Shoalhaven Astronomers Inc.
www.shoalhavenastronomers.asn.au

Volume 22
Issue 8

Astro Flyer

AUGUST 2022

Club News

From The President

After a long break Observing Nights have been reinstated – our thanks to Freya Bates and Andrew Wood for coordinating that issue and the information will be highlighted in the Astro Flyer from now on.

John Bambury managed the Jervis Bay Brewing Co. outreach event on the 13th July. The event went well with good feedback from the public. Thank you John!

Frank Gross has agreed to manage an outreach event with the Maritime Museum on 20th August – please assist him by going along, bringing a scope, helping out on the night or any combination of those options.

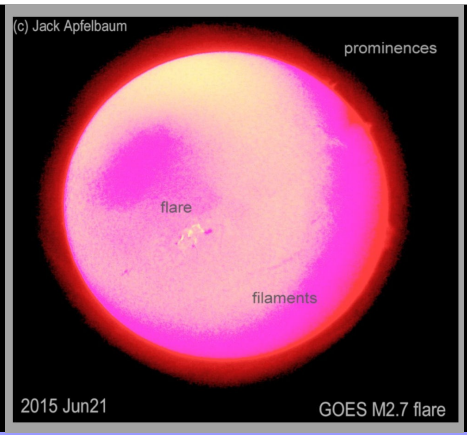
Observatory Project – a DA application has been lodged with Council and a draft operating agreement with UOW is being negotiated. Next steps are to get the DA approved, reach agreement with UOW and start foundation construction.

We are expanding our line-up of speakers for our meetings and again I call on the members to step up if you are able. The committee will be looking into the availability of guest speakers to increase our range of content. We will keep you posted as that activity progresses.

Keep on watching!

Next Meeting August 19th 6.30 for 7pm winter time.

Contents



MOON PHASES

New Moon	First Quarter	Full Moon	Last Quarter
Aug 27	Sep 4	Sep 10	start→Aug 19

Viewing Nights

VIEWING NIGHTS
Starting again

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.

Dates & Locations

Sat Aug 27th Uni
Sat Sept 24 Woncur Rd
Sat Oct 22 Uni
Sat Nov 26 WoncurRd

More Club Information Including viewing site Directions Page 12

In Memory of Jack Apfelbaum by Harry Roberts

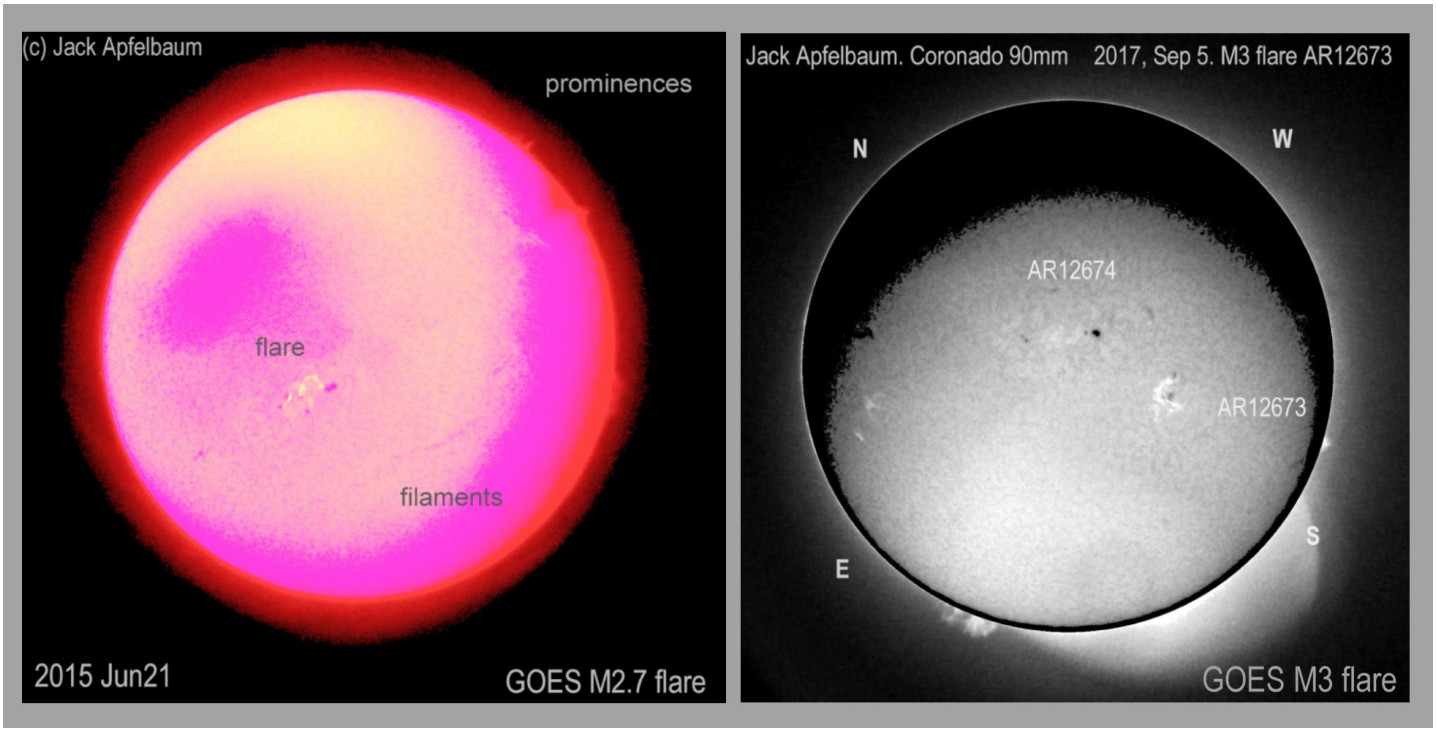
When did I first meet Jack? This is a hard question! My 'pile' of astronomy diaries helped. After much leafing through I came to sketches of that rusted traction engine amid its copse of gums: 'Wiruna', in March 1998, was likely the answer! At the time I was not sure of the group's names, but they were camped nearby and using a 3inch Takahashi refractor on the Sun. Superb views! They were Dan, Kim and Jack! They mentioned the "Shoalhaven"; wherever that was?

I often met Jack at that wonderful site around year 2000, but it was a very busy time at work and Wiruna was a long drive from Sydney.

Some years later, in May 2011, I was invited to talk on the Sun at "Shoalhaven Astronomers" and we met again. The Campus site was superb, with 'roos and wombats as a bonus! The next day I browsed some Real Estate windows and saw it was feasible to retire there. This would happen two years later.

Jack Apfelbaum was President of the "S.A. Inc." for something like 30 years, an impressive commitment. He was to become a firm friend.

Indeed, we collaborated a lot with solar observations – alerting each other when big solar events arose, always at very short notice! As solar cycle 23 waned and SC24 began, late in 2011, Jack purchased a 90mm Coronado H-alpha 'scope and began to make photos of solar flares (Fig). He was to be one of only two or three to do so in NSW! We daily discussed solar events, their magnitudes, locations etc. Many of his pictures formed presentations that were used in reports and published in journals. The attached jpg shows two images Jack made of flares in SC24. They are unprocessed images; I have added captions.



In Memory of Jack Apfelbaum by Harry Roberts

As well as solar astronomy, we had regular viewing nights with many other S.A. members at Shoalhaven Tip in Bomaderry, or Woncor Ave. Nowra Hill. Jack loved “Deep Sky”observing!

He had some real favourites; galaxy NGC253 in Sculptor, the Eta Carina Nebula, The Tarantula in LMC, Omega Cen “globular”(now known to be a galaxy nucleus) and so on. He was not a “Big-Dob” pusher! He preferred the more compact ‘scopes like Maksutovs, huge binoculars, refractors etc. He built the Club’s 12inch Dob, often used after Campus Meetings.

Jack was a big helper to others in the Club: assisting with ‘scope repairs, making simple solar filters, supplying missing parts, finders, eye-pieces etc. and I think, in the past, machining parts on his lathe. He was able to help Eugene in regreasing his ‘new’ 6inch Maksutov by disassembling it to apply the molybdenum grease! A hard job indeed!

I recall one viewing night when Jack arrived at ‘The Tip’ and (in the dark) ran off the dirt track, to become hopelessly bogged in his Citroen! Bob Spruyt kindly fetched a ‘snatch ‘em-strap’ so we could haul him out with my old 4X4! His poor car got so dirty!

The wonderful eulogy given by his daughters at his Service was, mostly, all new to me! A very impressive early life! He was always a modest Man, yet he had a certain ‘presence’. He was a very natural Leader. And we both shared a love of the music of Gustav Mahler.

When I last saw Jack at Nowra Hospital with Ian Scott, we both felt he might “pull through”. Very sadly we were wrong! Hopefully he is now where the “seeing” is always perfect and Sirius B is always in view! Farewell Jack.

You will be missed.

OUT THERE BY BOB TURNBULL
OBSERVATION OFFICER

September to October

Hopefully we can look forward to some drier warmer nights to poke out scopes to the heavens!

Before I commence with astronomical objects for the next 2 months, I will refer to John Bambury's organising towards our club assisting Public Schools and the general public.

Thursday 22nd September at 7pm, Shoalhaven Heads Public School. Mark Town will attend with his 16" Meade Lightbridge scope, John Gould will have the clubs 4" refractor and Jon Bambury will have his 14" SDM.
It is hoped one or two more people will attend if possible.

Astrology The Ngungwah Aboriginal Corporation is organising an evening on 16th October at Coolangatta Estate.
These details are as the Committee has advised me on 11th August.

"They are hoping to combine a night of astrology with Cultural stories about the sky from this Yuin Country. They have invited
Dr Robert Fuller, and Paul McLeod to be in attendance. They believe that there is considerable interest in Aboriginal understanding of the night sky.

Recommended reading "The First Astronomers" by Duane Hamacher"

Planets

Jupiter is at opposition on 27th September diameter 49.9" and magnitude of -2.9 rising in the early evening, refer for position on 11th-13th evening sky page 69. *Jupiter's Satellites*: of this planet on top right and bottom right page 69.

Mercury is in Virgo, low in the western sky.

Comets c/2017 K2 Panstarrs will remain 6 magnitude in October and moves out of view but begins in Lupus after which it crosses back to Scorpia and then in Norma in months end.

Moonlight on the Nepean
Spend time learning about Ruby Payne-Scott 1912 – 1981 (Page 72 of your Astronomy 2022). She was unique in the achievements in Science and one of our rare women that encouraged many women to enter Science and Astronomy in Australia.

Wishing you all good viewing!

Bob Turnbull
Observation Officer

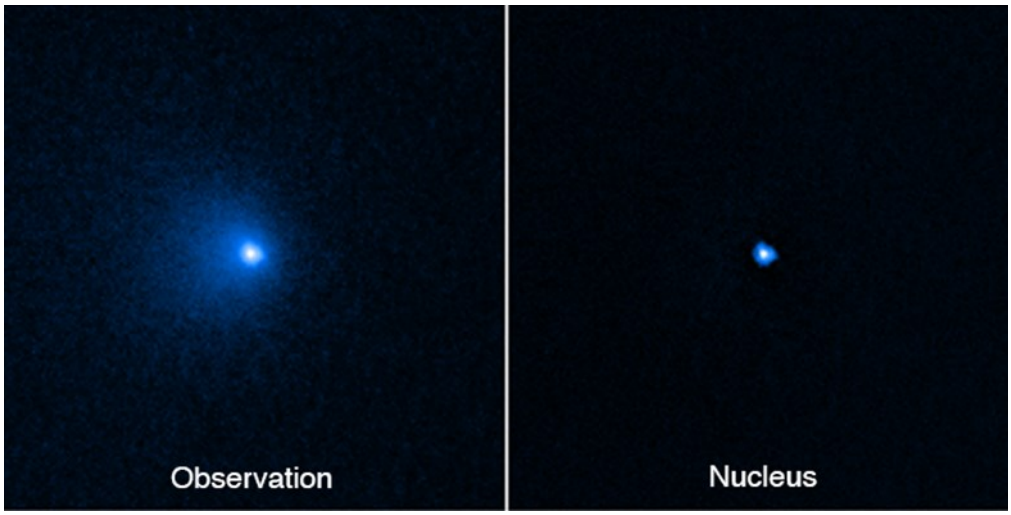
Astro Events from Frank Gross

GOING BACK IN TIME

If you've felt like the days are shorter than usual - yes, we are in the middle of winter - but the clocks are slightly out on keeping time. On 29 June, Earth had its shortest day on record after completing a full rotation in 1.59 milliseconds less than its usual 24 hours. In recent times, scientists have maintained that the Earth's average rotational speed decreases over time, which has seen 27 'leap seconds' - or 1-second adjustments - added to the clock since the 1970s. But the phenomenon has reversed, and that could see clocks forced to turn back to compensate. Scientists aren't 100% sure what's causing it, but some attribute it to the 'Chandler Wobble', which is when things like the tides, the moon and even climate change affect the speed our Earth rotates on its axis. While a few milliseconds doesn't sound like much, it can throw satellites and navigational systems out of whack. Sadly, it doesn't account for why we're perennially 5 minutes late for everything…

Ancient Comet—80 Miles Across—Traveling Our Way Comes From The Oort Cloud


Vladislav Tchakarov
Posted on April 12, 2022



Scientists confirmed the size of comet C/2014 UN271 Bernardinelli-Bernstein and it is the largest Oort Cloud object ever discovered.

Oort Cloud research and discovered objects
Scientists' current understanding of the population of the Oort Cloud is based on a small sample of bodies that are in orbits with perihelions of less than 10 astronomical units. At the same time, only some of them had cometary activity, which facilitates the search for such objects and makes it possible to estimate the composition of their surface layer.

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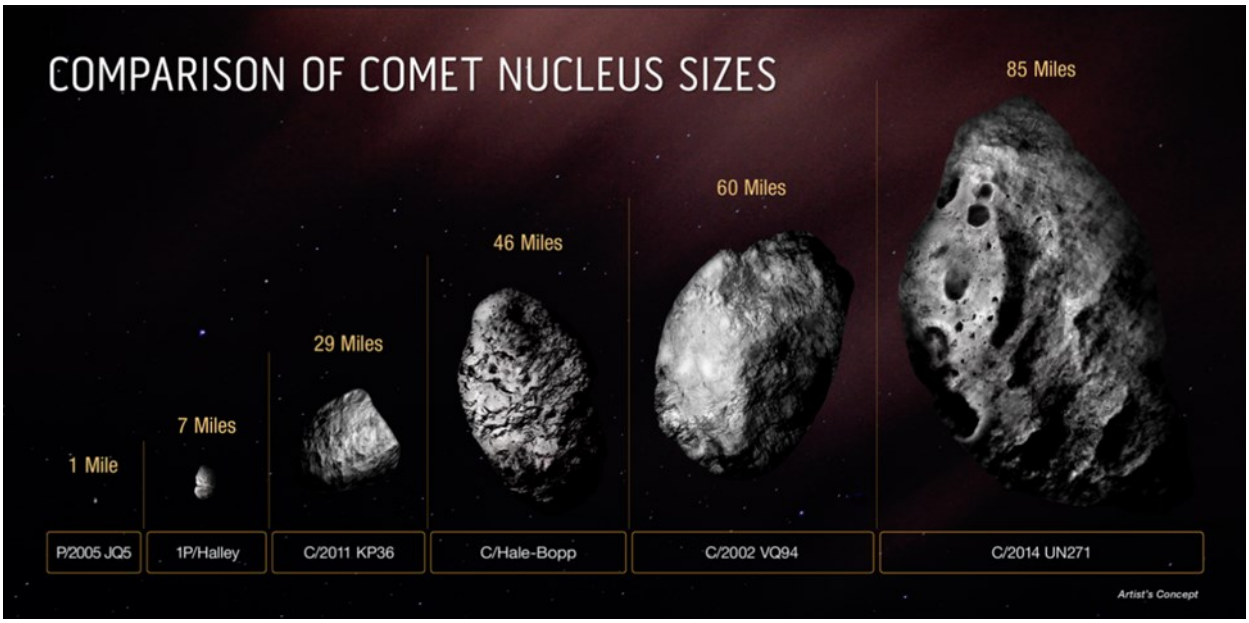
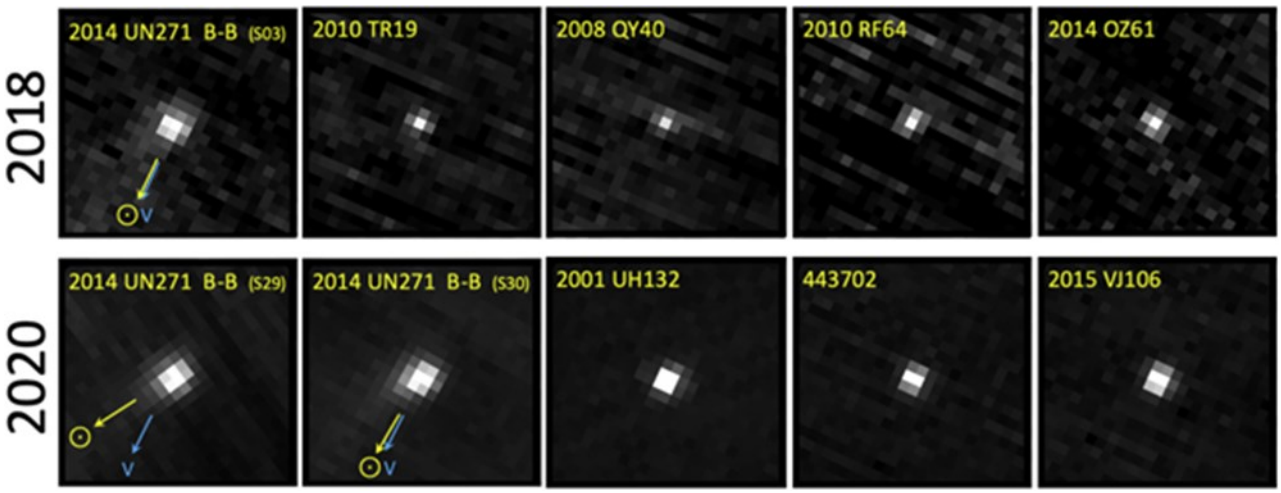


Comparison of the nucleus sizes of the largest comets discovered to date. Credit: NASA, ESA, Zena Levy (STScI)
The recent discovery of comet C/2014 UN271 (Bernardinelli-Bernstein), originally thought to be an Oort cloud dwarf planet now moving towards the Sun, allows astronomers to learn more about the properties of bodies from the outskirts of the solar system, which include objects captured from the interstellar medium, and bodies born at the dawn of the Solar System.

Comet C/2014 UN271 (Bernardinelli-Bernstein) is the largest comet in the Solar System

Initial discovery of the now-largest comet

The discovery of 2014 UN271 was announced on June 19, 2021, as part of the DES (Dark Energy Survey). Initial observations of the object indicated that its current orbital period is 3 million years, with the aphelion of its orbit reaching the interior of the Oort cloud. A preliminary estimate of the size of 2014 UN271 suggested that it is a fairly large object, possibly a dwarf planet.



TESS images of comet C/2014 UN271, as well as Kuiper Belt objects and asteroids. Credit: Tony L. Farnham et al. / The Planetary Science Journal, 2021

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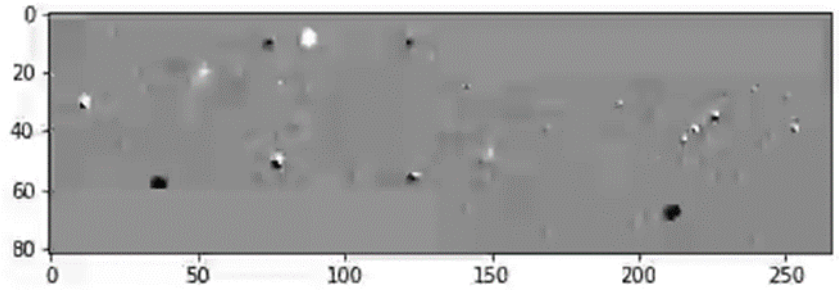
Further observations, classification, and distance

New observations of the object made on June 22, 2021, using the 1-meter Sutherland telescope on the ground network LCOGT showed that it is active and has a slightly asymmetric coma, which is typical for comets. At the time of the 2014 observations, UN271 was at a distance of 20.18 astronomical units, the brightness was estimated at 19.8 magnitudes, which is slightly larger than predicted. The presence of a coma is also confirmed by observational data from the SkyGems telescope in Namibia.



Animation from TESS images showing the movement of the comet over a period of 4 weeks. Credit: Ben Montet / TESS Speed & Trajectory. (Animation not working in this publication. Ed)

In this regard, the Center for Minor Planets reclassified the object as a comet on June 24, 2021, now it has the designation C / 2014 UN271 (Bernardinelli-Bernstein). The object is moving at a speed of 35 thousand kilometers per hour from the edge of the solar system towards its center. According to scientists, we can all remain calm: the comet will not approach the Sun closer than 1.6 billion kilometers. This is even further than the planet Saturn.

Size & Mass: Largest Comet to date

While the comet is located extremely far and our telescopes cannot capture it in better quality at this point, scientists used the brightness of the nucleus to create a computer model and use it for accurate simulations.
It was confirmed that the approximate size of the nucleus is about 80 miles, which makes it 50 times larger than the majority of the largest comets to date. Scientists also believe that its approximate mass is 500 trillion tons.

When will it approach Earth?

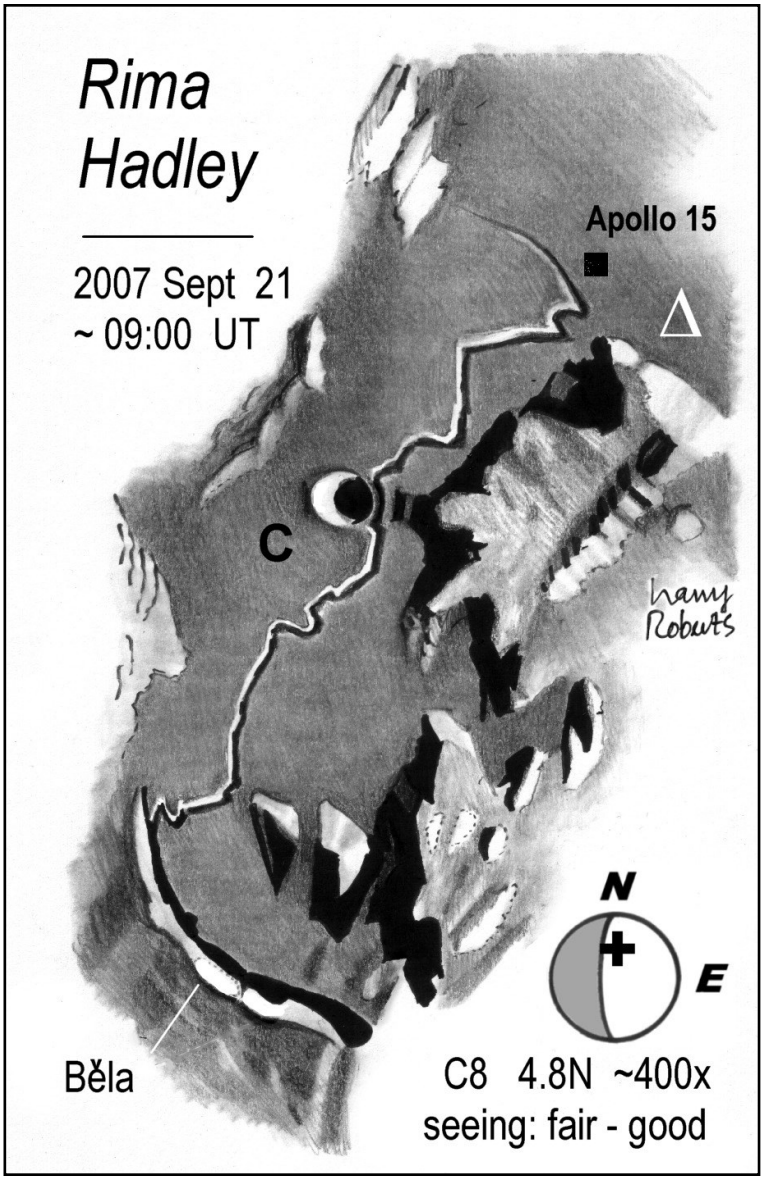
The comet is expected to pass its perihelion at a distance of about 10.5 astronomical units from the Sun in early 2031. Scientists hope to conduct a series of observations of it, as they can provide unique information about the properties and composition of bodies left over from the formation of the Solar System.

Sinuous rilles: a visit to Rima Hadley by Harry Roberts

Sinuous rilles: a visit to Rima Hadley

A rare clear night and 8 day old Moon gave a superb view of Hadley's Rille in the 4.8N. at 265X. The scope had been little used over the last wet six months, yet it all worked fine. The next day I dug out this 'piece' from days passed, to remind me of the Apollo era, now so long gone. I have (somewhere?) a DVD of the Apollo15 crew reliving their "drive" through this landscape...51 years ago!

The Moon abounds with rilles (rimae) of two kinds, the straight (or non-sinuous) rimae, and the sinuous rimae. The latter are bright, smooth, "dried river bed" structures that meander across lava flooded plains. They are remarkably uniform in width, but can often be seen to taper subtly into invisibility. They can be very long, sometimes hundreds of kilometres. Rilles can form branches like terrestrial streams, but they branch only rarely.



Rima Hadley arises on the west side of the Apennine Mountains at an elongated crater named Běla, that Rükl says is 11 x 2 km. though it looks wider (Fig 1). Běla is a Slavic female name, I think, and the crater connects to an arcuate valley-like formation that curves NW, terminating in a pointed end. Near this pointed end Rima Hadley emerges, and 'flows' generally northwards.

Sinuous rilles: a visit to Rima Hadley by Harry Roberts

Cont...2

Various authors suggest that Běla and the arcuate feature are volcanic landforms (elongate vents) and that lava from them excavated the rille we see today. An alternative view is that volcanic gas and lava flowed through an underground lava tube across the plains of Palus Putredinis, winding its way around obstacles like the protruding headlands of the mountains, to dwindle when reaching the lower levels of the Palus. The Běla formation is known to be elevated well above the plains, so this is plausible. Subsequently, through seismic action (crater impacts) the roof of the lava tube collapsed leaving the v-shaped channel we see today.

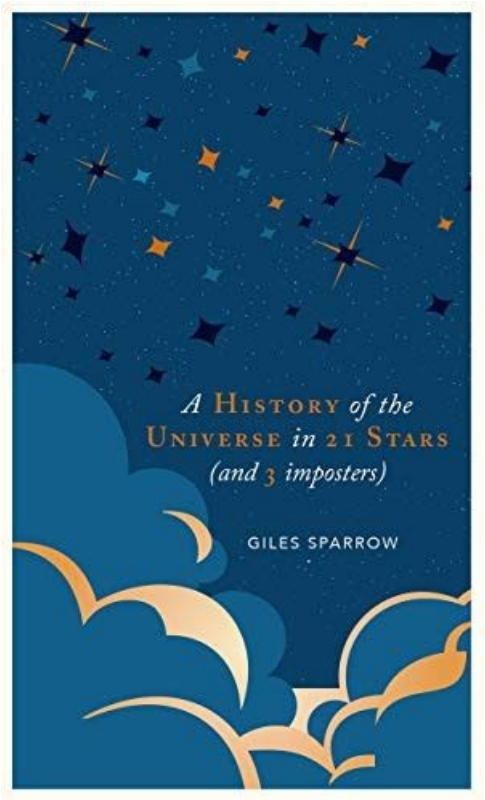
Perhaps both explanations are right. Apollo 15 astronauts explored the rima in their moon buggy and imaged it close-up (Fig 2). Although it looks smooth from Earth, the rim shows backwasting, i.e. rim material has collapsed into the rille forming scree-slopes. The screes rise at about thirty degrees from the floor, and the rille is 1½ km wide and 300 m deep. Boulders as big as houses lie scattered along the floor!

At the half way point Hadley Rille briefly contacts fresh looking crater Santos-Dumont C. Did the crater impact on the rille, or did the rille flow around an existing crater? It's hard to know. Where the rille reaches the foot of Mount Hadley Delta (Δ in Fig 1) it takes a sharp turn west, becoming hard to see, perhaps due to the lighting direction. This turning point marks the Apollo 15 landing site. Rima Hadley is 80 km long, although Orbiter photos show it faintly continues much further that this.

Hadley rille is an elegant feature, and the arcuate vents (Běla etc) are the best examples of the landform type that I know of. Also another vent-like form lies just east of Běla in the mountains. Perhaps these vents erupted shortly after the titanic Imbrium impact, as eruptive volcanism is known to have followed the more recent Mare Orientale impact on the Moon's west limb.

Though often viewed by moon watchers the Rima Hadley region repays closer study. Clear skies!

Book Review by Andrew Wood



A History of the Universe in 21 Stars (and 3 imposters)
Giles Sparrow

Considering the weather of recent months, it was nice to find a good "armchair Astronomy" read. Also not expensive, in this little hardback publication we are taken, if not from A-Z, then from the simplest stars and their everyday significance to the most complex and intriguing astronomical objects known to modern Astronomy.

Dwarf stars to supergiants, Wolf-Rayet stars, binaries, variables, quasars, etc are all covered around 24 typical examples; the 3 "imposters" being not stars but a cluster, galaxy and quasar.

This is cosmology lite. Some concepts may be complex but are described in an easy-to-read and entertaining style. A nice touch the author includes, when an object is hemisphere-specific, is the addition of descriptions of a similar object from the opposite hemisphere. For example, in the first chapter about Polaris, a side-box describes how to find the South Celestial Pole.

Hand-drawn maps are included to help find the objects being described. In practice, a beginning amateur would not find these useful without some prior knowledge about navigating constellations. Someone with a burgeoning interest in astronomy will still find the book interesting, though; as will most experienced amateurs. This book can act as a handy introductory reference to complex topics.

I purchased *A History of the Universe in 21 Stars (and 3 imposters)* on-line through Booktopia for $20.75 plus postage. Currently one on-line seller has it for $12. Not bad for a solid little hardback.

New Moon Observing Nights

Monthly observing nights are planned alternately at two dark sky sites close to Nowra, on the Saturday closest to New Moon. If Saturday is clouded out, then the following Sunday is a possible alternative, weather permitting.

The alternate sites are:
University of Wollongong, Shoalhaven Campus, West Nowra
Woncor Avenue, Nowra Hill

Upcoming Observing Nights

August 27 Woncor Avenue
September 24 Shoalhaven Campus
October 22 Woncor Avenue
November 26 Shoalhaven Campus

Enquiries Andrew Wood (0401907012), Freya Bates (0415483656)

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 May 2022 monthly meeting. Elected officials for 2022- 2023

The 2021 AGM has been postponed due to Covid.

Executive
President: Mark Town
Vice President: John Gould
Secretary : Andrew Wood
Treasurer: Frank Gross
Public Officer; Frank Gross

Operation Positions
Website Manager: Mark Town
Observation Officer: Robert Turnbull
Editor: Kaye Johnston
Librarian: Chris O'Hanlon
Equipment Officer:Vacant

Committee General Members:
Freya Bates,
Larry Wakelin,
Chris O'Hanlon,

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The deadline for Articles for the Astro Flyer is The First Friday of the Month.

Editor Kaye Johnston