Desert Sky Observer

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NEWSLETTER OF THE ANTELOPE VALLEY ASTRONOMY CLUB, INC
P.O. BOX 4595, LANCASTER, CALIFORNIA 93539-4595
The Antelope Valley Astronomy Club, Inc., is a 501(c)(3) Non-Profit Corporation. Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/ The A.V.A.C. is a Sustaining Member of The Astronomical League and the International Darksky Association

Up-Coming Events

December 3: Sierra Elem. School Presentation
December 4: Christmas Party
December 4: Last Quarter Moon
December 11: New Moon
December 18: First Quarter Moon
December 26: Full Moon

President's Report

Terry Babineaux

The year is finally at its end. Along with our share of successes and mistakes have been a lot of hard work, a fair share of fun, and a lot of camaraderie. Many of you are probably also aware of the debate within the club that started earlier in the year when establishing a board of directors was proposed. It became obvious that the club could be thought of as either a community or member services organization. Sides were drawn and quite a bit of interesting discussion followed.

But I personally don't see these two issues as distinct entities. To my way of thinking, the mechanism by which an organization gives something back to the community can itself be thought of as a member service. One of the reasons I so dislike having to drive within typical city congestion is the ongoing battle that always seems to be taking place. Most drivers seem incredibly reluctant to yield a single foot of roadway. I can't count how many times I've been delayed by a lane closure waiting for someone to let me into the open lane next to it. How nice it would be if drivers simply made it a policy to let others by once in a while. As well as reducing stress, I have no doubt that this would make traffic move much faster overall.

Likewise, I cannot imagine how much better the world itself would be if all of us would take a bit more time to give something back to the community. It really doesn't matter what is chosen to give back as long as something is given. Such commitments can range from spending a few hours cleaning up the trash in a local park to managing full-time a wildlife rescue organization. Less important is the time committed than is the commitment itself. A large number of small contributions will quickly add up to a significant force. One of the advantages of a club such as ours is the opportunities it provides for making such commitments. A few months back, we talked about "what can I do for my club." I would invite everyone to give this some thought over the holidays and perhaps make it part of your New Year's resolutions.

I wish everyone the best as the New Year arrives!

Vice President's Report

Doug Drake

This, the last month of the year, sums up a grand tour of community events and some disappointing star parties for our club. As for the disappointing star parties, I'm afraid that Mother Nature intervened with cloudy skies. We are all very proud of our club and I expect that next year will bring great expectations with lots of fun. We'll have a very motivated Executive Board next year and they need our support to have a good balance between work and fun for all of us.

I was not able to give my full attendance as your Vice President this year because of my commitment to flight testing and work-related travel to Ft. Worth, Texas, and other places. I am sorry to say that I was not always able to pump out the Planet Watch each month for the DSO. I am now working at Edwards AFB and supporting F-16 fighter flight testing, which consumes most of my time. Wendy and I will still support our club events when we are able. It is important that each of us support each other for our club events, and to keep the fun in our actions and thoughts. Remember, our astronomy club is the best ever.

An important note: The Cassini Spacecraft "Huygens" probe will usher in 2005 with its landmark mission to Titan, Saturn's largest moon. After a seven-year journey strapped to the side of the Cassini Orbiter, Huygens will be set free on December 25, 2004, and begin a 21-day journey to Titan. Then on January 14, 2005, Huygens begins its descent through Titan's cloudy (nitrogen) atmosphere and will land on the surface about two-and-a-half hours later. The question is, what will the spacecraft probe find?

Do you know who is responsible for digital imagery as it is today? In the early days of space exploration, in the 1960s, engineers had to figure out a way to take a basic television signal and convert it to zeros and ones in order to store image information onto a computer and beam the pictures back to Earth. CCD and orthicons were very new to us in those days so we had to use vestigial signals (television) to collect visual images electronically. Our engineers developed the Multimission Image Processing Lab (MIPL) at the Jet Propulsion Laboratory. Thus, digital cameras and digital image processing were invented at JPL for the space program and enabled us the first views of the moon and Mars. As for digital imagery we have today, we use MIPL. How about that?

That wraps it up from the VP this year. I hope I've made a difference for you all. See you at the Christmas Party on December 4, at 6 p.m., at the Greenhouse Café in Lancaster. Have a very Merry Christmas!

Did you know? ?

Data from Cassini has blown away much of what scientists thought they knew about Saturn's moon Titan.

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Member Focus: Keith Lawson and the Keith Lawson Award

We present the Antelope Valley Astronomy Club's highest award for service to the club and dedication to amateur astronomy once a year. The award is named after our club's first president, Keith Lawson. Besides being a brilliant amateur telescope designer/maker and observer, he is a heck of a nice guy, always ready to help the club with difficult tasks including refurbishment of the club scopes, which he has done many times. Here's is a bit more about Keith taken from an article, "Star People" a few years ago…

Star People

(Reprinted with permission)

My first observations through a telescope were at the age of about 8 years old, but I became a steady observer while I was in the Air Force in the early 70's. At first, my astronomy was just general observing. I enjoyed "be-bopping "around the sky with my 60mm Sears equatorial refractor. It got quite a work out. I clearly remember the "spectacular views" of the moon, Jupiter and Saturn with it. As time went on I began to lust for more power. GI wages, a wife and three kids made buying a new instrument out of the question. In fact I remember breaking in our new Sears credit card with the purchase of the 60mm equatorial refractor. $130.00 was a lot of hobby money back then. I enjoyed drooling over the Celestron catalog. At that time, the C-8 was my dream scope.

One day while thumbing through the Edmund Scientific catalog, I ran across the optics books written by Sam Brown. They were written for a guy just like me with plenty of illustrations and diagrams. The one that got the most use was "All About Telescopes", which I still have and still reference. This book started my journey down the road of telescope making. As they say, necessity is the mother of invention. Since I could not buy I figured I could build.

My first telescope-making project was a 6" F/5 Newtonian. It had excellent Meade mirrors. The tube assembly was mounted on a modified Mayflower equatorial mount. While on leave back in Los Angeles, my uncle Phil gave me a 5-inch F/5 and a 4" F/15 Jaegers lenses. He also included a 32mm Erfle eyepiece. Upon returning to Alaska to finish my tour of duty, much of my spare time was spent in putting the 5-inch together. I had a ball with that telescope. I would drive outside of Anchorage to set up the scope in a dark sky site. The telescope gave spectacular wide field views.

When I returned to California I proceeded to put the 4" F/15 lens to use. This is the scope that appeared in the August 80 issue of Sky & Telescope. By this time I had a serious case of "TM fever". The only cure was to build! The 4-inch refractor was completely rebuilt and entered into the telescope competition at the Riverside Telescope Makers Conference in 83. It won a merit award that year. I also received merit awards in 84, 93, and 94.

I love experimenting with optics and optical designs. This is one of the major driving forces of my desire to design and make telescopes. I would guess that I have built or owned just about all the designs that an amateur astronomer would come in contact with, from a 60mm refractor to a 16" F/22 cassegrain and everything in between. I have learned many of the advantages and disadvantages of each design. Many were repeats for one reason or another. How many telescopes? I don't know. I stopped counting after about 20. I think the only person who might know is my friend Fredrick Ley. He has photos of many of them.

I first learned to use a computer in 85. The rest, as they say, is history. I now had the power to go from paper designs (and a lot of erasers) to computer-optimized creations. I still have fun throwing around different optical designs. I have many "paper" telescopes that will probably never be built. It sure is fun though. I have even designed some refractor lenses for friends. I'm still amazed at the power of optical software. Add 2-D/3-D computer aided design to this and you are talking about a telescope makers dream. I can design anything I want and test it without building it and when I build, I know that I have solved most of the problems "on screen". By the way, building computers is my second hobby and electronic music composition my third (No Rap Here).

I have no formal education in the engineering, design and fabrication of optical instruments. I learned everything "on the fly". Being a research and development machinist for the Air Force helped a great deal. You learn a lot by fabricating rocket motors and their support hardware. I love working with optics. When you enjoy doing something, it's amazing how much you can learn about it over time. I do wish I had the optical fabrication excellence of a guy like Jerry Logan, but I just don't think I have the patience to push glass. At least not with some of the designs I have dreamed up. (Anyone interested in an 8-inch F/15 super planetary 2-mirror "cat" schiefspigler with an off the shelf corrector and a diffraction limited field of ¼ degree?) See what I mean?

I founded the Antelope Valley Astronomy Club in 1980. It was started as an idea of mine to get together the local amateur astronomers in the high desert. Ron Standridge was my observing partner at the time and he owned a jewelry shop in Lancaster. This is where we held our first official meeting. I was the founding president and served for two years. The club is still going strong. It's run by a great group of guys who still hold to the original idea of getting together with other observers and having fun.

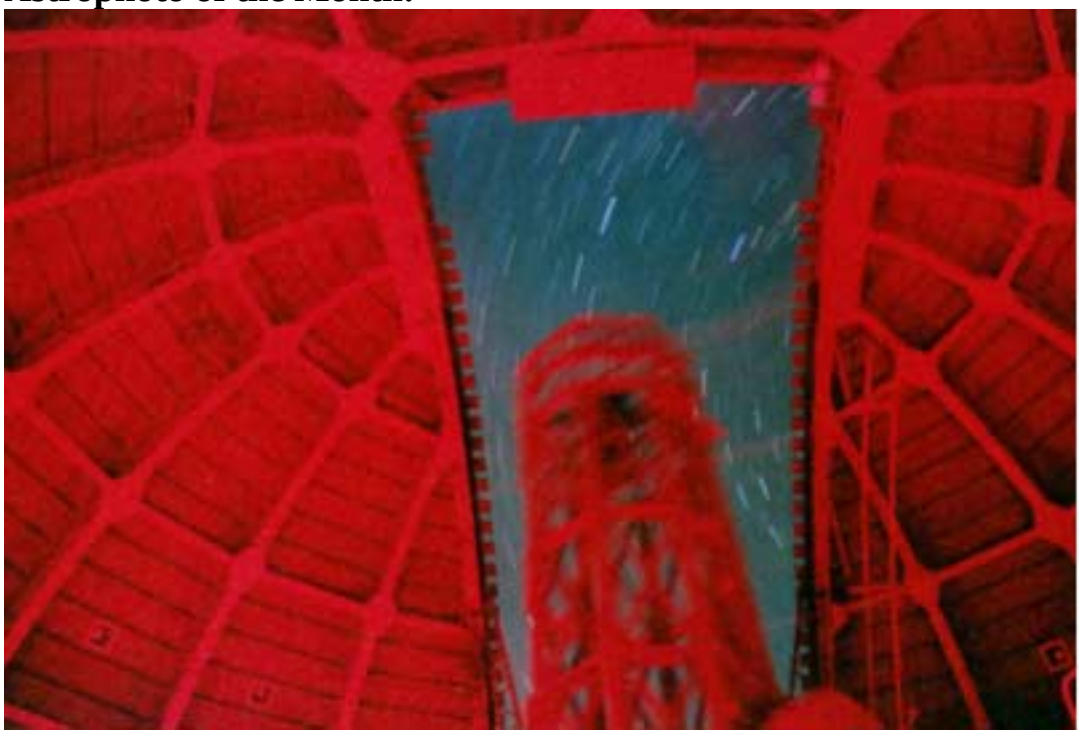
In 94 the RTMC board of directors decided that it was time I learned how to give as well as receive. I was appointed a telescope judge. If you think this is an easy job, try it just once. There is more to the job than you can imagine. Later I was elected to the Board of Directors. I got to see the inner workings of "The Big Star Party". What an honor and privilege! All I could say to them was thanks for the chance to serve.

I enjoyed working with Steve Edberg (The Grand Poo Bah of RTMC) and all the other members of "the Board". They are some of the most sincere, caring astronomers I know and are dedicated to the continuing excellence that is RTMC. I would also add Cliff Holmes and Rick Schaffer to that list of caring and dedicated amateur astronomers. They and many others like them made me feel at home at RTMC. I have been going there for over 20 years and I found that amateur astronomers as a whole are great people to be around.

Credit to whom it is due: My father, my uncle Phil and the grace of God were instrumental in guiding me toward things scientific. They deserve the credit for anything I have achieved in amateur astronomy. Growing up in south central Los Angeles is not the best place to pursue scientific endeavors, but they were the ones who instilled in me that there was more to life than "hanging out on the block". In my humble opinion my father and uncle are geniuses in their own right. I'm just a small chip off the block. I have a great wife (31 years) who has supported me in my hobby through the years. Life is good.

I don't enjoy tooting my own horn. Those who know me know this to be true. But maybe someone who reads this can say to himself, "Hey, he's just an average guy". "If he can do these things, so can I".

Astrophoto of the Month:



From inside the 60" observatory- Photographed by Tom Varden

Submit your "Astrophoto of the Month" to the following address by the 20th of each month: newsletter@avastronomyclub.org

Galactic Surprise

by Patrick L. Barry and Dr. Tony Phillips

Open an old astronomy textbook. The basic sketch you'll find there of galaxy formation is fairly simple: a vast cloud of diffuse hydrogen and helium gas condenses under gravity, and dense spots in the cloud collapse to form stars. Voila! A galaxy.

But real galaxies are much more complex than that. A galaxy is a swirling "soup" of billions of stars and roaming black holes, scattered clouds of gas and dust, random flashes of star birth and exploding supernovas, and an unseen and mysterious substance called "dark matter." Over time, all these ingredients mix and interact- pulling and compressing and colliding- and somehow that interplay leads to the galaxies we see today. No wonder it's such a hard problem to solve.

Just over one year into its three-year mission, GALEX is already shedding some new light on the problem.

"Some of the discoveries GALEX has made will change our understanding of how galaxies develop and when, where, and why stars form in galaxies," says Peter Friedman, a researcher at Caltech and Project Scientist for GALEX.

This small space telescope, called the Galaxy Evolution Explorer (GALEX for short), makes its discoveries by taking pictures of millions of galaxies scattered over the whole sky. Some of these galaxies are close by (at least by astronomical standards of "close"), while others are as much as 10 billion light-years away. Because light takes time to travel through space, we see these distant galaxies as they appeared billions of years ago. Comparing young galaxies from the distant past with older, modern galaxies will teach scientists about how galaxies change over time.

Looking at these pictures, scientists were surprised to find many newborn stars in the outer parts of old, mature galaxies. Scientists had assumed that as a galaxy ages, the clouds of gas needed to form new stars in these outer reaches either got used up or blown away. Finding so many new stars in these regions of old galaxies (such as Centaurus A, Messier 101, and Messier 81) shows that, apparently, they were wrong.

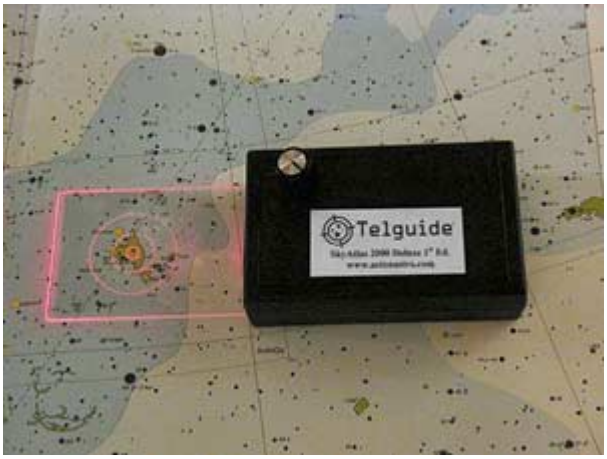
Friedman says that astronomers don't know yet how to explain these new findings. Rethinking and improving theories to explain unexpected discoveries has always been the way science makes progress- and GALEX is certainly making progress.

One thing is certain: It's time to re-write some old textbooks.

For more information, see http://www.galex.caltech.edu/ . Kids can do a galaxy art project and learn more about galaxies and GALEX at http://spaceplace.nasa.gov/en/kids/galex/art.shtml

M81 is 10 million light years away. The image on the left was made from GALEX data and shows UV light from hot, new stars. These star forming regions are not detectable in the visible light image on the right (McGraw-Hill Observatory, Kitt Peak, Arizona, Greg Bothum, Univ. of Oregon.)

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



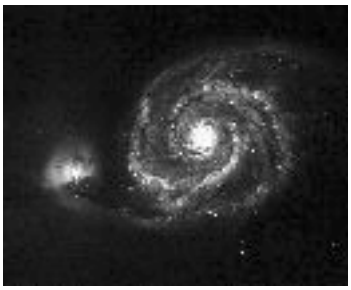
The ***Telguide***.
Our own Steve Trotta has invented the Telguide to aid you in your galactic hunts. To purchase a Telguide, click here.

Types of Nebulae

by Tom Koonce

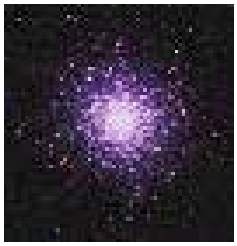
At the last couple of star parties, I have been asked about nebulae. What are they? Why does an O-III filter work on some nebulas and not others? Here's an explanation of the various objects that have been called "nebulae" in the past and present.

Originally, the word "nebula" referred to almost any extended astronomical object (other than planets and comets). The etymological root of "nebula" means "cloud." As is usual in astronomy, the old terminology survives in modern usage in sometimes confusing ways. We sometimes use the word "nebula" to refer to galaxies, various types of star clusters and various kinds of interstellar dust/gas clouds. More strictly speaking, the word "nebula" should be reserved for gas and dust clouds and not for groups of stars.



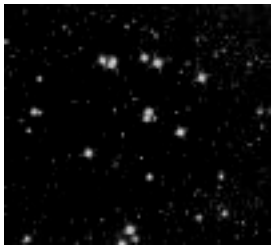
Galaxies

Early in this century, there was a great debate as to the nature of the nebulae like this one which at that time could not be resolved into individual stars. Thanks in large part to the work of Edwin Hubble, whose famous paper "The Realm of the Nebulae" finally put the issue to rest, we now know that these are really vast conglomerates- billions of stars which are very much more distant from the Earth than other nebulae. Our own Milky Way galaxy is just one of the billions of galaxies now known to exist. A typical galaxy is 100,000 light-years in diameter. Since galaxies are composed of stars emitting light at all frequencies, a filter will not improve your view. (M51 shown.)



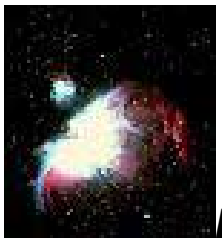
Globular Clusters

Globular clusters are gravitationally bound groups of many thousands (sometimes as many as a million) of stars. They consist primarily of very old stars. Globular clusters are not concentrated in the plane of the galaxy but rather are randomly distributed throughout the halo. There are several hundred globular clusters associated with our galaxy. A typical globular cluster is a few hundred light-years across. (M 13 shown.)



Open Clusters

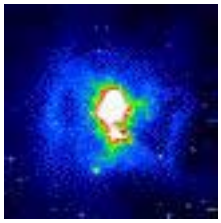
Open clusters are loose aggregations of dozens or hundreds of young stars. They are generally not gravitationally bound and will disperse in a relatively short period of time, astronomically speaking. They are often associated with more diffuse nebulosity, as well. Also called "galactic clusters" because they are usually found in the plane of the galaxy. A typical open cluster is less than 50 light-years across. (M 44 shown.)



Emission Nebulae

Emission nebulae are clouds of high temperature gas. The atoms in the cloud are energized by ultraviolet light from a nearby star and emit radiation as they fall back into lower energy states (in much the same way as a neon light). These nebulae are usually red because the predominant emission line of hydrogen happens to be red (other colors are produced by other atoms, but hydrogen is by far the most abundant). Emission nebulae are usually the sites of recent and ongoing star formation. (M 42 shown)

An O-III narrow bandpass filter isolates just the two doubly-ionized oxygen lines (496 and 501nm lines) emitted by planetary and emission nebulae, while blocking the rest of the overall spectrum of light. The result is extreme contrast between the black background of space and the delicate photons of O-III light needed for near-photographic views of the Veil, Ring, Dumbbell and Orion nebulae, among other objects.



Reflection Nebulae

Reflection nebulae are clouds of dust which are simply reflecting the light of a nearby star or stars. Reflection nebulae are also usually sites of star formation. They are usually blue because the scattering is more efficient for blue light. Reflection nebulae and emission nebulae are often seen together and are sometimes both referred to as diffuse nebulae. (NGC 7023 shown)

Dark Nebulae

Dark nebulae are clouds of dust which are simply blocking the light from whatever is behind. They are physically very similar to reflection nebulae; they look different only because of the geometry of the light source, the cloud and the Earth. Dark nebulae are also often seen in conjunction with reflection and emission nebulae. A typical diffuse nebula is a few hundred light-years across. (NGC 2264 shown; another example is the Horsehead Nebula)

Planetary Nebulae

Planetary nebulae are shells of gas thrown out by some stars near the end of their lives. Our Sun will probably produce a planetary nebula in about 5 billion years. They have nothing at all to do with planets; the terminology was invented because they often look a little like planets in small telescopes. A typical planetary nebula is less than one light-year across. An O-III filter enhances the viewing of these objects. (M 57 shown)

Supernova Remnants

Supernovae occur when a massive star ends its life in an amazing blaze of glory. For a few days a supernova emits as much energy as an entire galaxy. When it's all over, a large fraction of the star is blown into space as a supernova remnant. A typical supernova remnant is at most few light-years across. (M 1 shown)

(Article adapted from articles by Bill Arnett and Lumicon)

A.V.A.C. Membership Information

Membership in the Antelope Valley Astronomy Club is open to any individual.

The Club has three categories of membership.

- Family membership at $30.00 per year.
- Individual membership at $25.00 per year.
- Junior membership at $15.00 per year.

Membership entitles you to…

- Desert Sky Observer–monthly newsletter.
- The Reflector–the quarterly publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club telescopes, binoculars, camera, books, videos and other items.

The Desert Sky Observer is available as a separate publication to individuals at a cost of $10.00 per year. Subscription to the Desert Sky Observer does not entitle the subscriber to membership in the Antelope Valley Astronomy Club and its associated privileges.

Astronomy Links on the Web

http://www.astro-tom.com/ (Tom Koonce's website)
http://www.actonastro.com/ (Steve Trotta's website)
http://www.astropaws.com (Terry Babineaux's astrophotos)
http://www.noexitrecords.com/zerobox/astro.htm (Tom Varden's website)
http://mysite.verizon.net/res1atuo/index.htm (Terry Pedroza's website)
http://www.astromart.com/ (time to go shopping)
http://saturn.jpl.nasa.gov/multimedia/images/latest/index.cfm (the latest Saturn pics from Cassini)
www.avastronomyclub.org/ (us desert astronomy folks)

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QNET: 1529 E. Palmdale Blvd., Suite 200. (661) 538-2028. As an Internet provider, they are kind enough to provide us with a free website.

High Desert Broadcasting: General Manager, Vicky Connors (661) 947-3107; They assist us in advertising our Club.

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