Shoalhaven Astronomers Inc.
www.shoalhavenastronomers.asn.au

Volume 19
Issue 10

Astro Flyer

OCTOBER 2019

Club News

To the SA Members

This month we will be hearing FOR and AGAINST argument regarding the proposed constitution and objectives changes. If you have a view this is your opportunity for that view to be heard. Please consider voicing your concerns now so the membership can give them careful consideration before the vote at the November meeting.

The SA website has been up for 2 months and the traffic as of 06 Oct 19 was 161 Sessions with 301 page views in the last 30 days. If you haven't had a look yet then please do so. Each of you will receive an email from the website shortly 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.

I hope to introduce more items of a practical nature to the monthly meetings– demonstrations, discussions and presentations on technique and practical application of the knowledge and skills you have acquired.
If you have something to offer in that vein please put your hand up!. You never know – it is likely other members will be very interested in what you have to say.

Cheers and
Best regards,

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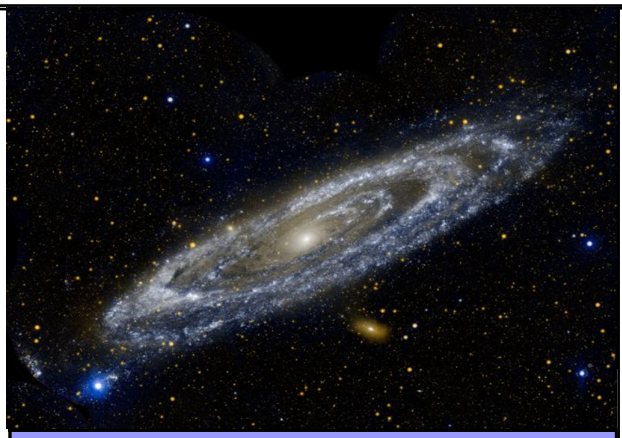

MOON PHASES

New Moon	First Quarter	Full Moon	Last Quarter
Oct 28	Nov 4	Nov 12	Oct 21

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 2nd Nov (back-up night Sun 3rd Nov) at Woncur Rd. (see page 3 for directions).

More Club Information Page ?

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

JUPTER 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 buy 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 the15th 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 witch into Auriga, during the first week, predicted to be brightest to 11th magnitude by months 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

NOVEMBER 2nd	WONCUR ROAD	6 45 PM TO 9:00 PM
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 11
Eugene O'Connor

Venus takes a Spring trip though the post sunset Solar System.

Over the coming months Venus again
returns as an 'Evening Star' and delights the visual viewer as it moves alongside the planets, Mercury, Jupiter and Saturn between the October meeting night and early December. Not only does the pearly brightest of all planets soar upwards in the evening sky in its journey away from inferior conjunction behind the sun, growing brighter, higher and more obvious in the passing weeks, but it forms some impressive near approaches -or conjunctions- with the three planets mentioned above.

The map at the end of this article shows the relative positions of all four planets and the tracks they make in the evening sky over coming weeks. Note that, except for Venus, as time progresses the remaining three planets rapidly head for the glowing western evening sky as darkness approaches.
All of the events can be observed with the naked eye on clear evenings in the weeks ahead, and if you have managed to observe the more elusive fainter planets, Neptune and Uranus some months back and the now departed Mars, you can claim to have observed all planets in the solar system during 2019.

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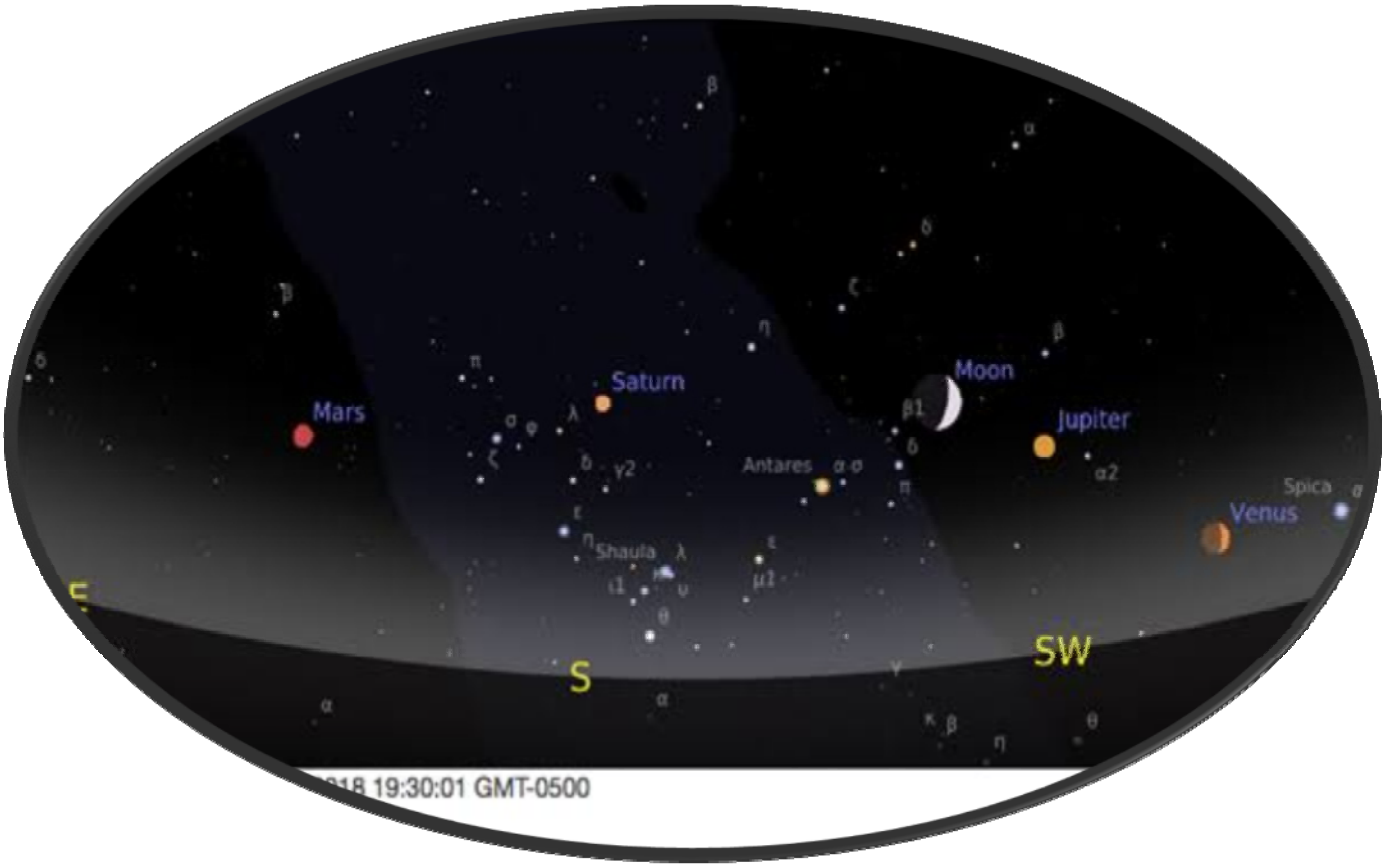

An artistic impression of a northern hemisphere evening sky with a grouping of 4 planets and a crescent moon in 2018.

Some post- sunset Viewing Tips:

Make sure your NW horizon is clear and you observe from 30 minutes after sunset.
To catch an early appearance of Venus or a one-day-old Moon, if you can observe in advance the point on the horizon where the sun sets you can pinpoint your search area later.
Venus will appear early as it is still bright even close to the sun. Check for it from the last week of October
Binoculars are the best help in the early spotting of twilight objects.

Just to add to the sunset drama in the coming days we have two striking appearances of two very new moons on October 29 and November 28th. Details below.

Cont...3

The elusive one-day-old moon.

Late October and late November provide an opportunity to spot a one-day-old moon in the sunset skies. On October 29th the Moon sets at 7.35 pm, just 80 minutes after the sun and is 30 hours old at that time. It sits about 6^0 NW of Venus. On November 28th, look for the 31 hours old Moon near the planet Jupiter and setting at 8.30 pm or about an hour and a half after the sun.
Please check your Yearbook, pages 65 and 70 for additional lunar conjunctions of the planets in October and November.
[*All times are E.A.S.T. so add an hour for Daylight Saving*]

The Elusive Mercury.

You will notice from the map below that the fleeting Mercury behaves differently to the others in the list. It arises from the
crepuscular sunset glow at a magnitude of 0.1 mag at the start of the third week in October where it is closely followed by the almost -4 mag. Venus. Towards the end of October Venus will first appear about 30 minutes after sunset and continue eastwards. Mercury reaches its eastwards journey's end on October 31st, already dimming by half a magnitude and is passed by the dazzling Venus $3\ ½^0$ to its east. Now is the time that Mercury heads for the horizon and displays its crescent form. However, though larger, it dims sharply from night to night. By November 7th it is down to mag, 2.7 and is soon lost in twilight. By November 12 it passes the sun and becomes a pre-dawn morning object by late November.

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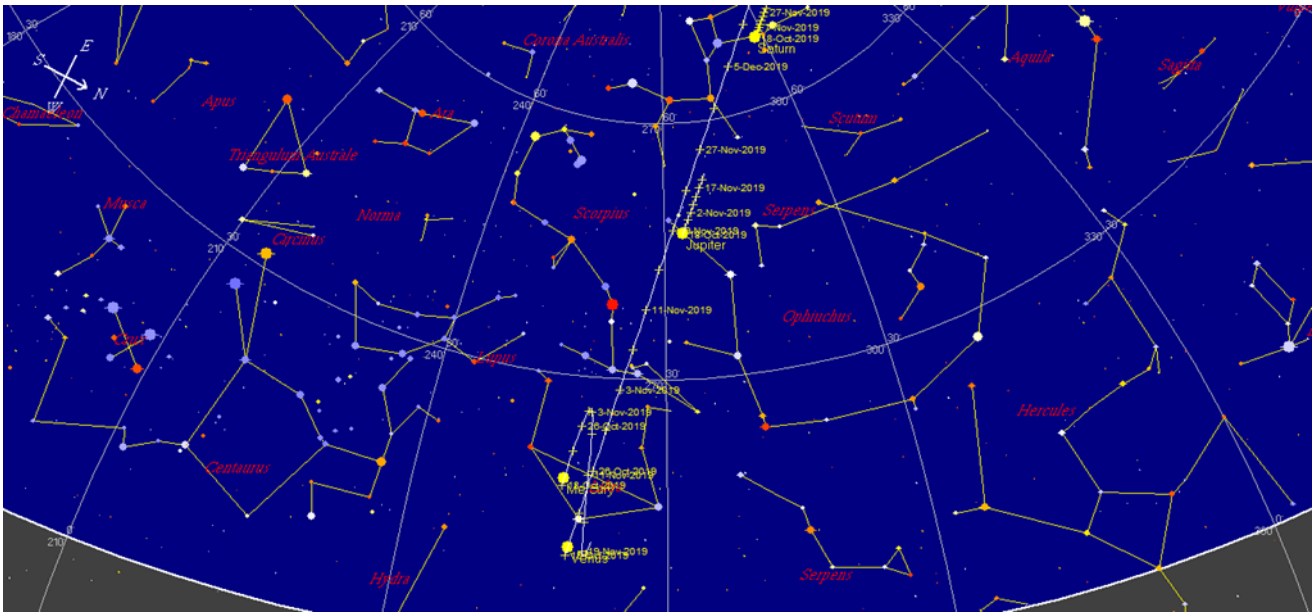


The Western horizon about ½ after sunset, October meeting night.

Astro Events from Frank Gross

Astrophysicists: gamma-ray jets exceed the speed of light

Scientists find that bursts of gamma rays may exceed the speed of light and cause time-reversibility.
PAUL RATNER
25 September, 2019

An artist's drawing of a particle jet emanating from a black hole at the center of a blazar.
Astrophysicists propose that gamma-ray bursts may exceed the speed of light.
The superluminal jets may also be responsible for time-reversibility.

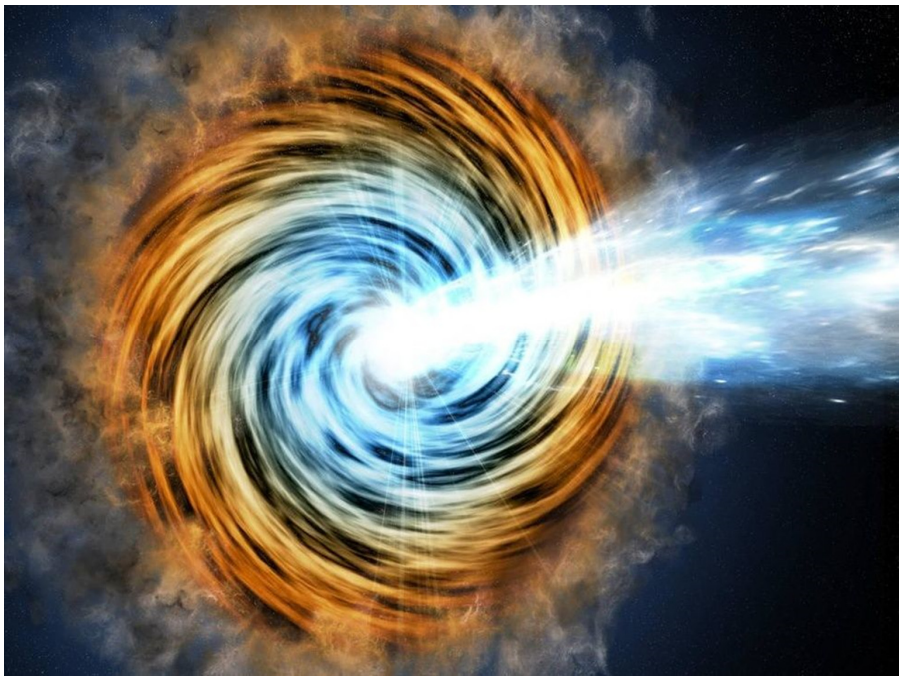
The finding doesn't go against Einstein's theory because this effect happens in the jet medium not a vacuum.
According to Einstein's theory of general relativity, nothing can travel faster than the speed of light in a vacuum. Yet in space many strange things happen, including a new proposal by two astrophysicists that blasts creating bursts of gamma rays may be able to speed up faster than light, going **superluminal**.

Yet, this research by the astrophysicists **Jon Hakkila** of the College of Charleston and **Robert Nemiroff** of the Michigan Technological University is not going against Einstein's theory. What the scientists found is that while these bursts surpass the speed of light in surrounding gas clouds, that only happens in the jet mediums, not in a vacuum.

The astrophysicists also think that these superluminal jets can create the time-reversibility that can be observed in gamma -ray burst light curves.

Astro Events from Frank Gross

Cont...2



NASA

Jet bursting out of a blazar. Black-hole-powered galaxies called blazars are the most common sources detected by NASA's Fermi Gamma-ray Space Telescope.

Jon Hakkila likens what they found to skipping stones across the pond. If someone was to throw such a stone into the water towards you, the stone would go through the air in between hops faster than the waves that it causes are moving through the water. As it gets closer, you will see the waves that are produced by each skip in reverse order. The most recently created ones will get to you first and those from the early skips along the water would come last.

> "Standard gamma-ray burst models have neglected time-reversible light curve properties," Hakkila explained. "Superluminal jet motion accounts for these properties while retaining a great many standard model features."

Astro Events from Frank Gross

Cont...3

The Andromeda Galaxy Has Been Devouring Other Galaxies Since It Was a Baby (And Earth Is Next)

By Brandon Specktor in Science & Astronomy

The cannibal next door has an even mightier appetite than we thought.

This beautiful satellite image shows the Andromeda galaxy, the Milky Way's closest neighbor at about 2.5 million light-years away, glowing in ultraviolet light.
(Image credit: NASA/JPL-Caltech)

Like most big galaxies, the Milky Way is a galaxy with a history of gobbling up smaller galaxies in order to maintain its lovely spiral figure. But, a few billion years from now, our cosmic home could meet its match with an equally hungry neighbor called Andromeda.

Andromeda, the nearest large galaxy to ours, is on a crash course to merge with the Milky Way about 4.5 billion years from now. How will the monstrous smash-up change the shapes of the participating galaxies? That's anyone's guess. But, given Andromeda's size, astronomers know our neighbor is no slouch when it comes to playing galactic tug-of-war — and, according to new research published today (Oct. 2) in the journal Nature, Andromeda may have a far more cannibalistic past than scientists gave it credit for.

Astro Events from Frank Gross

Cont...4

Using observations from five different telescopes, the study authors observed the diffuse halo of stars at the edge of Andromeda's orbit and detected at least two clusters of stars with distinct trajectories and velocities that didn't seem to match each other, or the rest of the galaxy. Based on the estimated ages of these clusters, the team determined they were the remnants of two ancient dwarf galaxies that Andromeda had devoured long ago — one, gobbled up just a few billion years ago, and the other swallowed nearly 10 billion years ago.

These findings, based on just a small fraction of Andromeda's constituent stars, might similarly represent a small fraction of the cosmic leftovers of other mergers throughout the galaxy's 10-billion-year life span.

"Andromeda has a much bigger and more complex stellar halo than the Milky Way, which indicates that it has cannibalized many more galaxies, possibly larger ones," lead study author Dougal Mackey, an astronomer at Australian National University, said in a statement. "Knowing what kind of a monster our galaxy is up against is useful in finding out the Milky Way's ultimate fate."

In the new study, Mackey and his colleagues focused their observations on 92 clusters of stars that had been identified in previous Andromeda surveys. Each of these clusters was located in the galaxy's halo, more than 81,000 light-years away from the galactic center, where the unusual movements of shredded galactic remnants would be easiest to spot. (Andromeda is about 110,000 light-years across, while estimates for the Milky Way's girth put it at between 100,000 and 200,000 light-years.)

The researchers estimated the velocities and apparent orbits of 77 of these clusters, finding two distinct groups — one older cluster, swirling perpendicular to the galaxy's disk, and one younger cluster orbiting at about a 90-degree angle to the oldsters. The researchers interpreted these groups as the remnants of two ancient merger events that occurred billions of years apart.

These findings don't do much to settle the question of "Who would win in a galaxy fight: Andromeda or the Milky Way?" Fortunately, astronomers have a few billion more years to work that one out.

On ‘Icy’ Shores: Sheepshanks

Riccioli’s lunar names have proved to be inspired creations of scientific taxonomy - vivid and memorable, they are here to stay. **Mare Frigoris**, the Sea of Cold, rings the Moon’s north polar regions, around latitude 55º north. In eastern Frigoris, on the same longitude as vast crater Aristoteles, we find crater **Sheepshanks**.

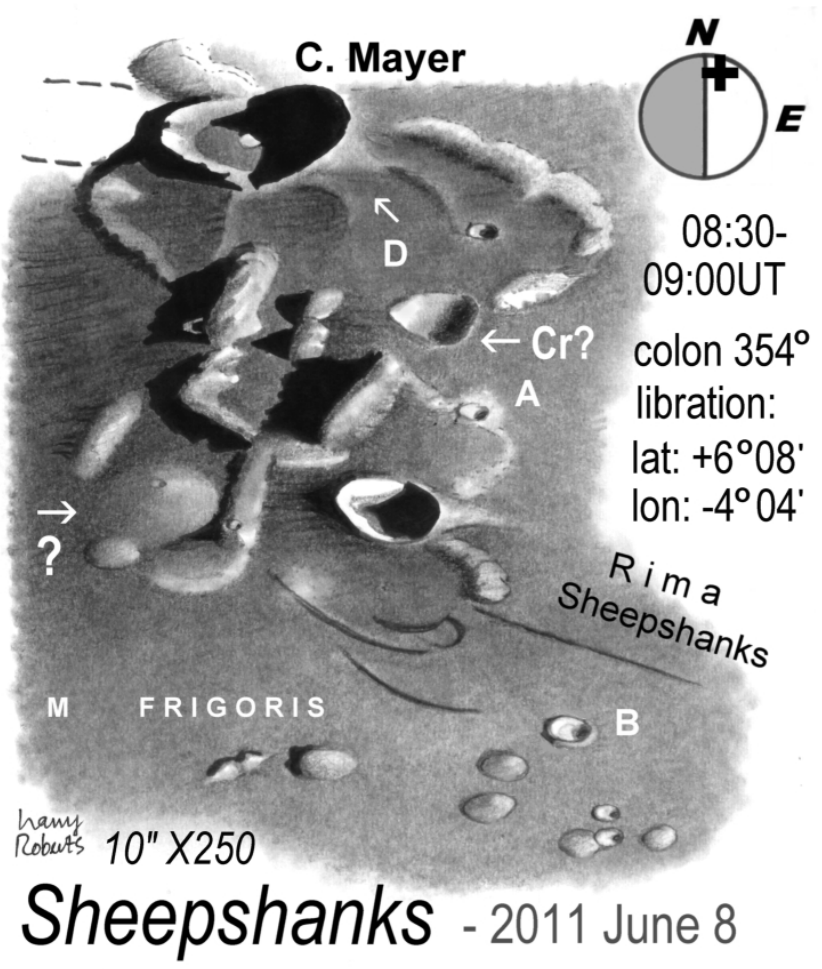
The two are very different - Aristoteles commemorates an ancient man of science, while Sheepshanks commemorates a more-recent woman of science. Where Aristoteles is huge at 90km, Sheepshanks is smaller, about 25km. Sheepshanks is bright and eye-catching on the northern “shores” of Frigoris, while the “Greek” and its vast debris field is sited on the south “bank”.

Sheepshanks sits amidst some interesting lunar terrain, within 30º of the north pole, and is affected by libration in latitude – on the night it was a favourable +6º. Sheepshanks is fresh, with maybe a little slumping of its inner walls. North of it is a jumble of mostly “ruined” landforms – that take some deciphering.

On the north edge (top) of the sketch is larger crater C. Mayer (there must be other lunar Mayer’s) –partly shadow-filled, with some terracing and a central peak; a notch in its west rim is a tiny crater. Mayer partly covers a larger ruined crater called C. Mayer D (the ‘primary’ crater is arrowed).

Between Mayer and Sheepshanks, box-like and half shadowed, is C Mayer B. Much of the terrain here is scarred and overlaid by ejecta from the Imbrium impact.

While Sheepshanks is the ‘primary’ crater for several small secondaries, only A and B are in the field of view. Two odd landforms were “seen” on the night that can’t be found on maps. These are a “crater” on the rim of C Mayer D (arrowed “Cr”?) and a “dome” west of Sheepshanks, also arrowed – that is not on my maps! But it is suggested by Orbiter images - *is it real?*



On ‘Icy’ Shores: Sheepshanks by Harry Roberts

Cont...2

From Sheepshanks a low ridge runs SE to where a thin dark rille leads eastwards. This is **Rima Sheepshanks**, a rille that rarely casts a shadow, and is seldom seen. More low ridges were logged nearby. Rima Sheepshanks marks the north “shore” of Mare Frigoris – and here the basalt plane changes colour and gets smoother. A few low mounds, like domes, and a mountain or two were logged. This was submerged landscape – and it looked like it!

Annie Sheepshanks, 1789 – 1876, was sister to Richard, a major English astronomer - sometimes a controversial one, and rather wealthy. On his death in 1831 she inherits - and becomes a major benefactor of astronomy. She endows Cambridge University with a huge sum, and donates Richard’s many fine instruments to the RAS - being then elected an honorary member.

Her name is first used on the Moon in Birt and Lee’s abortive BA Map, ~1880, perhaps soon after her death. So Annie Sheepshanks is a benefactor of astronomy -there are others named on the Moon, including Catherine Bruce (US). Take a look at Sheepshanks, it’s a fascinating area – can you confirm the dome just west of her crater?

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.