Shoalhaven Astronomers Inc.
www.shoalhavenastronomers.asn.au

Volume 18
Issue 4

Astro Flyer

APRIL 2018

Club News

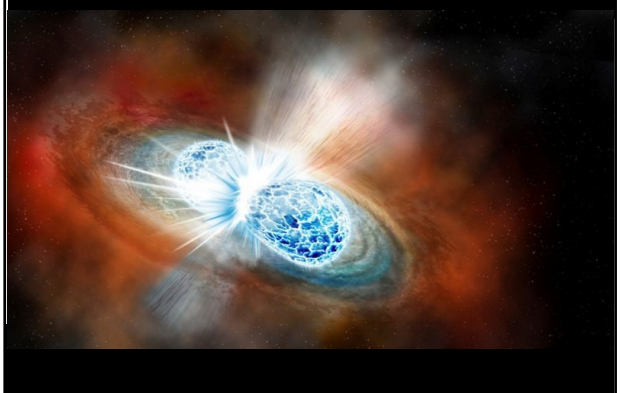
Hello All,

Well, we had a successful Astro BBQ on Sunday, March 25th. The weather was almost perfect but there were high clouds obscuring the sun from the H-Alpha solar telescope. Try as we might we couldn't get an image in the scope. However, six club members and two friends of the president found there way to Marriott Park and enjoyed BBQed sausage sandwiches, and my own homemade coleslaw. Great chat was interchanged on that lazy Sunday afternoon. All told we inhabited the park for two and a half hours. We'll do it again real soon.

President Frank Gross

Next monthly meeting will be held at the Shoalhaven Campus of the Uni of W'Gong, George Evans Road off Yawal Road, West Nowra, April 20th, 6.30 for 7.00 start. See you there.

Contents



MOON PHASES

New Moon	First Quarter	Full Moon	Last Quarter
16 April	23 April	30 April	8 May

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 12 May (back-up night Sun 13 May) 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).

More viewing nights page11

OUT THERE
Bob Turnbull OBSERVATION OFFICER

OUT THERE MAY-JUNE

CONSELLATIONS For those of us who haven't realised it, even if you stay up viewing all night, there will always be some parts of the visible sky not viewable from every place on Earth.

In the Southern Hemisphere. The further North a constellation is, the quicker it is lost from view but the further South the constellation is the longer it stays in view, and is even seen all night because it is revolving around the circumpolar and never sets. The Viewing notes assume you are in a middle Southern Hemisphere position, around mid- month but comments and the time of the evening when the Star Maps for each month show the best time to view.

THE PLANETS
MERCURY Best seen in the early morning until midmonth and on the 14th of May it is between at slender crescent on the Moon and Uranus, and if viewed with low powered binoculars, away from Mercury.

VENUS In the early Western evening sky in Taurus then moves into Gemini and passes M35 on the 21st.On the 28th it will be 0.4degrees from Epsilon.

MARS Rises in the late evening Eastern sky within Sagittarius then Capricornus. On the 14th- 15th I will be close to 8.5 magnitude globular M75 passing it at 0.5 degrees. The Moon will rise below Mars (see sky view page 28).

On May 23rd the commencement of the Martian equinox starts its autumn and southern spring and its disc will expand to 13 arc seconds in mid month. Seeing the South Polar Cap, emerging from the dark of winter. Notice that it will shrink as the warmer season approaches. Notice also that the South polar Hood which have been gathering over the SPC in late summer could be thinning to show the Life Saver effect (Dark centre in the middle of a lighter ring).

In June Mars rises around 8pm mid month within Capricornus the-1.6 magnitude dominates the 3rd and 4th stars producing the "smile in the sky " effect. Mars then starts a retrograde motion against the background stars at Month's end (p.84 to view for a large insert illustration) In JULY it reaches -2 magnitude and 20 arc seconds by month's end.

JUPITER Is at Opposition on the 9th of May and is a brilliant object in the eastern sky since March. Being -2.5 magnitude, it is third in brilliance from Venus and the Moon (on the western side) at 45 arc seconds compared to 50 arc seconds when it is closest to us in 2023.So plenty to see around this planet to entertain most AA's.By the 3rd and 4th of May an orange 5th magnitude star Nu (v) Librae can be seen 0.1 degrees from the planet. Even though it is around the same size as the Galilean moons it will be below their plane, plus the obvious colour difference. In June it will be past opposition, starting the month 1.0 degree from Libra's duo of Alpha stars in the eastern evening sky. Have a look for the remnants of the great storm first observed in 1664, known as the great red spot. Keep in mind that due to its 10 hour rotation things happen quicker than some other planets so the best time to see it is one hour each way of the meridian.

SATURN Rising in the mid evening eastern sky in May within 2.0 degrees of M22 for the rest of this month, but becomes the jewel to view in June during opposition.

Good Skies and Happy Viewing, Bob Turnbull

A Search for Southern Doubles

Episode 14: Corvus the Crow

As summer constellations leave our sky, the bright blue/white first magnitude star Spica is visible after dark on our eastern horizon. Sitting just above it in the night sky is the quadrilateral of stars that outline the constellation of Corvus, The Crow.

Look for the recognisable shape of Corvus, just above Spica (see map below to find the listed doubles:

1. Delta Cor. Ra 12hr.29m; Dec -16.30. mag. 3/8.5 sep 24.2".
Delta is one of a visual double and of the main stars in the group, nearest to Spica. This wide pair is easy to split in a small scope at medium power. I found the pair yellow and orange with contrasting brightness.

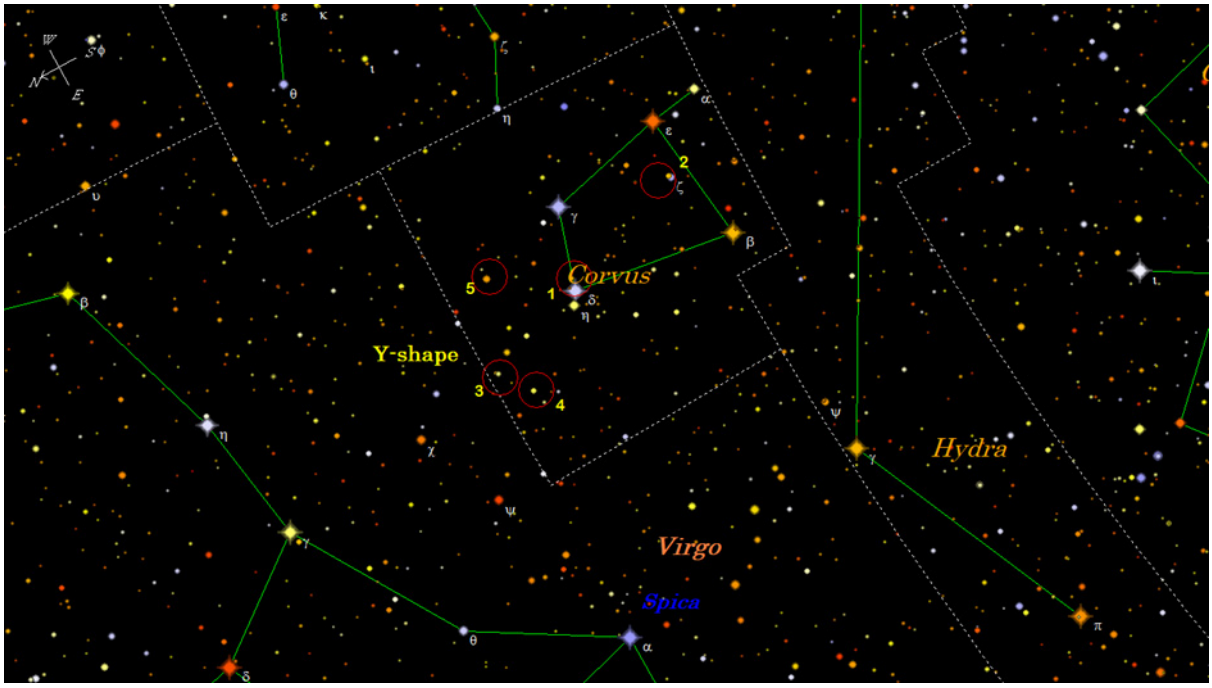
2. Zeta Cor: RA 12hr.20m; Dec -22.12 degrees. Mag. 5/13; sep 11.2" The main star is part of a visual double inside the main group and between Beta and Epsilon. The primary star which is light orange is easily seen but the companion though well separated is quite faint and requires at least a 6" scope. The colours are orange and light blue.

3. Three degrees NE of Delta lies a Y-shaped group of mag 6 stars(see map below).At the base of thi group lies Struve(Σ) 1659. This is a classic triple star **STF 1659: RA 12hr.35m; Dec -12.02; mag. 7.9/8.3; sep 28"** At moderate power you will observe a triangle of stars inside yet a wider triangle of brighter stars.

4. Struve(Σ) 1669.RA 12h.41m; Dec -13.01, mag 5.9/5.9/10.3; sep.5.2" and 60".
Moving 1.4 degrees SE of 1669 lies the almost equal pair of dazzling yellow stars separated at medium power in steady seeing. Look for a more distant 3rd star in the field which many describe as Lilac in co our.

5. Struve[Σ] 1604.RA 12h.09m; Dec.-11.51. mag.6.6/6.9/8.1; sep 9.2",10.4"
This truly is the gem of the collection! It is a little more difficult to locate, lying 3.4 degrees NW of De taCor. (see map below). However, it is worth the search as it reveals a miniature and close triangle of stars, with two stars almost equal but the third several magnitudes fainter.

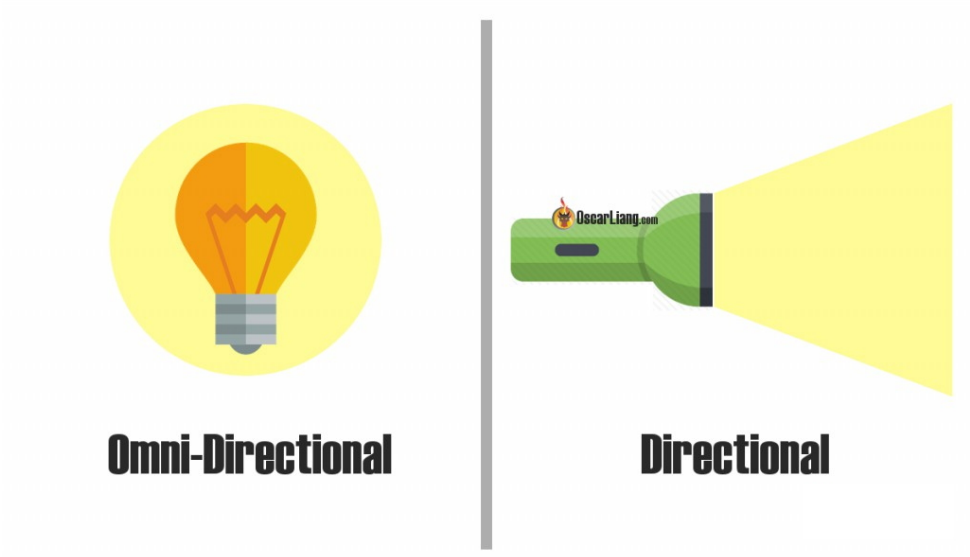
Cont...2



Astro Events from Frank Gross

If there was an Earth-like civilization in a close by star system (e.g. <20 l-y), would we have noticed it by now? Gleaned from Quroa

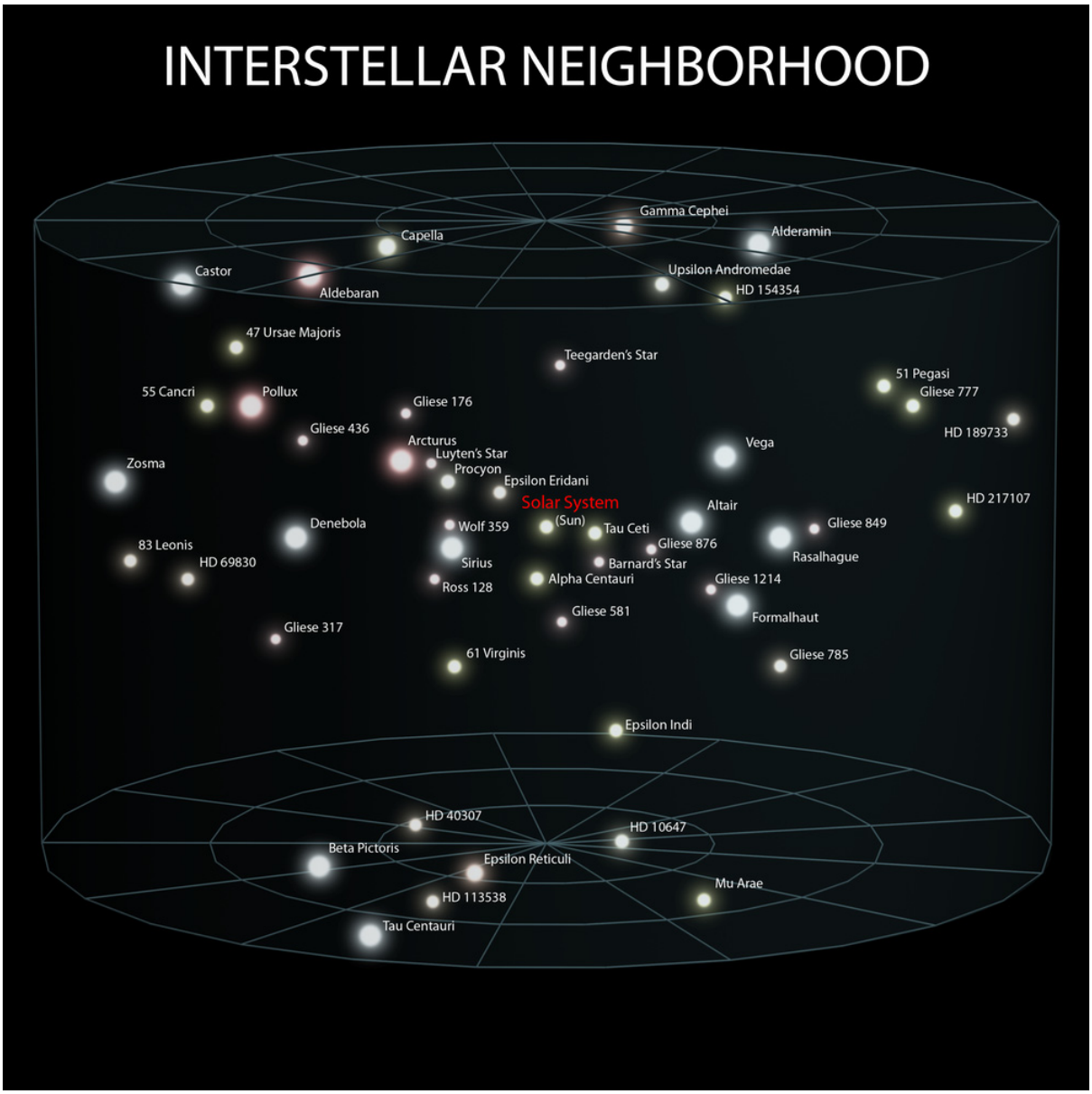
If you took the most powerful radio transmitter ever built and put it in orbit around the nearest star…
…then the most sensitive radio telescope ever built on Earth could not detect its transmissions.
There is a slight caveat to that…I should have said: "…the most powerful omnidirectional radio transmitter ever built…"
I believe that if we beamed a highly directional signal right at them, we could get enough energy into it for it to be detectable at the distance of Alpha Centauri.



So in order for us to find aliens orbiting that nearest star - it seems likely that they'd have to be beaming a signal right at us at precisely the time when we'd be listening with a radio telescope pointed in exactly their direction. That's actually rather unlikely. Conversely - in order for them to hear us - we'd have to be sending a narrow-band signal right at them. Now - we have tried to do that - I believe on a couple of occasions. But it wasn't done for very long…a matter of hours…a decade or two ago.

So maybe the alien planet was on the far side of their sun at the time…maybe they weren't listening for signals from our part of the sky back then…maybe our signal wasn't composed of information presented in the form of an interpretive dance - which is the only way they communicate? (Like bees do!)

Cont...2



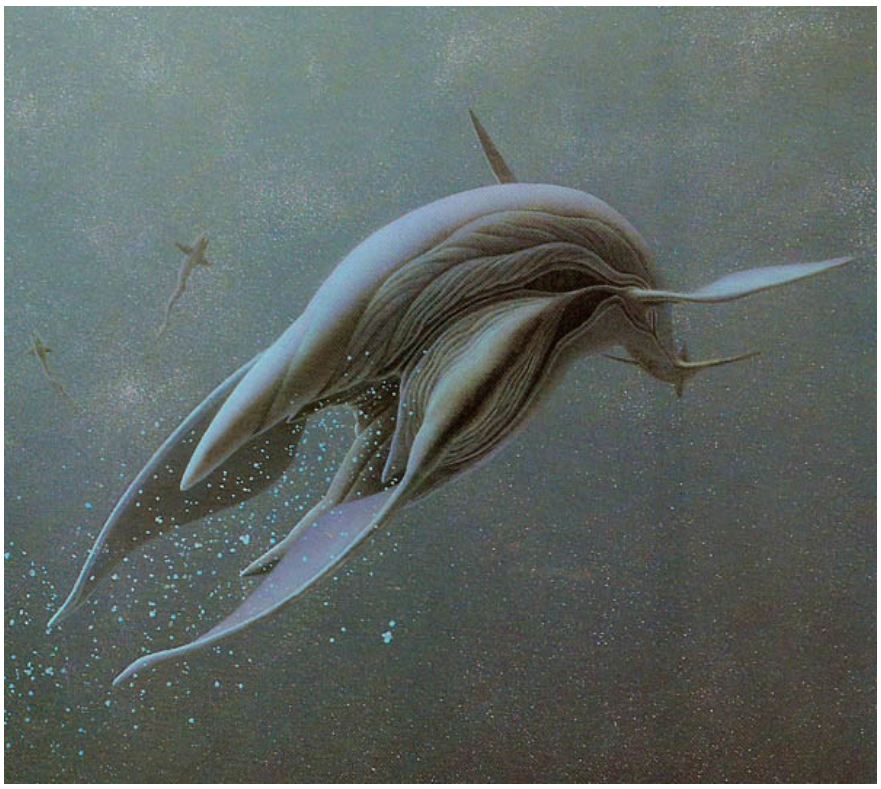
Maybe they did hear us - maybe they sent us a narrow-beam response - but if SETI didn't happen to be looking at their part of the sky at the time - maybe we wouldn't have heard them either. Maybe they have the technology to spot industrial emissions, figured out that there was intelligent life here - beamed massively powerful radio signals to us over a period of 100 years with huge signal strength - but gave up when we didn't reply…all of which happened 200 years ago before we had radio telescopes.

Maybe they are creatures that live for a million years but have thought processes 10,000 times slower than ours. They got our signal and have been spending the last 50 years deciding what to do about it. Maybe they live in a place like the moons of Jupiter and Saturn in a liquid ocean under a kilometer of ice. Maybe they didn't invent radio signals because they don't work well underwater.

Astro Events from Frank Gross

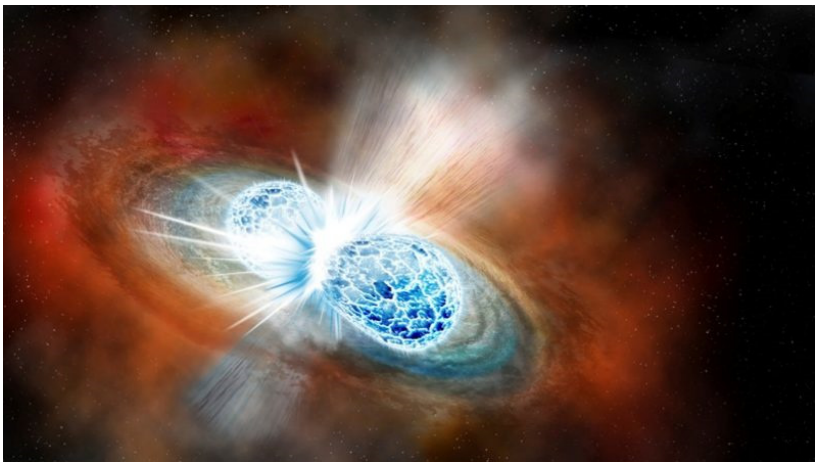
Cont...3

In terms of radio transmission civilizations - we're pretty new to this game.
There are MANY things that could cause two civilisations that are a mere 4 light years apart to fail to communicate.



Scientists Witness Huge Cosmic Crash, Find Origins of Gold

OCTOBER 16, 2017
Scientists Witness Huge Cosmic Crash, Find Origins of Gold



This illustration provided by the Carnegie Institution for Science depicts the collision of two neutron stars detected on Aug. 17, 2017. (Robin Dienel/Carnegie Institution for Science via AP)

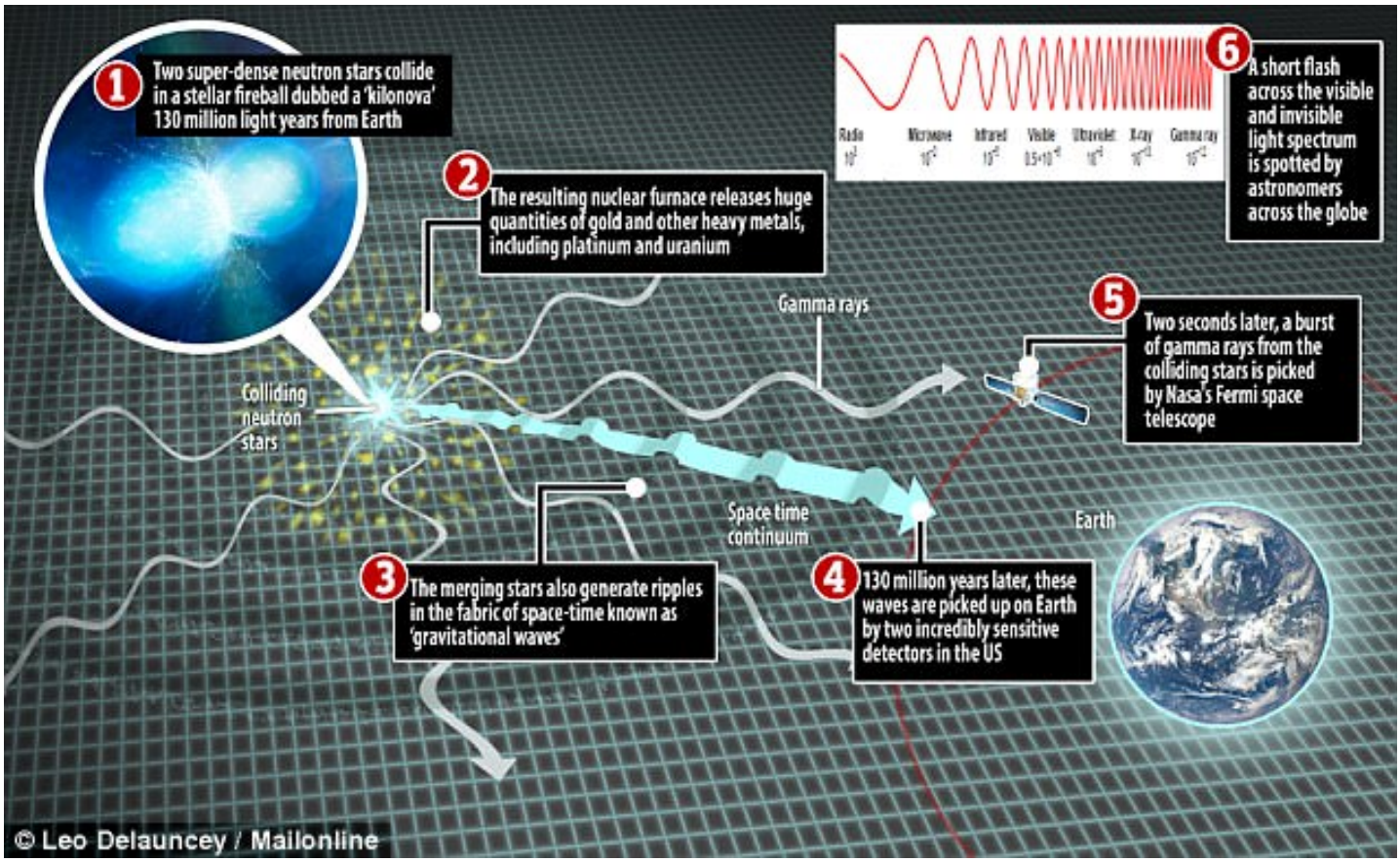
It was a faint signal, but it told of one of the most violent acts in the universe, and it would soon reveal secrets of the cosmos, including how gold was created.
Astronomers around the world reacted to the signal quickly, focusing telescopes located on every continent and even in orbit to a distant spot in the sky.
What they witnessed in mid-August and revealed Monday was the long-ago collision of two neutron stars — a phenomenon California Institute of Technology's David H. Reitze called "the most spectacular fireworks in the universe."

"When these things collide, all hell breaks loose," he said.
Measurements of the light and other energy emanating from the crash have helped scientists explain how planet-killing gamma ray bursts are born, how fast the universe is expanding, and where heavy elements like platinum and gold come from.

Astro Events from Frank Gross

Cont...4

"This is getting everything you wish for," said Syracuse University physics professor Duncan Brown, one of more than 4,000 scientists involved in the blitz of science that the crash kicked off. "This is our fantasy observation."
It started in a galaxy called NGC 4993, seen from Earth in the Hydra constellation. Two neutron stars, collapsed cores of stars so dense that a teaspoon of their matter would weigh 1 billion tons, danced ever faster and closer together until they collided, said Carnegie Institution astronomer Maria Drout.



The crash, called a kilonova, generated a fierce burst of gamma rays and a gravitational wave, a faint ripple in the fabric of space and time, first theorized by Albert Einstein.

The signal arrived on Earth on Aug. 17 after traveling 130 million light-years. A light-year is 5.88 trillion miles. NASA's Fermi telescope, which detects gamma rays, sent out the first alarm. Then, 1.7 seconds later, gravity wave detectors in Louisiana and Washington state that are a part of the LIGO Laboratory , whose founders won a Nobel Prize earlier this month, detected the crash. It issued a worldwide alert to focus telescopes on what became the most well-observed astronomical event in history.

Cont...5 **One part of the Ligo Observatory**

Before August, the only other gravity waves detected by LIGO were generated by colliding black holes. But black holes let no light escape, so astronomers could see nothing. This time there was plenty to see, measure and analyze: matter, light, and other radiation. The Hubble Space Telescope even got a snapshot of the afterglow.

“The completeness of this picture from the beginning to the end is unprecedented,” said Columbia University physics professor Szabolcs Marka. “There are many, many extraordinary discoveries within the discovery.” The colliding stars spewed bright blue, super-hot debris that was dense and unstable. Some of it coalesced into heavy elements, like gold, platinum, and uranium. Scientists had suspected neutron star collisions had enough power to create heavier elements, but weren’t certain until they witnessed it.

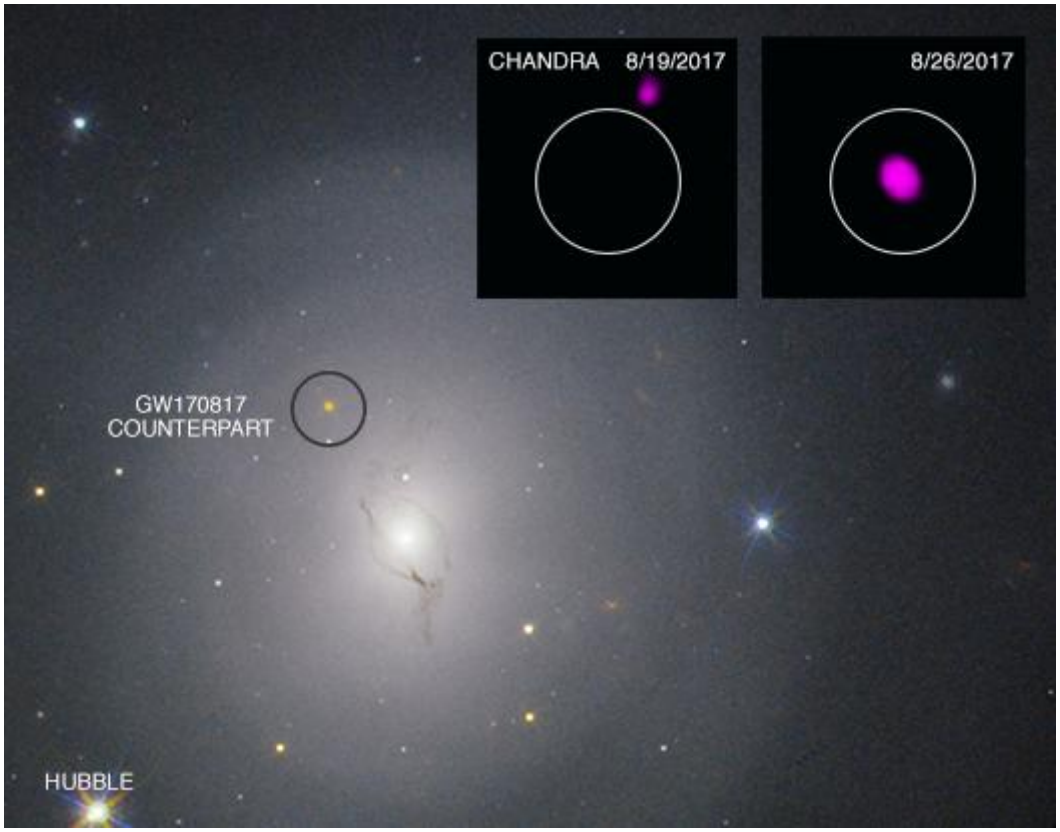
“We see the gold being formed,” said Syracuse’s Brown. Calculations from a telescope measuring ultraviolet light showed that the combined mass of the heavy elements from this explosion is 1,300 times the mass of Earth. And all that stuff — including lighter elements — was thrown out in all different directions and is now speeding across the universe.

Perhaps one day the material will clump together into planets the way ours was formed, Reitze said — maybe ones with rich veins of precious metals. “We already knew that iron came from a stellar explosion, the calcium in your bones came from stars and now we know the gold in your wedding ring came from merging neutron stars,” said University of California Santa Cruz’s Ryan Foley.

The crash also helped explain the origins of one of the most dangerous forces of the cosmos — short gamma-ray bursts, focused beams of radiation that could erase life on any planet that happened to get in the way. These bursts shoot out in two different directions perpendicular to where the two neutron stars first crash, Reitze said.

Astro Events from Frank Gross

Cont...6



In this image, the left panel shows the galaxy where the neutron star collision occurred. The right panel shows the optical glow of the collision (Supplied: David Coward/Zadko Telescope)

Luckily for us, the beams of gamma rays were not focused on Earth and were generated too far away to be a threat, he said.
Scientists knew that the universe has been expanding since the Big Bang. By using LIGO to measure gravitational waves while watching this event unfold, researchers came up with a new estimate for how fast that is happening, the so-called Hubble Constant. Before this, scientists came up with two slightly different answers using different techniques. The rough figure that came out of this event is between the original two, Reitze said.

The first optical images showed a bright blue dot that was very hot, which was likely the start of the heavy element creation process amid the neutron star debris, Drout said. After a day or two that blue faded, becoming much fainter and redder, and after three weeks it was completely gone, she said.

Scientists involved in the search for gravitational waves said this was the event they had prepared for over more than 20 years.

The findings are “of spectacular importance,” said Penn State physicist Abhay Ashtekar, who wasn’t part of the research. “This is really brand new.”

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:

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

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

Editor Kaye Johnston

Club Video Projector Rental

The Video Projector is available for club members for a small rental fee. If a club member would like to project a football game, cricket game onto a wall for a party this is the way to go. You will get up to a 100 inch diagonal picture on a light coloured wall with the Epson video projector. The projector has an inbuilt speaker but you can add your own speaker units if necessary. The unit s very easy to use and instruction would be given before the borrowing (2 days) occurs. The rental price is set at present at $15 for two days.