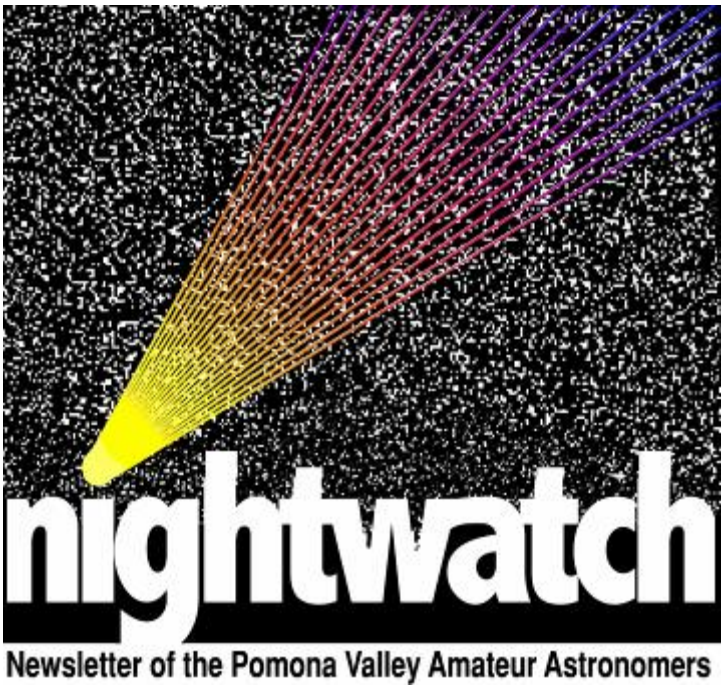


Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.
Dr. Seuss

CHECK OUT PVAAs YOUTUBE CHANNEL

Volume 43 Number 11 ***nightwatch*** **November 2023**

Holiday Party Announcement

December is almost here, and you know what that means, the big annual PVAA Holiday Party! This year the party will be on Saturday, December 2nd at Casa Jimenez on Foothill Blvd. in Claremont. We will meet at 6:00 PM.

Besides good food and plenty of camaraderie the festivities will include a drawing with numerous door prizes. The **grand prize** will be a **$50 gift certificate** from Woodland Hills Camera and Telescopes. But even if you don't win the grand prize, don't worry. Everyone will win something in the drawing. No one goes home empty handed.

Ron Hoekwater

Club Events Calendar

Nov 17	**General Meeting In Person and on Zoom – Robert Reeves "Postcards from the Moon"– 7:30pm**
Nov 18	**Star Party – GMARS**
Nov 29	**Board Meeting 6:15 PM**
Dec 2	**Holiday Party at Casa Jimenez in Claremont at 6pm**

----NOTE THE CHANGE----

Dec 2 Holiday Party - Casa Jimenez - 6:00 PM

PVAA Officers and Board

Officers

President ….....	Mathew Wedel	909-767-9851
Vice President ..	Joe Hillberg	909-949-3650
Secretary	position is currently open	
Treasurer	Gary Thompson	909-935-5509

Board

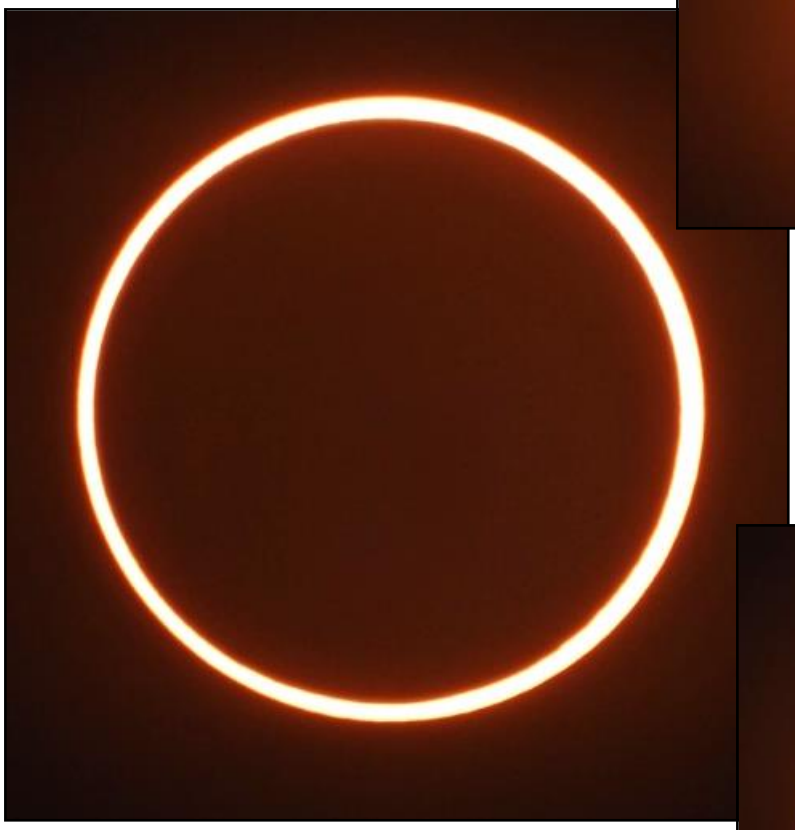
Jim Bridgewater (2024).....	909-599-7123
Richard Wismer(2024)	
Ron Hoekwater (2023).....	909-706-7453
Howard Maculsay (2023)……	909-913-1195

Directors

Membership / Publicity....	Gary Thompson .	909-935-5509
Outreach	Jeff Schroeder	909-758-1840
Programs	Ron Hoekwater	909-391-1943

PVAA General Meeting 10/27/23

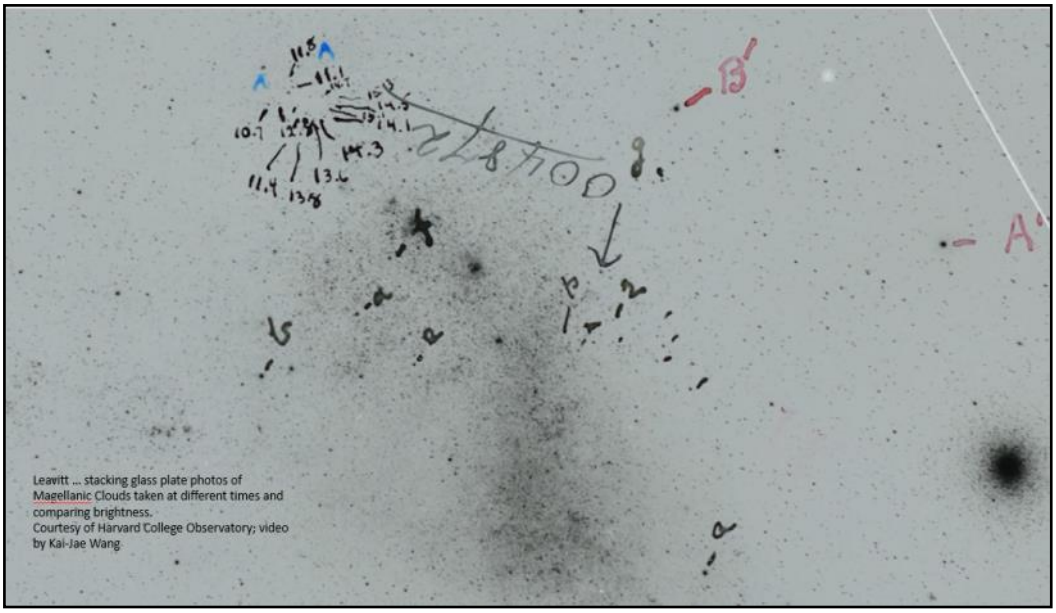
We had a special presentation by Mike Carter who filmed the last Solar Eclipse. The moon was further away from the Earth, so it did not totally cover the sun, leaving a small ring around the edges during maximum. This is called an annular eclipse.



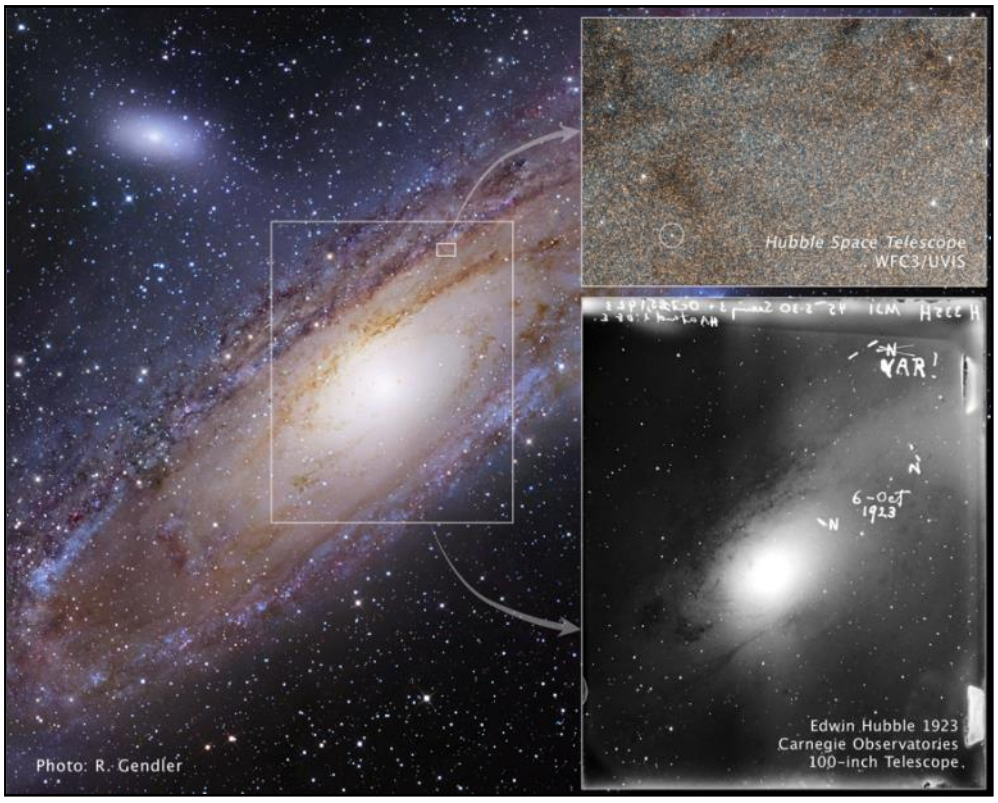
Our speaker for the night was Joann Eisberg of Chaffey College. Her topic was "A Ruler to Measure the Universe – Henrietta Leavitt, Cepheid Stars and the Magellanic Clouds" Henrietta Swan Leavitt lived from 1861-1921 and went to Oberlin College in Ohio. She worked at the Harvard College Observatory where she discovered Cepheid Stars in the Magellanic Clouds. This was the first effective ruler to measure Galactic distances. She was also posthumously nominated for a Nobel Prize.

The Magellanic Clouds are two small galaxies that are satellites of our Milky Way between 160,000 and 200,000 light-years away and have 1/10th to 1/100th as many stars as the Milky Way.

Leavitt worked with the data from the Harvard College Observatory in Peru. She identified 1777 Cepheids and discovered that brighter variables have longer periods, establishing the Period-Luminosity relationship in 1912. Cepheids ARE standard candles. The Magellanic Clouds are outside our galaxy, and spirals – (like Andromeda) are external galaxies – comparable to the Milky Way.



Leavitt ... stacking glass plate photos of Magellanic Clouds taken at different times and comparing brightness.
Courtesy of Harvard College Observatory; video by Kai-Jae Wang



Women were employed by the Harvard College Observatory because they were cheap labor, and meticulous. Data analysis was considered low prestige, as it was neither observation nor theory. The women also did the data analysis for Spectroscopy and Photometry.

Annie Jump Cannon 1863-1941 was also a notable workhorse in data analysis. She classified over 350,000 stars at a speed of 200 stars per hour. She worked on the Henry Draper Catalog and came up with the star classifications of OBAFGKM. She was the first female to get an honorary doctorate from Oxford.

Right now (thru Nov 18th) there is an exhibit at Chaffey College about art and science.

Gary Thompson

Images: Harvard College Observatory

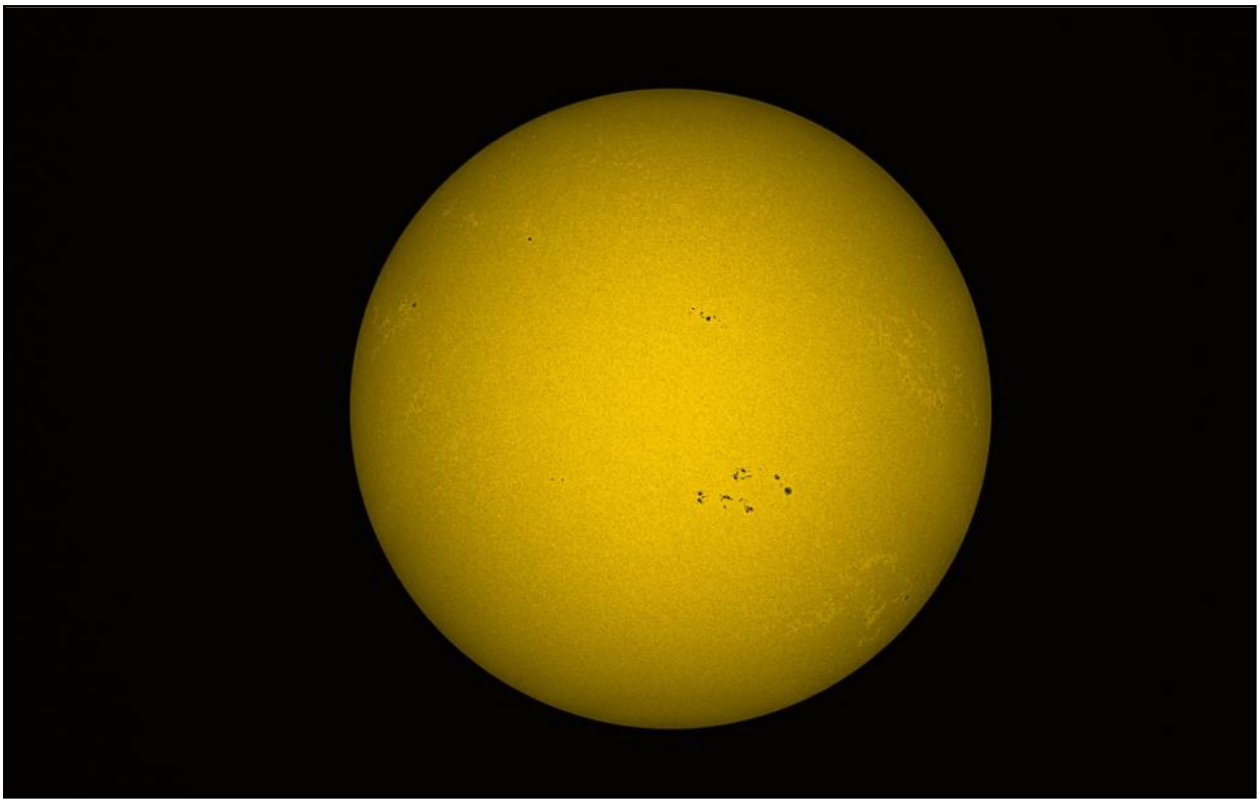
A Busy Fall

I've been busy imaging from the end last month to the middle of October. I've included 4 images taken from home, two from the dark site, and one link to the partial solar eclipse of October 14. Several images were taken with a new imaging camera purchased to replace the slightly damaged camera I had been using – I forgot to put the solar filter on and burned in a ghost image on the sensor; thankfully though, it's possible to remove the ghost using calibration frames. All the images, except for one, were taken using my 90mm StellarVue refractor reduced to 490mm focal length. Due to the number of images, I'll try to keep the descriptions short.

The first image is the Cocoon Nebula, located in Cygnus near its eastern border with Lacerta. This image was taken from home over the nights of September 23-26. Known also as IC 5146, Caldwell 19, and Sh2-125, it is a reflection and emission nebula illuminated by a cluster of embedded stars known as Collinder 470. A feature that I really enjoy, but never captured very well until now, is the dark nebula, Barnard 168, that makes the nebula appear to be plowing through the star field, at least to me it does. The Cocoon is about 2,500 light years away and spans about 15 light years.

By stretching the stars more aggressively, the path near the nebula because clearer.

The image is a combination of around 160 2-minute frames through RGB filters and 482 1-minute frames through the luminance filter (clear filter) for a total of just over 24 hours of data using the damaged ASI1600MM cool camera. The images were all calibrated using 21 dark, flat, and flat-dark frames. Processing was difficult. Normally, I'd add the stars back a less aggressive stretch but when I did that, I lost the path the Cocoon was taking.



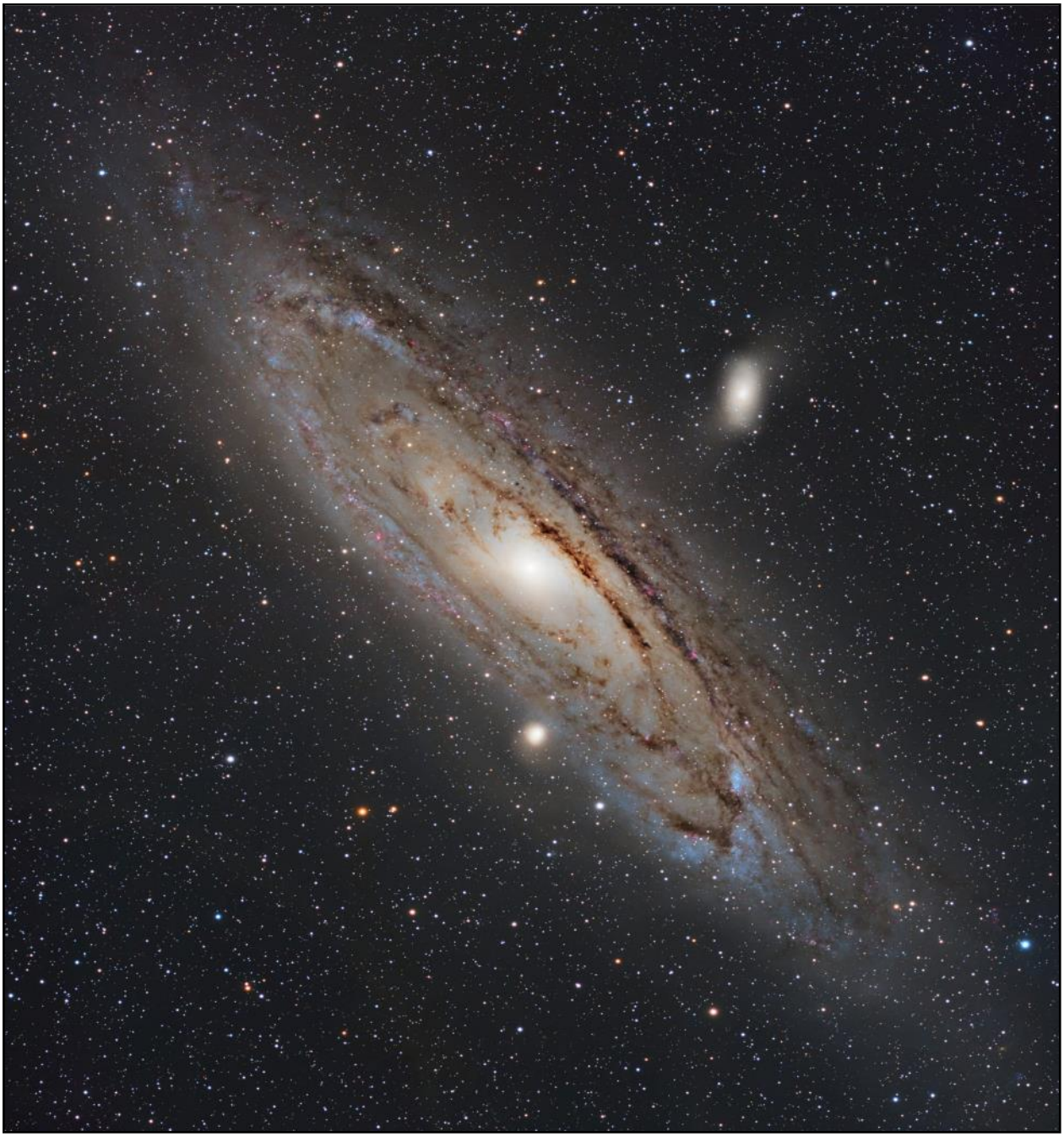
Next up is an image of the Sun taken as practice for the October 14th solar eclipse. This image was taken on October 6 around 1pm using my new camera, the ASI294MM Pro. Two sets of 100 images were taken through a Thousand Oaks solar filter. One image also included the H-alpha filter while the other also included the luminance filter. The image presented here is from the latter set. All the frames had an exposure time of 0.001s. The best and most stable 15 were automatically selected and stacked using AutoStakkert software for planetary imaging. Since the camera is monochrome, the stacked image was colorized in Photoshop and sharpened. I enjoyed seeing the clarity of the sunspots, but even more so the granularity on the Sun's surface.

After imaging the Sun, I needed to determine acquisition settings for deep sky imaging with the new camera. The next target includes NGC 225, also known as the Sailboat Cluster, a small reflection nebula in the upper left of the image near the cluster known as vdB 4 or LBN 604, as well as a rich star field. While the cluster and nebula are small for the field of view, I didn't want to change the set up prior to heading out to the dark site. Both the cluster and reflection nebula are about 2,000 to 2,200 light years away. This shot is in Cassiopeia near the center star of the "W". With only about 15 hours of data, a third of which was luminance data, I was surprised to pick up a little of the dust clouds in the area, especially since it was imaged from home. This is an LRGB image processed in my usual manner of working on the color separately from the luminance and working on the stars separately from the background and nebulosity.

While processing the previous image, I was somewhat concerned that the edges of the camera chip might not be performing well, so I chose another target that was brighter and wouldn't need as aggressive processing techniques. I chose Cederblad 214 or Sh2-171, a part of a larger complex known as NGC 7822 in Cepheus. This is a very confusing area so sort out, so I'm hoping I have accurately described the scene. The small cluster of stars toward the top of the nebulosity is Berkeley 59. The complex is located about 2,900 light years away. There are several pillars of gas that are lit up by a very hot star reminiscent of the famous Pillars of Creation in the Eagle Nebula. This is also an LRGB image of nearly 25 hours of imaging time, about half of which was through the luminance filter. Like the previous image, I followed my typical processing workflow.

I have two images and a video from the new moon weekend up next. First up is a wide field shot with a Canon 80D on the Sky-Watcher tracking mount. I was aiming for the constellation Cassiopeia hoping to pick up some of the clusters and nebulae near the bright stars that make up the "W". After I started imaging, I visually looked at where the camera was pointing and felt I was too far west. Even though I thought I missed the constellation, I was hoping to pick up at least some deep sky objects. I took 2 hours of 2-minute images at ISO 1600, f/5.6, and 55mm FL, and calibrated them with 21 dark frames and 21 flat frames. The frames were all stacked in DeepSkyStacker and processed in PixInsight without star removal. I was surprised how well the tracking was evidenced by the stars showing almost no trailing. At first, I couldn't get the image to plate solve, but a friend did plate solve it and found Cassiopeia was centered. The star Caph is along the top edge of my image and following downward in a zig-zag pattern are the stars Shedar, Navi, Ruchbah, and Segin at the bottom, a little left of center. I did manage to capture a few goodies in the picture. Along the left edge, near the top is Cederblad 214 along with the rest of NGC 7822. This should give a good idea of the area of the sky my widest telescope images. Below Shedar is a nebulous patch that is the Pacman Nebula, NGC 281. Finally, heading downward from the Pacman, near Ruchbah, is NGC 457 known as the Owl Cluster or ET cluster.

I had two cameras documenting the partial solar eclipse from the dark site. One was the same set up that captured Cassiopeia and the other was the StellarVue set up that I practiced with, both equipped with solar filters. Unfortunately, the camera on the tracker slipped while imaging, and while I only lost a frame or two, the framing changed significantly, so a lot of work will be needed to realign the frames. I'm not sure it will be worth the effort. But the StellarVue set up worked well taking a picture of the sun every 2 minutes, although, in hindsight, every minute would have been better. Regardless, all the frames were colorized in Photoshop and sharpened, although the focus shifted during the imaging session due to the rising temperature in the morning. The frames were then assembled into a short time-lapse video. The video is actually too large to send, so I'll provide a link to it. Please visit https://www.astrobin.com/6lnk2f/ to see it.



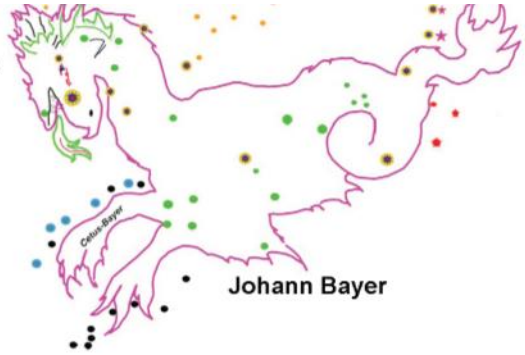
The last image is M31, the Andromeda Galaxy. Some of you may already know, but we have a meet-up date with M31 in a few billion years. That should be something to see since M31 has about twice the number of stars as the Milky Way! M31 is a huge object in the sky and is reportedly the most distant object you can see with your naked eye. It's about 2.5 million light years away from us, obviously in the constellation Andromeda, and spans about 110,000 light years, or about 1x3 degrees of the sky at that distance. For comparison, the moon occupies about 0.5 degrees of the sky. Many pink-colored H-alpha regions and blue reflections can be seen in this image along with thick dust lanes. And, I suspect the side of M31 with the darker dust bands is closer to us. Visible also are two satellite galaxies, M32 closer to M31 and M110 further away. The image is also an LRGB composition taken as a 2-panel mosaic. The top half and bottom half of the image were shot separately with about 15% overlap for alignment. The top half was shot early in the evening and then after midnight, the bottom half was taken. The two halves were stacked separately then merged using Microsoft ICE. Final processing was done in PixInsight using my typical workflow. The image is formed from a little more than 26 hours of data with half allotted to each panel.

That was a lot to get through, hopefully you all made it to the end. Until next month, clear skies!

Ron Ugolick

https://www.astrobin.com/users/ruccdu/

Another Look - December 2023



Johann Bayer

December's New Moon is on Tuesday the 12th. The Full Cold Moon will be on Tuesday the 26th. Fridays the 8th and the 15th have smallish moons that will contributed to dark skies for your star parties.

The Full Cold Moon on the 26th will be the first full moon of winter. The winter solstice is on December 21, at 1927 hrs.

There are a number of conjunctions this month, one with Venus on the 9th and one with Saturn on the 17th. Neptune will be occulted by the moon on the 19th. Occultation visibility will be in the southern Indian Ocean off the southwest coast of Australia. In the southwestern US, we can expect a close approach.

Native American names for the December Full Moon include Drift Clearing Moon, Frost Exploding Trees Moon, Hoar Frost Moon, Little Spirit Moon, Long Night Moon and Moon of the Popping Trees.


Urania's Mirror

The Old English and Anglo-Saxon names are the Moon Before Yule or the Long Night Moon while the Celts added the Oak Moon and the Full Cold Moon.

In French its Pleine lune de Décembre,
In German Vollmond im Dezember,
In Spanish Luna llena de Diciembre and in
Greek Φεγγάρι Γεμάτος Δεκεμβρίου, or Fengári Gemátos Dekemvríou,

This year 1st magnitude, El Nath, Beta **β** Tauri, will be occulted on December 25th from 1657 to 1920 hours.

The constellation of Cetus is identified across the world. In French we have Baleine, In Italian its Balaeua, and in German Wallfiseh and in classical Greek its Ϗetos-Ketos

Cetus is the fourth largest constellation, it has dimensions of 50^0 East to West and 20^0 North to South, at one time it was written that Cetus is the largest constellation, but contains few telescopic objects of interest.


Thank you to Percy Jact At Skylarks

There appears to be some thought on how Cetus died. We are .accustomed to the story of Perseus unmasking the head of the Medusa and turning our sea monster to stone. This is a very popular legend bolstered by the accounts of historians claiming the petrified remains were carried to Rome. No less a personage as Jerome, who first translated the bible from Greek to Latin, claimed to have seen them in Tyre.

Charles Kingsley has so beautifully told the story:

> "On came the great sea-monster, coasting along like a huge black galley, lazily breasting the ripple, and stopping at times by creek or headland to watch for the laughter of girls at their bleaching, or cattle pawing on the sandhills, or boys bathing on the beach. His great sides were fringed with clustering shells and seaweeds, and the water gurgled in and out of his wide jaws as he rolled along, dripping and glistening in the beams of the morning sun. At last he saw Andromeda, and shot forward to take his prey, while the waves foamed white behind him, and before him the fish fled leaping."

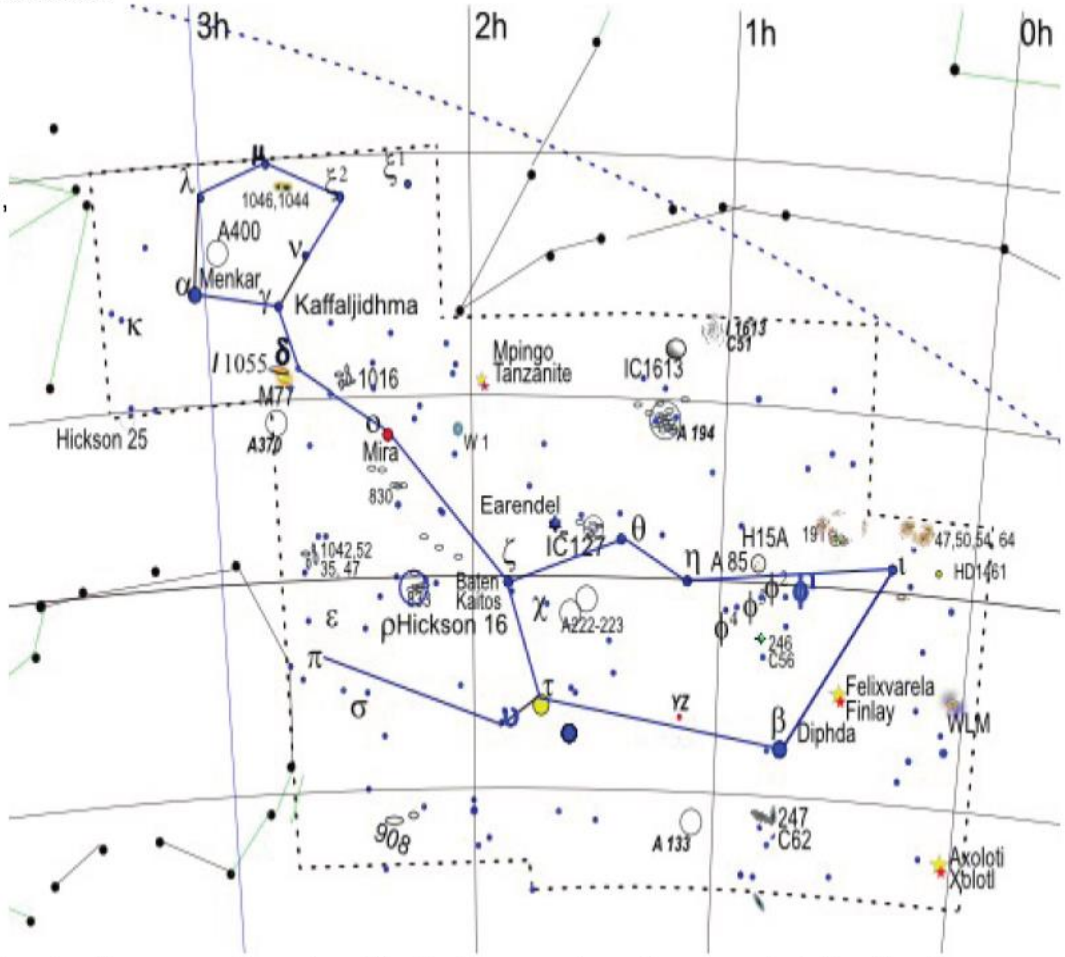
" Then down from the height of the air fell Perseus like a shooting-star—down to the crest of the waves, Andromeda hid her face as he shouted. And then there was silence.
"Slowly she looked up trembling, Perseus springing toward her; and, instead of the monster, a long, black rock, with the sea rippling quietly round it."
(Adapted from "Astronomy with an Opera Glass" Garrett P. Serviss 1888)

An alternative, though not as poetic, view is that Perseus had to put up a fight, using his sword to slay the monster.

Commonly depicted by the Greeks as a hybrid creature, Cetus had forefeet, huge jaws, and a scaly body like a giant sea serpent. Even though the constellation is also known as the Whale, the mythical creature does not in fact look like a whale. Historically, we can track Cetus back to the Two Rivers and the Babylonians, at least 4000 years ago. We believe the original Cetus was the dragon Tiamat, a creature still feared in fantasy novels today.

Of course, Chinese culture has also named the stars around Cetus, seeing farms silos, and even a farm manager.

In time and for thousand of years water was feared as "Chaos" and Tiamat was one of the agents of Chaos. In the centuries before, during and after the agrarian civilizations of the Euphrates, water was the source of life. The story of the flood almost certainly originated with the annual flooding of the Tigris and Euphrates. It was paralleled by early Egyptians who also relied on the annual flooding of the Nile to reinvigorate the land with new soil and nutrients. It was along the coast of the Mediterranean, for millennia the sea was the source of food, commerce, travel and trade.

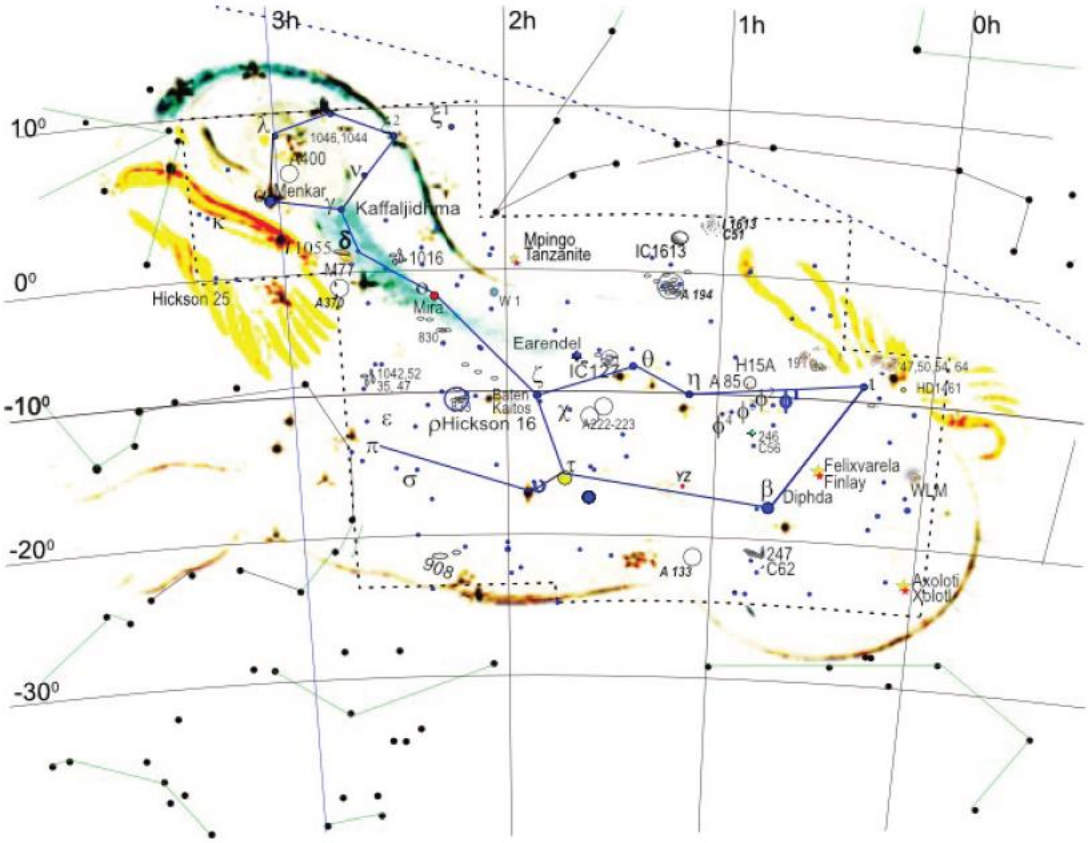


Is it any wonder than that those same ancients, trying to understand their existence, created connections with the nature surrounding them and ascribed reason to the rising of the

constellations and reason to the movement of the sea. Our first sea monsters, our first Cetus' were demigods in need of appeasement to bring the rain, grow the crops, calm the water and bring luck to the fishing. It is little wonder that in times of drought, flooding and wild storms, we offered gifts and sacrifices, even, if necessary a young woman.

To the original Babylonian astrologers, a large portion of the sky became "The Sea"; water-related constellations: Cetus, Aquarius, Pisces, Eridanus. Pisces Austrinus and Capricornus the sea goat.

With gills pulmonic breathes the enormous whale,
And spouts aquatic columns to the gale;
Sports on the shining wave at noontide hours,
And shifting rainbows crest the rising showers. Darwin.



Cetus is a somewhat faint constellation without any stars brighter than 2nd magnitude. However it is still a rich hunting ground for double, multiple and variable star observers. Plus since it is away from the glare of the Milky Way it is a wealthy hunting ground for galaxies. It even has a planetary nebula bright enough to reach from your backyard. Also in Cetus, Patrick Moore chose three objects for inclusion in his Caldwell catalog.

Cetus has several stars with wonderful names that show a little of rhe Arab influence in the constellation. Alpha **α** Ceti's name is Menkar, meaning Nose. It is also a part of one of the Chinese celestial granaries and in Arabic a hand,

Beta **β** Ceti has two names, Diphda and Deneb Kaitos. **β** is the brightest star in Cetus, a bit brighter than **α**. Diphda comes from the Arabic "southern tail of the frog" and Deneb Kaitos from the Arabic "tail of the whale". In China this star bore the strange title of "Superintendent of Earthworks." Gamma **γ** Ceti has the tongue twister name of Kaffaljidhma, meaning the "Short Cut Hand", the name actually includes several other stars in the Arabic cosmos. **γ** is a triple star system.

The most famous star in Cetus is Mira, "The Wonderful, Omicron **ο** Ceti. Mira is the first variable star scientifically described and the first variable I reported to the AAVSO.

There are 19 more stars in Cetus with Bayer designations, many of them multiple systems, 18 stars are named either alone or in system combinations.

There are 61 planetary systems and close to Mira, on the line between **δ** and **ζ** is a star with the beautiful name Earendel, the Morning Star. You will not see Earendel, she is 27th magnitude and 28 billion light years away. She is the oldest star we' ve found yet. . You see her on the distortion caused by the gravitational lensing in the center of the red circle.

Another beautifully named star is Axólotl, named in Mexico, Axólotl means water animal and is a species of salamander. Axólotl is a planetary system having a massive planet named Xolotl after the god of fire and lightning.

Felixvarela and its planet Finley were named by Exoplanets in honor of a great human being. The first to teach science in Cuba.

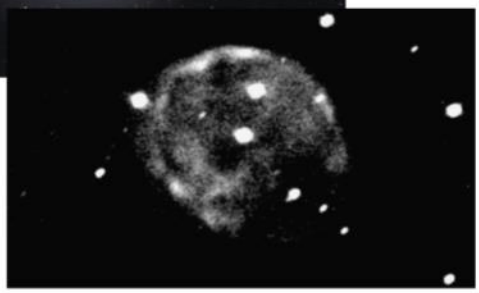
Mpingo is an ebony type wood used in Tanzanian music. It is also a star with a planet named Tanzanite.

Cetus' distance from the Milky Way allows us to spend some quality time searching for galaxies away from the dense background of the Milky Way. Historically, Cetus was considered rather boring, with no bright stars or star clusters. Certainly we have some individual galaxies we love to come back to time and time again, and, it is my experience that galaxies tend to like to group together. There always seems to be another just a bit out of the field of view. Cetus is no exception. It has Abell clusters, a Seyfert galaxy called Cetus A, the planetary nebula and its Caldwell objects.

M77 is close to **δ** and is 9th magnitude so will be easy to find. Its a big face on spiral with an easy to see bright nucleus. M77 is also known as Cetus A https://www.astrobin.com/91f58r/B/?q=M77

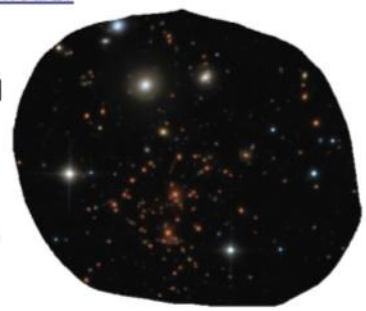
NGC 246, Caldwell 56 is an 8th magnitude planetary nebula that you will enjoy finding. Its big enough and bright enough that you will see some detail. This image by John Sanford taken back in 2003 will help you get an idea of what it will look in your eyepiece.

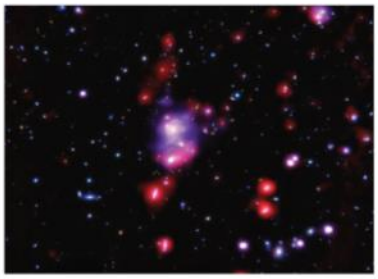
https://ocastronomers.org/wp-content/uploads/2018/12/NGC246Cet.jpg



Abell 370 https://www.astrobin.com/352w9d/B/

There are 5 galaxy clusters in Cetus. Abell 133, Abell 222, Abell 370 and Abell 400. There is also JKCS 041, near Mira, and in 2009 the furthest cluster of galaxies seen from earth. Also not too far from Mira is IRC 0218, the most distant strong gravitational lensing galaxy currently known. Very close to **β** is a galaxy cluster with the curious name Gioiello, which is Italian for Jewel. Gioiello, found in 2011, is, at that time, the most distant massive galaxy cluster found. It got its name from the jewel-like colors in its image.



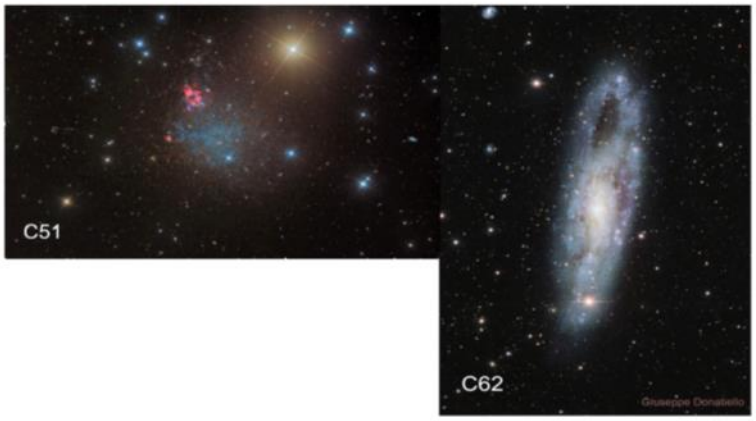


https://upload.wikimedia.org/wikipedia/commons/7/73/XDCP_J0044.0-2033_(Gioiello_cluster).jpg

Two of our Caldwell objects in Cetus are C51 and C62, They are

both 9th magnitude, however, C51 is a dwarf galaxy, I.e.low surface brightness. It'll be fun to find it. **NGC247 https://www.astrobin.com/search/?q=ngc+247#vv7eq7IC 1613 https://www.astrobin.com/zss9uq/?q=ic 16**

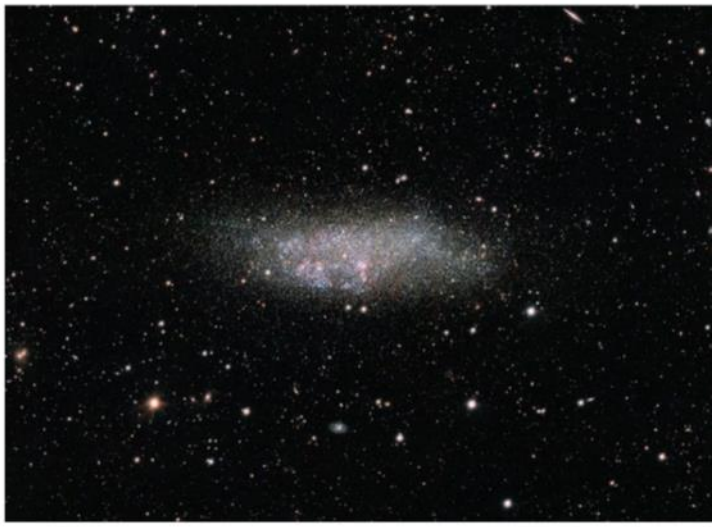
For you guys with big mirrors, Whiting1 is a15th magnitude Globular Cluster in the halo of our Milky Way galaxy. It is not too far from Mira. I have its location labeled W1 on the chart.



Holmberg 15A is also on the chart at RA 00h 42m and -9^0. It is almost 15th magnitude. It anchors Abell 85, which is faint. Holm 15A is a huge elliptical galaxy with a huge central core, which you can find in your larger scopes. The closest bright galaxy to H15A is NGC 191, a 12th magnitude colliding pair of galaxies, a good starting point.

Over close to Eridanus is a small group of galaxies and an extremely diffuse rather strange galaxy. NGC 1052 is an 11th magnitude elliptical galaxy close to 14th magnitude 1042 and in a tight group with 12th magnitude 1035 and 13th magnitude 1047. Interestingly, the group contains NGC 1052-DF2 an ultra diffuse galaxy with no visible magnitude determined

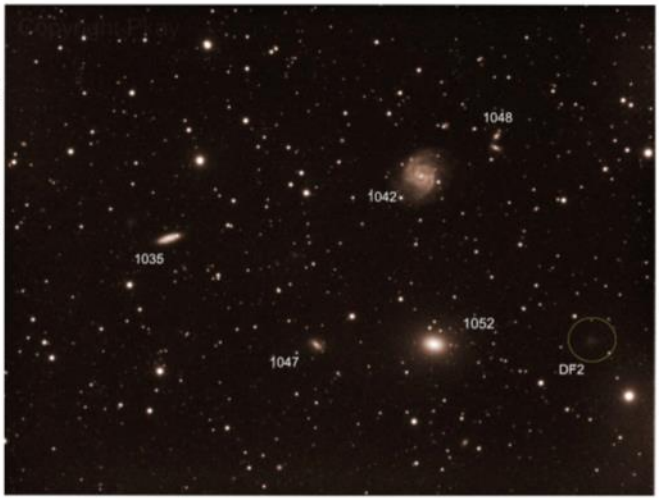
jclopez01 @https://www.flickr.com/search/?text=wlm galaxy



and reportedly with no Dark Matter.
DF2 would be an incredible find.

It will be interesting to observe Wolf-Lundmark-Melotte. It's at 11th magnitude and 11' x 4' in size, so not too small. WLM stands for, the three astronomers who had a hand in finding and figuring out what it is. They determined that its an irregular galaxy as seen in this image by jclopez01. Its way out there on the outer edges of of the local group, so not a bad galaxy to put on your life list. **WLM-Jon Flickr**

So Cetus, the 17th, 18th, 19th and early 20th century astronomers did not have too much to say about it except for the obvious. They didn't have the equipment we have today for visual work, so it was mainly a large open area sprinkled with some interesting stars and whatever their four and six inch Clark's could find. Best of luck stretching your observing chops and



Dark Skys

Dave Phelps