SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

June 2023 Free to members, subscriptions $12 for 12 issues **Volume 50, Number 6**

This is the Cocoon nebula (IC5146) shot on film (hypered Konica 400) back in June 1988 by Rick Hull at the Anza site using a 12.5 inch Newtonian telescope. It is a single exposure of 40 minutes.

Upcoming Events - free and open to the public

Beginner's class	Friday, 7 July at 7:30 to 9:30 PM **In person** This is session 5 of the class which covers how to use your scope. Meet at the Heritage Museum of Orange County and bring your telescope for hands-on help from experienced club members.
Club Meeting	Friday,9 June at 7:30 to 9:30 PM **In person** at Chapman University and **ONLINE** "What's Up?": John Garrett from TVA Main speaker: Tim Lister from Las Cumbres Observatory whose talk will be "Throwing DART(s) at Asteroids"
Open Spiral Bar	Saturday, 10 June at 10:00 to 11:30 PM **ONLINE** Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.
Star Parties	Saturday, 10 and 17 June at the OCA Anza site. ??? Irvine site dates are yet to be determined

The monthly club meeting is viewable in progress on Zoom and our social media platforms. The recording is available on these platforms after the meeting is over.

https://twitter.com/OCAstronomers
https://www.facebook.com/OrangeCountyAstronomers
https://www.youtube.com/@ocastronomers

Please consult the calendar on the OCA website to RSVP online meetings (required)

President's Message

By Barbara Toy

June is the month of the Summer Solstice, the longest day and shortest night of the year. After that, the days start getting shorter and hotter, and the nights usually become more comfortable for viewing, temperature-wise. After winter viewing in multiple layers and possibly hand warmers and other devices to help keep warm, summer viewing in shirtsleeves or one or two thin layers can seem almost decadent.

Summer or winter, you might notice that you can spend hours with other viewers sharing sights in the eyepiece and having interesting conversations – and then not recognize them at all in daylight. Even without all of the hats, scarves and other wraps of winter, people look different in the dark lighted only with some red light. We tend to joke about these situations, but if you find yourself not recognizing your new viewing friends if you run across them under regular white lights, you're not alone!

Summer Monsoons

Usually, we worry about monsoon activity in the Anza area around August, sometimes July, but this year it's looking like these weather patterns may be starting early. There have already been forecasts of afternoon thunderstorms in late May, when we're usually more concerned with the Marine Layer causing overcast skies (many years, May Gray and June Gloom seem like they'll last forever).

Thunderstorms are the most dramatic result of monsoonal conditions, from monsoonal moisture meeting desert heat. We can often see the resulting thunderheads from Orange County, building up behind the mountains. Often afternoon thunderstorms in the Anza area will clear up shortly after sunset, though we can't always rely on that. If we have a really active monsoon season, thunderstorms could come through any time of the day or night, and it can be quite dramatic watching them approach. It can also add interest to an evening's viewing when there's lightning playing around the horizon, and usually when you see it out that far in the distance at night it ultimately fades out without coming closer. It's less fun if you realize that clouds from that activity are heading toward the site, which I've seen happen a couple times – one time bringing an intense burst of rain that made me glad I hadn't gambled on the sky clearing up and had gotten the roof of the observatory closed before it hit us.

Whenever thunderstorms occur, they tend to produce periods of intense rainfall that can cause local flash flooding and damage to the dirt roads around and sometimes on our Anza site. This rain can cause deep muddy patches on the roads that are hard to cross until they dry out. Thunderstorms can also produce high winds, which can easily blow away sunshades and anything else that's not strongly tied down. And, of course, they're associated with lightning strikes – we haven't had any lightning strikes directly on the site that I know of, but lightening activity in the area can cause power fluctuations, which have been a problem in the past for sensitive equipment. If you have a computer or other electronic equipment plugged in at Anza, it's a good idea to use surge protectors.

I think most people check weather forecasts before going out to Anza – there's no need to go all that distance just to look at clouds, after all. This summer you should probably also check for any recent storm activity and possible road damage more than usual as well. The club's email groups are good sources for that kind of information, particularly the AstroImaging group as there seem to be more people in that group who go out to Anza regularly.

Annual Starbecue

We are currently planning to have our Starbecue, our annual Anza potluck party, on the evening of the July star party, which will be Saturday, July 15. In pre-Covid times, we would often see members at these parties who generally didn't make it out to Anza much but would make a special effort to be there, and hopefully we'll start seeing that again. The Starbecue is held on the shady side of the club observatory, where it's cooler than elsewhere on the site, and usually starts around 5:00 p.m. so people have time to eat and visit before heading off to their regular star party activities.

Everyone is asked to bring some food to share. We have a microwave in the observatory if you need to warm something up (and, of course, you can microwave things at Anza House as well), we have a power outlet near where we set up if some heat is needed, and we also plan to have at least one barbecue in operation for those who want to do some grilling. The club provides plates, tableware and napkins, and there'll be some tables set up, mainly to hold the food. You should bring a chair for comfort (we have some in the observatory that can be used but not enough for everyone), and your favorite drink if you want something other than water.

These parties are always a lot of fun – it's great to spend time with fellow club members and their families (these do tend to be family events). In these times it's also welcome confirmation that things are returning to some level of normalcy. Even though Covid is still with us (though it's no longer being classed as an emergency), the fact that this is an outdoor event and well-ventilated should minimize the risk for everyone attending – of course, if you're sick, regardless of what you have, please stay home and focus on getting better.

We hope we'll see you out at Anza for our reestablished annual party!

RTMC Reprise

I know that somewhere we (my husband and I) have pictures of past Starbecues, and I decided to look for them to help illustrate this column. I couldn't find them but did find a group picture of club members who were at RTMC in 2008 and who also showed up for the group picture, which was something of a tradition in those years. 2008 was a year when we experienced a bit of chilliness at RTMC, as evidenced by our attire in the picture. It was taken in front of the club booth, where we sold donated books and other items to help support the club's library.

Actually, when I say it shows people who showed up for the group picture, that's not entirely true. There was a couple who mistook the time and showed up just after everyone disbursed – Alan took their picture separately and added them in later. And Chris Butler also had to be added, but there was some dispute about it and the upshot was that he now shows up more than once in the photo, not that any club member who's had the pleasure of seeing his presentations is likely to complain.

Well, maybe we can take some club group photos at the Starbecue, and maybe there will be some other opportunities for group photos on other occasions, too, so we can enjoy looking at the current membership in years to come. One reassuring aspect of that 2008 picture for me is that, even though it's been 15 years, most of the members shown there are still around or at least (where they've moved out of the area) are still in touch. If you were there, I hope that picture brings warm memories, and if you weren't, I hope you at least enjoy seeing some of our members from back then.

And I also hope that whatever challenges the weather may bring, you all have nights of excellent viewing as we head toward the summer season!

Response to COVID-19 Crisis

Meeting in person:	Astrophysics SIG, Anza star parties, Beginner's class (July) and **monthly club meeting**
Meeting via Zoom:	**Monthly club meeting**, Beginner's Astronomy class (other than July this year)
Coming soon:	Orange County Star Parties
Cancelled until further notice:	AstroImaging SIG
Check with Coordinator:	Outreach events

Help Wanted (Volunteering Opportunities)

- OC Astronomers Club Representative to WAA (Western Amateur Astronomers)
- Communications Coordinator doing social media presence and announcements to members

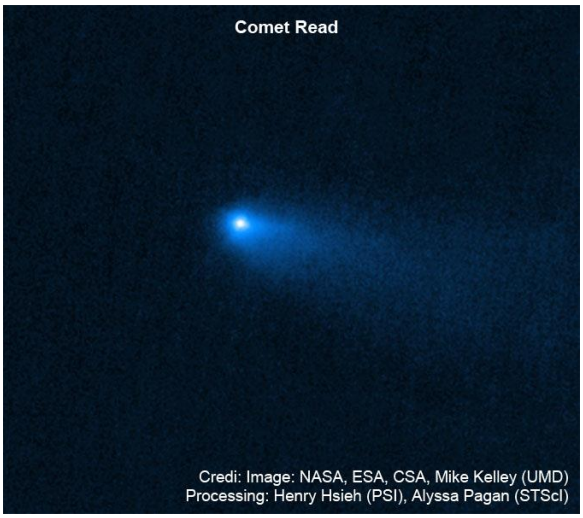
Due dates for submission of articles, pictures and advertisements

Issue	Due date
July	24 June
August	22 July
September	19 August

AstroSpace Update

June 2023

Astronomy and space news summarized by Don Lynn from NASA and other sources



Comet Read – The James Webb Space Telescope (JWST) observed Comet **Read**. The body orbits in the asteroid belt, not in an elongated orbit like most comets do, and so is known as a main belt comet or an active asteroid. As expected, water vapor was detected, but carbon dioxide, which is found in all comets, was not found. Further work is needed to determine if **Read** formed without carbon dioxide, or whether it lost its carbon dioxide later. This was the first confirmed observation of water vapor from a main belt comet, though observations of comas and tails on main belt comets suggested water vapor was likely. Until a few main belt comets were found, starting in 1996, it was thought that water would be depleted from bodies orbiting as close to the Sun as the main asteroid belt.

Early Protocluster of Galaxies – JWST was used to observe a cluster of 7 small galaxies that appeared to be still in the formation stages. Because the galaxies are so distant, we are seeing them as they were when the light left them over 13 billion years ago, very early in the history of the Universe. Their distance and that they are gravitationally bound were confirmed through spectra. They are termed a protocluster of galaxies because they likely grew to the size of galaxy clusters like are seen today, such as the Coma Galaxy Cluster. Because the protocluster is located behind a much nearer and massive galaxy cluster, the image of the protocluster was gravitationally lensed, making it appear larger and brighter than unlensed galaxies at this distance. The protocluster was first seen in Hubble Space Telescope images and was judged a good candidate for observation with the more powerful JWST.

Water Vapor Detected – JWST observed an exoplanet known as GJ 486 b and detected water vapor. However, astronomers have not been able to conclusively prove the water vapor is in the planet's atmosphere, or whether the observations picked up water vapor from star spots. The planet is rocky with a diameter 30% larger than Earth's. Because it orbits quite close to its red dwarf star, the planet's surface temperature is about 800° F. Its orbital period (year) is only 1.5 Earth days. If the water vapor is in the planet's atmosphere, it would likely be depleted by the star's radiation, and so might have to be replenished somehow. Because red dwarf stars actively flare, it is not known whether planets there would be able to maintain atmospheres, especially if they orbit so close as GJ 486 b. More JWST observations at different wavelengths are planned to try to distinguish where the water vapor spectral signal is coming from.

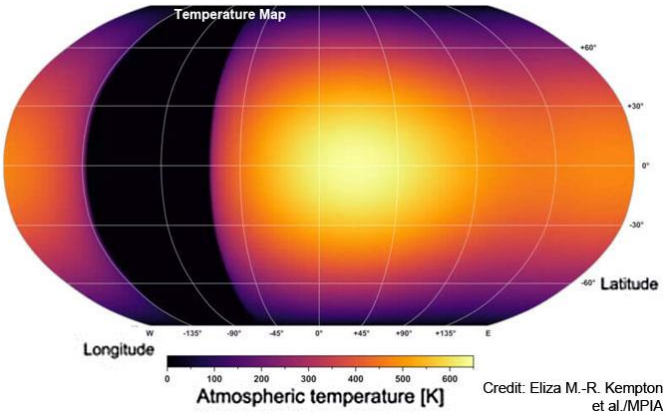
Globular Cluster Formation – A star cluster formed cosmically recently generally has similar element composition in all its stars, while stars in a globular cluster, usually formed about 13 billion years ago, have varying amounts of the elements. The cause of this variation has been hotly debated. One theory is that conditions early in the history of the Universe favored formation of gigantic stars, which nuclearly burned at their cores much hotter than stars of today and would distribute unevenly to their surroundings the elements generated in their cores. New JWST observations of very distant globulars just forming support this theory. What they found is excessive nitrogen, which would be produced only in the cores of extremely hot stars.

Super-Earth Exoplanets – Observations by the TESS planet-finding space telescope and ground-based telescopes have discovered many properties of a pair of exoplanets known as TOI-2095b and TOI-2095c. TESS finds planets with the transit method, and the additional observations detected these planets by the radial velocity method. Both planets are super-Earths, having diameters about 25% and 33% larger than Earth. Their masses are about 4 and 7 times Earth's mass respectively. Their surface temperatures are estimated to be about 80-170° F. This puts them on the inner edge of their star's habitable zone, that range where temperatures would allow liquid water to exist. The planets orbit a red dwarf star, and such stars are known to have excessive flare activity, which could make the planets not habitable by life as we know it.

Planet-Forming Dust – JWST observations have found planet-forming dust in the NGC 346 star cluster. What makes this surprising is that the cluster is in the Small Magellanic Cloud, a neighboring galaxy that is low in heavy element content, and low-heavy-element planet-forming disks tend to disburse more quickly, ending planet formation early. The observations were designed to study formation of low-mass stars, which is best done in infrared because it penetrates the dust that often obscures star formation.

Fomalhaut Rings – It has been known since 1983 that there is a dusty asteroid belt surrounding the nearby star Fomalhaut. A new JWST image shows that it is actually 3 concentric belts. The divisions between the belts are likely caused gravitationally by planets that are too difficult to see directly. The outer belt is far larger than the Kuiper belt, which consists of small bodies orbiting beyond Neptune in our own Solar System.

Exoplanet Atmosphere – The mini-Neptune exoplanet GJ 1214b is close enough (40 light-years away) to be a good target for observation but has resisted astronomers learning much about it because it has a high-altitude haze layer obscuring it. New observations by JWST, using infrared wavelengths that penetrate the haze, show its atmosphere is likely composed of water, methane, and hydrogen cyanide. This is "likely", not certain, as the spectra are somewhat ambiguous. The planet orbits a red dwarf star very closely, taking only 1.5 Earth days to do so. It is tidally locked, showing the same face to the star constantly, and the day side upper atmosphere reaches 530° F, while the night side is merely 330° F. The density of the planet is too low to be a rocky planet and too high to be a highly hydrogen gas giant. So, it is likely a gas giant with substantial water vapor, which would increase the density. By observing the planet through entire orbits, astronomers were able to make a temperature map of the atmosphere covering most of the planet. They were also able to calculate the planet's reflectivity, which was quite high, comparable to Jupiter in our Solar System. Exactly what within the haze layer reflects so well is under debate.



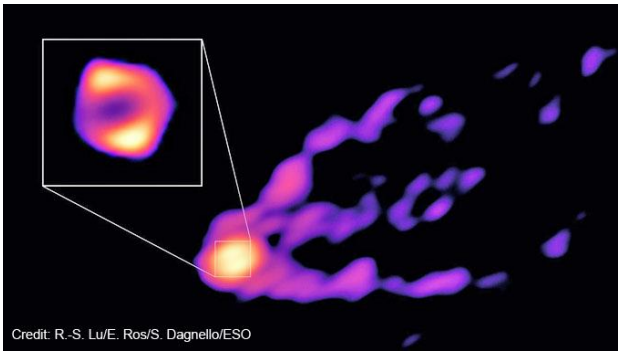
Credit: Eliza M.-R. Kempton et al./MPIA

Close TDE – A tidal disruption event (TDE) occurs when a star gets too close to a supermassive black hole and it is ripped apart gravitationally. The nearest known TDE (at 137 million light-years distant) was discovered in the galaxy NGC 7392 in infrared observations. Only about 100 TDEs have ever been observed. Most of them were discovered in X-ray or visible light observations, but apparently the new discovery was shrouded in dust that blocked the X-rays and visible light. The galaxy is rich in star formation, in contrast to the galaxies harboring most previously known TDEs. This may be because rich star formation galaxies are also rich in obscuring dust, so TDEs there may not usually be seen. The new discovery was made by searching archived infrared observations from the NEOWISE space telescope. The search was made to find any changes in galaxies, not just TDEs. The brightening of the TDE began in 2014. A TDE was found to be the only cause of galaxy brightenings that fit the observations. The black hole that ate the star was estimated to have the mass of 30 million Suns.

"Barbie" Transient – Another interesting brightening in the night sky was found in data from the Zwicky Transient Facility, which is a program that images the entire northern sky every 2 days, searching for things that change (transients), using the Palomar 48-inch Schmidt camera refitted with a monster electronic detector. This transient was assigned the letter sequence identifier ZTF20abrbeie. It has lasted over 800 days and is 1000 times more energetic than the brightest supernova. Noting that the identifier almost spells "Barbie", it acquired the nickname "Scary Barbie". It appears to be bigger than the TDE of a star could produce, so the best theory is that it is the result of a supermassive black hole tearing apart a gas cloud that is much bigger than a star. That theory still has the problem that it is not located at the center of a galaxy, where almost all supermassive black holes lie. Observations at many wavelengths will continue to try to explain Scary Barbie.

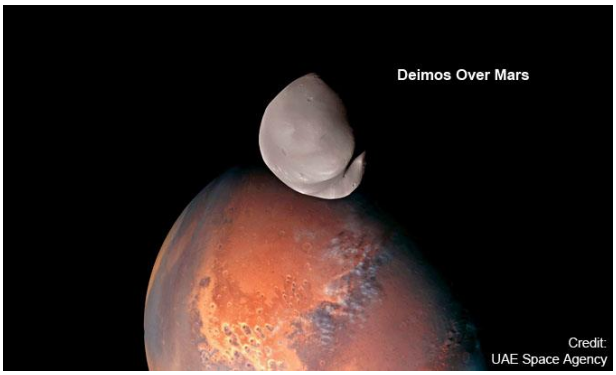
FRB Source – Fast Radio Bursts (FRBs) last only milliseconds and generally come from sources in distant galaxies. Exactly how they are generated is highly debated. A new study of an FRB originating in a small galaxy 4 billion light-years away showed something unusual: there is a magnetic field at the source that moves and changes over time, even reversing. The best explanation for this is that the source is a binary star so that the components' orbital motion changes the magnetic field. The FRB is known as FRB 20190520B and observations were made with the Green Bank Telescope in West Virginia and the Parkes Telescope in Australia.

Black Hole Imaged – The supermassive black hole central to galaxy M87 has again been imaged with a widely spread network of radiotelescopes, this time at a somewhat longer wavelength than the previous image, known as the Event Horizon Telescope image. The new image shows not just the shadow and accretion disk of the black hole, but also the jet being expelled. It is hoped that this will help astronomers understand exactly how such jets are formed. The accretion disk appears roughly 50% larger than the previous image, perhaps because the longer wavelength is sensitive to more of the disk material. Future plans are to observe this black hole at more wavelengths.

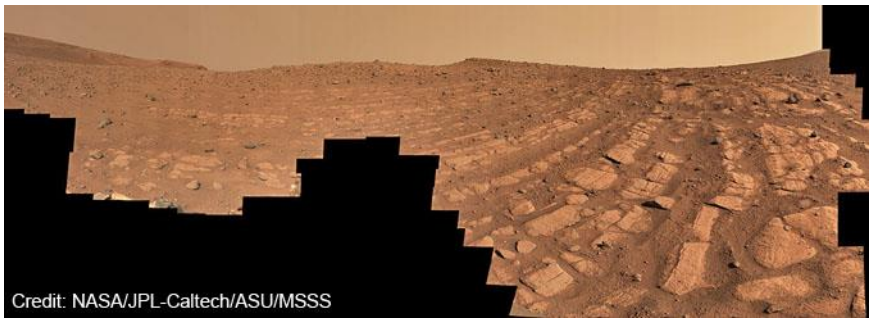

Credit: R.-S. Lu/E. Ros/S. Dagnello/ESO

Dark Energy Constant – Using the eROSITA X-ray space telescope, astronomers studied galaxy clusters over a range of distances, and therefore over a range of times when the light left those clusters. They then counted the number of such clusters as that number varied over about 10 billion years of time. Clustering of galaxies depends on various factors, including the strength of dark energy, the force that is making the expansion of the Universe accelerate. From the galaxy cluster history, astronomers were able to show that dark energy has remained at a constant strength for 10 billion years, and also constant over all of space. This rules out theories of dark energy that predict the strength would vary over time or space.

New Deimos Images – The Hope spacecraft, built by the United Arab Emirates Space Agency, has made a close pass by the Martian moon Deimos, sending back some of the best images ever of that moon. The leading theory of the origin of Deimos (as well as the other Martian moon Phobos) is that it is a captured asteroid, though another theory has it splashed from a body colliding with Mars. New ultraviolet and infrared Hope observations of Deimos show that the surface constituents more closely resemble those of the Martian surface than those of asteroids, showing the captured asteroid theory to be unlikely. Deimos measures just 9 x 7 x 6.8 miles. Most previous Mars orbiters have passed below Deimos's orbit, while Hope passes above. Thus, the new views are best of the away-from-Mars side of Deimos (the moon is tidally locked with one side always facing the planet).



Martian River Evidence – New images from the Perseverance Mars rover show curving bands of rocks that appear to have been formed by a deep, fast-moving river, apparently faster than other long-past rivers evidenced by Martian geology. The river flowed into Jezero Crater, which Perseverance is exploring. Moving the coarse material in the rocks would have required fast-moving water.



Moonquakes – It has long been known that some of the moons of Saturn and Jupiter have moonquakes caused by tidal forces from the planets' gravity. A new study shows that some of these moonquakes can cause landslides that smooth out those moons' surfaces. It appears that the moonquakes cause ridges to rise along fault lines. Computer simulation of the moonquakes showed they are sometimes strong enough to cause those ridges to landslide. The landslides help explain why these moons are generally smoother than they should be when considering the fault activity.

Saturnian Moons – A team of astronomers has found 62 previously unknown moons of Saturn, bringing its total to 145 known moons. This puts Saturn into the lead of the moon race, surpassing Jupiter with "only" 95 known moons. The team used the "shift and stack" technique, where images are stacked after shifting them by the amount a moon should move in the time between images, thus bringing extremely faint objects to visibility. This is the first use of the technique for Saturn, though it has been used on Uranus and Neptune. Then the faint objects imaged at different times had to be matched up to each other and orbits calculated from their multiple positions. The smallest moons found are about 1.5 miles in diameter. Images taken by the Canada-France-Hawaii Telescope in Hawaii were used. Saturn's moons are classified as regular if their orbits are relatively small and circular with little tilt, while those classified as irregular have orbits with opposite properties. It is thought that the irregulars are bodies that the planet captured long ago, while the regulars probably formed when the planet did. All the newly found moons are irregulars. The irregulars have been further divided into 3 groups depending on their orbital tilt. All 3 groups have representatives among the newly found moons.

JUICE, the European spacecraft launched in April toward the large icy moons of Jupiter, has experienced a problem in deploying the antenna for its radar. Apparently, a pin that was supposed to come out during deployment had stuck partially in locking position. That instrument is designed to study the moons' surface and subsurface structures down to a depth of more than 5 miles. All other instruments on JUICE were found to be working excellently. Spacecraft controllers tried shaking and warming the stuck antenna, but no luck. Then in mid-May, they tried actuating a nearby part, and that shook the pin loose and allowed the radar antenna to deploy successfully. Expect great discoveries from JUICE after it arrives at Jupiter in 2031.

Martian Interior – A new study has learned a great deal about the interior of Mars. The study is based on data taken by the Mars InSight lander seismograph regarding 1300 marsquakes, particularly the strongest of those quakes that occurred in May 2022 and produced surface waves that circled the planet up to 3 times. Also, gravity and topography data were used. Conclusions of the study are: 1) the thickness of the Martian crust averages somewhere in the range of 26-35 miles, though the thickness varies from 12 miles (in the Hellas impact basin) to 56 miles (in the Tharsis plateau). This is much thicker than the crust of Earth or our Moon. 2) The density of the Martian crust is similar between the northern and southern hemispheres, even though the thickness varies greatly. 3) The heat coming from the Martian interior is from the decay of radioactive elements, 4) 50-70% of which is in the crust. This differs from Earth where the heat remaining from the planet's formation is more significant than radioactive heat. As scientists expected, the smaller planet lost its heat of formation earlier.

Zhurong Mars Rover – The radio transmitter on the Chinese Mars rover Zhurong has not been heard from for about a year. Chinese space officials finally announced that efforts have been unsuccessful to wake up Zhurong after its hibernation for the Martian winter, perhaps due to insufficient sunlight on its solar panels to power it up. This is not unusual for Mars missions: for example, NASA's Insight lander succumbed to insufficient solar panel sunlight, caused by dust accumulation.

Lunar Lander Crash – The HAKUTO-R Mission 1 Lunar Lander lost contact with controllers about the time it was to land, indicating a probable crash (or "hard landing" as officials called it). This mission was run by the private company ispace, inc, principally located in Japan. This is the first attempt ever of a Moon landing by a non-space-agency. ispace is continuing its plans for a Mission 2 and Mission 3 for lunar landings. Divisions of ispace have contracts with NASA and the European Space Agency to return lunar samples, to land on the far side of the Moon, and to extract water from lunar soil during the next few years.

Voyager 2, which made the grand tour of gas giant planets in the 1970s and 80s, is running low on power because the plutonium in its power generator is naturally decaying. It was predicted that controllers would have to turn off some of its instruments soon to allow the spacecraft to exist on less power and continue exploring space beyond the heliosphere with remaining operating instruments. But a new plan is predicted to allow at least 3 more years of operation without turning off instruments. The new plan changes the way voltage is regulated and results in an increase in power available to the instruments.

TESS At 5 Years – The TESS planet-finding mission has completed 5 years in space. It stares at a 24 x 96 degree field of the sky looking for slight dimmings of stars caused by planets passing in front of (transiting) the stars. TESS is not as sensitive to dim stars as its predecessor Kepler was, but TESS covers far more sky. Its orbit is synchronized (at a 2:1 ratio) with the Moon's orbit to keep the Moon and Sun and Earth all out of its field of view. Every lunar month it moves its field to keep it ahead of the Sun. So, in the first 13 lunar months (about a year) it covered an entire hemisphere, and the other hemisphere was covered in the second year. Years 3 and 4 repeated that coverage. Due to small gaps between monthly fields the coverage is actually 93% of the entire sky. With improvements in operations, the 30 minute interval of taking images in the first year has now been improved to an image every 3.3 minutes. TESS has found about 6000 planet candidates, which must be confirmed by other observations (more than 300 have been). Astronomers other than exoplanet specialists have also used TESS data, such as variable star and asteroseismology observers. TESS's mission has been extended to September 2025, and probably will be extended longer.

Advertisements

Buy, Sell or Trade some of your gear? This is where club members can place advertisements. Please contact the editor at newsletter@ocastronomers.org to place an advertisement or to learn more about placing one. There is no cost to club members for non-commercial advertisements in the newsletter.

For Sale contact Ron Choi rchoi1983@gmail.com

- Orion StarShoot AutoGuider further reduced price $ 200
- Tele Vue 8mm plossl 1.25" eyepiece $ 80

For Sale contact Michael Newman mnewman2112@gmail.com

- Pad lease for LP-12 in Lower Pads section and the pier upon it $ 1000

It includes a pier that is very nicely aligned and can support a C-8 up to a C-14 I believe although the new owner may need to drill new holes. For questions and to express your interest in the pad, please contact me via email.

For Sale contact Bill Prats b.bill.p@gmail.com

- QHYCCD PoleMaster Camera Adapter for Losmandy GM811xx Mount, IEQ30/IEQ45 # 020038 $ 30
  3 Pieces, Bright red finish, no scratches
- Spotter Scope: Orion 6X30mm Correct Image Right Angle $ 30 obo
- ZWO OAG, Off Access Guider, new never used, full kit $ 100
- 12VDC to 17VDC 3 amp Voltage booster with digital voltmeter used on a Losmandy G811GM $ 50
- Losmandy Servo motor/Gemini 2 cables (pair) recent & hardly used Make offer
- Losmandy Gemini 2 Hand Controller, recent & hardly used Make offer

Contact Bill Prats b.bill.p@gmail.com Shipping is extra. All items can be picked up in Huntington Beach.

For Sale contact Eric Mjolsness emj@uci.edu

- Mars Hill Pad # MH-05 OCA license is up for sale. Includes solid equatorial pier. $ 2300 obo
  Price in 2010 was $2300. I am seeking that amount back or best offer.

For Sale contact Val Akins akins7821@gmail.com 949-301-5956

- Telescope: Orion's Sirius 8" Go-To Reflector, Focal Length: F6, 1200 mm, Case: for 8 x 6 OTA $ 1200
  Mount: Sirius EQ-G Go-To Equatorial with tripod
  Controller: Synscan 42,000 Celestial object database
  Lens: Siriusplossl 26 mm
  Viewfinder: 8 x 50 mm Rt. Angle
  Note: Equipment is used, but all functional

- Telescope: Meade Lx200 8" SCT Cassegrain F10. The scope is like new. $ 650
  Tripod: Heavy duty
  Mount: Fork tine slow motion knobs, both axis
  Lenses: 1 1/4" 26mm super plossl; 16 mm - super plossl, Meade series 2 X apochromatic barlow
  Viewfinder: 8 x 50 mm
  Note: Hand controller missing, but available on internet as a classic scope.

For Sale contact William Lee wlarch@socal.rr.com

- Vixen A70Lf #2602 Optical Tube Assembly $ 120
  New, in factory sealed carton. Very light weight with very sharp and color free optics.
  Includes finder scope, two eyepieces, star diagonal, tube rings, and Vixen mounting plate.
  Pickup in the City of Orange, or at the Monthly Meeting
  Reference Link for detailed description: Vixen A70Lf 70mm f/12.9 Refractor Telescope - OTA # 2602 (agenaastro.com)

Carpooling OC to Anza contact Gene Kent kenthouse@cox.net 714-604-8396

I'm Gene Kent, a long time OCA member. I live in Tustin, CA. I'm looking to find someone to share the drive to and from Anza. I have a Chevy Trail Blazer. It will hold all the astronomy stuff for 2 people. I usually set up on the ball field below Anza House. If you have a pad or an observatory, I can drop you and your gear off there.

Another Look

Dave Phelps June 2023

The Full Moon for this month will occur early in the month on Sunday, June 4th. The New Moon will happen later in June on Sunday, June 18th.

In June it's the Strawberry Moon as the little red berries ripen at this time and could be gathered by the Native American tribes. Other native names are Berries Ripen Moon, Green Corn Moon, and Hot Moon.
The Celtic names are Mead Moon, Horse Moon, Dyan Moon, Rose Moon and Honey-Moon. Other English names are Flower Moon and Planting Moon.

The Summer solstice is on Wed, Jun 21, 2023 7:57 AM PDT. In the Northern Hemisphere, the Summer Solstice occurs when the sun is directly above the Tropic of Cancer, usually June 21.

When we look back at the history behind the constellations we find a remarkable divergence from old, very old, very very old, recently new and kinda new. Hevelius, Mercator, Bayer and all the astronomers and cartographers from mid-millennium forward relied on Ptolemy and the giants of the classical era for the basic model of the heavens they used for their maps and globes. The first millennium BCE saw the rise of tribes of the middle east and their myths, legends and stories. These are the cultures created around the confluence of the Tigris and Euphrates plus nations forming on the Arabian peninsula and the Indian sub-continent. As it was, the Greeks were relative late bloomers and the Romans almost certainly copycats.

When did it start? Just how old is astronomy? It almost certainly began with the naturalistic representations of star locations and formations as named clocks, calendars, timetables and humanistic deities and the sympathetic magic they associated with everyday life. Where does it start? There is evidence of the Egyptians, Euphratians and other cultures rising as early as the stone age using the certain stars as harbingers of seasonal changes and the relationship during the seasons when particular asterisms and stars shone during planting, shearing and lambing.

https://publicdomainreview.org/collection/uranias-mirror-or-a-view-of-the-heavens

https://collections.louvre.fr/en/ark:/53355/cl010028871 From the Dendurah Zodiac, Egypt, now in the Louve.

Is astronomy the oldest science? It has been claimed that we recognized star formation and seasonal relationships as early as 5000 BCE. One of those formations, of a young woman, with and without wings or with and without wheat or corn has been a part of astronomical lore worldwide for at least the last 5000 years. We can identify her during the Bronze age including early Egyptian old kingdom, Mesopotamian early dynasties, Akkadian, and the Indus Valley. In Egypt she was Isis who formed the Milky Way from corn. Isis did not carry a sheaf of wheat in her right hand, she carried at tool called a distaff that women used in the spinning of wool and in Egypt, flax.

At that same time in the Euphrates she was named Ishtar, goddess and proclaimer of rain and Astarte, Bel's wife. In India she was known as "the Maiden". We even have evidence of a zodiac created in Ceylon where Virgo is a woman on a ship with a stalk of wheat. An interesting story comes from the Scottish-English merge where the constellation marks the time of the "Kern" i.e. Corn baby. The Arabs, who did not draw the human body called her Ears, the Chinese the Frigid Maiden. We even found evidence in Peru (Incas) where the asterism was called the Magic Mother.

So, it is clear that Virgo is worldwide throughout history and is almost certainly one of the oldest star formations identified and named.

Below Bootes thou seest the Virgin,
An ear of corn held sparkling in her hand.
Whether the daughter of Astraeus, who
First grouped the stars, they say, in days of old.
Or whencesoever,—peaceful may she roll.

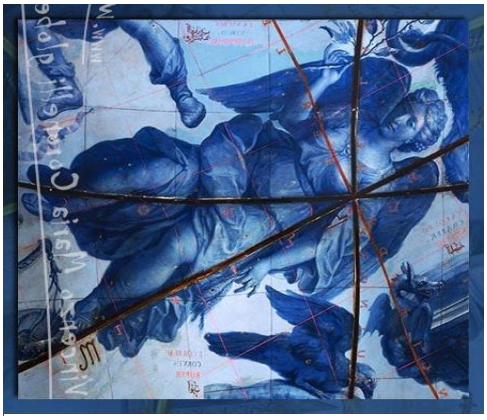
Her lovely tresses glow with starry light,
Stars ornament the bracelet on her hand;
Her vest in ample fold glitters with stars;
Beneath her snowy feet they shine, her eyes
Lighten all glorious, with heavenly rays,
But first the star which crowns the golden sheaf.

Virgo has eight named stars. Herschel counted 383 galaxies and one globular cluster. Burnham has 213 galaxies, 1 globular cluster, 68 variable stars, 109 double and multiple star systems and one quasi-stellar object. Eleven of the galaxies are Messier's and one is a Caldwell.

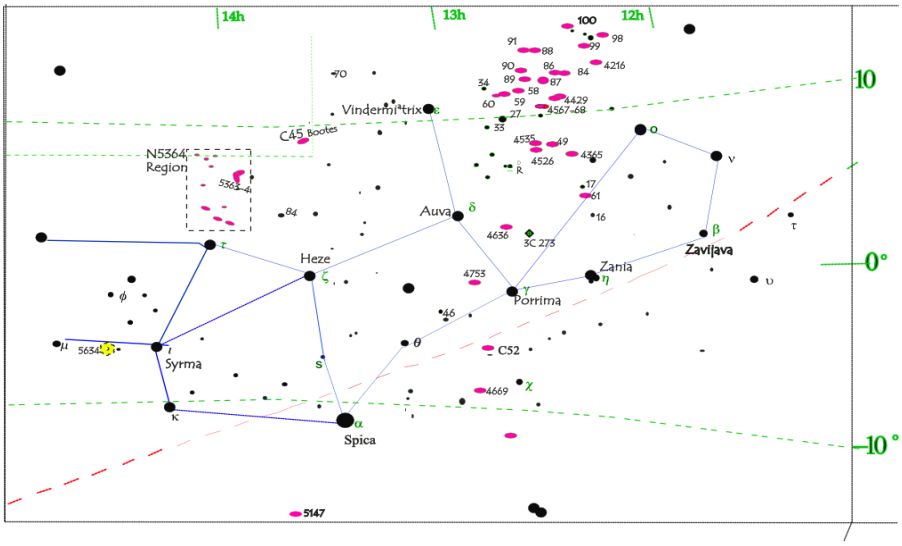
By themselves, the star's names draw a history of Virgo. As mentioned, the Arabs do not draw images of humans. So, to them, this area was a dog kennel. The stars ε, δ, γ, η, and β form a bowl that was a kennel as well as the finder for the Virgo Cluster. β "Zavijava" comes from the meaning for the word kennel, as does γ Porrima from "corner of the barker". Porrima by the way is also the name of one of the goddesses of prophecy and peace. It was she who held, in some stories, the scales, Libra, who follows her in the night.

A whole new tradition is formed around ε Virginis, named Vindemiatrix, the grape gatherer, another clock in the sky signaling the time to pick the grapes and make the wine. Vindemiatrix is also, at 2nd mag, the third brightest star in Virgo. But, where's the girl? We do have stellar references to the maiden: ι, Iota Virginis, named Syrma, means skirt and ζ, Zeta Virginis, Heze, points to "under the girdle". Rolling all around the tradition we come to α, Alpha Virginis, Spica, signifying an ear of wheat.

The basic design of the images drawn in the Atlas's goes back at least 400 years to Bayer's Uranometria in 1603. He took Ptolemy's catalog and expanded it, imagined it, drew it, and numbered it. He assigned Greek letters to the stars till they ran out and then Latin letters. Subsequent map makers seemed to have copied his basic design at least until the 19th century where they were idealized by cartographer Sidney Hall, whose Virgo is near the top of this article and by Vincenzio Coronelli, shown here, from about 1688.



Globe celeste de Coronelli Paris France Wikipedia Commons



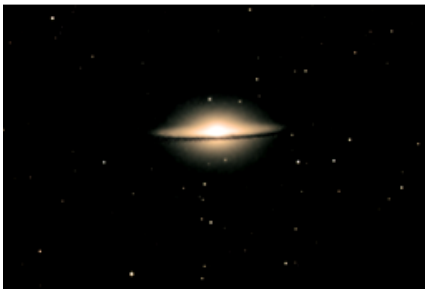
Virgo has Messier's M49, M58, M59, M60, M61, M84, M86, M87, M89, M90 and M104. She also has Caldwell object C52. All of Virgo's Messier galaxies are in the 8th and 9th magnitude making great objects for our backyard telescopes and great fun galaxy hopping. As an example, I remember using M87 and the galaxies around it as finders when I found Pluto at RTMC years ago.

M89 is featureless ball in your 8" It is a perfectly symmetrical elliptical. You may see a brighter nucleus. A little over a moon diameter away in your field of view is M90. M90 is big, so you will see it easily in your 8" Dob. Still, you will need your C14 and decent seeing to pick out spiral arms.

https://www.temeculavalleyastronomers.com/photo-gallery.html
Markarian's Chain Image by Curtis Croulet, TVA

Now we're getting somewhere. M104, the Sombrero is findable in your binoculars and easy in your 8". In my 17.5 the dust lane is well defined and the whole galaxy a beautiful oval. The picture next to it is a beautiful image of M61. I don't know what it is about my eyes, but I have a hard time seeing the bar in some galaxies. You'll need your C14 for a hint of the spiral arms. Credit M104 and M61 to Jerry Floyd from the TVA site gallery.

M84 is a tightly wound spiral. It is in a very rich field. M86 is right next door. M49 is the brightest member of the Virgo Cluster at 8th magnitude but visually you will see little of no differentiation. M49 is kind of a secondary center to the cluster, so searching for and identifying nearby galaxies would be a treat.



M 104

M 61

Tom Wildoner Flickr.com M84, NGC 4387 (small) and NGC 4388

Both M59 and M60 are smooth ellipticals that are featureless except for the possibility of seeing a bright or stellar nucleus. M87 is the center of the Virgo Cluster, a giant smooth elliptical galaxy. The jet was first seen in 1918, but not visible in my 17.5.

M59, M60 & Friends Antione and Dalia Grelin at: https://www.galactic-hunter.com/post/m59-m60

https://ocastronomers.org/wp-content/uploads/2018/12/Kuhn_m87_cropped_2x.jpg Pat Knoll

The Virgo III Cloud encompasses eight groups of galaxies and a large number of independent galaxies. Virgo III stretches between Virgo, Serpens Caput and Libra. Virgo III is composed of at least 75 clusters stretching between the three constellations. It would be a work of art just to identify visually the individual member clusters. The area I have hatched off on my chart is the location of the NGC 5364 group. The group consists of eight galaxies and is anchored by 11th magnitude NGC 5364.

Virgo is not limited to just Messier's and clusters however, there are dozens more interesting objects. A few in particular are NGC 4216, NGC 4526, NGC's 4435 & 38 the Eye galaxies, NGC's 4567 & 68 the Butterfly or Siamese Twins and 3C 273 the only quasar I have seen visually.

Remidone NGC 5364 - NGC 5363 & Co.Flickr.com

NGC4526 and NGC4535 Camille COLOMB Flickr.com

If you look on my chart near the center of the bowls where the Arabs identified the "Kennel Corner of the Barking Dogs" you will find a smallish grouping of galaxies anchored by NGC 4526. In the image by Camille Colombo, 4526 is the lenticular galaxy to the left between the two stars. The colorful face on spiral is NGC 4535. It looks slightly barred and it also looks like it will take some magnification.

Why is it called Markarian's Chain? The feature has been at least partially known since Herschel's time and all the individual galaxies are included in Dryer's catalog. Markarian was the one to show that the whole curved arc of galaxies had the same proper motion. Near the center of the chain are NGC 4435 and 4438, a pair of 10th magnitude interacting galaxies called "The Eyes".

One of the more interesting examples of interacting galaxies in the Virgo Cluster is the Butterfly- NGC's 4567 & 4568. They also have detail under magnification, but you will need some mirror size, they were beautiful in my 17. Their combined magnitude of the pair is 12 and they are less than 3 arc-minutes in size.

Have a great time enjoying Virgo, and I wish you
Dark Skys
Dave Phelps

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