



**Pay club dues at the General Meeting or by mail. \$30 individual / \$40 family.**

### President's Address

I have just returned from our July star party at Grandview Campground in the White Mountains. Those of us who were there had a great time. I wish more of you could have attended.

Speaking of star parties, PVAA will have two club star parties in August. The first is on August 2<sup>nd</sup> at Mount Baldy Ranch RV Park near Cow Canyon Saddle, above Baldy Village. The owners have been kind enough to let us have our star parties there. We will be setting up on the hillside south of the headquarters building. *Please try to arrive before dark.* The site can be difficult to find, especially if you haven't been there before.

The second August star party will be a very special event! Through the efforts of club members Larry Kawano and Ken Crowder our August 30<sup>th</sup> star party will be on Mount San Jacinto at the Astrocamp facility near Idyllwild. The people at Astrocamp will very kindly provide free accommodations both Friday and Saturday nights with camping on the soccer field and dorm housing. Showers and restrooms will available. There will also be a complimentary dinner on Saturday evening. Please let me know if you will be attending so the people at Astrocamp how many to prepare for. See website for more details about Astrocamp: <http://www.guidediscoveries.org/index.cfm?SID=5&MID=2>.

On September 13-14 the Pacific Astronomy and Telescope Show will be held in the Pasadena Convention Center.

Discounted tickets will be available at the general meeting. This is a chance for you to save money and support PVAA at



#### Site Legend

- (CC) Cow Canyon Saddle above Mount Baldy Village
- (IA) Idyllwild Astro Camp
- (WM) White Mountains - Grandview Campground

### June General Meeting

June was a stellar month for visitors to our Club as 10 new faces joined us for our meeting at Harvey Mudd College. The new people found us through referrals from friends or sister Astronomy Clubs, using on-line searches for local astronomy groups, and by reading newspaper articles about our meetings. It was great to see so many new folks along with our existing members. We hope everyone had a great evening and is back next month.

Alex McConahay reminded us about the first Pacific Astronomy and Telescope Show (PATS), to be held at the Pasadena Convention Center this September 13<sup>th</sup> from 9 AM to 5 PM and 14<sup>th</sup> from 9 AM to 3 PM. Follow the links on this web page, <http://www.rtmcastronomyexpo.org/PATS.htm> for more details. You will be able to purchase discounted tickets from our Club at a price of only \$15 per day. Regular prices are at least \$20 per day – more if you don't buy it directly from the Convention Center as ticket handling fees are added.

Ron recommended JPL's von Karman lecture series to us. They are held monthly throughout the year at both JPL and at Pasadena Community College. They may also be viewed on-line and cover many interesting science and technology topics. See their website for more details:

<http://www.jpl.nasa.gov/events/lectures.cfm>

### PVAA Events Calendar

Month	Star Party	General	Board
August	2(CC) 30(IA)	15	7
September	27	12	4
October	25	17	9

Pg1  the same time. For more info on the show:

<http://www.rtmcastronomyexpo.org/PATS.htm>.

Summer is election season for PVAA. At our July 18<sup>th</sup> general meeting nominations for PVAA board positions and club offices will be accepted. Be thinking of who you might want to nominate. All of our current board members have consented to run again. Of course, you can nominate anyone who is a current member. The elections will be held at our August 15<sup>th</sup> general meeting. Please try to attend both meetings if you can.

Our speaker this month is retired physics professor and PVAA member Eldred Tubbs. You won't want to miss his presentation on the determination of the speed of light.

I hope to see many of you at the July meeting and at the upcoming star parties. Happy star gazing!

*Ron Hoekwater*

## NASA soccer

Some of us on the NASA/Edwards trip were big time soccer fans and the trip happened to coincide with the **Euro 2008** semi-final match between Spain and Russia on that Thursday. We were dying to find out what was going on as the match was on TV even as our tour was ongoing. We could find no TV in the lunch area that had soccer on it and I even asked in the NASA gift shop and was told their TV was controlled by NASA, Houston.

We were resigned to waiting till we got home when standing under the huge wing of the B-52 jet bomber in the Air Force Outdoor Museum chatting with several air force men I noticed their uniforms were a bit different and they spoke with accents. I asked them what their accent was and they said Norwegian and when asked if they had heard anything about the Spain-Russia match they knew right off and told us it was 3-2 Spain over Russia. It pays off to be friendly with those in uniforms, especially if they have European accents.

*Bill Vaskis*

## June Speaker

We were lucky to hear from Tim Thompson of JPL. He is a member of a research group at the Lab which studies the evolution of galaxies. Studies are underway to better understand the formation and changes in galaxies since the universe was formed and well as to more completely understand the structure of our own Milky Way and its nearby neighbors.

Tim is a physicist who earned both Bachelors and Masters Degrees in this discipline from the California State University at LA. He also has extensive experience in an important area of astronomy today – the computer processing side of handling, understanding and displaying the vast amounts of data being generated from our space science missions. He has been involved in software development and engineering on many projects, including his current work to improve the resolution of images from the Spitzer Space Telescope.

Tim shared beautiful photos of various types of galaxies and of interactions between them. We saw how the bluish leading edges of spiral galaxies contained the active star forming regions while the more yellow central part of the arms consisted of older more established stars. The structure of our own galaxy has been hard to determine as we try to use measurements of star densities in the night sky to deduce the big picture of the features that surround us. It is much easier to take a photo using a huge telescope of a galaxy millions of light years away.

These studies are going on right now and a revision to our local galaxy map was just announced last month. Using infrared observations taken by Spitzer over the last couple of years, the Milky Way galaxy appears to consist of just two main spiral arms along with several minor ones, not four major arms as was previously believed from radio telescope observations done in the 1950s.

Thanks, Tim for sharing a small portion of the beautiful details of our huge universe with us all.

*Claire Stover*



Artist's impression of a two-armed Milky Way including our location.

References:

<http://science.jpl.nasa.gov/Astrophysics/Galaxies/index.cfm>

<http://www.tim-thompson.com/>

<http://www.universetoday.com/2008/06/03/the-milky-way-has-only-two-spiral-arms/>



Three color image of galaxy M101 taken by NASA's Galaxy Evolution Explorer on June 20, 2003.

## White Mountains and Dark Skies

Although our club star party was still more than a week away, after the terrific tour of Edwards Air Force Base, I immediately headed north towards the White Mountains and Grandview Campground. It is such a great observing site; I wanted to spend as much time there as I could.

As I listened to the radio on the drive up the announcer said that there were 800 wild fires burning in California. Fortunately none of them were very close to where I was going, but the smoke was still a potential problem.

When I arrived at the campground I was very happy to see that my preferred campsite was unoccupied. I quickly moved in and started to unload my equipment. Laura Jaoui also drove up and as this campsite is large enough for several vehicles, we shared it. Laura brought her Coronado PST and an 8-inch dob.

The first few nights the observing was somewhat hampered by smoke from the fires. But on Saturday the wind changed and the air cleared. I was able to start looking at my favorite faint fuzzies. Laura was having success looking for some of the Messier objects.

On Sunday Mark, Jim, and Mike, from the San Diego club, arrived and set up nearby. They brought some really nice equipment (including a Takahashi) which they used to do astro-imaging. We marveled at the Milky Way and the thousands of points of light over head. With some many stars to sort through we briefly had trouble locating Hercules. It is easy to get lost in the clear dark skies of Grandview.

Our camping neighbors went over to the radio observatory at Cedar Flats and convinced the astronomers to give us all a tour on Tuesday morning. The facility is named CARMA, Combined Array for Research in Millimeter-wave Astronomy. A post-doctoral student from Cal Tech and a graduate student from Exeter were operating the telescopes. I received most of my tour from the Exeter student. He is researching protoplanetary disks. The CARMA website address is: <http://www.mmarray.org/>.

We were joined in the campground by the San Bernardino Valley Amateur Astronomers and the Santa Monica Amateur Astronomy Club. It's always nice to have more telescopes around and more people to share observations with.

Laura and I did some hiking in the Bristlecone Pine Forrest. We visited the Law's Museum and Crowley Lake. We also walked up to the Barcroft Laboratory where they are putting in a new observatory dome.

Laura had to return home, but on Friday, July 4<sup>th</sup> Bill Connelly and Ken Crowder arrived. Bill brought his Meade Light Bridge and Ken brought his SCT. Friday there was a little smoke in the air, but for the official PVAA star party Saturday it was clear. It was like that the whole 11 days and nights that I was there. From day to day it just depended on the wind. But we had several good nights and no really bad ones.

Last year while at Grandview, for the first time I looked at the Einstein Cross. (The Einstein Cross is a gravitationally lensed quasar behind the galaxy known as Huchra's Lens.) This year I looked again. The difference was that this year I had a better idea of what I was looking for and the difficulties involved in seeing it. Next year I may try to see another gravitationally lensed quasar. There are perhaps one or two more that I have a chance at.

On Monday, July 7<sup>th</sup> I headed for home (avoiding the Independence Day weekend traffic). As always I had a great time up at Grandview. I'm already getting excited about next year.

*Ron Hoekwater*

### On June 25<sup>th</sup>

I went with a group of Pomona Valley Amateur Astronomy members to visit Edwards Air Force Base and took a tour not only of the Air Force Base itself, but also of the NASA complex within the base where so many of the space shuttles have landed. Seeing the great dry lake with its many runways was eye opening.

Getting to have a walking tour of the NASA complex and seeing the many planes they are working on was intense. We saw the 747s which carry the space shuttle piggyback back to Florida

After lunch we got a bus tour of the flight line on Base itself. NASA is only a tenant on a part of the Edwards Air Force Base. We saw a number of their planes taking off and landing including a KC 135 tanker, an F-16, an F-18 fighter and also a top of the line F-22 which is replacing the F-18s.

Seeing an F-22 take off and head strait up was just mind boggling. We also saw a whole bunch of other aircraft including a B-1 Bomber, helicopters, and planes without pilots (autonomous planes they call them) currently being used in Iraq and Afghanistan. We all had a great day.

*Bill Vaskis*

### PVAA Officers and Board

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## Hercules, Summer Olympic Hero

Hercules is full of athletic tales, but hard to find. He's the fifth largest constellation and a favorite of the Greek gods for his heroic spirit. But they failed to give him any bright stars. Maybe that's why he's always fighting with nearby Draco (the dragon), Cancer (the crab) and Leo (the lion). He always wins, even when given twelve Herculean labors. He fights the many headed Hydra (the giant water snake), Taurus (the bull) and even some killer birds. There are two huge bird constellations in the vicinity, Cygnus (the swan), and Aquila (the eagle). They're part of the Great Summer Triangle. But first lets see what we can find in Hercules besides wild quarrelsome stories.

Hercules' only notable asterism is "the keystone." It represents some beefy part of his muscular body, perhaps his blocky head. Here lies the brightest globular cluster (M13 or the Hercules Cluster) in the northern sky. It passes directly overhead and is visible with the naked eye. I have looked up on very dark nights far from city lights and seen its fuzzy glow. Nearby is another globular cluster (M92), dimmer but equally beautiful. Both clusters are over 20,000 light years away, like little compact galaxies.

It fact one theory about the mysterious origin of globular clusters is that they're the last kernel remnants of lesser galaxies ingested by our Milky Way Galaxy. It's one of many theories about the enigmatic origin of these stunning cosmic clusters.

But let's leave sprawling Hercules and look at three neighboring first magnitude stars Altair (bird) in Aquila (the eagle), Vega (perhaps from vulture in Arabic), and Deneb (tail) in Cygnus (the swan), These three stars with their bird associations form the Great Summer Triangle. A huge asterism that's always visible even in a sky full of urban light pollution.

Although these three stars seem nearly the same brightness their distances tell us that one is much larger. Vega is 25 light years away and twice the size of our sun. Altair is 17 light years away and closer to our sun in size. But Deneb is 7,000 light years away and some 300 times larger than our sun. Appearances are deceiving.

Let's look at Vega first, since it's the first star to have a photograph taken of its spectrum. It's also the first to have a car named after it and the one Jody Foster travels to in the movie Contact. At 0.0 magnitude, it's the baseline for the magnitude system. More recently Vega has been discovered to have a dusty rotating disk that might be forming a new planetary solar system.

Vega shines bright in the musical constellation of Lyra (the lyre). Nearby is the brightest of planetary nebulas, the Ring Nebula (M 57). This expanding shell of an exploding star is sometimes known as the "cosmic cheerio." Close to Vega is the striking "double-double" star Epsilon Lyrae, no relation the hamburger.

The second star, Altair in Aquila (the eagle), twinkles at the point of this long right-angle triangle. In Chinese mythology Altair is a husband who is separated from his wife (Vega) by the Milky Way which flows between them. In Hollywood mythology Altair was featured in the classic movie Forbidden Planet.

The third triangle star is Deneb, which is the tail of Cygnus (the swan) who flies down a gorgeous section of our Milky Way. It's most bird-like in form, the Arabs saw it as a giant chicken. At its head is the college-color double star, blue and gold Albireo. Cygnus also contains several popular astronomy calendar subjects such as the shapely North America Nebula and the ghostly Veil Nebula. The Veil is the remnant of an ancient supernova explosion that may have involved more than one star. Its wraithlike veils that remain are certainly bewitching. Nearby is Cygnus A, visually dim but an extremely intense object for a radio telescope. It's a highly unstable galaxy sending us a lot of hard radiation from over a billion light years away.

Between Cygnus and Aquila lie three noteworthy little constellations. Here is the newer Vulpecula (the little fox). This dim, shapeless asterism was invented in the 1690 star catalogue of Helvelius as the Fox and the Goose. But thankfully the goose got cooked along the line, leaving us with a foxy home for the greenish Dumbbell Nebula (M27). This deep sky object, along with the Ring Nebula, demonstrates a theory that planetary nebulas might look like dumbbells or butterflies from the side but like rings from the front. Unfortunately one would have to travel a distance of 2 to 3,000 light years to prove this proposition.

Hovering nearby is an ancient constellation, Sagitta (the arrow) which looks like what it's supposed to be. Was it shot from the bow of Sagittarius (the archer) to the south? It contains the loosely constructed globular cluster M71.

The last of these is Delphinus (the dolphin). Legend tells us it may be one of several helpful dolphins who served the sea god Neptune. Its main asterism is a tight diamond shape also know as "Job's Coffin" in parts of Europe. The origin of this grim biblical name is yet another cosmic mystery. However the decidedly Christian name of the "Northern Cross" for the long necked, short winged Cygnus (the swan) is quite obvious. At least it contains a central star, which is lacking in its companion "Southern Cross" constellation of Crux (the cross).

These seven heavenly constellations are full of Summer stars, but are they Olympic stars? There's certainly a lot of award-winning sights to see in this star rich area.

*Lee Collins*

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## While You Are At PATS

Frank Busutil plans to have a booth to publicize his **Bright Sky Program** which provides astronomy education opportunities for sight impaired individuals. If you would like to have a break from all the fun convention booths and speakers, please express your interest to Frank. He would be glad of some assistance staffing the Bright Sky booth so he doesn't have to sit there for the whole 14 hour show! You can read and see more about Frank's projects at

<http://brightsky.pvaa.us>.

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