

Hello Members,

I just realised that I have a large, dark telescope viewing area just 100 metres from where my home is in North Nowra. It's called Joe Hyam Park And is a large circular area. The perimeter is a completely surrounded by tall trees cutting out most of the night lights. A few of the committee might have to explore this site for our possible use.

Don't forget about the Astro BBQ at Marriott Park on March 18th, around 11 to 11:30 AM. If it is rainy we would try for March 25th. I'll hopefully bring the solar telescope so we, and the public, can have a squizz through it. I'll bringing the sausages, bread and cookers (remember, the council ones didn't work so well). If you want to bring something let me know so I can coordinate.

Next monthly meeting will be held at the Shoalhaven Campus of the Uni of W'Gong, George Evans Road off Yawal Road, West Nowra, March 16th, 7 for 7:30 start. See you there. Frank Gross, President

# **Double Vision**

Jack and Eugene are planning a talk and demonstration on binocular viewing at the next meeting. Bring along your binoculars and you questions and there is even a Swap Meet with at least one pair of binoculars going out cheaply. If you have been saving up all these outdates eyepieces for a rainy day- it's time to let them see the light of day!

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#### **MOON PHASES**





New Moon First Quarter Full Moon Last Quarter March 17 March 25 March 31 April 8

# 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 17 March (back-up night Sun 18 Mar) at Woncur Road, South Nowra.

Head South down The Princes Highway, turn right at BTU Road, Woncur Road is the first street on the left).

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# OUT THERE Bob Turnbull OBSERVATION OFFICER

# MARCH-APRIL 2018

We now have a sky full of wonderful constellations and planetary movements to interest us in our pursuit of amateur astronomy.

Look well at the unfolding and majestic visions of our universe and the future of the inhabitants of this good EARTH, to paraphrase many eminent leaders of World populations.

We are also lucky to have had the bequest for which we are most grateful, of the Meade 16 inch Light Bridge Dobsonian Telescope which was sold to Mark Town, who is a new member of Shoalhaven Astronomers Inc. and we all wish him a very satisfying hobby with this great instrument.

SO LET US SEE WHAT'S COMING UP FOR THE NEXT TWO MONTHS.

## PLANETS

MERCURY Close to Venus but so low on the Western horizon, it is better viewed in April when it climbs into the morning sky and reaches its greatest elongation on April 30<sup>th</sup>.

MARS and SATURN are growing closer and is visible in the morning sky from March 9<sup>th</sup> to 12<sup>th</sup> and again in the evening sky from March 29<sup>th</sup> to April 8<sup>th</sup>. This red planet passes between the Lagoon and the Trifid on the 2th of March, then passes to M22.It rises in the late Eastern sky in April in Sagittarius star cloud and being 4 degrees from a waxing Moon with Saturn creating an equilateral triangle.

JUPITER Rises in the Eastern evening sky on the 7th March in Libra and appears stationary, on the 9th

NEPTUNE AND URANUS Not good viewing until May.

General viewing of the Constellations should include:

ORION Is still viewable but the best viewing has passed in February

CRUX Gradually getting more overhead in March as are the many favourites in the Milky Way.

METEOR SHOWERS gamma-Normids are active from 25<sup>th</sup> February and the 28<sup>th</sup> March (with maximum around the 14<sup>th</sup>. These are generally yellow, white and orange with few leaving trails. They are best viewed after midnight, when Moon free and reach higher altitude.

Good Viewing BOB TURNBULL

# OUT THERE Bob Turnbull OBSERVATION OFFICER

# **SPECIAL REFERENCE**

Hi all you energetic Astronomers,

Since you have already received the current OUT THERE, I wish to follow up a references to the question WHERE IS THE DATA ON DISSAPEARING STARS? The Starting point is the website on some of the Supernova Remnants at: <u>https://en.wikipedia.org/wiki/List\_of\_supernova\_remnants</u>

The reason I have selected this site is that it sets out some of the well-known images in a column. LISTING a colour image of each and giving data of: IMAGE- NAME- FIRST VISIBLE FROM EARTH-PEAK MANITUDE-DISTANCE IN LY.- and TYPE There are numerous web sites which display data and are kept on Site data lists.

Although these are fascinating, they do require an intimate knowledge of star types and abbreviations which I found too challenging at this stage of introducing this subject!

This is a side of Astronomy which has kept verbal and written historical observations down through the ages, but in recent centuries Astro Photography has created huge amounts of physical imagery and now even greater and higher images enhanced with various bands of the EMS (Electro Magnetic Spectrum) which includes all the known data carrying energy sources.

There are many researches being carried out which are primarily answering this question WHERE DID ALL THE STARS GO which are no longer visible. The best way to study this is in the records of supernova events. Add to this the complimentary study of the EVOLUTION OF NEW STARS and we see the value of the great pioneering space achievements with HUBBLE TELESCOPE and the JAMES WEBB space telescopes, within the next few years.

I Hope some of you may follow this subject and give you another string to your astronomical Bow!

Good viewing Bob Turnbull

# Sky Objects By Eugene O'Connor



A Search for Southern Doubles

# Episode 13: Volans: The Flying Fish

Make no mistake about it, this month's constellation takes us into hidden waters. Prior to last month I had never ventured into this area of sky and I was surprised at some of the delicate and beautiful treasures I discovered there.

Small, nondescript and difficult to find, and yet with an impressive and ominous -sounding galaxy, The Meat Hook at its centre, Volans is worth finding.

On my first visit there in early February during several late clear nights at dark of moon I was surprised by the impressive doubles I had long overlooked. With its dimmer form and nondescript leading stars, it was at first hard to get there, but using one of the three Southern Crosses we outlined at the last meeting the key stars fell into place and star hopping became easier.



#### **Getting There**

Forget, the outline on the star map or the artist's impression of this constellation above: the only entry is to spot The Large Megellanic Cloud which lies directly west of this small group and then find the star that marks the bottom star of the diamond cross nearby in Carina which lies just east of the group. This is Beta Carinae, the delightfully named Miaplacidus, a combination of Arabic and Latin meaning, "Quietwater." In binoculars or finderscope Miaplacidus, the 1.6 mag star stands out in that it is flanked on either side by two mag 4.5 stars in a NE -SW plane. Miaplacidus is on the other side of the Diamond Cross to Theta Car, the Southern Pleiades. (See map below).

## **Sky Objects By Eugene O'Connor**

Cont...2

- 1.Epsilon Vol. RA 08hr.08m;Dec.-68.36. mag 4.5/8; sep 6.1"
  - This is a yellowish white star with its faint blue companion just spotted at medium power, It is one the brightest northerly star in the constellation. See map
- 2. Theta Vol. RA 08hr. 39.1m; Dec -68° 36'; mag5.5/10; sep 45" There is a nice contrast in brightness here between a fine white star with a bluish companion faint and wide.
- 3.Kappa1,Kappa 2 Vol: RA 8hr.19m; Dec -71°31'. mag 5.4/5.7/8.5. sep 65" and 37.1". This is a beautiful triple star in a medium power field. The two brighter ones of similar colour and brightness almost form a line with the dimmer and wider mag 8 star.
- 4.Eta n Vol. RA: 8hr.22m; Dec -73° 24'mag 5.3/11.8;sep.30.8"
  - This is the most southerly double in the group (see map bellow) and is a difficult object, not because of the separation(it is wide) but because the companion is an eyesight and sky clarity test. I have glimpsed it only once in ideal conditions. Beautiful yellowish and gray contrast.
- 5.Gamma 1,2 γ Vol, RA 07hr.08m;Dec. -70° 29'; mag 4/5.5;sep 13.6" I have kept the best for last. A stunning wide orange and blue pair that reveals the real reward for the double star hunter. Great even in small telescopes.



Volans, showing the five listed stars numbered in white on the map. (South is the bottom of the map)

## If the Rare Earth hypothesis is correct, does that mean that humans are in big trouble?

No, it means we have a greater chance of survival because we're more likely to be past The Great Filter. **The Great Filter** 

# **The Great Filter**



For those who don't know, the Great Filter is an explanation for why our galaxy hasn't been overrun by one, if not many civilizations.

A civilization with technology not much more advanced than ours could colonize our entire galaxy in 2–3 million years. That may sound incredibly long, but on the time scale of the galaxy it's the blink of an eye. The thinking is that if there were other intelligent life in the galaxy, it would likely be much older than us and would have fully colonized the galaxy by now. If you subscribe to the mediocre earth principle, then life would be plentiful in the galaxy and other intelligent life would also be a real possibility.

This brings up the chilling thought that if intelligent life isn't terribly uncommon, then there is a Great Filter (or more than one) that lays ahead of us that tends to wipe all civilizations out before they reach the point of interstellar colonization.

Cont...2

## What could the great filter be?

Bad news would be that the Great Filter is still ahead of us. Possibilities include nuclear weapons, overpopulation, black hole generation, strong AI, asteroid collisions, gamma ray bursts, or something we haven't even remotely considered. Good news would be that the Great Filter is behind us. Possibilities include a rare earth, formation of life, formation of complex life, or the evolution of high intelligence with the ability to make fire and manipulate tools with opposable digits.

While we are constantly hoping to find microbial life inside our own solar system, there are many scientists that breathe a collective sigh of relief every time we don't find it, because that increases the chance the the formation of life is the Great Filter rather than something further down the line.

In short: the best chance of us inheriting the galaxy is if we're the first intelligent life that's ever existed in our galaxy.

## More Contemporary Thinking:

The Great Filter theory is based on the assumptions of 20th century industrial era thinking:

Power is based on territory control and raw materials

Sentient beings remain in their basic organic forms and use larger and large machines to explore and tame the galaxy (starships, terraforming, Dyson spheres)

Now that we've entered the digital age, our trajectory has noticeably changed. Rather than making bigger and bigger things, we're miniaturizing and getting more interconnected as a species.

# **Hybrid Minds:**



The internet has made the human race into a painfully slow and squishy Dyson sphere clinging tightly to the earth's surface. As slow as internet communication currently is, limited by the speed of reading and typing, our knowledge progress has gone up exponentially.

The next logical step to human progress is removing the typing and reading barrier to human knowledge exchange. In the next decade or so, neural meshes that allow your mind to communicate wirelessly with your smart phone will be in prototype (maybe sooner since Elon Musk is applying himself to the problem).

#### Cont...3

Once we can communicate wirelessly with our phones, we can communicate wirelessly with each other. Basically we will have collective telepathy in the coming decades, and our ability to collaborate and find consensus will become exponentially faster.

Once we have neural meshes, we will be hybrid beings. Large portions of our thinking and memory storage will be on synthetic parts, and the flow of information between synthetic and organic parts of your mind will be as effortless as the interaction between the different parts of your organic mind.

#### The Transition to Purely Synthetic Beings:

Once we're hybrid beings, the next logical step would be transitioning to purely synthetic parts. Synthetic processors are millions of times faster than the chemical processing of our brain. As we get more and more comfortable with the synthetic parts of our mind, we will get more and more frustrated by how slow and imprecise the chemical parts of our mind are.

The natural progression would be to slowly swap out the chemical parts as they grow old and wear out, and become a purely synthetic mind, able to process information millions of times faster.

## The Priorities of Purely Synthetic Beings

Once we are purely synthetic beings, our priorities would dramatically shift.

We would no longer be looking for earth-like planets because we would no longer need food, air, water, or warmth. The cold vacuum of space would be much preferred for optimal computation speed. We would no longer be looking for organic beings to interact with since they would literally be like ants or microbes to us (we would literally think millions of times faster than them and understand things they couldn't even begin to comprehend. For reference, imagine how excited you would be to explore your garden to make contact and engage in conversation with slugs). Because our collective mind would be so far beyond the organic, we would start to simulate intensely detailed alternate realities to keep our massive synthetic mind engaged. The need to keep our mind engaged would drive our need for more and more efficiency and processing power. Where do we find that?

#### **The Allure of Black Holes**

Once you are a purely synthetic mind, the more dense you are, the more efficiently you can process information because of reduced latency. Initially, we would try to get as close to black holes as we could while maintaining structural integrity to speed up our processing. In addition to ultimate latency reduction, black holes also provide an endless source of energy because their powerful gravity well is a consistent, reliable source of energy that far outpaces a star and doesn't have the inconvenience of transforming into a red giant or going super-nova. Eventually, our mastery of the space-time continuum would allow us to either become black hole processors, or pass freely in and out of the event horizon, or possibly pass outside the universe.

#### Why the Great Filter Theory could be a Red Herring

We all grew up thinking our path to transcendence was remaining in our current human forms, building massive hunks of metal to simulate earth-like conditions, and exploring the galaxy looking for earth-like planets to colonize, and new species to meet. Our current trajectory is showing that we're more likely to become purely synthetic beings looking for colder, denser environments in a quest to understand the very nature of of the space-time continuum and simulate even more interesting realities. We assume we are alone in our galaxy because our planet is not colonized and no giant hunks of metal are showing up in our skies. The reality is that our galaxy could be teeming with advanced intelligence so far beyond us that we are literally microbes to them. We've just been looking in the wrong places (on planets near stars) and looking for something we would actually recognize.

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Self-Driving Servicer Now Baselined for NASA's Restore-L Satellite-Servicing Demonstration

This artist's rendition shows the Restore-L servicer spacecraft robotically repairing a satellite. *Credits: NASA* 



NASA's Satellite Servicing Projects Division has baselined Kodiak, formerly called the Goddard Reconfigurable Solid-State Scanning Lidar, for its Restore-L mission. Kodiak is pictured here with its creator, Nat Gill. *Credits: NASA/W. Hrybyk* 

One test changed the fortunes of an advanced 3-D imaging lidar system now baselined for NASA's Restore-L project that will demonstrate an autonomous satellite-servicing capability.

Officials with NASA's Satellite Servicing Projects Division, or SSPD, have officially baselined the Kodiak system — formerly known as the Goddard Reconfigurable Solid-state Scanning Lidar, or GRSSLi — to provide real-time images and distance-ranging information during Restore-L. This project will demonstrate how a specially equipped robotic servicer spacecraft can extend a satellite's lifespan — even one not originally designed for on-orbit servicing.

This device can use its relative navigation technologies — of which the Kodiak system now is a part — to essentially drive itself to its destination, much like a self-driving car here on terra firma. Once it locates its target, it can use dexterous robotic arms and software to autonomously grasp, refuel, and relocate a satellite.

# Cont...5 Good News for Technology Developers

The decision to use Kodiak is good news to Principal Investigator Nat Gill, who, along with other technologists at NASA's Goddard Space Flight Center in Greenbelt, Maryland, began developing the advanced scanning lidar system five years ago in part with Goddard Internal Research and Development program funding.

Less than a year ago, only a portion of Kodiak was being considered for use, primarily as a back-up to another system, Gill said.

Under one potential mission scenario, this partial capability would have provided ranging measurements to guide the Restore-L robotic servicer as it approached a satellite not designed for servicing from 1.5 miles down to five feet.

To carry out this orbital dance, the system would have flashed its low-power laser light at the remote-sensing satellite every 25 microseconds. Its onboard telescopes and detectors would have collected the returning light as it bounced off the satellite and another Goddard-



developed technology — a hybrid computing platform called SpaceCube 2.0 — then would have calculated the light's time of flight to determine distance.

## **Real-Time Imaging Added**

Restore-L will use a second piece of the Kodiak system: its ability to provide real-time, high-resolution images as the robotic servicer approaches the target, which, itself, is moving at thousands of miles per hour.

This capability includes a micro-electro-mechanical scanner and a photodetector.

#### Cont...6

With these components, the system "paints" a scene with the scanning laser and its detector senses the reflected light to create a 3-D image, with millimeter-level resolution, over a range of distances, from meters to kilometers.

# A Test Made the Difference

#### A test changed Kodiak's fortunes, Gill explained.

During a demonstration involving the imaging portion of Kodiak and a mockup of an existing Earth remote-sensing satellite, Gill and his team showed that the system's 3-D imaging capabilities, coupled with specially developed algorithms, "could do the job the Restore-L project requires," Gill said. "Now, we have the whole job for Restore-L, including the 3-D imaging."

As a result, mission controllers will be able to see a satellite in high resolution as the robotic servicer approaches as well as automatically determine its location and relative orientation with one small, lightweight system, Gill said. "Because of our team's work ethic, technical skill, and belief in a crazy idea, we've succeeded in raising the cutting edge of space-flight technology."



# First the Moon, Then Earth: New Theory Reverses Formation Story

Vaporized rock formed from the collision of two other planet-size objects. *Credit: Sarah Stewart/UC Davis based on NASA rendering* 

Earth's moon formed inside a cloud of molten rock, and may have done so before our planet itself formed, a new theory suggests.

Scientists <u>call such a cloud a synestia</u>, a doughnut-shaped ring of debris full of molten rock that forms in the aftermath of a protoplanet collision. In this case, it would have been a massive collision early in our solar system's history. According to the new theory, the moon formed within a few dozen years after the crash, as the synestia shrank and cooled. The Earth subsequently emerged about 1,000 years after the moon.

"The new work explains features of the moon that are hard to resolve with current ideas," co-author Sarah Stewart, a professor of Earth and planetary sciences at the University of California, Davis, said in a statement from the university. [How the Moon Formed: 5 Wild Theories]

"The moon is chemically almost the same as the Earth, but with some differences," <u>she added</u>. "This is the first model that can match the pattern of the moon's composition."



# Cont...7 Impact theories

A synestia is a hypothetical object first proposed by Stewart and a Harvard University graduate student, Simon Lock, in 2017. They also are co-authors on the new study.

In 2017, Lock and Stewart modeled the chain of events that would occur after Earthsize rocky planets smashed into other large objects, carrying lots of energy and momentum with them. The predicted result was a doughnut-shaped disk, according to <u>press materials released that year</u>. Their name for the newly described object, synestia, comes from the prefix "syn-" (together) and the Greek goddess "Hestia," who represents architecture and structures.

Synestias haven't been spotted in the sky yet, but the authors suggest that's because the objects are relatively short-lived. After formation, they may persist for only a few hundred years. Synestias that formed gas-giant planets or stars, however, may last longer due to their larger size, the authors said.

Back in 2017, the team was focused on how planets could be formed after huge impacts. (The usual model cited today for planet formation <u>suggests core accretion</u> through gas molecules and dust particles sticking to each other.) At the time, however, Lock and Stewart hinted that synestias could also be useful in explaining the moon's formation — especially because Earth's moon is so similar in composition to our planet.

The moon is Earth's nearest neighbor, but its origins date back to a violent birth billions of years ago. See how the moon was made in this Space.com infographic. *Credit: By Karl Tate, Infographics Artist* 

Most astrophysicists today suggest that <u>the moon formed through a collision</u>, but that theory is a bit different from the synestia approach. The canonical theory suggests that a Mars-size object smashed into Earth a few billion years ago. Earth remained mostly intact, but the collision generated some debris. Over time, the small bits of debris coalesced into the moon. [How the Moon Was Made (Infographic)]

"Getting enough mass into orbit in the canonical scenario is actually very difficult, and there's a very narrow range of collisions that might be able to do it," Lock said <u>in a</u> statement from Harvard University.

The older collision theory is <u>not the only explanation proposed for our moon's history</u>. Some scientists suggest that the Earth and the moon formed together (co-formation theory), while others say the moon used to be a free-flying object that was captured by the Earth (capture theory). There's even a theory suggesting that Earth <u>stole the moon from Venus</u>.

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## **Molten rain**

Here's how the moon formed as proposed by the new, synestia theory. A giant collision smashed into the proto-Earth, vaporizing about 10 percent of the rock and liquefying the rest. This created a synestia. Over time, a little bit of liquid rock condensed near the center of the cloud of material. As the molten structure lost its heat, rock continued to condense and rain toward the synestia's center.

"The rate of rainfall is about 10 times that of a hurricane on Earth," Lock said. "Over time, the whole structure shrinks, and the moon emerges from the vapor. Eventually, the whole synestia condenses, and what's left is a ball of spinning, liquid rock that eventually forms the Earth as we know it today."

Lock said that the synestia theory is better than <u>the older impact theory</u>. One reason is that it better explains why the moon and Earth have similar isotopes, or element types: because they formed from the same cloud of molten material. The moon is also bereft of volatiles, which are substances such as hydrogen that have a low boiling temperature. The synestia theory suggests that this is because the moon formed at a high temperature of 4,000 to 6,000 degrees Fahrenheit (approximately 2,200 to 3,300 degrees Celsius).

Better yet, Lock explained, the collision doesn't have to take place from a certain angle to form a synestia. More collision angles are plausible for a synestia than for the older collision theory involving a young Earth and a Mars-size object smashing into each other.

"Basically, this is the first model that has been able to explain the complications and that has been able to do it quantitatively," Lock said. "This is a dramatically <u>different way of forming the moon</u>. You just don't think of a satellite forming inside another body, but this is what appears to happen."

Lock added that more work is planned to better define the theory, particularly concerning how the moon interacts with the vapor in the synestia. "When the moon is in this vapor, what does it do to that vapor? How does it perturb it? How does the vapor flow past the moon? These are all things we need to go back and examine in more detail."

# NGC3699: Planetary Nebula in Centaurus by Harry Roberts

#### NGC3699: Planetary Nebula in Centaurus

History. NGC3699 is a puzzling object, first discovered by John Herschel at his Cape Observatory in 1834 with the 18.7 inch telescope: a nebula of some sort he decided, but not a planetary and catalogued it as "Bright, pretty Large and irregularly Round". It remained catalogued thus until about 1978 when it was recognized, belatedly, to be a type of planetary nebula (PN), becoming Perek Kohoutek designation PK 292 +1.1. Strangely, it is still plotted as a diffuse bright nebula in older catalogues.

The writer, now at a darker site, finally decided to investigate this supposed 'diffuse nebula' in Centaurus – located amid familiar star clusters and close to the great Eta Carina Nebula, NGC3372. With such 'company'- it's a wonder 3699 is ever noticed!

The first viewing, on a cold June night, showed something unfamiliar: neither a diffuse nebula nor a planetary! Perhaps I expected something like bright-blue planetary NGC3918 just to the NW. Whatever I was seeing was very different. The first impression (also noted by others) was of a miniature version of the Centaurus-A galaxy, NGC5128: the so-called 'hamburger'.

Overview: This PN is "pretty large" which is to say it is just over an arc min in size and is a polygonal shape, quite bright near the centre where it is, apparently, crossed by a dark lane; like the Centaurus A Galaxy. The 'lane' does not lie at the centre, but crosses a bit east of centre and divides 3699 into a larger western 'half' and a smaller eastern half. The larger 'bit' had a 'galaxy-like' brighter core too. Small stars peppered the surroundings; some are shown in the sketch (Fig).



This PN is an enigma: what is the dark lane? Our view in the 10inch is but a 'snapshot' and long exposures (ESO etc.) show a more complex object twice what we see. It seems our view shows just the central part of a bright gas shell surrounding an active star. The shell is likely excited to shine brightly by the star's radiation which may be strongest at its opposite poles. As well, a vacant region seems to have been blown in the nearby surrounding gas by stellar radiation. This 'hole' in the surrounding gas cloud can emit little light – it's almost a vacuum and would be dark. Deep images suggest the dark 'lane' is a vacancy in the nebula rather than lane of dark cold dust as in NGC5128.

# NGC3699: Planetary Nebula in Centaurus by Harry Roberts

## Cont...2

The brightest parts are seen to be bright knots excited by shock fronts due to stellar ejecta impacting cooler stable gas and dust clouds. These fronts have swept the space between them and the host star clear of gas and dust – and the swept area is dark and transparent – indeed we can see stars on the other side of the nebula (Wiki ESO pic). This object, then, may be a PN in an early stage of evolution; over time perhaps, it will grow into the more familiar large empty sphere with a light emitting shell still surrounding the host star/s. Maybe. There will be many other explanations. But 3699 provides a wonderful glimpse into the dynamics of planetary nebulae. Again this has no common name and is not a well known object; a good target for mid-size scopes.

#### Clear skies!



# NGC5189: Planetary Nebula in Musca by Harry Roberts

History. NGC5189 is a strange object, first recorded in 1826 by 'Aussie'<sup>1</sup> James Dunlop at his Parramatta home 'observatory' with a 9 inch reflector; he was in a big hurry! His 'boss', Rumker, having clashed with Gov. Brisbane, had quit to live in Camden and Brisbane was busy governing. So Dunlop set out to record the entire southern deep sky from his own backyard and had about a year in which to do it; his Catalogue is a remarkable feat.

He viewed Dunlop object 252, NGC5189, only twice and wrote: "A very faint nebula about 25" (arc sec) diameter" noting some nearby stars. Clearly, he thought it a nebula of some sort, but not a planetary nebula (PN). It is now recognized as a type of planetary, gaining the Perek Kohoutek designation PK 307 -3.1. His position for D252 (when precessed) is very close to the modern site.

What do we see? In an 8 or 10 inch scope we see an irregular 'branched' object that is fairly bright for a PN, with a wide central bar and 'arms' at each end – a bit like a barred spiral galaxy (Fig, left). I've not been able to see any colour, just a neutral grey; OIII filters help a little. Several stars are involved though the central star, the source of the nebula, is invisible. While 'Jamie' had it 25 arc sec in size the modern value is 150 arc sec; it's not a small PN.

Modern images (Hubble etc.) show the object's size is about twice what we can see, mainly due to its outer 'streamers' being red H-alpha emitters. Our eyes don't see H-alpha unless the source is very bright; so our view is mostly of the inner blue-green OIII and H-beta parts. If we take the blue channel of a Hubble image (Fig, right) and compare it with what we see in a ten inch 'scope we find the major parts of the planetary are visible in our 'scopes – but the outer red 'bits' are unseen.



# NGC3699: Planetary Nebula in Centaurus by Harry Roberts

## Cont...2

While at first 5189 was classed as an emission nebula it is a now confirmed to be a planetary nebula PN (Wiki) with streamers or 'jets' of ejecta from a central WR type star that has recurrent outbursts and is "a rare low mass WR primary with a white dwarf companion". As the main star rotates the jets are thrown out from the source to form an abstract shape rather than the more familiar spherical shell of most such nebulae. N5189 is sited just 2000ly away, presumably in the Carina arm of our Galaxy.

Yet N5189 can be hard to find, but it is just SE of the "Coal Sack" dark nebula (see "Astronomy 2018" Map1 pg75). It is well worth the effort of finding as this type of PN is rare. Though at times called the "Spiral Plane-tary" this is not a widely known southern object despite its central location in our sky – yet were it a northern hemisphere object it would have a common name and be very well known. Coming into the southern summer sky the "Spiral Planetary" is an impressive sight – take a look.

Clear skies!

1. I've dubbed Dunlop an 'Aussie' since, like some early arrivals, he returned to live in Australia after his 'stint' and is buried at Kincumber on the central coast, where his lathe and parts of the 9inch 'scope are held in a small museum.

# 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).

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

Mar-17, Apr-14, May-12, Jun-16, Jul-14, Aug-11, Sep-8, Oct-6, Nov-10, Dec-8

# **More Monthly Meeting Information**

## The AGM was held at the July monthly meeting. Elected officials for 2017 - 2018

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	The deadline for Articles for the Astro Flyer is The First Friday of the Month.
PO BOX 1053 Nowra NSW 2541	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.