



Newsletter of the Pomona Valley Amateur Astronomers

One sometimes finds what one is not looking for.
Alexander Fleming

Volume 28 Number 02

nightwatch

February 2008

Breaking News

We are planning a tour of Edwards Air Force Base in late June.
See page 9 for details

President's Address

It is the middle of February and already this month, we have had three terrific public star parties! (Unfortunately, a fourth had to be postponed due to clouds.) Much of the credit for this goes to our new Public Star Party Director, Craig Matthews. Craig is a busy guy and can't always make it to the meetings or to the club star parties, but he is one of our most faithful public and school star party participants. I really appreciate the efforts of Craig and all of the other club members in making our public outreach events successful. By the way, we will be having another public star party at 6:00 PM on the 26th at the Colony branch of the Ontario Public Library. I hope to see many of you there.

We had to change the location of our February club star party at the last minute. Thanks to Alex McConahay for arranging the use of the Riverside Astronomical Society's Landers observing site. RAS has a very nice site out at Landers which they call GMARS (Goat Mountain Astronomical Research Station). If you haven't already, you should join them at an RAS star party sometime and get a look at the place. I am told that our members are always welcome.

Even if one has been observing for years, there are always new objects and new phenomena in the sky to see. After several attempts over a number of years, I finally saw the "green flash" while taking pictures of the sunset through a telephoto lens. I saw it down at Oceanside, just as the Sun disappeared below the waves. It was somewhat less spectacular than I had expected, but it was still exciting to at last see it. There is a short article elsewhere in the *Nightwatch* on the green flash.

Well, that is about all I have time to write before the deadline, so happy stargazing everyone.

Ron Hoekwater

Road Trip!

Our next club star party will be March 8 at Mesquite Springs campground in Death Valley. It is at the north end of the park. This site has an excellent dark sky. It is a long drive but it is worth it. With the evening moonlight gone, check out star clusters M36 M37 and M38. They are 4000 light years from earth. M41 is 2300 light years away and 700 times more luminous than our sun.

Points of interest: Badwater (282 feet below sea level), Telescope Peak (elevation 11,000 feet) and Scotty's Castle

Check out NPS.GOV for info on Scotty's Castle plus up dates on desert wildflowers, maps, lodging, RV parks and ranger programs. Also check day and night temperatures to make your stay more enjoyable.

See our star party list online for a [map](#) . Hope to see you there.

Jim Bridgewater

PVAA Events Calendar

Month	Star Party	General	Board
March	8(MS)	21	13
April	5(CS)	18	10
May	3(CC)	16	8

Site Legend

- (CC) Cow Canyon Saddle, near Mount Baldy Village
- (CS) Cottonwood Springs campground, Joshua Tree Natl. Pk
- (KD) Kelso Dunes
- (MB) Mecca Beach Campground
- (MS) Mesquite Springs campground, Death Valley National Pk

January General Meeting

We were joined at our meeting by a few visitors: the Sullivan family, Mr. Leo, and a group of three counselors from the Idyllwild Astro Camp. I hope everyone enjoyed the evening and will join us again.

Member Bob Griffin shared with us a collection of charming thank you cards from a Star Party the Club supported in December at Hollyvale Elementary School in Victorville. Not only did they enjoy our telescopes and a talk on night sky objects, they appreciated our long drive to see them and, of course, the hot chocolate provided by the parents to help keep everyone warm. I am pleased to report that the drive wasn't nearly as bad as I'd anticipated when we planned 1 ½ hours for the trip. Since we were going against the commute the journey to see them went so smoothly Ron and I even had time for dinner before the event. Given the good manners of all the kids, the excellent science education they have already received, and now that I see their excellent penmanship and writing skills - I hope we are invited back to see them again next year!

January's Featured Speaker

We were lucky to have attracted Dr. Marc Rayman to our Club event. Dr. Rayman works for JPL and is a Project System Engineer for the DAWN mission. His enthusiasm for the excitement of space exploration and for the discovery of new things was contagious and attracted many questions both right after his lecture and for another hour into the evening as he stayed and responded to the curious about his work, new technologies, and the potential discoveries to be made. While the DAWN mission itself is full of potential – after its launch in September of 2007 it plans a visit to asteroids Vesta in 2011-12 and Ceres in 2015 – the technology behind this unusual two body trip was fascinating to learn about.

Many of us had at least a vague notion of ion propulsion technology – and much of our knowledge came from the Deep Space 1 mission. Marc was the Project Manager on that mission, which was where ion propulsion was first tested on such a large scale and was proved successful.

We heard about the basic benefits and drawbacks to this new technology – and the risks taken by Deep Space 1 as the first high profile mission to use this new propulsion method. While the theory of ion propulsion has been studied actively and small tests have been done since the late 1950s, no one was willing to rely on it entirely until Deep Space 1 took that leap of faith and launched in 1998; testing not only the new propulsion system but 11 other pilot technologies as well. When it was successful it paved the way for future missions like the current DAWN project. Playing it safe by relying on past-tested chemical propulsion methods was no longer a limitation to those dreamers in NASA who saw ion propulsion's advantages. There was now a new method available which would take us where we wanted to go using only 1/10th the weight in propellant. It seems appropriate that Dr. Rayman, who helped pioneer the technology, is now helping to use it on such an interesting science mission.

The basic concept of DAWN's ion propulsion engine is that xenon atoms are ionized after being hit with electrons from a hot cathode filament. The xenon ions now have a positive charge. They are then electrically accelerated and exit through a

The Green Flash

There are more things in the sky than planets and stars, nebulae and galaxies. For years, I have heard of the "green flash" but not until recently had I seen it. After seeing what in my case was actually more like a green dot, I wanted to learn more about it. As I suspected, when I started reading about it, the subject turned out to be far from simple.

One of the first things I learned in doing the research for this article is that not all flashes are green. Violet, blue, red, orange, and yellow are also possible. There are actually a number of different phenomena with somewhat different causes which are usually grouped together under the name green flash. So, what is the "green flash?" Green flashes are optical phenomena which are observed, just before the Sun rises and just after it sets. Briefly, a green spot appears above the sun, or a green ray shoots up from the sunrise or sunset point. An unobstructed horizon is beneficial if not essential in seeing the green flash. Thus the beach is an excellent location for attempting to see the green flash. A mountain top where you can look down upon the horizon is also good.

The most basic explanation of green flashes is that they are caused by "large variations in astronomical refraction near the horizon." (For much more information see Andrew T. Young's website, <http://mintaka.sdsu.edu/GF/>, from which I gathered much of the information for this article.) That is to say that they are a type of mirage.

Apart from the science there are also a number of stories, myths, and urban legends associated with the green flash. The green flash itself is thought by some to be a myth or an illusion. But it is real. One myth within a myth is that of the ancient Scottish legend of the green ray. The story goes that "he who has been fortunate enough once to behold [the green ray] is enabled to see closely into his own heart and to read the thoughts of others." Actually there is no such Scottish legend and the whole idea comes from a Jules Verne novel.

There are many images of green flashes on the internet. The above mentioned website even has animated simulations of the phenomenon. One of the reasons it took me so long to see a green flash was that I didn't know exactly what to look for.

To see a green flash, choose a location with clear air and a flat horizon. Use an optical aid such as binoculars, *but be safe*. **Only look at the Sun through binoculars or a telescope when it is right on the horizon!** When the Sun is any higher it can cause eye damage. Ultra violet light is invisible and the eye may feel no pain, but the loss of sight is permanent. When it is right on the horizon the atmosphere dims the Sun enough that it can be observed safely.

So next time you are out at the beach watching the sunset, why not try looking for the green flash.

Ron Hoekwater

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grid at the back of the spacecraft. As the ions rush from the spacecraft in one direction the good old “equal but opposite reaction” rule come into play, propelling the spacecraft in the opposite, forward direction.

This new method of moving objects through space is capable of accelerating them to speeds ten times faster than conventional chemical engines. So why has it not been used for years so we could travel long distances more quickly and spend less energy lifting expensive propellants into space? OK, when we look at the best sports car performance, you’d like from 0 to 60 mph in less than 10 seconds, right? Well, ion propulsion does 0 to 60 all right – but in 4 DAYS. Missions that are to nearby objects or which can’t work around this agonizingly slow acceleration can’t stand to wait until the ions really get the speed going and must stick with conventional chemical propellants for now. It is the tortoise and the hare dilemma: if you have enough time and distance to wait, the slow and steady ion propulsion eventually speeds ahead and wins the race.

It is this ability to go so far with so little fuel that will enable the DAWN mission to conduct its unusual mission to two separate bodies. The objects in the asteroid belt share a common ancestry and are thought to be the remnants of a failed planet. During the formation of the Solar System, matter coalesced at various distances from the sun, forming the small rocky planets close to the Sun and the larger gas giants further away. It is thought that the influence of gravity from huge Jupiter prevented the rocky and icy bodies between that planet and Mars from forming a planet so they remain the collection of smaller bodies we see today. Of the large asteroids we have observed, the two to be studied represent different types – Vesta is a relatively hot and dry body like those in the outer part of the solar system while Ceres is cool and has water like the inner planets. While they have been studied from afar they should be fascinating objects for such close up observation. We learned the interesting fact that Earth scientists have done a small amount of detailed examination of one of these objects already as approximately 5% of the meteors found on Earth are believed from their composition to have originated on Vesta.

Thank you so much for spending the evening with us, Dr. Rayman. I think you gained a room full of night sky enthusiasts who now look forward not only to the future of ion technology in space exploration but to the new discoveries we will soon see from the DAWN mission.

<http://nmp.nasa.gov/ds1/tech/ionpropfaq.html>

http://en.wikipedia.org/wiki/Ion_engines

<http://www.jpl.nasa.gov/news/dawn/>

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**Goat Mountain Astronomical Research Station
 Star Party - One To Remember**

Amateur astronomers long for days when we look outside and realize that all of the weather models for that week were correct and tonight will be a spectacular night for a dark sky star party. February 9 2008 was such a day. After weeks of rain and cold weather, the forecast was for daytime temperatures in the low to mid 70s and nighttime temperature at a pleasant 41 degrees Fahrenheit with light winds. The morning skies were blue as far as you could see with a background of snow capped mountains. This night’s star party location was the Riverside Astronomical Society’s Goat Mountain Astronomical Research Station (GMARS) located at Landers.

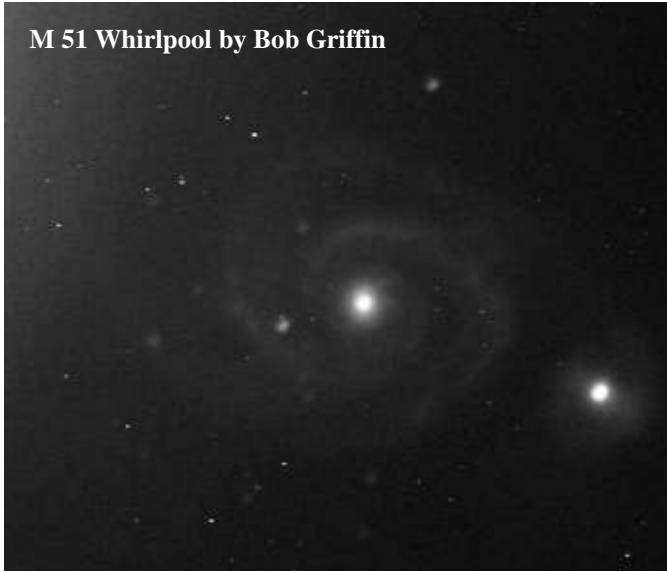
When Barbara and I arrived at Goat Mountain, Jim Bridgewater was already set up. We would be joined by other club members Bill Connelly, Ken Crowder, Bob Griffin, Ludd Trozpek, and Bob Akers with his son and grandson (both named Kenyon King). I wish we had more members all with same name attend our star parties so I would remember full names when typing these articles.

As evening approached and everybody was busy setting up we realized what lay ahead; a night of outstanding observing. Everyone observing with additional technologies such as astronomical cameras would find that their technologies were well worth the money and they all worked flawlessly. I had all my alignments in order with my Stellacam II perfectly focused and ready to proceed to my first Deep Sky Object when my “lovely wife” banged into my tripod leg knocking everything out to some distant galaxy many light years away. She was on “timeout” for only 30 minutes. I have never removed my camera and realigned my telescope so fast. She actually helped me learn some new techniques for when things go haywire.

We all enjoyed views of many Deep Sky Objects as well as Saturn. We started the evening with the Orion Nebula. It was very detailed with its vast amount of nebulosity and unusual trapezium group of young stars. M82, the Cigar Galaxy, was next and this was especially detailed in the live views by those using transmission systems onto monitors. Jim Bridgewater was using his Meade DSI to capture lunar images along with many other views. Bob Griffin was capturing very impressive views of the Whirlpool Galaxy (M51) with his DSI and laptop. Tonight I was enjoying live images of many Deep Sky Objects on my 12 inch monitor and a separate 4 inch monitor, giving me a large monitor look as well as a detailed eyepiece effect on the smaller screen. Ludd and Akers were, as always, involved with many objects throughout the evening. They did however do something that I must try. They sat back on very comfortable outdoor chairs, relaxing and looking at the moon unaided while deciding whether an approaching airplane’s vector would have it crossing over the bright daytime portion of the moon. A very relaxing activity full of challenges and vector analysis of sorts. Everyone else was busy at their telescopes enjoying the beautiful universe.

For anyone who has never visited GMARS, you should make plans to go there someday. It’s an impressive amateur astronomy site. This rectangular 5 acre property is equipped with cement observing pads with electricity, roll off

M 51 Whirlpool by Bob Griffin



roof telescope sheds and a small house. A great set up. The roll off sheds house some very impressive equipment. PVAA thanks RAS for this fantastic opportunity.

As the evening progressed some of us had to return to civilization. With feelings of wanting to stay longer, we packed our equipment and headed home. I was so excited with the evening that Barb didn't have to drive home as I am sometimes fortunate to have her do when I come up with some excuse.

That night was a keeper.

Frank Busutil

PS

We are confirmed for our 5th annual Desert Adventure Star Party at Joshua Tree National Park on April 14th 2008.

As always, all of you are invited.

What's Up? – A Superstar Hunting Party

The supergiant 1st magnitude stars are red Betelgeuse (shoulder) and blue-white Rigel (foot) in Orion (The Hunter). Huge Betelgeuse, 60,000 times brighter than our Sun, has an old shrunken core depleted of hydrogen. Now it varies in brightness as its unstable atmospheric shell pulsates at a width wider than Neptune's orbit. It's so big the Hubble Telescope can photograph irregular spots on its surface. It could explode into a supernova, becoming as bright as the half moon. But don't worry; it's still 425 light years away, the juice of the beetle won't reach us. Rigel, at 40,000 times brighter than our Sun, is almost as unstable with its double 7th magnitude companion. At 775 light years in distance, Rigel is the a monster among many hot blue-white stars in Orion. They shine in the grand Orion Nebula (M42) in nearby M43 and in the famous Belt.

After Betelgeuse and Rigel, it's Orion's remarkable three-star Belt that impresses viewers. It's had a magical attraction down through history, sometimes called the Three Kings. Orion's strikingly human form has also been written about as far back as Homer's *Odyssey*. But in those ancient days the glowing Orion Nebula (M42) in his "sword" was never mentioned. Is it possible that it was dimmer then? Small parts of the large nebulous area that surrounds Orion (the Orion Molecular Cloud Complex) have become both dimmer and brighter in current observable times. It's an enormous, complex area of interstellar nebulosity that includes many of the popular calendar and magazine cover nebulas. In nearby Monoceros (The Unicorn) there is the flowery Rosetta Nebula and the spooky Cone Nebula crowning its Christmas Tree Cluster of stars. Back in Orion there's the M78 nebula, charted by Messier when it seems to have been brighter. Nearby is Barnard's Loop, the Flame Nebula, and the icon of all emission nebulas, the chess-piece-like Horsehead Nebula. But of all these it's only the great Orion Nebula that can be seen with an unaided eye, burning high in a winter sky like glowing coals.

In some folk tales the Orion Nebula is a warm hearth of coals, but in modern telescopes it reveals itself to be the birthplace of hot young stars that illuminate its swirling gasses. Situated about 1,400 light years away, M42 glows with an energized ultraviolet radiation emanating from stars like the Trapezium. This group of white hot young stars has burned a hole in the 25 light year wide nebula, allowing us to peek into its restless gassy heart.

But Orion wouldn't really be a hunter if it wasn't for his two hunting dogs by his side. Most legendary is Canis Major (Big Dog) with its "dog star" Sirius (Searing One), the brightest star in our skies. It first appears in the searing "dog days" of late summer to rise to glory in autumn and winter with its running mate Canis Minor (Little Dog), with its star Procyon (Before Dog) rising before a more luminous Sirius. Unlike the superstar giants of Orion these 1st magnitude dog stars are much closer and smaller. Nevertheless, Sirius (8 light years) and Procyon (11 light years) are intense white stars, brighter and larger than our sun. Both dog stars have small planet-sized white dwarf star companions (Sirius B is called "The Pup"), reminding us that most stars are multiple systems.

Of the two dog stars, Sirius has received much more attention down the centuries. First mentioned 1,700 years ago in the poems of Hesiod, Sirius was worshiped by the ancient Egyptians because it appeared just before the annual enriching flood of the Nile. As the brightest star in the sky, Sirius has a superlative connotation. Royal Navy flagships have flown its name, as have Lockheed Sirius aircraft, Mitsubishi automobile engines, and Sirius Satellite Radio.

But who is it that Orion and his dogs hunt? Is it his ancient enemy Scorpius (The Scorpion) that sets in the west as Orion rises in the east? No, they have been safely separated by celestial powers. Is it Taurus (The Bull) who seems to bar Orion from the sexy seven sisters of the Pleiades? Perhaps it's Lepus (The Rabbit) who hides unnoticed beneath Orion's feet? Or are we letting our imaginations run away with us? Remember, in Australia all these constellations are upside down, and Orion's belt and sword are called the "celestial saucepan."

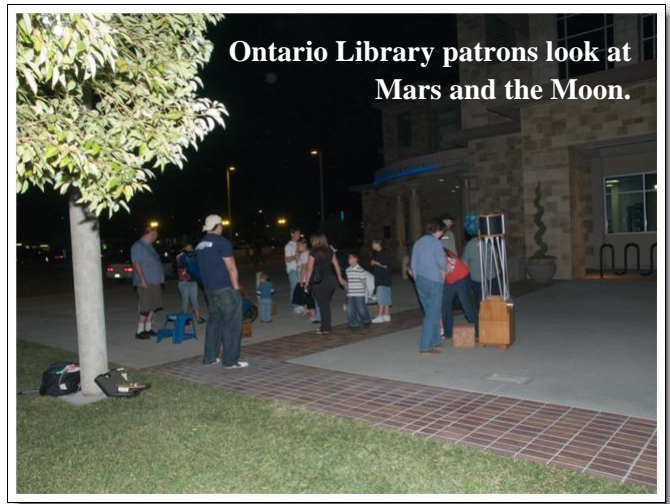
Lee Collins

Here are some photos that I want to share with you.

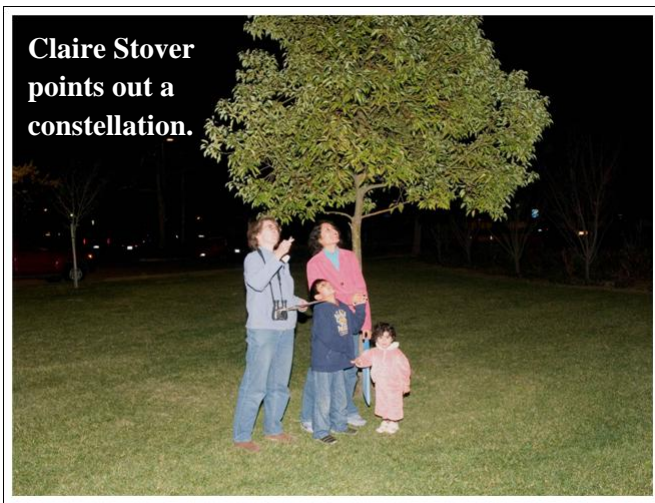
Ron

Ontario Public Library Star Party

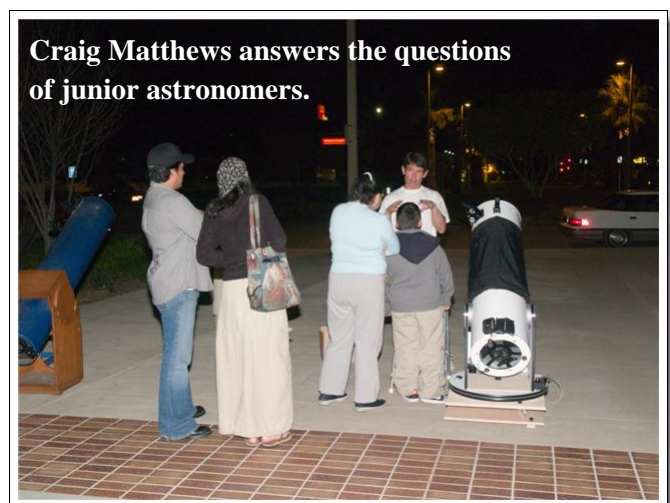
February 11, 2008



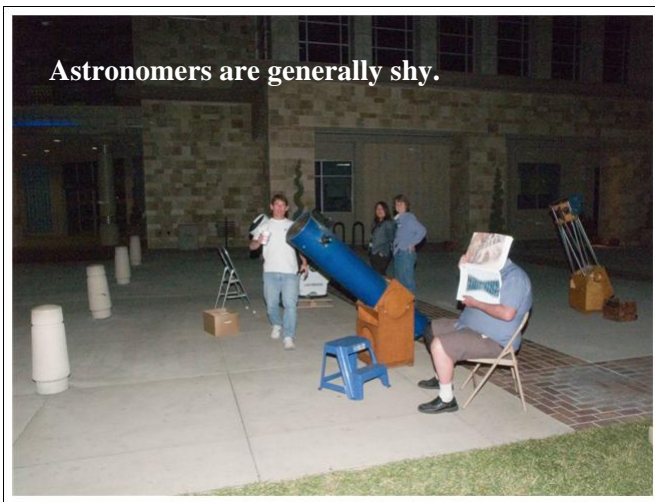
Ontario Library patrons look at Mars and the Moon.



Claire Stover points out a constellation.



Craig Matthews answers the questions of junior astronomers.



Astronomers are generally shy.



The crew of the starship Enterprise beams in to take a look.

Sycamore Elementary School Space Science Night

February 12, 2008

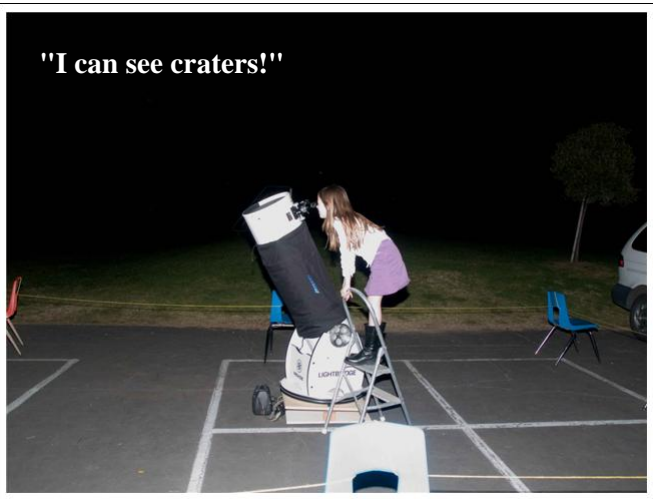
Craig Matthews getting ready for the students.



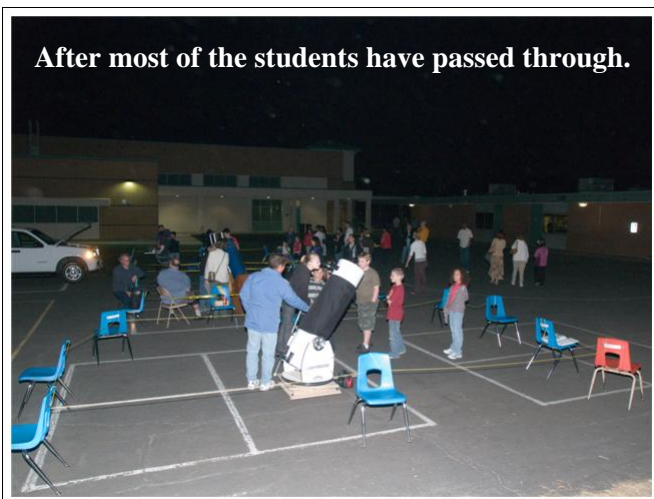
Bob Griffin making a final adjustment.



"I can see craters!"



After most of the students have passed through.



Dear Pomona Valley Amateur Astronomers

You may have already heard of AmSky. In case you haven't please allow me to introduce you to us. AmSky is a website devoted to amateur astronomy. Our flagship feature is AmSky Magazine, The On-line Mega-magazine for Amateur Astronomy. This is a "central clearing house" for articles about astronomy, amateur telescope making, observing and virtually anything else about amateur astronomy from several participating astronomy club news letters. We are also the home of The Astronomy Yellow Pages, a list of over 300 astronomy-related businesses, The Astronomy White Pages, a list of over 700 astronomy clubs in English speaking countries, The Astronomy Events Calendar, a list of over 100 national and regional star parties and events and The Astronomy Headlines, the latest astronomy-related news from NASA, JPL, ESA and other sources. We also have The Astronomy Classified Ads.

AmSky an excellent on-line resource that complements the paper magazines you may already subscribe to. Best of all, AmSky is free at www.amsky.com. For a complete list of AmSky features please go to link.amsky.com. Thank you.

Clear Skies,

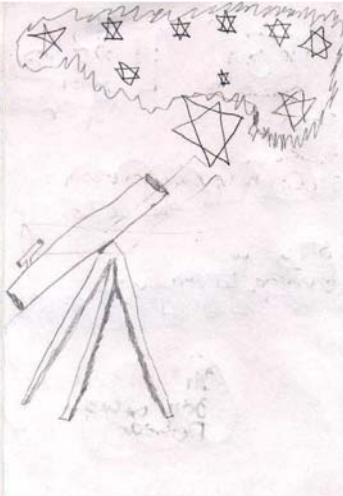
Bob DuHamel
AmSky

Thank you notes from
Hollyvale Elementary School in Victorville
We were there December 4, 2007

TRANKS

11645 Hollyvale Ave.
Victorville, CA 92392
December 17, 2007

To The
Romona
Astronomy
Club



Thank you for taking the time to drive 50 to 60 miles to come to our school. Thank you for bringing the telescopes, they were awesome I can't believe the telescopes looked all the way up to the sky. Thanks again for coming to our school.

From
Christian, Grea,
Brittanie, and
Desean

Dear Romona Valley Astronomy Club,
We want to thank you for coming to Hollyvale Elementary School and showing us all the cool stuff you brought. We really liked the telescopes that we got to use during the star party. We all liked that one telescope that had the laser attached to it that shot straight to the sky. We would like to thank the people for brought hot chocolate. Thank you for driving all this way to come here and staying late.

Sincerely,
Matthew W.
Miguel C.
Christina G.
Seena M.



11645 Hollyvale Ave.
Victorville, CA 92392
December 17, 2007

Dear Romona Valley Astronomy club,
We really enjoyed your visit. We really had a good time. Everyone at our school enjoyed looking at the stars. We really enjoyed the hot chocolate. We really liked the meteor rights. It was really cool seeing Mars and stars. I hope that we can see you again sometime.

Your Friends,

Gian Chavez
James Hill
Miguel
Ejler



11645 Hollyvale Ave.
Victorville, CA 92392
December 17, 2007

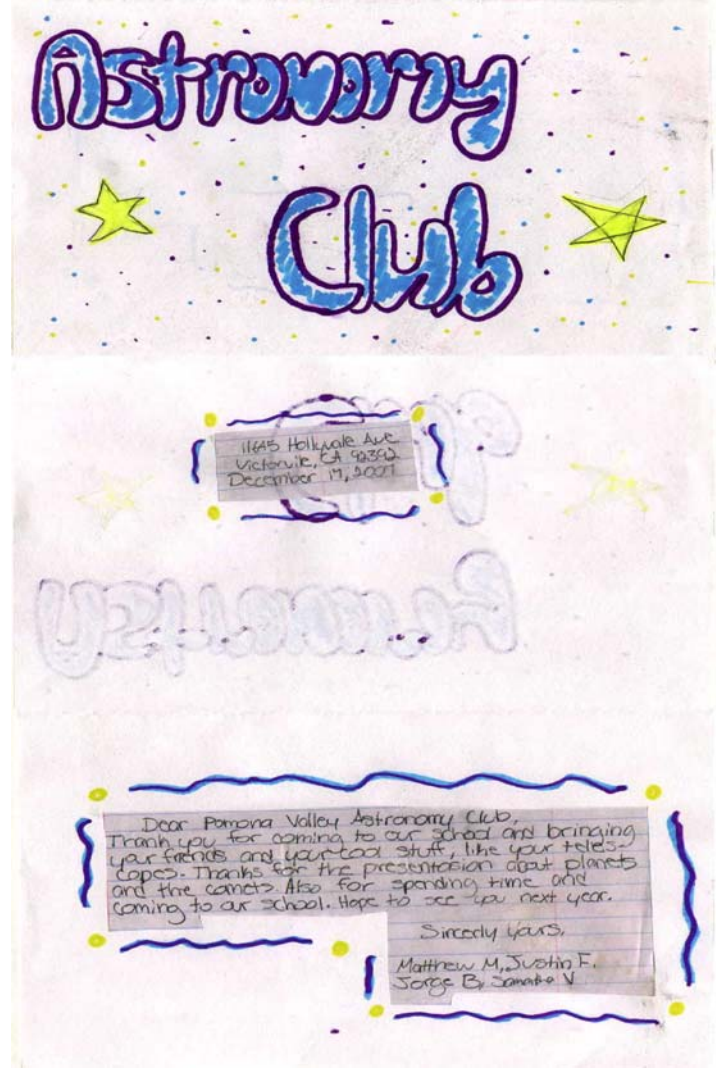
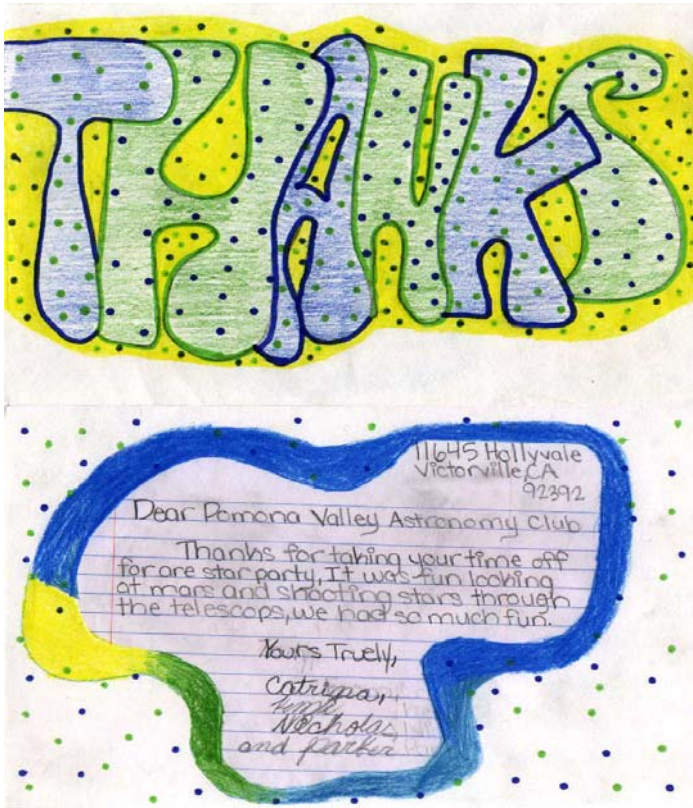
Dear Romona Valley Astronomy club
- Thank you for taking your time, and bringing your telescopes, meteorites and for your great speech.
Thank you for driving up here, from 30 miles away.

Sincerely yours,
Donovan Oliver
Dorothy Borda
Miguel Galindo
Bella



Thank you
for your
Time!





**tech
trek**

SCIENCE CAMP
FOR GIRLS

A PROJECT OF
AAUW CALIFORNIA

February 8, 2008

Claire Stover, Secretary
Pomona Valley Amateur Astronomers
PO Box 162
Upland, CA 91785

Dear Ms. Stover and the PVAA,

The American Association of University Women, Ontario-Upland-Rancho (OUR) Branch, gratefully thanks you for your generous contribution to the California AAUW Tech TrekSM program:

Your donation will help the OUR branch provide scholarships for local seventh grade girls to attend Tech TrekSM, an exciting, weeklong residential math, science and technology camp during the summer of 2008. Since 1998 more than 4,200 girls have completed the program, which is still run by volunteers and held on six different college campuses in California. The OUR branch, with generous contributions from local organizations and community members, is committed to providing outstanding lifelong educational opportunities for women and girls.

Again, we thank you for your generosity.

Sincerely,

Gloria Romero
Gloria Romero
OUR President

Alice M. Hill
Alice M. Hill
Tech Trek Chair

Holiday Dinner Pictures from Dorene Hopkins



We are planning a tour of Edwards Air Force Base in late June. We will be with NASA from 10 to 11:30 am, have a lunch break then spend from 1 to 3 pm with the Air Force. Claire will be accepting sign-ups at our next meeting or you may e-mail her at secretary@PVAA.US

To sign up please provide :

- 1 name
- 2 address
- 3 date and place of birth
- 4 citizenship

Our very own Frank Busutil's **Proect Bright Sky** is featured in:

[Astronomers Without Borders
Newsletter January 2008](#)