



Newsletter of the Pomona Valley Amateur Astronomers

The sky is the daily bread of the eyes.
Ralph Waldo Emerson

Volume 32 Number 03

nightwatch

March 2012

President's Message

I tried something new this month, and it was such an interesting experience that I had to share it.

I came across an article on Cloudy Nights called "The Lap Scope", by Douglas Bullis ; (thanks to Doug for permission to use the photo!). In it Doug describes how he put handles on an old Meade SN6 Schmidt-Newtonian telescope tube and used it freehand to scan the night sky, using it as a Richest-Field Telescope (RFT). He writes, "RFT wasn't a field



of image so much as a quality of feeling. It was my right brain giving me insight rather than knowledge. It was like the difference between a Monet painting of his famed garden at Giverny compared with a hi-rez digital photo of the same scene. It was an emotional bond rather than an analytic fathoming."

I was entranced by Doug's poetic description of using the lap scope in the spirit of exploration rather than analysis. I remembered that I had a 5" f/5 Newtonian telescope whose tube was sitting neglected in a corner of the garage. I pulled it out, dusted it off, dropped in my lowest-power eyepiece--a 32mm Plossl yielding 20x and a 2.5-degree field--and sat down for lap scoping.

How did it work out? Surprisingly well. No-one is going to split tight double stars or track down the Herschel 400 with a lap scope, but for just cruising around the heavens at low power it is ideal. I found that I could brace the tube against one leg and get bigger, brighter, and sharper views than I can with my 15x70 binoculars. Navigation was the hardest part. At low power the field of view was wide enough that I could usually just point to things by dead reckoning, but for some reason the inverted view that doesn't bother me at all when I use my Dob had me totally flummoxed. But oddly enough it was not an uncomfortable feeling. It took me back to the days when I was first learning the sky and sometimes just got lost in space, and not in a bad way. I love observing but sometimes I turn it into work. The lap scope turned it back into play: I was only looking to have my mind blown. Anything more serious would have been impossible.

As Doug notes in his article, really the only scopes that it's possible to use from your lap are Newtonians of a convenient focal length—about the distance from your lap to your eyes! If you've got one, I say give it a try. It won't hurt anything, and you may find that sort of untethered observing a welcome change of pace. If you don't have the right tube for lap-scoping, don't worry. As Doug says, richest-field observing can be a state of mind. The next time you're out observing, with whatever instrument you have on hand, set aside the charts for a minute, drop in your lowest-power eyepiece, and deliberately get lost. Who knows what you might find?

Our speaker this month is author and presenter Robert Piccioni, PhD, whose stated goal is "making the wonder of our universe accessible to everyone". You can learn more about his work and his books at his website,

<http://www.guidetothecosmos.com/>.

Matt Wedel

February General Meeting

PVAA President Matt Wedel started the meeting with an update of the "Library Telescope" for the Claremont Public Library. We will try to have it ready and on display at the library by March 31st of this year. The Friends Of The Library want to get the word out by having a "Name That Telescope" contest. Starting April 15th of this year the public will be able to check the telescope out. The entire cost of the telescope will be shouldered by The Friends Of The Library. PVAA will provide technical support, and make sure the scope stays in working order.

Frank Busutil talked briefly about Project Bright Sky. He heads the PVAA effort to bring astronomy to the legally blind. The next Project Bright Sky event will be this April 25th at the Orange County Braille Institute.

PVAA Secretary Bill Connelly reminded everyone about the Star Party in March 24th at the Mecca Beach, Salton Sea.

Gary Gonnella put in a short plug for "Virtual Star Parties". First you go on-line and join Google Plus. Then create a circle with Gary Gonnella and Fraser Cain of UniverseToday.com. You could be part of a star party while you are sick at home!

We finally moved the stored PVAA equipment out of Ludd Trozpek's hanger at Bracket Airport in La Verne. It is now in a rented storage unit. Bill Connelly went though and took inventory of the items. Thanks Bill!

Following the announcements, Lee Collins showed us around the constellations of Gemini and Lynx. The area includes Hubble's Variable – a nebula that varies in brightness. This part of the sky also includes lots of giant stars and double stars.



Alex McConahay with his setup.

The speaker for the night was Alex McConahay. Alex is the past president of the Riverside Astronomical Society (RAS). <http://www.rivastro.org/> <http://www.alexastro.com/> Alex's subject for the night was "2012: Syzygy and the End of the World". Syzygy is a straight line configuration of three celestial bodies. Basically any outer planet that is in opposition to us, i.e. Opposite the sun, would cause a syzygy. - The Sun, the Earth, and the other planet would all "line up" to form a straight line. When Venus passes in front of the sun, it is called a "Transit" and it too is a syzygy. For the Los Angeles area the transit will occur on June 5th starting at 3:06:26pm and will still be in transit at sundown.

THIS WILL BE THE LAST TRANSIT OF VENUS IN YOUR LIFETIME – so don't miss it! (I'm taking the day off.)

Lunar eclipses and a solar eclipses are also examples of three celestial bodies lining up. (The Sun, the moon, and the Earth.) There will be a solar eclipse on May 20th. It will be visible in the United States, with Los Angeles getting a partial eclipse. This eclipse is called an "annular solar eclipse" because the moon is a little too far away from the earth to totally hide the sun. Only 94% of the sun will be blocked out if you are at the exact center of the moon's shadow. Alex suggested that you may want to go to the Reno, Nevada area to get a better percentage of moon blocking the sun, as compared to Southern California. This is another celestial event that you should not miss. (Another vacation day!)

As for the end of the Earth, Alex doesn't see that happening any time soon.

Gary Thompson

How Does It Work?

In my previous article we found that in order to see the faintest star possible, we need to suppress the background until it appears black. Then the size of the objective and the eye detection threshold will determine the faintest star we can see. We can do this by selecting an eyepiece with a sufficiently short focal length.

When we select such an eyepiece the airglow seems to diminish. That is because we have effectively spread out the portion of the sky we are looking at and our eye now sees a smaller solid angle. The result will be limited either by our eye's minimum detection threshold, the diffraction limit of our scope or the seeing conditions smearing the star.

A handbook will tell us that the best a scope will do is determined by the objective size. The minimum star magnitude for various objectives are: 4 inch – 13.7; 8 inch – 15.2; 12 inch – 16.1. This can be accomplished by choosing a sufficiently short focal length eyepiece.

I have an 8 inch LX-90 which is F/10. On a good night when the airglow is low, I can suppress it sufficiently with a 16 mm eyepiece. Then a magnitude 15 star is just visible. On a good night at my urban home with air glow from city lights, it takes an 8 mm eyepiece to get the same result. But with that eyepiece I have run up against the diffraction limit. Even the faint stars start to look like discs. Clusters are smeared.

A 12 inch Dobson which is F/5 is a nice scope. It has more than twice the collecting area that my LX-90 has. It will top out under the low air glow condition with an 8 mm eyepiece. With that eyepiece a magnitude 16 star can be seen.

I also have an ETX-70. The objective is only 70 mm. One might expect this to have very limited use even under good air glow conditions. But, because it is F/5, it tops out with an 8 mm eyepiece just like the 12 inch, F/5 Dobson. It can see a magnitude 12 star. That's not bad at all for a grab and go scope. Of course the magnification is low, so those Messier star clusters are small. But I can see them.

Reaching that point where the background appears black depends only on the brightness of the airglow and therefore the brightness of the image in the eyepiece. That is determined by F number and magnification.

The smaller aperture offers a less bright background image to start with. So it doesn't need to be spread as much to fall below the eye threshold. The larger aperture buys us a brighter image and more magnification. But the eyepiece that does the job is the same for all scopes with the same F number.

Brighter is important when we are searching for Messier's. They are all above the minimum star threshold. Brighter makes the star clusters come alive. It also cuts exposure time for astrophotography. But even a small scope or binoculars can be fun on a good night.

So now we know how to get the best results for those faint Messier star clusters. The question is then, how will we do with the faint fuzzies? I will save that for the next article. .

Do you have a topic you would like covered? Please send your thoughts to me at lcrowder@roadrunner.com .

Ken Crowder

Club Events Calendar

- March 9 - General Meeting - Robert Piccioni**
- March 24 - Star Party - Mecca Beach , Salton Sea**

- April 5 - Board Meeting, 6:15**
- April 13 - General Meeting**
- April 21 - Star Party - Cow Canyon Saddle , Mt. Baldy**
- April 25 - Public Outreach - Anaheim Braille Institute 7pm**

- May 3 - Board Meeting, 6:15**
- May 11 - General Meeting**
- May 20 - Annular Solar Eclipse**
- May 23 - 28 [RTMC](#)**
- May 26 - Star Party - RTMC**
- May 31 - Board Meeting, 6:15**

- June 5 - Venus Transits Sun - starting 3:06pm**
- June 8 - General Meeting**
- June 16 - Star Party - White Mountain**

- July 2 - School Star Party - Colony High School, Ontario**
- July 5 - Board Meeting, 6:15**
- July 13 - General Meeting**
- July 21 - Star Party - Cottonwood Springs - joint with Palm Springs Braille Institute**

PVAA Officers and Board

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What's Up - A Weird Kid, A Dim Cat

The magic of number seven is revealed astronomically by the Big Dipper's seven stars. Always visible in the north as they circle Polaris. In many Asian cultures they are Seven Sacred Sages on a ritual circle journey. In Europe they're a wagon, a plow, a curving compass showing north. Runaway slaves followed a "drinking gourd" north to freedom.

A Big Dipper magic image of today is 1995's Hubble Deep Field. Only 2.5 arc minutes across at 4½ degrees north of Megrez (meaning bear's center in Arabic), that star where Dipper's handle joins the bowl. It's a photographed field about 1/28,000,000th of total sky. It shows 3,000 remote galaxies, some of the youngest and most distant known. Showing so many galaxies in a bit of sky it became a sacred icon for seeing an early universe.

Its Big Dipper location was chosen because it had to be a high Milky Way galactic latitude free of dust. This avoided foreground light, infrared, ultraviolet, and X-ray emissions from bright stars and interstellar clouds. Also it was in the Hubble Telescope's continuous viewing zone not occulted by Earth or Moon. The image came from 342 exposures over 10 days.

In 1998 the space telescope produced a Hubble Deep Field South, and in 2004 a Hubble Ultra-Deep Field (in Fornax the Furnace). This image contains 10,000 galaxies. It was the deepest astronomical image of the universe ever taken, looking back 13 billion years.

But to return to those seven sacred stars, they are also the framework of the Big Bear (Ursa Major). Great bears feared and revered by people of the northern woods. The word arctic comes from arktos the Greek for bear. Ursa Major has a very long tail, seen by some Indians as three hunters following the bear. Here the double star, Mizar and Alcor, became a hunter with his cooking pot. Mizar and Alcor (called Horse and Rider) have long been used as a test for sharpness of sight. Alcor is actually three lightyears behind Mizar. Mizar is itself made up of two close double stars. So it's part of an optical binary, it then became the first telescopic binary (1617) and the first spectroscopic binary (1889).

This Big Bear also has three big paws represented by three pairs of stars to the south. They are Talitha, Tania, and Alula Borealis (north) and Australis (south). The Arabs called them the Three Leaps Of The Gazelle.

Even further north is the seven star Little Dipper with unmoving Polaris at the end of its tail. Properly the Little Bear (Ursa Minor) but it has no bearish body and holds only one faint galaxy. Here the long tail can be explained as having been stretched by swinging around a fixed North Star.

The Big Bear has over 75 galaxies visible with a large amateur telescope. The most observable are the pair M81 and M82 (12 million lightyears) discovered by Johann Bode in 1774. They are part of a group of 34 galaxies. M81 is large and luminous radiating a lot of heat in its spiral arms. Its close

companion M82 (pictured) is an edge-on that has been greatly agitated into starburst activity by interaction with big brother M81. Its called the Cigar Galaxy for its firm shape and a cigar band crossing its middle. This band explodes out into space with x-ray, infrared, and all sorts of radiation. There is a super massive black hole here, and an "unknown object" that radiates unlike anything else in the universe.

The next best galaxy in Ursa Major at 21 million light years is the giant "Pinwheel" galaxy M101. Its was one of the primary "spiral nebulae" reported by Lord Rosse in 1845. One of the first extragalactic supernova was seen here, and a new one just appeared in 2011.



Other Messier objects in Ursa Major are largest (but not the brightest) planetary nebula M97 (The Owl). Here is the embarrassing Messier's Mistake, M40. It's actually two close double stars Messier's telescope saw as a blurry nebula. There're two fainter galaxies M108 (near Owl Nebula), and M109 near the bowl bottom star Phecda (bear's thigh in Arabic). They are two of the last objects added by Messier in competition with rivals.

The Big Bear's brightest star is Dubhe on the Dipper's lip. It means bear's back in Arabic. Combined with the second brightest star Merak (bear's loins) they form The Pointers directing the eye toward Polaris.

The Arabic names of the tail stars are Alioth (tail fat). Mizar and Alkaid weirdly refer to two mourner girls at the funeral of Callisto, one of the lovers of Jupiter. Here the bowl is seen as a coffin trailed by mourners. In other versions Callisto isn't killed by the jealous wife Juno but is changed into a bear and hidden in the sky to forever circle. If we follow the tail arc we can arc to the star Arcturus (in Bootes) which means bear guard. One can get very bearish about this northland of seven sacred circling stars.

Ocotillo Wells SVRA Is Proud to Present

“Hot Stars and Heavenly Bodies”

Friday, March 23rd and Saturday, March 24th

Call: 760-767-5393 for more details

Join us at Ocotillo Wells on the weekend of March 23rd and 24th to help us celebrate the spring equinox in a very special way. This free and open festival will feature our guest astronomers Steve Kennedy and Paul Maag who will join staff interpreters Ali Barnes and Ken Conway for a weekend-long event. Join us on Friday and Saturday night from 7pm until after midnight. At Ocotillo Wells we have a tradition of weekend off-highway riding during the day and stargazing at night. Hot chocolate will never be the same after seeing the heavens through a 22-inch and a 28-inch telescope. This event will blow you away! Make your plans to circle up the wagons and camp out on March 23rd and 24th. Watch for special Jr. Ranger astronomy programs on Saturday! **Go big or go home! That's what we say at OW.**

Paul Maag joins us from Palm Springs, CA. Paul's day job is Alternative Media Specialist and Counselor at the College of the Desert. He specializes in adaptive/assistive technologies in order to increase learning opportunities for disabled students. Paul is a published author and writes about mountain biking in the local area. Check out his book "Mountain Biking around The Coachella Valley." He is also an amateur astronomer and pioneered using video cameras with the astronomical telescope. Paul utilizes a MallinCam CCD observational video system attached to his 22-inch Starsplitter telescope. The sensor in this video system produces amazingly-detailed, colorful astronomical images with astounding quality. Come see his live projected images of galaxies and nebula at the Ocotillo Wells Amphitheater.



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Our other special guest for this weekend extravaganza is Steve Kennedy, owner of Kennedy Optics of Yucca, CA. His company specializes in the production of custom telescope optics. Steve custom grinds mirrors from 22-inches to 32-inches for use in Newtonian-style telescopes. He personally grinds, polishes, hand figures, and star tests every mirror until they produce images that will satisfy the most discriminating observer -- you. Steve's passion is producing exquisite, large-aperture Newtonian optics for the discerning observer. Come share his passion for astronomy. Steve will set up his amazing 28-inch telescope so prepare to step up the ladder and observe the heavens in a whole new way. Don't miss "Hot Stars and Heavenly Bodies" in the desert of Ocotillo Wells SVRA.



Contact Steve Kennedy at:
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PVAA Secretary Bill Connelly reminds everyone about the PVAA Star Party on March 24th at Mecca Beach, Salton Sea