Shoalhaven Astronomers Inc.
www.shoalhavenastronomers.asn.au

Volume 23
Issue 11

Astro Flyer

NOVEMBER 2023

Club News

President's Report.

One night from November 20th to 24th (the night will have to be a clear skies one) I am going to use the Shoalhaven Observatory to photograph objects on the Moon. I want to use the different powers the telescope has to offer and also want to do some videoing. All this will be for gathering data for a future talk on aspects of the Moon. If you are a member of the club and have the ambition and the observatory training to do some Astrophotography please consider booking YOUR night at the Shoalhaven Observatory.

The next monthly meeting will be on November 17th in the large lecture hall in the Ray Cleary Admin building:

- At 6pm tours of the observatory
- 7.00pm welcome, and introduction to Shoalhaven Astronomers Association, and welcome by the UoW
- 7.10pm a 1 hour talk given by me titled "Amateur Astronomy" which is basically the same talk I gave at the Science Expo, covering all the different aspects of astronomy which might be of interest to amateur astronomers.

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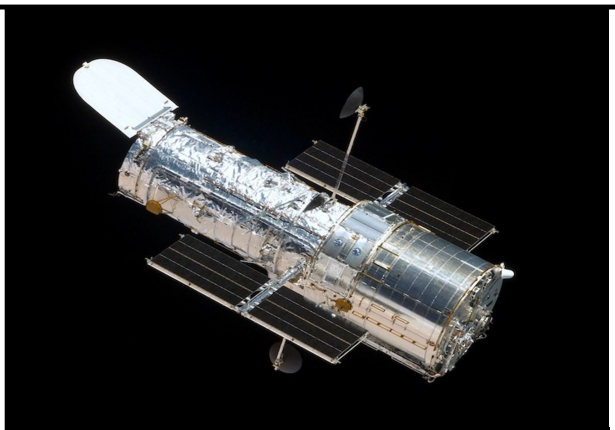

MOON PHASES

New Moon	First Quarter	Full Moon	Last Quarter
Dec13th	Nov 20th	Nov 27th	Dec 5th

Viewing Nights

We are aiming, once daylight saving is over, to make observing at Friday meetings a priority if the weather permits.

New and Last Quarter moon phases are good times for Dark Sky Observing.

The President's Report Continued

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- 8.10pm Refreshments provided by UOW

8.30pm possible projection of Jupiter and Saturn (the moon does not rise until 8.23pm) into the lecture theatre.

Finally, don't forget the Christmas dinner to be held at the Bomaderry Hotel, Meroo Street, Bomaderry at 7:30 PM on December 15th. You buy what you want to eat (I hear the food is pretty good) and have a night chatting with club friends.

Frank Gross (2023)

Observatory Report Mark Town

The RC-14A , the Esprit 100 and the Evostar 72 are now all mounted on the CEM120 mount (see picture). And the observatory can now be used for some operations.

The operations that will be available from the 18Nov23 are:

Manual observing through the Esprit 100
Manual observing through the RC-14A
Camera observations through the EvoStar 72 via the SharpCap program on the PC
Camera observations through the RC-14A via the SharpCap program on the PC
Computer assisted observing – i.e. using the PC and a planetarium program to control the telescope – point & shoot!

The eyepieces currently available are a 42mm Vixen and a 9mm Delite. If you have a favourite eyepiece, you are welcome to bring it along and use that instead.

Training in the use of the observatory is available and will be delivered to interested SA members on a demand basis. To use the observatory you need to do at least the first 3 training modules:

- Work Health & Safety
- Observatory Overview, and
  Manual Visual Observing.

We will be running a training session at the observatory starting around 5pm ahead of the public information night on the 17Nov23.
The training is easy to do and done in the observatory in small groups so each person gets some practical experience of using the systems. I encourage all of you to get the training so you can start to enjoy the observatory and what it can offer SA members.

Time on the observatory can be booked via the Members Area / Observatory Activities page on our website. You will need a username and password to login so message or email myself at marktown@shoal.net.au for that information.

Best Regards,
Mark Town

Observation Report Andrew Wood

What's on in the Cosmos –November/December 2023

Our November 17 meeting occurs mid-way between New Moon and First Quarter. The club's viewing night at the Shoalhaven Observatory on November 18 will accompany a crescent Moon which will not set until after midnight.

Moon Phases

New Moon	13th November	Dark all night
First Quarter	20th November	Dark after midnight
Full Moon	27th November	Enjoy the Moon
Last Quarter	5th December	Dark before midnight
New Moon	13th December	Dark all night

Planets

Mercury is visible in the western evening sky, highest on December 4, after which it becomes harder to see as December progresses.
Venus remains in the east before sunrise. Telescopically it is gibbous.
Mars is hidden from view until Jan 2024.
Jupiter reached opposition Nov 3 at nearly 50 arcseconds in diameter. Prime viewing time through November and December. At magnitude -2.9, nothing apart from the Moon will be nearly as bright in the night sky.
Saturn is still prominent at about magnitude 1 in the north-western evening sky after sunset. Past opposition, its disc is still around 17 arcseconds.
Uranus is at opposition Nov 14. At 4 arcseconds in diameter and magnitude 5.6 it will show as a blue-green planetary disc through a telescope.
Neptune at magnitude 8, a telescope is required to see the outermost of the planets. It has a disc of 2.3 arcseconds in diameter and is visible from evening until the early hours of the morning. On November 22 the slightly gibbous Moon is about a degree away from the planet.

Comets

At a predicted magnitude of 8, **Comet 62P/Tsuchinshan 1** will be 1 degree north of the famous Beehive Cluster (M44) on the morning of November 15. Predicted to brighten further in December, early December sees it in the sickle of Leo, then moving to within 1 degree of the M65/66 pair of galaxies in Leo. Should make a great wide field telescopic sight and imaging opportunity.
Plenty of other faint telescopic comets around. See *Astronomy 2023.*

Observation Report Andrew Wood

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Meteor Showers

	Active	Maximum	ZHR at maximum	Moon phase at maximum
Northern Taurids	**Oct 20-Dec10**	**Nov 13**	**5**	**New**
Leonids	**Nov 6-30**	**Nov 18-19**	**10**	**First quarter**
Phoenicids	**Nov 28 – Dec 9**	**Dec 2**	**Variable**	**Last quarter**
Puppid-Velids	**Dec 1-15**	**Dec 7-8**	**10**	**Last quarter**
Geminids	**Dec 4 -17**	**Dec 14-15**	**150**	**New**

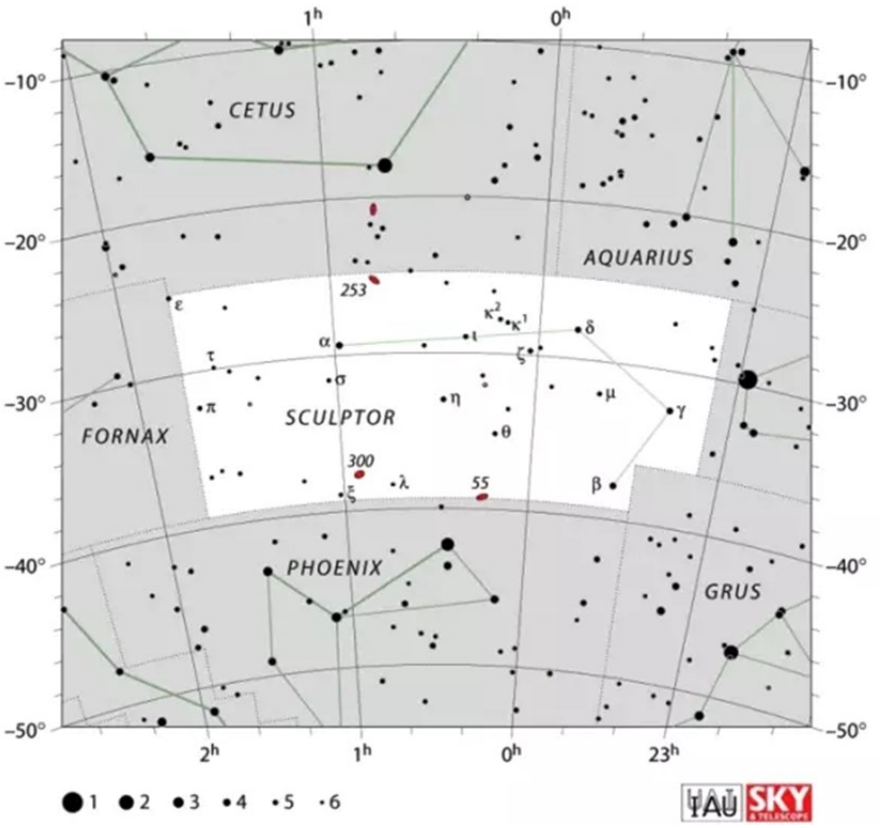
Beyond the Solar System

Heading into summer and with daylight saving in effect, the sky will not be completely dark until around 10PM. The Magellanic Clouds, mentioned in the previous *Astroflyer*, are high and prominent in the south.
A bit further north, the constellation Sculptor contains many bright, large, galaxies. Shown in the map below,

NGC 55 (magnitude 8.1) and NGC 253 (magnitude 7.1), also known as the Sculptor Galaxy, are bright enough and large enough to be detected with binoculars under a dark sky; and both are wonderful objects through a telescope. Also shown is NGC 300, which is magnitude 9 and very large at 20 arcminutes across: smaller than both the previously mentioned galaxies.

There are many other galaxies in Sculptor. For something different, there is also the bright (mag 8.1) globular cluster NGC 288. Not shown on the map below, it lies between α-Sculptoris and NGC 253. It's more irregularly shaped than a typical spherical globular.

NGC 288 is within our own galaxy at 27,000 light years distant from the Sun. The galaxies mentioned above are between 4 and 11 million light years distant from our own galaxy.



Always great to read and hear reports of observations of Solar System and Deep Sky Objects made by members, either visual descriptions or via images. Write a report of your observations for the *Astroflyer* or request a spot to speak at meetings.

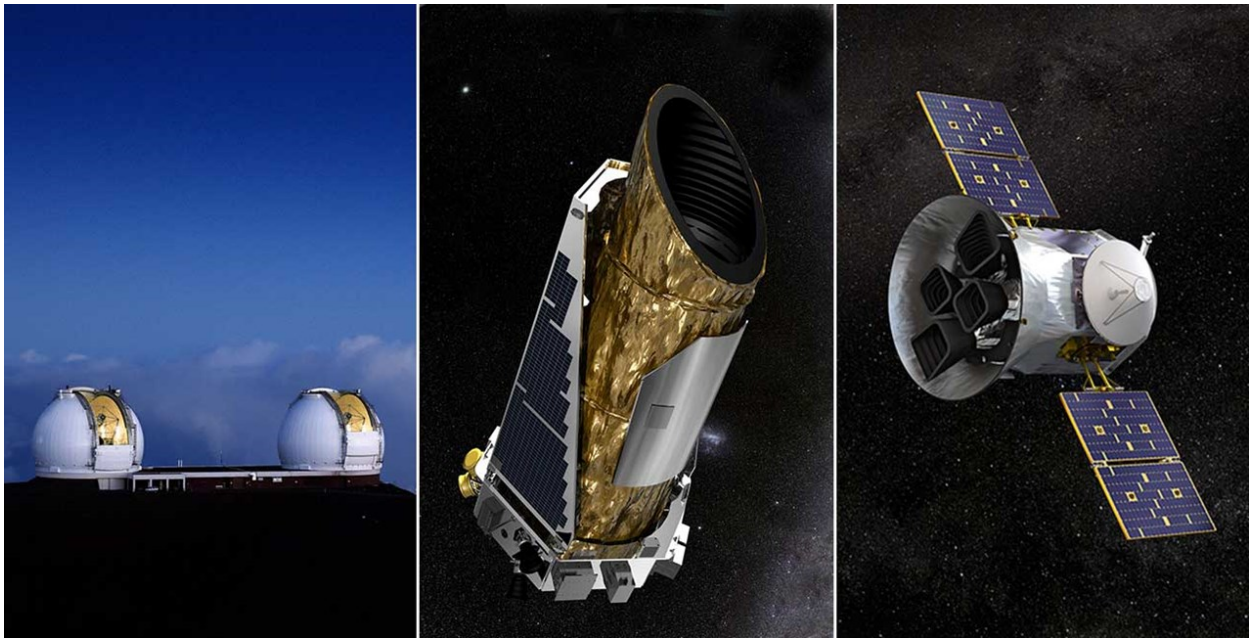
Clear skies and happy viewing.
Andrew Wood.

Astro Events from Frank Gross

How NASA Finds Planets

How many space telescopes does NASA have?
NASA has several space telescopes studying the universe right now:

Hubble
Swift Gamma Ray Burst Explorer
the Transiting Exoplanet Survey Satellite (TESS)
Chandra X-ray Observatory
Fermi Gamma-ray Space Telescope
NuSTAR (Nuclear Spectroscopic Telescope Array)
the Neutron star Interior Composition Explorer on the International Space Station
the Imaging X-ray Polarimetry Explorer (IXPE)
and the James Webb Space Telescope
The planet hunters



Observing from Earth, and from orbit

The very first planets detected around other stars were wild, extreme worlds. Some orbited a spinning stellar corpse – the core of an exploded star – called a pulsar, and were regularly raked by pulses of radiation. Another, a scorching gas giant with about half the heft of our own planet Jupiter, hugged its star so tightly that a year, once around the star, took only four days.

Their extreme nature, however, also made them easier to find with the early planet-hunting technology of the 1980s and ’90s. Ground-based observatories took the reins, providing the historic first burst of exoplanet discovery. The technology got better and the planet count ran into the hundreds. Still, Earth’s thick atmosphere and its rippling interference kept even the best ground-based telescopes from seeing more clearly.

Lifting our telescopes above the veil of Earth's atmosphere revealed a dazzling universe across the light spectrum. It also extended our reach in the search for planets around other stars. Now we count these confirmed distant worlds – exoplanets – in the thousands, many of them about the size of Earth and orbiting in their stars’ "habitable zones." The next generation of space telescopes will open new windows in the search for life as we peer into the atmospheres of these planets, and taste their skies.

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Historic timeline

April 1984
First planetary disk observed
The original discovery image of a disk of dust and gas around the star Beta Pictoris,was taken with the du Pont 2.5-meter telescope at the Las Campanas Observatory in Chile in April, 1984.

April 23, 1990
Hubble Space Telescope launched
Influential mission will later aid in the identification and study of exoplanets by watching for the dimming caused when a planet moves in front of its star.

January 1992
First exoplanets discovered
Aleksander Wolszczan and Dale Frail announce the discovery of two rocky planets orbiting PSR B1 257+12, a pulsar in the constellation Virgo. Because they are constantly bombarded by radiation from the dead neutron star that they orbit, these rocky planets cannot support organic life. A year later, the planet PSR B1620-26 b is found orbiting a binary system composed of a pulsar and a white dwarf. Located 1,170 light years from Earth, the planet, which is about two and a half times the size of Jupiter, takes over 100 Earth years to complete a single orbit. It is also the first planet found in a star cluster (globular cluster M4).

October 1995
First exoplanet found around a main-sequence star
Didier Queloz and Michel Mayor announce their discovery of the first planet orbiting a main -sequence star, 51 Pegasi. The planet, which is half the size of Jupiter, practically grazes the surface of its star, a revelation that baffles astronomers. Later discoveries indicate that this type of close-orbiting planet, nicknamed a "roaster," is a common phenomenon.
1999

First transiting exoplanet observed
Research teams led by David Charbonneau and Greg Henry independently observe a planet passing across the front of the star HD 209458 in the constellation Pegasus. This observation allows astronomers to analyze the atmosphere of the planet, which they believe contains water, oxygen, nitrogen, and carbon. Because of the planet's close orbit of its star, its atmosphere is being stripped off, forming a tail behind the planet similar to a comet's. Image: Artist's concept of the HD 209458 system. (credit NASA)
1999

First multi-planet system discovered
Researchers from San Francisco State University and the Harvard-Smithsonian Center for Astrophysics, working independently, announce the discovery of two additional planets orbiting the star Upsilon Andromedae in the constellation Pegasus. The three-star system is the first multi-planetary system discovered around another star. Image: A simulated view of the Upsilon Andromedae system. (Credit: Sylvain Korzennik)

April 4, 2001
First planet found within the "habitable zone"
Astronomers from Geneva University announce the discovery of HD 28185 b, a planet that orbits about the same distance from its star as Earth does from the sun. The planet, which is nearly six times as massive as Jupiter, is the first to be found in the so-called "habitable zone" around a star, where life could possibly exist. Image: La Silla observatory in Chile, site of the discovery. (Credit: ESO)

October 2001
First measurement of an extrasolar planet's atmosphere
Teams led by David Charbonneau and Timothy Brown use the spectrometer on the Hubble Space Telescope to analyze the atmospheric composition of a planet orbiting the star HD 209458.

June 22, 2003
MOST launches
Suitcase-sized Canadian space telescope is designed to detect brightness changes in stars, and can observe exoplanets transiting their host stars.

Astro Events from Frank Gross

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August 24, 2003
Spitzer Space Telescope launched
Infrared space telescope later begins observations of exoplanets, gathering both size and atmospheric data.

March 2005
First light from an exoplanet observed
Astronomers using the Spitzer Space Telescope announce direct observation of infrared light from an exoplanet for the first time, from planets HD 209458 b and TrES-1. This marks the first time that astronomers were able to see light emanating from a planet itself, and the beginning of a new type of direct observation of planets. The discovery allows the atmospheres, sizes and orbits of planets to be analyzed. Image: Artist's concept shows what a hot star and its nearby planetary companion might look if viewed close up in visible (left) and infrared light.

December 26, 2006
CoRoT satellite launched
French satellite detects planets as they transit across the surface of their stars. Discovers its first planet in May 2007.

May 2007
First map of an exoplanet
Astronomers David Charbonneau and Heather Knutson report using the Spitzer Space Telescope to create the first map of an exoplanet's surface. The rough map shows the temperature of cloud cover on the surface of HD 189733 b. (Credit NASA's Goddard Space Flight Center).

February 2007
First planets observed with spectroscopy
Gas giants HD 209458 b and HD 189733 b are the first two planets to have their spectra observed using the Spitzer Space Telescope, astronomers announce. The readings provide information about each planet's atmosphere. This method of detection is thought to be a way to observe signs of extraterrestrial life. [credit NASA, ESA, G. Bacon (STScI) and N. Madhusudhan (UC)]

March 6, 2009
Kepler planet-finding mission launches
A Delta II rocket carrying NASA's Kepler space telescope blasts off from Cape Canaveral Air Force Station in Florida. Kepler will stare for four years at a patch of sky containing 150,000 stars, watching for tiny dips in starlight as planets crossed in front of some of them. The pioneering spacecraft will find more than 1,000 confirmed exoplanets—a gold rush of discovery—before a malfunction ends its primary mission in 2013.

January 2011
Kepler's first rocky exoplanet discovered
NASA's Kepler mission announces the discovery of its first rocky exoplanet, and the smallest planet found outside the solar system up to that point. Kepler-10b, 1.4 times the size of Earth, has the density of an iron dumbbell, weighs in at 4.6 times the mass of Earth. It is also extremely hot, with an orbit more than 20 times closer to its star than Mercury to our sun.

September 2013
First exoplanet cloudmap created
Relying on data from the Kepler and Spitzer space telescopes, astronomers announce the creation of the first cloud map of a planet outside our solar system—a scorching world 50 percent larger than Jupiter called Kepler-7b. Spitzer helped astronomers determine that light from Kepler-7b's star was bouncing off cloud tops in the planet's western hemisphere.

April 2014
First Earth-sized planet in the habitable zone
The first Earth-sized planet orbiting within its star's habitable zone—where liquid water could exist on a planetary surface—is revealed by the Kepler space telescope team. Kepler-186f, just 10 percent larger than Earth and thought to be rocky, orbits a star about half the size of our sun some 500 light years away.

June 2014
A new mission is born
After mechanical troubles end its first four years of observation, the Kepler mission begins anew as K2, using the pressure of sunlight to help stabilize the space telescope. This requires switching to a new field of view every three months.

Astro Events from Frank Gross

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July 2015
Kepler discovers bigger, older cousin to Earth
Earth's "bigger, older cousin," Kepler-452b, makes its public debut. About 1.6 times the size of Earth, this planet's main claim to fame is its 385-day orbit around a G2-type star—very much like our own orbit, and very much like our own sun. Considered a "super Earth," Kepler-452b, if rocky, could have liquid water on its surface, although its true composition remains unknown.

May 2016
Kepler's largest batch of planets
The Kepler mission hauls in a historical cache of more than 1,200 exoplanets. Almost 40 percent could be rocky planets with a composition similar to Earth's. Image credit: NASA/W. Stenzel.

August 2016
Closest exoplanet discovered
A planet that is probably rocky and a bit more massive than Earth is discovered around our nearest neighboring star, Proxima Centauri. The new planet, Proxima b, orbits its star at a distance that could allow liquid water to form on its surface. Image credit: ESO/M. Kornmesser (artist's rendering).

February 2017
Seven Earth-sized planets found orbiting red-dwarf star
NASA announces the discovery of seven sibling planets orbiting TRAPPIST-1, a star some 40 light-years away. All are in Earth's size range and some are in the star's habitable zone. Future studies will help determine whether they have atmospheres, oceans or even potential signs of life. Image credit: NASA/JPL-Caltech (artist's rendering).

December 2017
Eight-planet system
An eighth planet is found in the Kepler-90 system – equal to our own solar system in having the largest number of known planets. All crowd closer to their star than Earth to our Sun. The discovery is made with the help of artificial intelligence.

April 18, 2018
TESS launches
In a two-year survey of the solar neighborhood, TESS will monitor the brightness of stars for periodic drops caused by planet transits. The TESS mission is expected to find planets ranging from small, rocky worlds to giant planets, showcasing the diversity of planets in the galaxy.

May 2018
Helium detected in an exoplanet atmosphere
The first-ever detection of the second-most common element, long anticipated, was made with NASA's Hubble Space Telescope. Helium was found in the atmosphere of WASP-107b, a gas giant more than 200 light-years from Earth.

August 7, 2018
TESS's first light
The latest planet-hunting space telescope delivers its first science image, a portrait of the Large Magellanic Cloud – one of our Milky Way's small, satellite galaxies.

November 15, 2018
Kepler ends observations
NASA bids "good night" to the Kepler space telescope, instructing it to sever communications with Earth after running out of fuel and ending science operations. The spacecraft, which discovered thousands of exoplanets over its nine-year lifespan, will continue to drift in a safe orbit around the Sun.

January 2019
TESS's first three planets
The freshly launched TESS space telescope finds its first three confirmed exoplanets: LHS 3844b, Pi Mensae c, and HD21749b. Image credit: NASA/MIT/TESS.

Astro Events from Frank Gross

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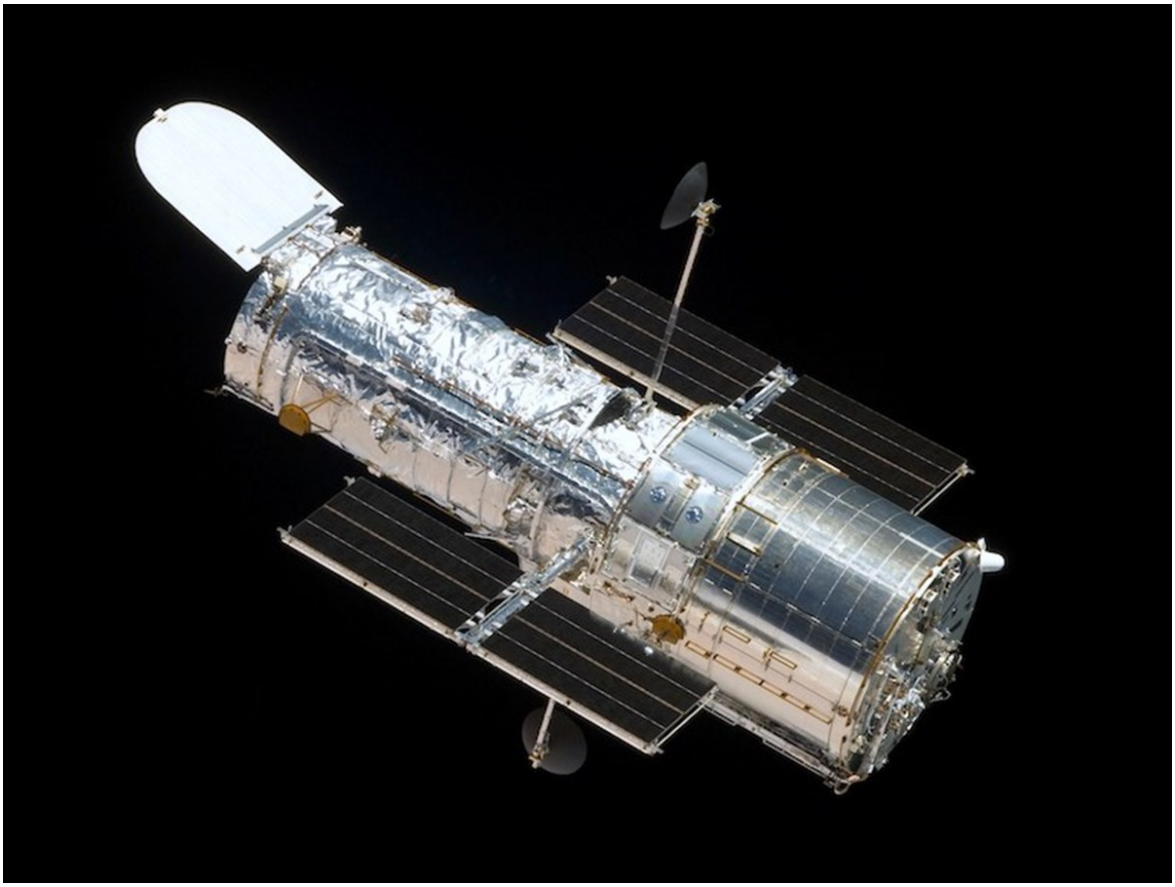
June 13, 2019
Planet counter hits 4,000
NASA's Exoplanet Archive announces 31 newly confirmed exoplanets discovered by ground and space-based telescopes. Five were detected by the recently launched TESS space telescope. They push the official planet count past the 4,000 mark for the first time.

December 25, 2021
James Webb Space Telescope launches!
The James Webb Space Telescope launched on Christmas Day, 2021. Seen here in our last look, still folded for launch, and moving away from Earth. Webb is finding the first galaxies that formed in the early universe and peering through dusty clouds to see stars forming planetary systems. It's also getting our best looks ever at exoplanet atmospheres.

March 21, 2022
Age of Discovery: 5,000 exoplanets!
The count of confirmed exoplanets ticks past the 5,000 mark, representing a 30-year journey of discovery led by NASA space telescopes. Not so long ago, we lived in a universe with only a small number of known planets, all of them orbiting our Sun. But a new raft of discoveries marks a scientific high point: More than 5,000 planets are now confirmed to exist beyond our solar system.

Legacy of light: Hubble

NASA's Hubble Space Telescope, marking its 30th anniversary in orbit in 2020, was a pioneer in the search for planets around other stars; Hubble even has been used to make some of the earliest profiles of exoplanet atmospheres.



Orbital photo of the Hubble Space Telescope in 2009. Image credit: NASA

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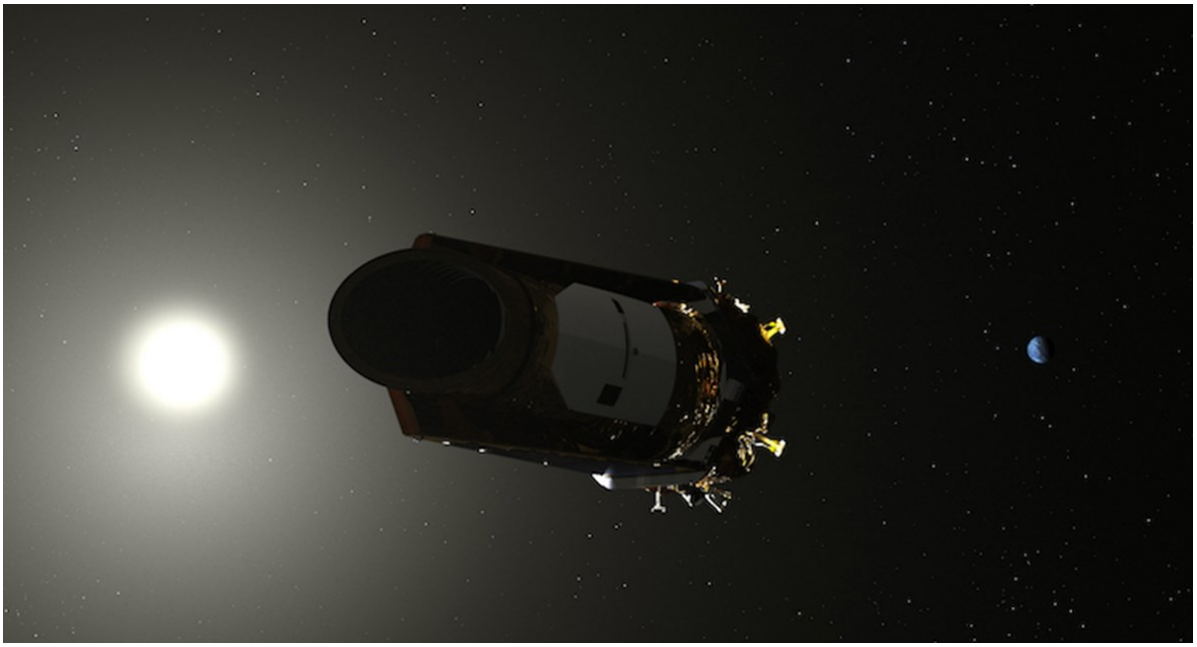
Kepler and K2

Another space explorer, NASA's Kepler Space Telescope, made history with its discovery of thousands of exoplanets, searching for tiny dips in starlight as the planets crossed the faces of their stars. In its first mission, from 2009 to 2013, Kepler monitored more than 150,000 stars, watching for tiny dips in starlight as planets crossed in front of their stars.

The first mission ended in 2013 when technical problems caused the spacecraft to lose much of its pointing ability. In 2014, it began its second mission, dubbed K2, and continued discovering exoplanets despite its diminished directional capability. Decommissioned in 2018, Kepler remains credited with discovering the most exoplanets of any mission so far – more than 2,600. Researchers are *still* finding planets in Kepler's data and will continue to for years.

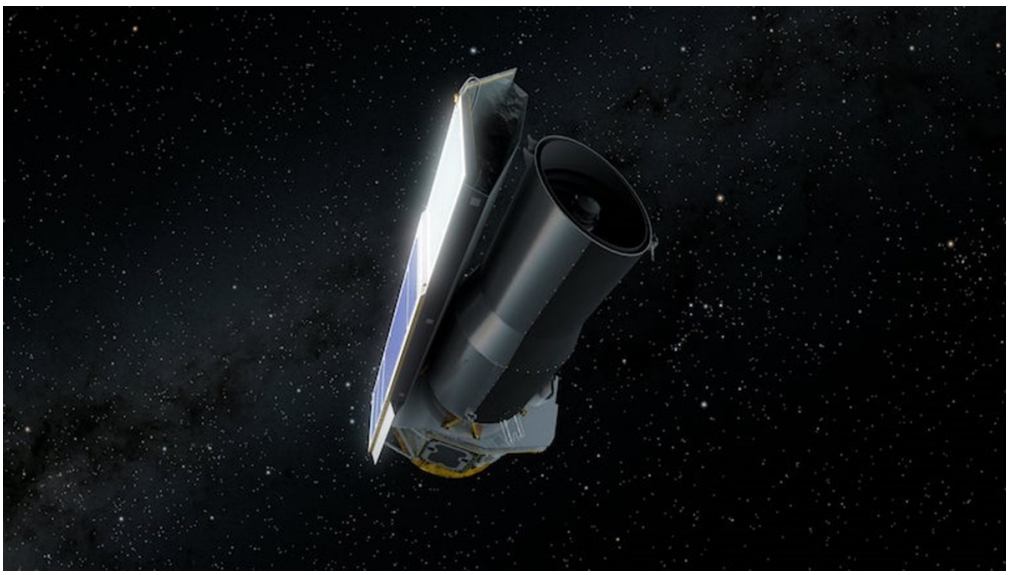


Artist's rendering of NASA's Kepler Space Telescope. Image credit: NASA

Spitzer

Spitzer probed the heavens in the infrared portion of the spectrum, capturing images of newborn stars nestled inside thick clouds of dust along with millions of other images.

The space telescope was retired in 2020 – although, like Kepler, the data it gathered will be mined by scientists for years to come, likely yielding a continuing stream of discovery



Artist's rendering of the Spitzer Space Telescope. Image credit: NASA/JPL-Caltech

Astro Events from Frank Gross

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A 2008 image of the star-forming region, Rho Ophiuchi, as captured by the Spitzer Space Telescope.

Image credit: NASA/JPL-Caltech/Harvard-Smithsonian CfA

One of NASA's four Great Observatories, a distinction it shares with Hubble, Chandra and the Compton Gamma Ray Observatory, Spitzer proved a powerful contributor to the hunt for exoplanets and analysis of their atmospheres. Among its most celebrated work is the detection of seven planets roughly the size of Earth orbiting a star called TRAPPIST-1; Spitzer was able to determine both the masses and densities of these worlds. It ended its 16-year observing run in January 2020.

Taking the baton: TESS

The Transiting Exoplanet Survey Satellite (TESS) picked up where Kepler and K2 left off, again conducting a grand survey of the sky. But while Kepler in a sense drilled core-samples into the heavens – taking deep, penetrating looks into small patches – TESS's star pictures are painted in broad strokes. TESS is conducting a nearly all-sky survey in sequential segments, first the dome of stars that would be seen from the Southern Hemisphere, then the Northern. Its mission is to find planets around brighter, closer stars, again by searching for shadows: the incredibly tiny subtraction of light from a star when a planet crosses in front of it.

During its 4-year prime mission, Kepler was a statistical transit survey designed to determine the frequency of Earth-sized planets around other stars. Kepler revealed thousands of exoplanets orbiting stars in its 115 square degree field-of view, which covered about 0.25 percent of the sky. While Kepler was revolutionary in its finding that Earth-to-Neptune-sized planets are common, the bulk of the stars in the Kepler field lie at distances of hundreds to thousands of light-years, making it difficult to obtain ground-based follow-up observations for many systems.
TESS is designed to survey more than 85% of the sky (an area of sky 400 times larger than covered by Kepler) to search for planets around nearby stars (within about 200 light-years). TESS stars are typically 30-100 times brighter than those surveyed by Kepler. Planets detected around these stars are therefore far easier to characterize with follow-up observations, resulting in refined measurements of planet masses, sizes, densities, and atmospheric properties.

Astro Events from Frank Gross

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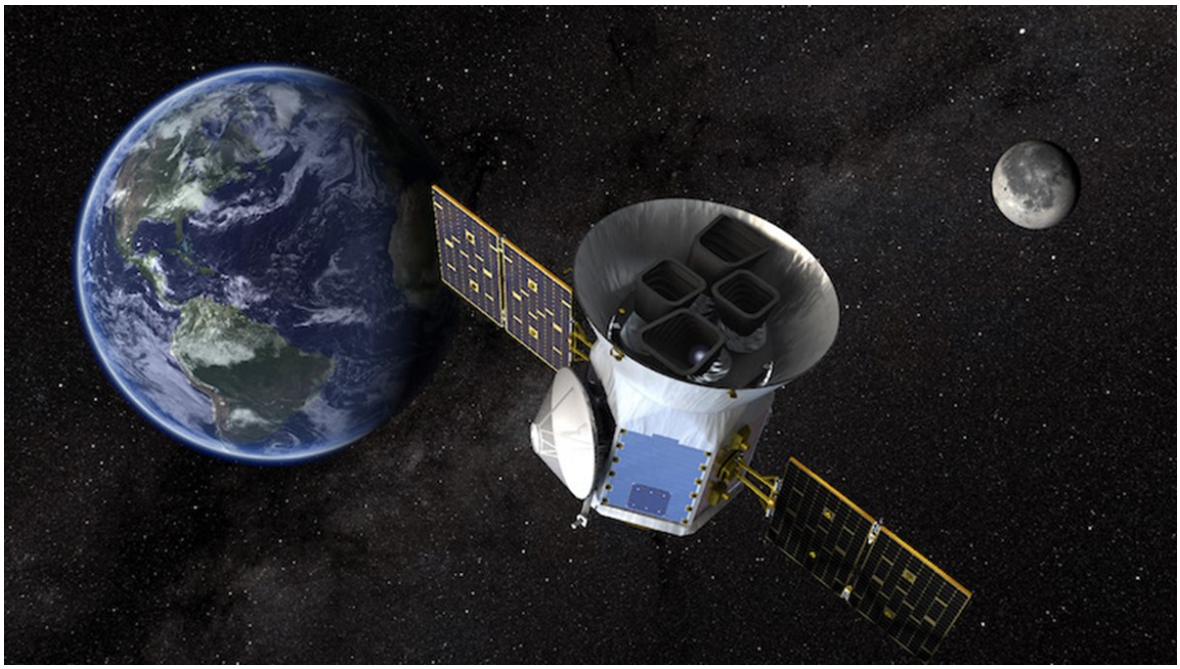
TESS

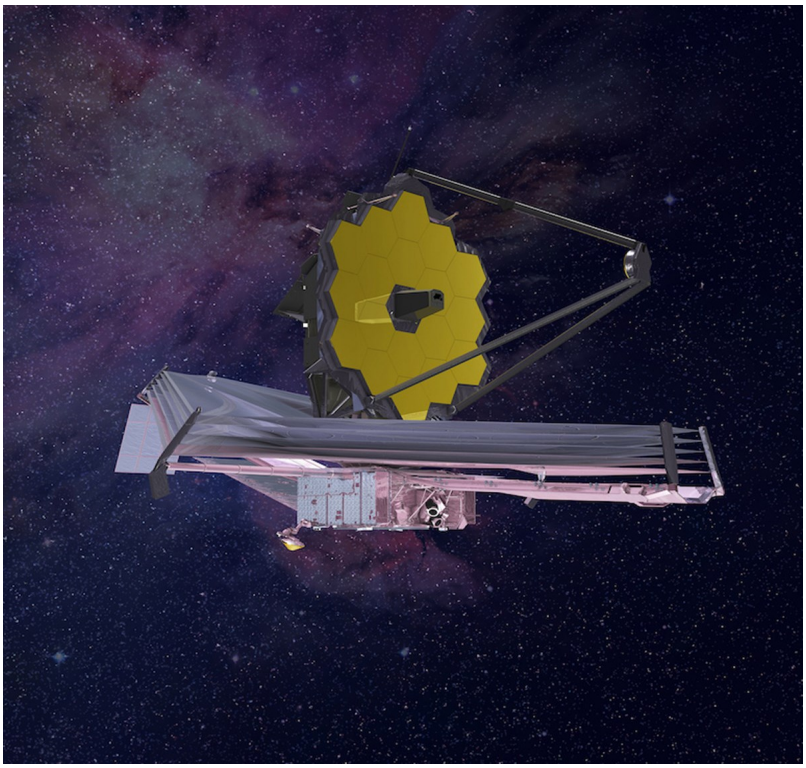


Artist's rendering of NASA's Transiting Exoplanet Survey Satellite. Image credit: NASA's Goddard Space Flight Center

James Webb Space Telescope

We took a bold step forward in 2021 with the launch of the James Webb Space Telescope, the largest and most complex space science observatory ever built.

This giant spacecraft could cover a typical tennis court with its sunshield. It launched from French Guiana on Dec. 25, 2021. Atop the sunshield is the largest primary mirror ever sent into space – some 6.5 meters (21 feet, 4 inches) across.



Seeing the universe in infrared light, the Webb telescope is expected to become the premiere observatory of the decade, studying billions of years of the universe's history and reaching back nearly to the Big Bang. It can reveal details of the formation of planetary systems like our own, and even sample (via the rainbow spectrum of captured light) the composition of exoplanet atmospheres.

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Partnerships – from the ground up

NASA works with partners across the country and around the world to investigate exoplanets – whether studying them from space or from the ground.

Collaborating with ground-based telescope teams is essential. When the TESS space telescope captures evidence of a new exoplanet, observations from the ground not only can confirm its existence but tell us more about the planet itself. Measurements of the planet's "mass," or heft, can be combined with TESS' measurement of its diameter, yielding its density. That, in turn, can tell us whether it's a gas planet, like Neptune, or a more dense, rocky world like ours.

Ground-based telescopes that have helped confirm and characterize exoplanets, or will soon, include the Magellan II at Las Campanas Observatory in Chile, the NEID instrument on the WIYN telescope at Kitt Peak, Arizona, the Keck Observatory on Mauna Kea, Hawaii, and the Hale Telescope at the Palomar Observatory in Southern California to name just a few among dozens. They will work with space-based telescopes – TESS and, soon, the James Webb Space Telescope – to provide details of exoplanet atmospheres, composition and other vital statistics.

The WIYN telescope atop Kitt Peak in Arizona. Image credit: NSF's National Optical-Infrared Astronomy Research Laboratory/KPNO/NSF/AURA

Missions to come

Powerful next-generation instruments will bring us closer to what would be a long-anticipated, profound discovery: a small, rocky, habitable world somewhere in the galaxy with an atmosphere that reminds us of our own.

A space-based platform: the Roman telescope

A telescope powerhouse now under development could open new windows of knowledge when it launches, as soon as the mid-2020s. And the Nancy Grace Roman Space Telescope – formerly known as WFIRST – will have a wide window indeed, about 100 times the field of view of the Hubble Space Telescope.

The Roman telescope, named for a NASA pioneer, will probe the depths of dark matter and dark energy – mysterious, mostly unknown phenomena that make up most of the universe – as well as making direct images and other observations of exoplanets as part of a technology demonstration. At the heart of its mission: the star-dense interior of the Milky Way galaxy, where the telescope could find thousands of exoplanets through gravitational microlensing.

Equipment Officer Report Andrew Wood

Solar Telescope

Apart from the Observatory and its state-of-the-art telescopes, our club also has a range of other very good telescopes. The committee is looking at this equipment and assessing what is required, mainly eyepieces and adaptors, so that kits can be put together for members to borrow. Some of the scopes also require maintenance. It may also be decided that some will be sold to fund other purchases. These items will firstly be advertised internally to see if any club members are interested.

One telescope ready to go now is the club's **Coronado PST Solar Telescope**. This is a telescope designed specifically for viewing the Sun; and, unlike a normal telescope with a full-aperture solar filter fitted, which will show only sunspots, this scope will also show solar surface granulation, filaments and prominences.

It is kept in its original foam padded box. With it is a 12mm Plossl eyepiece and a camera tripod. Currently this instrument is in my possession. If you would like to borrow it, contact me.

Andrew Wood – amwood1961@outlook.com

Club News

The AGM was held at the July 2023 monthly meeting. Elected officials for 2023- 2024

Executive
President: Frank Gross
Vice President: Laurence Wakelin
Secretary : Andrew Wood
Treasurer: Frank Gross
Public Officer; Frank Gross

Andrew Wood
Mark Town
John Gould
Ian Scott

Operation Positions
Website Manager: Steve Holloway
Observation Officers: Andrew Wood, Mark Town and John Gould
Editor: Kaye Johnston
Librarian: Chris O'Hanlon
Equipment Officer: Andrew Wood

Committee General Members:
Laurence Wakelin
Frank Gross
Andrew Wood
Mark Town
John Gould
Ian Scott

Club Notices

Astronomy yearbook and calendar

This year, we will not be ordering these publications to sell to members. For anyone wanting to purchase them, the details are as follows:
Astronomy 2024 can be purchased through Quasar Publishing https://quasarastronomy.com.au/ . This publication, once it becomes available, can also be found in bookshops and newsagents.
Astronomy Calendar 2024 can be purchased through Astrovisuals https://astrovisuals.com/ .
National Australian Convention of Amateur Astronomers (NACAA)
NACAA will be held in Parkes over the Easter weekend of 2024. See https://nacaa.org.au/2024/programme .

Dear Members of Shoalhaven Astronomers
This is a reminder to members who paid last year, and have not yet paid membership for 2023-4, that fees are due. My apologies if there has been a mistake. If you have paid let me know and I will check with our treasurer Frank Gross. I know that in some cases illness may be a factor at the present time.

Payment ($30) can be made at club meetings. The next is Fri Sep 15 at 7PM

Or Pay by direct deposit into the club IMB account – Please ensure your name is in the reference section. BSB 641800 Account 009135475

Hoping for your continuing membership – the Shoalhaven Observatory is now open and functional!

Kind Regards Andrew Wood Secretary

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