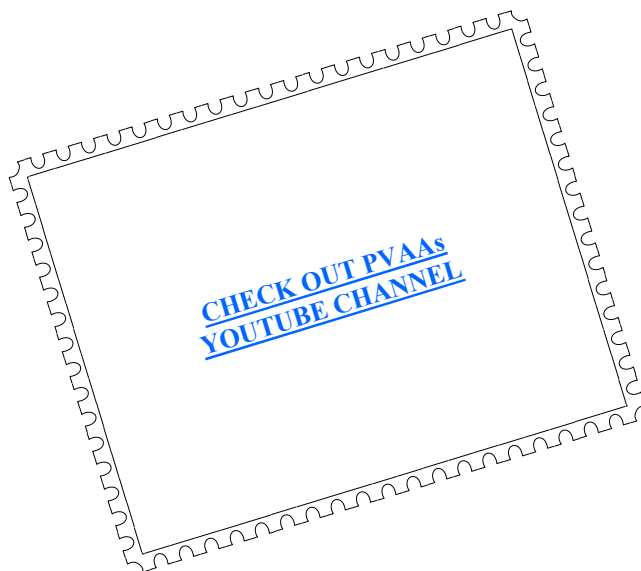




Newsletter of the Pomona Valley Amateur Astronomers

During the winter my attention was attracted to the changes in the stars and planets in the sky.

Paul Nurse



Volume 42 Number 12

nightwatch

December 2022

Club Events Calendar

Dec 10 Christmas Party – Casa Jimenez, Claremont 6PM
Dec 28 Board Meeting 6:15 PM
Jan 6 Virtual General Meeting 7:30 PM
Jan 21 Star Party – Mecca Beach
Jan 25 Board Meeting 6:15 PM
Feb 3 Virtual General Meeting 7:30 PM
Feb 18 Star Party – Anza Borrego
Mar 1 Board Meeting 6:15 PM
Mar 10 Virtual General Meeting 7:30 PM
Mar 25 Star Party – TBD
Mar 29 Board Meeting 6:15 PM
Apr 7 Virtual General Meeting 7:30 PM
Apr 22 Star Party–TBD
Apr 26 Board Meeting 6:15 PM
May 5 Virtual General Meeting 7:30 PM
May 20 Star Party – TBD
May 24 Board Meeting 6:15 PM

Jun 2 Virtual General Meeting 7:30 PM
Jun 17 Star Party – TBD
Jun 28 Board Meeting 6:15 PM
July 7 Virtual General Meeting 7:30 PM
July 15 Star Party – TBD
July 26 Board Meeting 6:15 PM
Aug 4 Virtual General Meeting 7:30 PM
Aug 19 Star Party – TBD
Sep 16 Star Party – TBD
Sept 20 Board Meeting
Sep 29 Virtual General Meeting 7:30 PM
Oct 14 Star Party – TBD
Oct 18 Board Meeting 6:15 PM
Oct 27 Virtual General Meeting 7:30 PM
Nov 8 Board Meeting 6:15 PM
Nov 17 Virtual General Meeting 7:30 PM
Nov 18 Star Party – TBD
Nov 29 Board Meeting 6:15 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 (2022)..... 909-599-7123
 Richard Wismer(2022)
 Ron Hoekwater (2023)..... 909-706-7453
 Howard Maculsay (2023).....

Directors

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



Wanted – Telescope Builders and Mentors

Mt. SAC is launching a new Adopt-A-Telescope program this semester. We've had several telescopes generously donated to Mt. SAC for this program, but these telescopes are in need of some repair. Mt. SAC students who participate in giving these telescopes some much needed TLC will be eligible to adopt these scopes at the end of the semester to take home and keep. However, these students are not experienced astronomers! They don't know everything you know! They need your guidance to learn how to fix and use these scopes. Please help us mentor the next generation of astronomers by meeting with us once a month for a Telescope Repair Party. Meet with the students, enjoy some pizza and help mentor a future astronomer in repairing and using their telescopes.

Tools will be available to use. There may be some restrictions on some tool use. You will need to sign up as a Mountie MakerSpace member (registration is free) and have a safety tour before repairing telescopes. Closed-toe shoes are required at all times. Eye protection will be required for some activities.

Skills especially needed this semester are:

- Collimating
- Aligning finder scopes
- Cleaning mirrors/lenses
- Motor repair of a "The Optical Craftsman" 1968 telescope
- Replacing a homemade eyepiece holder with a more modern one

Telescope Repair Parties

Mt. SAC Mountie MakerSpace
Building F7 (near the farm) – Free Parking Available
6:00 – 9:00 PM

October 11, 2022

November 8, 2022

December 6, 2022

Please let us know you're coming by emailing
Heather Rookhuyzen at planetarium@mtsac.edu in advance. Thank you!

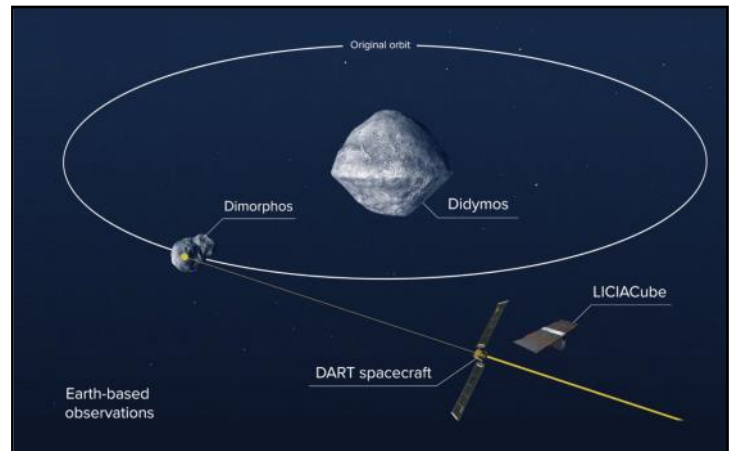


PVAA General Meeting 11/04/22

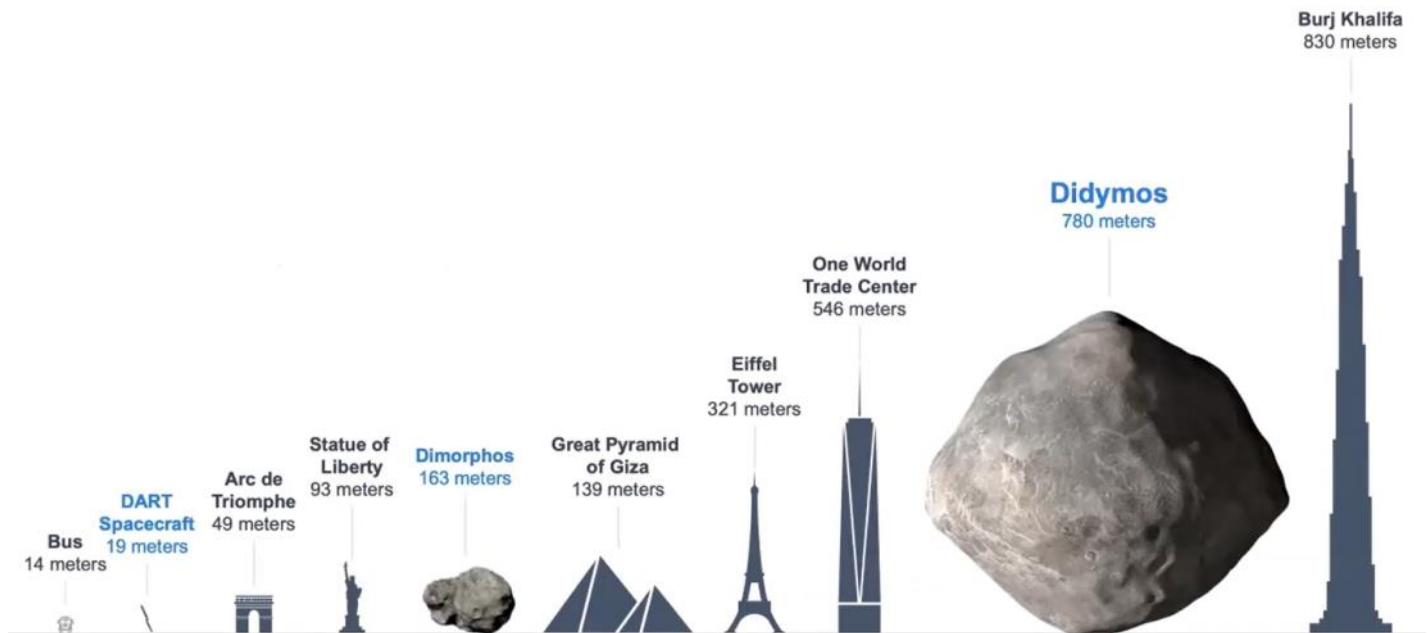
After a brief announcement time, Ken Elchert gave a DART Mission update. DART is an acronym for “Double Asteroid Redirection Test”, which NASA funded, but was run by the John Hopkins Applied Physics Laboratory. This was the first real test of a planetary defense of the Earth. While the asteroid impacted was not going to hit the Earth, this test was to see what the impact of the DART spacecraft would have on the asteroid’s orbit. The mission selected an asteroid named “Dimorphos” orbiting another, larger, asteroid “Didymos” to see how much change there would be in Dimorphos’ 11 hour and 55-minute orbit of Didymos. The Dart spacecraft, the size of a small car, impacted Dimorphos head-on at 4 miles per second, relative to its own speed. This did change the orbit of Dimorphos, which now has an 11 hour and 23-minute orbit of Didymos. This was a change of 32 minutes – or 4.5%. The impact also lowered Dimorphos by 51 meters, or 167 feet. This mission has been hailed as an “Outstanding Success” by NASA & other world space agencies.

On March 23, 1989, an asteroid twice the size of a football field crossed Earth’s orbit at a speed of 46,000 miles per hour. If it had hit Earth, it would have equal to the force of 20,000 hydrogen bombs, leaving a crater 10 miles wide and a mile deep. If it would have created tsunamis with extreme devastation world-wide. March 23rd is now named ‘National Near Miss Day’.

Ken showed his calculations, NASA/John Hopkins light curves, and – using the same spacecraft weight and speed, it would have to launch 50 years before Earth impact to miss the Earth. Or, as they said in the movie ‘Jaws’, “We’re going to need a bigger boat.”



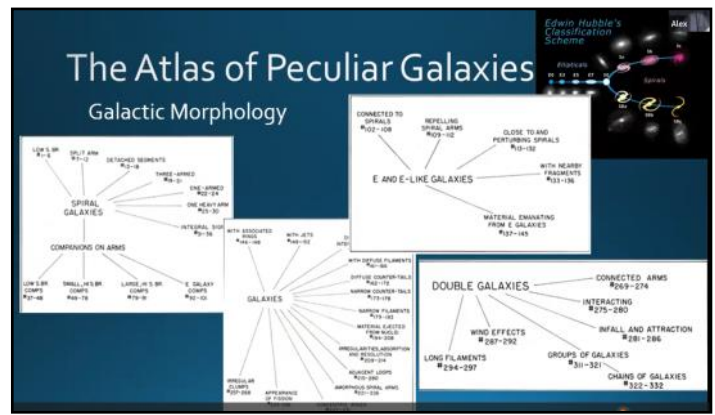
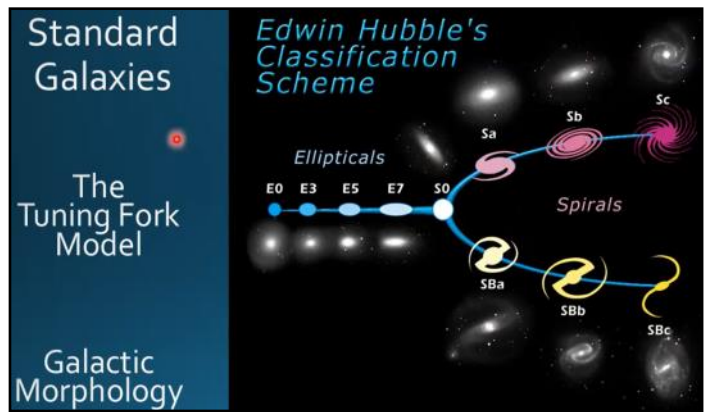
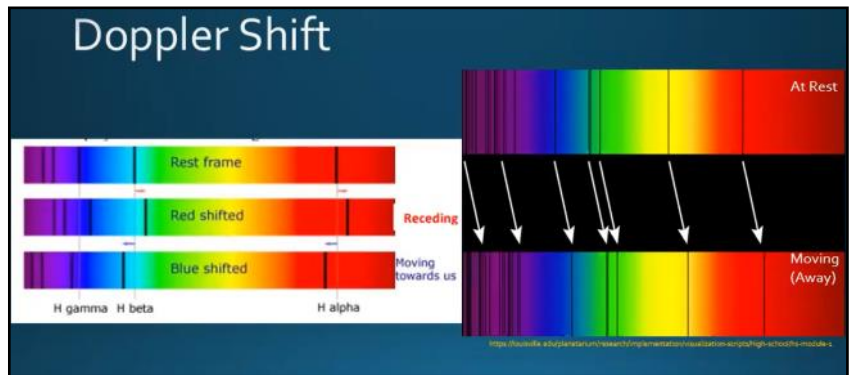
Size Comparison



Alex McConahay was our second speaker after a brief break. The title of his presentation was “Arp’s Peculiarities”. This is a list – or catalog - created by Halton Christian “Chip” Arp, who won the Helen B Warner Prize for Astronomy in 1960. He was also awarded the Newcomb Cleveland Award in 1960 and the Humboldt Senior Scientist Award in 1984. Dr. Arp was born in 1927 in New York City and died in 2018 in Munich Germany. He worked at the Mt. Palomar Observatory and the Schmidt Camera. He started studying ‘non-standard’ – or peculiar galaxies. Looking at the red or blue shift in a spectrograph you can tell how fast an object is moving away from you, or towards you. Even with the evidence mounting for the Big Bang, Arp didn’t like that explanation. He believed that the red shift could be explained away without the universe expanding.

You can get the Atlas of Peculiar Galaxies on Amazon for only \$999.98. He has his own classifications of peculiar galaxies. Alex recommends going to the Astronomical League website and trying out one of their programs – like seeing all the Messier Objects, etc. Alex also suggests visiting the <https://www.cloudynights.com/> website.

Gary Thompson



Another Look - December 2022

The winter solstice or the first day of winter is on December 21, 1348 PST. For those readers in Brisbane, this time will mark the first day of Summer. (Note APOD October 21, 2022)

December 8 full moon

November 25 and December 23 are December's new moons

Moon Names : Cold Moon, Snow Moon for the Cherokee, the Chinese, Bitter Moon, the Old English had the Oak Moon and the Christmas Moon in early America.

Striding across the cold winter sky, stars cracking in the wind and burning down through the air, he brandishes his club and holding his lions pelt shield up, Gilgamesh or maybe Uruanna or even Tammuz shines for us as he has for 30,000 years. Over 4000 years ago he marked the rise of Sirius and the inundation of the Nile. He has, as Tammuz, risen in June for the Assyrians. He wears his belt and sword and is dressed in (maybe) a lions skin. He is a son of Poseidian who gifted him with the ability to walk on or (maybe) in water.

For the Greeks, the constellation now known as Orion, marked the new year when he rose with the sun. Orion is followed by his dogs Canis Major and Minor. Canis Major's brightest star Sirius was the star the Egyptians used to calibrate their year by the rising of the Nile. Not much remains of the oldest stories of Orion except his various names and his importance as a seasonal marker.

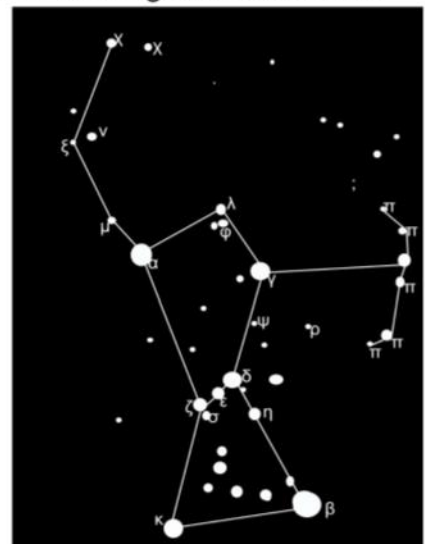
More imaginative, and through centuries of oral and some written tradition, the Greeks had him falling in love with the Plead Merope, chasing her across the heavens, being blinded by Merope's father, Oenopion, regaining his sight by the light on the sun and becoming the favorite hunting companion of the goddess Artemis

• [https://commons.wikimedia.org/wiki/File:Sidney_Hall_-_Urania_%2Ts_Mirror_-_Orion_\(best_currently_available_version_-_2014\).jpg](https://commons.wikimedia.org/wiki/File:Sidney_Hall_-_Urania_%2Ts_Mirror_-_Orion_(best_currently_available_version_-_2014).jpg)

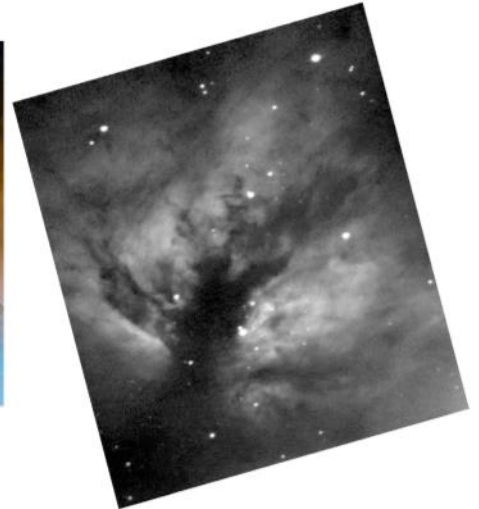
•Phew, when did guy stop to eat?

The easternmost (left) star in the belt is zeta ζ Orionis, a beautiful triple star system but you will probably only see two, the third is very close to ζ .

Zeta's ζ common name is Alnitak, meaning girdle, and it is associated with several very famous astronomical objects.



Right next to Alnitak is the Flame Nebula, NGC 2024. One of the objects that actually look something like its name. Its big and will fill the field in your medium power eyepiece. Close to the Flame is the Horsehead, long thought to be a mystical and difficult object to view. The Horsehead is Number 33 on Barnard's list of dark nebula and the reason I make sure to study each constellation for its own dark nebula.



From my backyard venues I never found it with my 3" refractor. In my 8", my light polluted backyard also made everything in that area pale and faint. But when I put the 17 on it at a dark sky site, Wow! IC 434 was large and bright and the black cloud of B33 was huge. Actually, Alnitak is embedded in IC 433's nebulosity. Look for Sigma σ Orionis. Sigma's bright light illuminates IC 434. On the other side of the Horse, between it and the Flame is NGC 2023, full of Hydrogen clouds. All I remember seeing is the star, an 8th magnitude Herbig star embedded in NGC 2023. Its star is designated 37903 in the Henry Draper catalog.

[Horsehead and Flame – Rick Gonzalez TVA](https://oceanomasters.org/user_images/ngc2024-flame-nebula/)

https://oceanomasters.org/user_images/ngc2024-flame-nebula/

<https://www.adamblockphotos.com/ngc2024.html>

A little further down from the belt is Orion's sword, Part of the huge Orion molecular cloud and maybe the closest star forming regions to our solar system. The Orion nebula, M42, has been recognized for thousands of years and is one of our favorite deep sky targets



The Orion Nebula has been visible for 30,000 years. Who can say what those early tool makers thought of that little fuzzy star and what significance they gave it. There is a Aurignacian mammoth ivory carving dated between 32,000 to 38,000 years old that was found in Germany depicting the nebula. Even just 50 years ago all we really new was that it was big and composed of gas. Our spectroscopes told us there was hydrogen and we were pretty sure it was a stellar nursery, but we had no idea just how big I it was. *OCAstronomers.org*

Unattributed

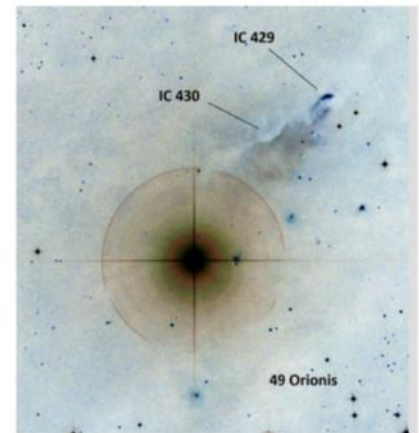
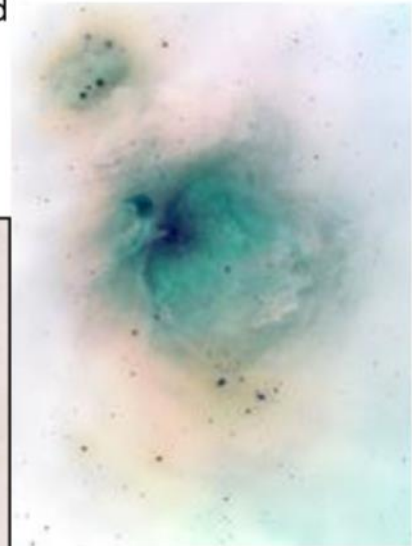
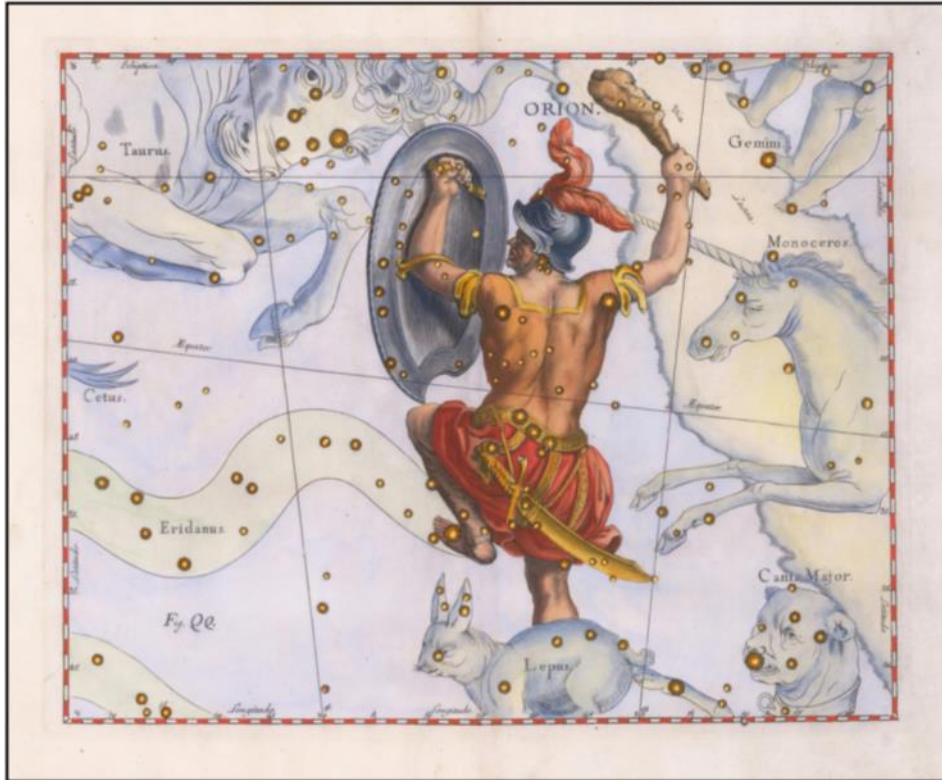


When I turned my 3" on it in the early 1960's I saw the great cloud, but what was front and center was the Trapezium. Now, that was sumptin'. I could split it with my 3, but my buddy's brother only saw three in his 60mm Tasco. Not bad, the first observations of the Trapezeium were done by none other than Galileo, and he also saw only three. You will be able to pick out six if your seeing allows and it would be interesting to see what some big long focus instruments in our amateur's hands can accomplish.

The main piece of the image we see here is composed of M42 and M43. The bluish nebula closer to the corner is NGC 1977.

<https://www.temeculavalleyastronomers.com/photo-gallery.html> Curtis Croulet TVA 0311

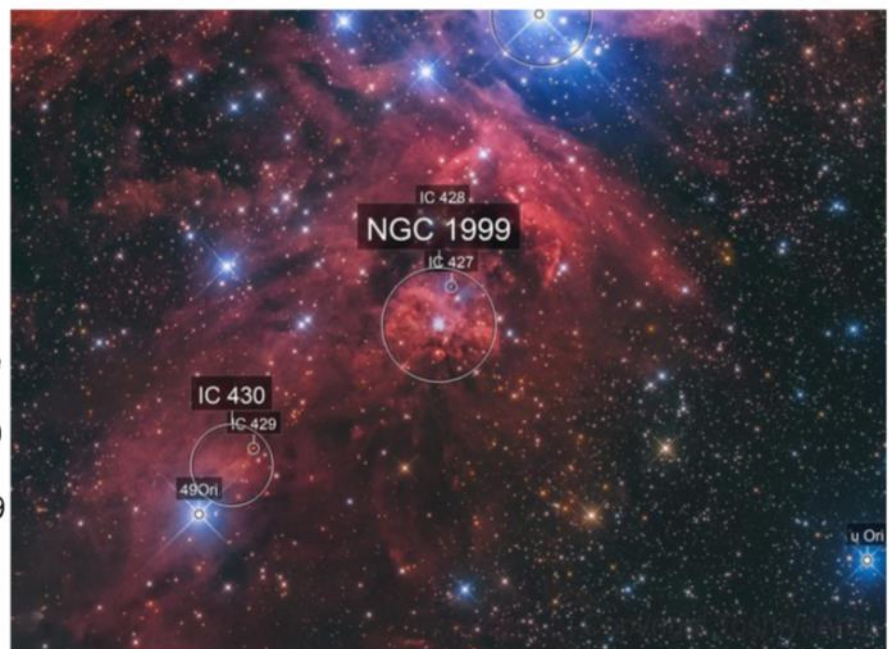
I have searched diligently for the classification of the dark lane separating M42 and M43, but could not find it. Current professional images often show a significant gap between



42 and 43, others not so much.

https://commons.wikimedia.org/wiki/File:Orion_constellation_Hevelius.jpg

Below the nebula and fading off into the greater Orion molecular cloud are several bits of nebulosity I found. As amateurs, we tend to look for the glorious objects like M42 and tough objects like the Running Man. I inverted Curtis's image to bring out NGC 1980 and the nebulosity south of M42. There are two more clusters of nebulosity running south, the area around NGC 1999 and around IC 430. The Inverted image around 49 Orion is IC 429 and IC 430. You can find an image of the hole in NGC 1999 at APOD on March 7, 2018 and on the OCA website.



The original image can be found at [https://commons.wikimedia.org/wiki/File:49 Ori - IC 430 - IC 429 - DSS2 labeled.png](https://commons.wikimedia.org/wiki/File:49_Ori_-_IC_430_-_IC_429_-_DSS2_labeled.png).

The colored image will take you from NGC 1999 down to 49 Orionis.

<https://www.hansonastronomy.com/ngc-1999>

Under Orion's feet, mark too the Hare,
Perpetually pursued .
Behind him Sirius Drives as in chase,
hard pressing when he rises ,
And when he sinks as hotly pressing still .
Frothingham's Aratos

While Orion fights Taurus in an effort to reach Merope and the Pleiades, His dogs, the big guy and the pup are chasing a rabbit across the sky. The rabbit's name is Lepus, meaning the Hare, and I suppose he is running for the shore of Eridanus, probably to hide in the rushes that grow deep on the river's shore. Lepus is another ancient constellation, showing up on cuneiform tablets, coins and seals from the Euphrates Valley, Chinese artwork, Indian astronomy and even into the oral legends of Australia and the islands nearby. The mythology put Lepus at odds with Corvus. The one rises, soon after the other sets. In addition, Lepus is hunted by Aquila, the Eagle, they are opposite and one rises as the other begins to set.

There are two red variable stars and one exciting multiple star in Lepus to find. The first is the famous Hind's Crimson Star, R Leporis. A red variable changing in magnitude from 5th to 12th. "R" is found 3.5 degrees from Mu μ Leporis. The top right star of Orion's stool. RX Leporis is also 3.5 degree from Mu μ but almost due north and right next to Iota ι Leporis. RX is a pulsating variable of only about one-half a degree of magnitude from 5 to 5.5. Although not physically related to Iota they make a terrific Blue/Red image in your eyepiece, only one degree difference in magnitude. To add to the excitement, Iota is also a double star with a 10th magnitude companion.

<https://www.sciencephoto.com/media/331140/view/variable-star-rx-lep>



Another interesting star(s) is NGC 2017, but first observed by John Herschel as a sextuple star and given the designation h3780, though Burham lists only 4 companions. Its only 6' west of Alpha α Leporis. https://commons.wikimedia.org/wiki/Category:NGC_2017#/media/File:NGC_2017_PanS.jpg

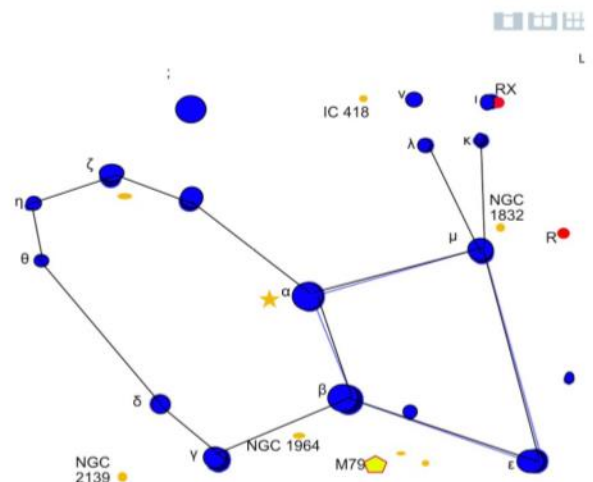
Staying with the colorful theme for the present, shift your telescope 4 degrees (about 15' of Arc) west to NGC 418. Its pretty small, 12", but is 9th magnitude with a 10th magnitude central star and lots of nebulosity. Hubble did an incredibly colorful one back in 1999. You can find it on hubblesite.org.

<https://www.nasa.gov/feature/goddard/2017/messier-79>



On the other side of Lepus, south of Beta β , is another one of Messier's

<https://oc astronomers.org/wp-content/uploads/2019/01/m079.jpg>



globulars. It's M79 and it's big and at 8th magnitude somewhat resolvable in your 8". NASA did an outstanding piece of darkroom work and came up with a really great image. Hubble's image of M79 is also on hubblesite.org.

The image was done by a local member of the Orange County Astronomers and can be found at

<https://ocastronomers.org/wp-content/uploads/2019/01/m079.jpg>

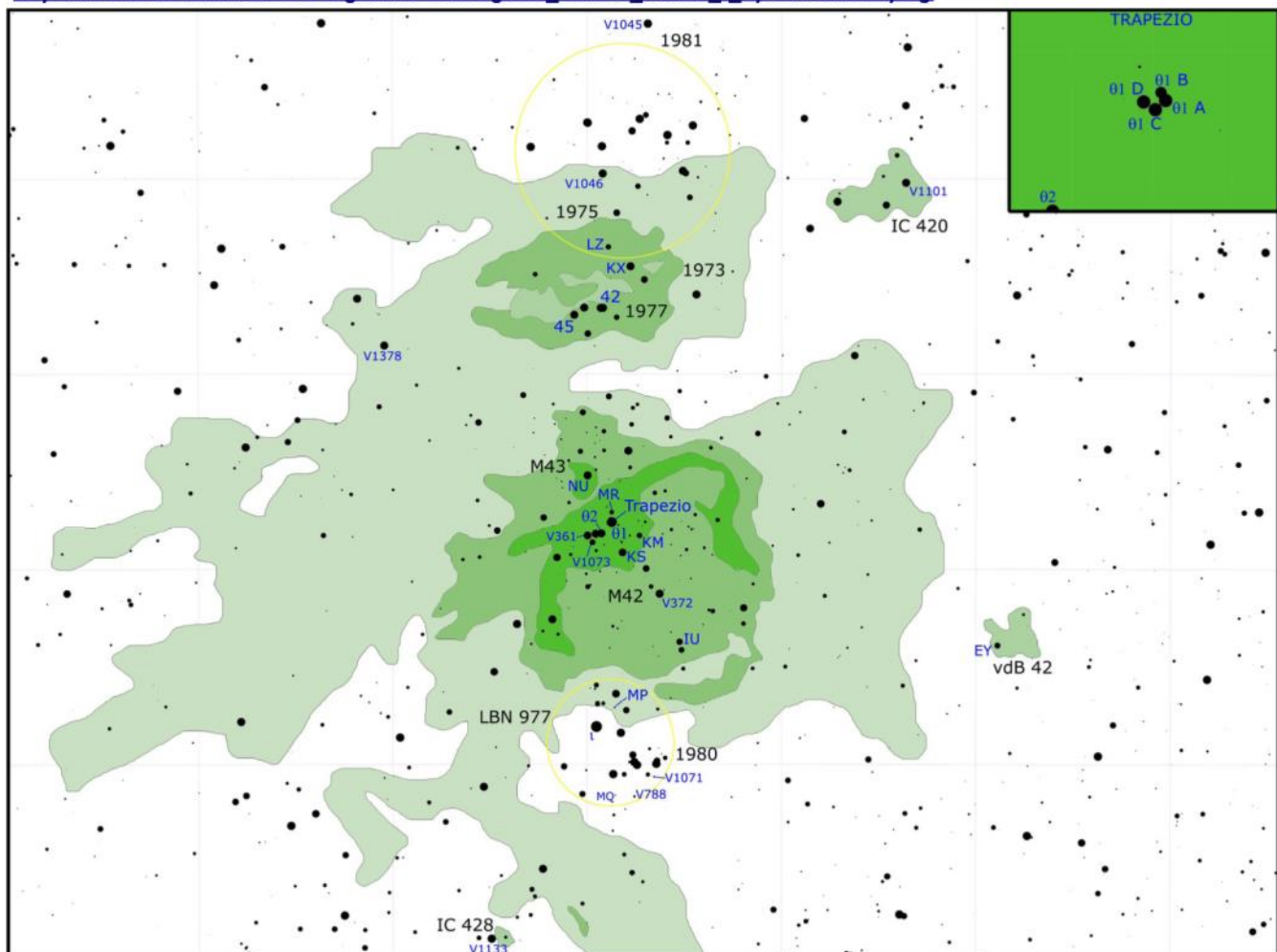
We have two "bright enough" galaxies near M79 that we want to see. NGC 1964 is 11th magnitude and NGC 2139 is 10th. All you will see with N2139 is its nucleus. It get bright real fast as the arms fade. N1964 is a different animal. Its titled sharply and at a steep position angle. Look it up at:

https://en.wikipedia.org/wiki/NGC_1964#/media/File:NGC_1964_-_Potw1739a.tif



Dark Skys
Dave Phelps

https://commons.wikimedia.org/wiki/File:Regioni_celesti_scelte_-_SpadaOrione.png





This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Binoculars: A Great First Telescope

David Prosper

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope? There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: a good pair of binoculars!

Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching, and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky. Binoculars also travel well, since they easily fit into carry-on luggage – a difficult feat for most telescopes! A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42). While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupiter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

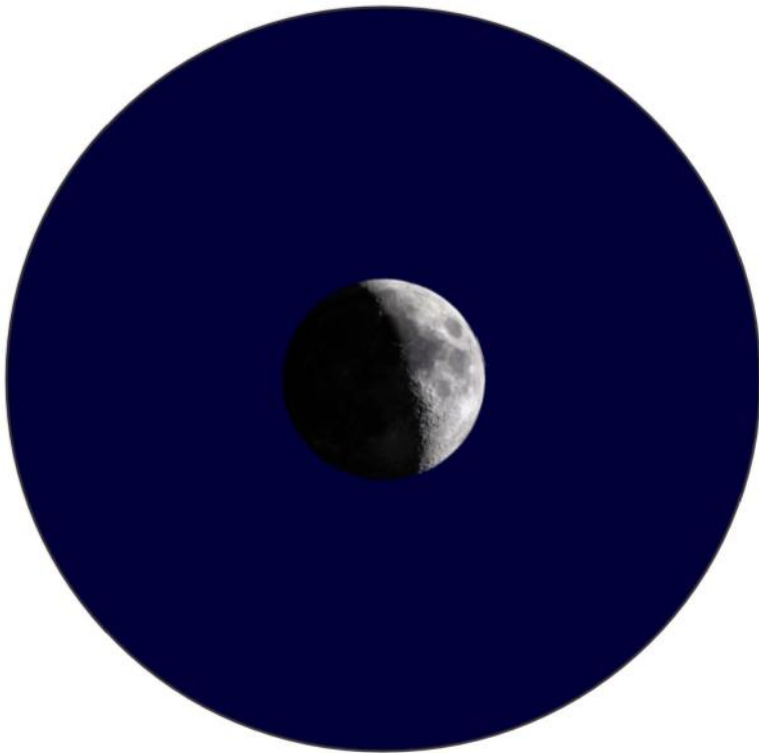
What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters (mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter. It can be tempting to get the biggest binoculars you can find, but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more power often have narrower fields of vision and are heavier; while technically more powerful, they are also more difficult to hold steadily in your hands and "jiggle" quite a bit unless you buy much more expensive binoculars with image stabilization, or mount them to a tripod.

Would it surprise you that amazing views of some astronomical objects can be found not just from giant telescopes, but also from seemingly humble binoculars? Binoculars are able to show a much larger field of view of the sky compared to most telescopes. For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great investment for more advanced observing, as later on they are useful for hunting down objects to then observe in more detail with a telescope.

If you are able to do so, real-world advice and experience is still the best for something you will be spending a lot of time with! Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars of all kinds – just ask permission before taking a closer look! You can find clubs and star parties near you on the Night Sky Network's Clubs & Events page at bit.ly/nsnclubsandevents, and inspire your binocular stargazing sessions with NASA's latest discoveries at nasa.gov.



The two most popular types of binocular designs are shown here: **roof-prism** binoculars (*left*) and **porro-prism** binoculars (*right*). Roof prisms tend to be more compact, lighter, and a bit more portable, while porro-prisms tend to be heavier but often offer wider views and greater magnification. What should you choose? Many birders and frequent fliers often choose roof-prism models for their portability. Many observers who prefer to observe fainter deep-sky objects or who use a tripod with their observing choose larger porro-prism designs. There is no right answer, so if you can, try out both designs and see which works better for you.



A pair of good binoculars can show craters on the Moon around 6 miles (10 km) across and larger. How large is that? It would take you about two hours to hike across a similar-sized crater on Earth. The “Can You See the Flag On the Moon?” handout showcases the levels of detail that different instruments can typically observe on the Moon, available at bit.ly/flagmoon. Moon image courtesy Jay Tanner