwindling sunlight, light-obscuring dust and harsh winter temperatures.

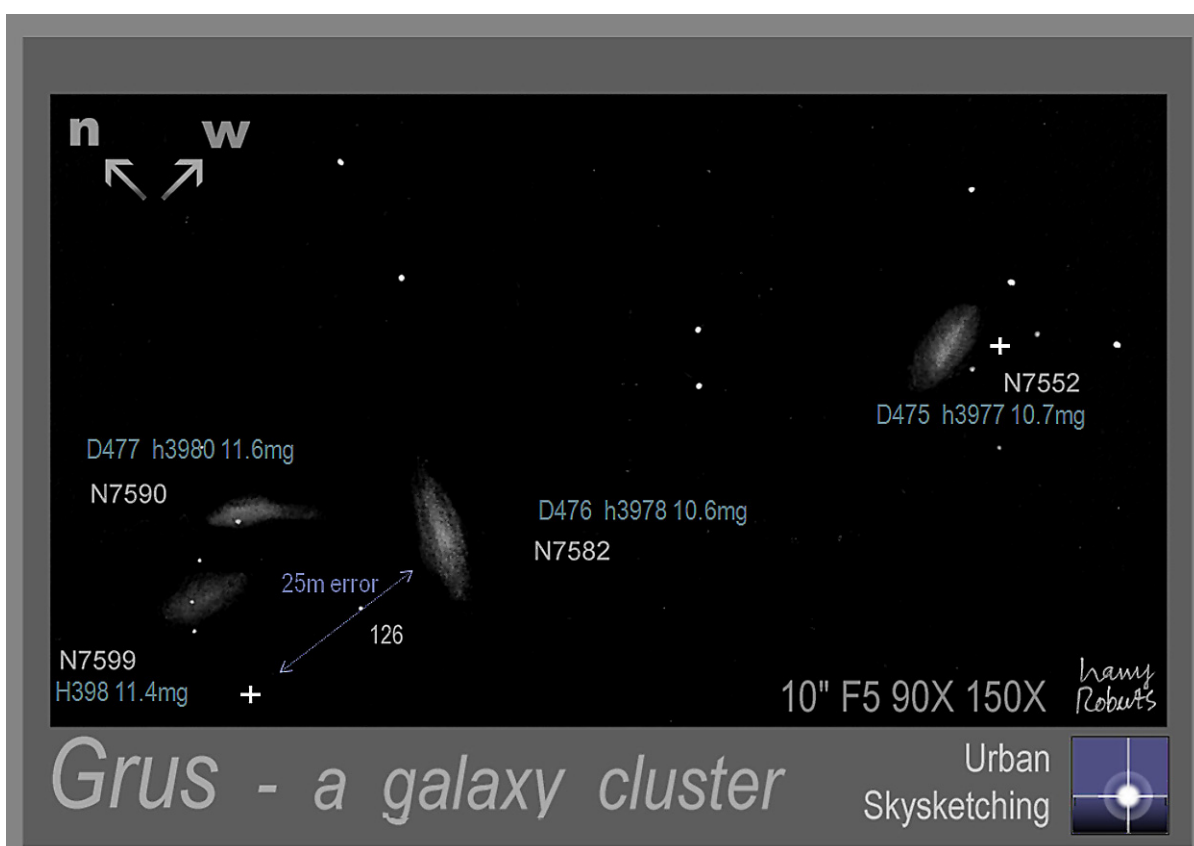
The Mars Reconnaissance Orbiter itself continues to have a prolific career in orbit around the Red Planet. The powerful probe began circling Mars on March 10, 2006 and is currently in an extended phase of its mission.

The orbiter continues to provide valuable insights into the planet's ancient environment and how processes such as wind, meteorite impacts and seasonal frosts are continuing to affect the surface of Mars today, NASA officials said. MRO has transmitted more data to Earth than all other interplanetary missions combined.

Urban Sky-sketching - "*The Grus Quartet*" by Harry Roberts

Overhead in Spring, the Grus star group hosts some remarkable deep sky objects, bright enough to be seen with 'scopes big and small from urban sites. And yet the patch of sky dominated by Grus, Sculptor etc looks a bit empty compared to Milky Way areas like Orion or Canis Major, that rise later in the night.

Grus contains about 30 galaxies brighter than magnitude 13, many grouped in clusters; all are seen best from a true dark site, but some *are* visible in suburbia. A pair of mag 4 stars, Iota and Theta, on the east side of Grus were the starting point, as a cluster of galaxies is charted nearby, 2° NE of Theta. These galaxies are NGC numbers **7552**, **7582**, **7590** and **7599** (shortened to N7552 etc), and the red-dot finder soon had the 10in 'scope on target, with a fairly bright compact spiral in the field and some mag 10 stars nearby. This, the chart said, was N7552, an 11.6 mag barred spiral.



Continuing NE from Theta half a degree led to a trio of galaxies, heralded by N7582, a shapely mag 11.8 edge-on spiral, a nice object well seen with direct vision, and appearing much larger with averted vision. N7528 has an elongated bright core surrounded by fainter outer regions.

The other two galaxies, N7590 and N7599 were harder objects with direct vision at my site; N7590 was brightest of the pair with a central core and irregular outline. N7599 was a challenge; distinct with averted vision, but almost invisible with direct, and oval shaped. N7590 and 7599 are magnitudes 11.9 and 12.0 respectively, and tougher "gets" than their brighter companions.

Urban Sky-sketching - “The Grus Quartet” by Harry Roberts

Cont...2

Dunlop’s work. All members of the “Grus Quartet” were discoveries of James Dunlop, working at Parramatta in 1826 (with his 9 inch/f12 speculum telescope). If we refer to his 1827 Catalogue (extract Fig2) we see he logged N7552 as D475, N7582 as D476 the latter with at 25arcmin position error. N7590 and 7599 he logged as D477, “two very small round nebulae”. While the Herschel’s would spend much time discrediting Dunlop’s work, using intermediaries, we must acknowledge his remarkable achievement of mapping our southern sky in about half a year. Dunlop’s positions were precessed and plotted as ‘+’ signs in the Fig. He had no time to go back and check positions: errors occurred.

<i>"Catalogue of Nebulae and clusters of stars etc." by James Dunlop, Esq. December 20, 1827 (extract)</i>					
475	23	7	9	46	28
A small faint nebula, rather elongated in the parallel of the equator, about 30" broad, and 40" long ; there is a pretty bright point situated near the centre of the nebula : a small star precedes it					4
476	23	10	58	46	45
A small faint round nebula, about 30" diameter : a double nebula follows this.....					2
477	23	12	40	46	53
Two very small round nebulae, nearly the same \mathcal{R} , and differing about 1' in polar distances.....					1

The “Quartet” members are spirals - all about 70 million light years distant and some 80,000 L.y. in diameter – their recession velocity is ~1600 km/s – so they are truly a quartet. The sketch suggests they are all “edge-on” – but this is misleading - their elongated cores are much brighter than their outer regions – and mostly the cores were seen – the spiral arms recorded in ‘deep’ photographs were not visible.

No UHC filters were used for the sketch – but full dark adaption and a head covering were – as well as a higher power of 150, which, it seems, darkens the background and improves contrast.

There is something satisfying in gazing at a cluster of galaxies with your own eyes (rather than Hubble’s) - countless stars and “worlds” in the field of view with, perhaps, unimaginable life forms. All of it seen in Dunlop’s ‘backyard’ in Parramatta in 1826. Astronomy; it’s amazing!

More Club News continued from page 1

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

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

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.