

# East Valley Astronomy Club

February 2002

[www.eastvalleyastronomy.org](http://www.eastvalleyastronomy.org)

Scottsdale, Arizona

## Spring Adopt-A-Highway Cleanup

By Martin Bonadio, President

It's time again to have some fun picking up trash! Our Club has scheduled its semiannual cleanup of the EVAC Mile scheduled for Saturday, March 30th at 8:00 AM. Our task is to pick up trash from the shoulder of the highway to the right-of-way fence (State crews are responsible for the median dividing the highway). Look for a sign up sheet at the February & March monthly meetings, or call me and let me know you want to attend. With 10 volunteers, we can finish by around 10:30am. We meet at Florence Junction (Intersection of Highway 60 and 89) on the north side in the far west corner of the parking lot (closest to the radio tower).

As in the past your reward for helping will be a free **club-sponsored** lunch at the Village Inn in Apache Junction (our own Randy Peterson is the manager) following the cleanup! These cleanups have always been a great time. On every one someone manages to find a very **interesting** "treasure"! So, come out, get some exercise, and get to know each other in the daylight. As well, the conversations at lunch revolve around telescopes, telescopes, and more telescopes.

Hopefully, we'll have some first-timers. They need to know:

- Participants must be at least 12 years old and work in groups, facing oncoming traffic. Dress appropriately; long pants, sturdy shoes/boots, long sleeves and/or sun block, hat, and heavy GLOVES.

- Safety vests to be worn will be provided. Please bring some water too, as you'll work up a sweat.
- Pick up bags and other litter with caution-it could contain hazardous material, be hiding a snake, etc. A stick with a nail or hook is recommended to use instead of your hands, while a large bucket cuts down trips to the trash bags. Few large objects are found out there, but if lifting one, keep your back as straight as possible, the object close to your body, and let your legs and arms do the work.
- Don't let anything surprise you-our fellow citizens dispose of everything imaginable along our roadsides. If anything looks odd or is really heavy, leave it alone! Note it's location and we'll notify the State about it afterwards. When a trash bag becomes full, place it on the very edge of the pavement, not in the pullout lane.

As with any government program, there are a few requirements to complete before starting. One is a briefing from the cleanup coordinator. The second is to sign the usual waiver for the State saying participants won't sue if something happens. The forms are kept on file so one signature covers you for all future cleanups.

Contact me at 480-926-4900 or email:

[mabastro@aol.com](mailto:mabastro@aol.com) if you want to help or have questions. Thank you.

## January EVAC Meeting Minutes

by Tom Polakis, Secretary

President Martin Bonadio opened the meeting with some announcements of upcoming events. He announced that future pre-meeting dinners with speakers will be at Sweet Tomatoes.

Robert Kerwin presented an award for observing (and drawing) the entire Messier list to Dawn Schur.

In club news, we have a new Webmaster, Dave Kelley. Many thanks go out to Robert Kerwin, who has maintained the club site for so many years.

*January Minutes Cont'd on Pg 2*

EVAC & Other Events: 2002						
	New Moon	Meeting	Members Only		Gilbert	Other
			Local	Deep Sky		
Feb	2/12	2/13	2/2	2/16	2/8	
Mar	3/13	3/13	3/9	3/16	3/8	3/23 Adopt A Hwy
Apr	4/12	4/10	4/6	4/13	4/12	4/13 Marathon 4/16 SCC Star Party
May	5/12	5/8	5/11	5/18	5/10	See Note 1

1. Astronomy Day @ Science Center May 4-5  
Boyce Thompson Arboretum May 11  
RTMC Astro Expo @ Big Bear, CA May 24-26

January Minutes Cont'd from Pg 1

Member presentations came after the break. Gene Lucas showed a video of aurora shot in real time in Alaska. Joe Orman showed various slides, including some from the All Arizona Star Party, a recent aurora, and the Leonid meteor shower.

The main speaker was club member Chris Schur, who gave a sweeping talk about CCD imaging. In the first half, he discussed the many things that have to be done right in order to produce good images. He made sensible comments on the current costs of equipment as they relate to expectations. The second half of Chris' talk was a slide show of exclusively galaxies, a class of object that he finds most suited for CCD imaging. His Web site may be found at:  
<http://www.psi.az.com/Schur/astro/>

Tom Polakis  
Tempe, AZ  
Arizona Sky Pages

## 2001 ALL ARIZONA MESSIER MARATHON

Site: Arizona City, AZ  
Date: April 13/14, 2002

Solar Data: (all times are MST):

April 14: 4:33am astronomical twilight  
April 13: 6:55pm sunset 5:58am sun rise  
7:55pm moon set 7:13am moon rise  
8:21pm astronomical twilight

Why marathon?

If you decide to participate be sure to read and follow all of this information:

First arrive at the site early, don't plan on arriving by sunset. Give yourself time to setup your telescope and for it to reach thermal equilibrium. Also give yourself time to meet old friends and make new ones. If you are not going to stay all night, then park near the entrance so you don't disturb others when you depart. Please give a shout a few minutes before leaving and then as you are about to depart. This will give observers time to hide so the light doesn't interfere with night vision.

There will be a check off list available at the site to record your observations. Be sure to pick one up, preferably before you start marathoning and fill in the top portion so awards can be made. It is important to remember that you must turn in your form to one of the Coordinators before leaving the site or by sun rise. We cannot accept any after these times.

If you plan on participating, then doing some homework ahead of time will pay dividends. If interested the check off list can be made available prior to the marathon for your reference. Study the list, or use your own sequences. Be prepared for the extremely unlikely case it should become cloudy.

Although it is possible to do the marathon with a 4 inch or smaller telescope, it is not suggested unless you are an experienced observer.

The marathon this year has been scheduled for a somewhat later time than normal for several reasons. First the earlier date in March has interference from the moon well after astronomical twilight. The selected date has no interference of this type, is the day after new moon and will give marathoners a chance to brush up on the late risers, particularly M30!

For the selected date the following will not be available at all; M74, M77 and M33. Only M34 and M76 will only be available in the evening. Whereas M39, M31, M32 and M101 will only be available in the morning. That leaves an easy 101 objects, or 107 if you really work at it!

Concerned that you can't get a high count? Don't worry, set your own goals and don't be bothered about the high counts. The important point is for you to have a good time and not become frustrated. This is supposed to be a fun time - enjoy it!

Your efforts will not go unnoticed, as there will be awards in recognition of your participation. People observing 50 or more objects will receive an 8 1/2 X 11 certificate. For first, second and third place there will be plaques suitable for mounting on your telescope. Duplicate awards will be made in case of ties.

This event is run on the honor system, there are no referees or umpires. We accept all legitimate observations. We will need your and your club's support to help purchase the awards for its members.

If you don't care to marathon, don't worry - come anyway! You can do your own deep sky or planetary observing or astrophotography. There's always the chance to just relax under a clear dark sky or just socialize to your hearts content.

AJ Crayon, e-mail - [acrayon@mindspring.com](mailto:acrayon@mindspring.com)  
Jack Jones, e-mail - [spicastar@msn.com](mailto:spicastar@msn.com)

Messier Marathon Coordinators  
Saguaro Astronomy Club <http://saguaroastro.org>

## If it's clear...

for February 2002

by Fulton Wright, Jr.  
Prescott Astronomy Club

Shamelessly stolen information from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find data. When gauging distances, remember that the Moon is 1/2 a degree or 30 arcminutes in diameter.

On Saturday, Feb 16, after about 7:00 PM, you can see Jupiter between two stars. With a small (3 inch) telescope look 60 degrees above the east horizon for Jupiter. There will be a star north and a star south of Jupiter, each about as bright as the 3 satellites which are showing. The forth satellite (Ganymede) appears from Jupiter's shadow at 8:28 PM.

On Wednesday, Feb 20, at 4:22 PM, you can see the Moon occult Saturn. With a small (3 inch) or larger telescope, look 50 degrees above the east horizon for the first quarter Moon. Even though it is daylight, you should be able to spot Saturn near the northern part of the moon. The planet appears again at 5:14 PM.

On Thursday, Feb 21, about 6:45 AM you can see Mercury at its greatest elongation. With binoculars look 10 degrees above the southeast horizon for a magnitude 0 point of light. Mercury should be visible for a week around this date.

On Friday, Feb 22, about 7:00 PM you can see the Moon and Jupiter near each other. With your unaided eye or binoculars look 65 degrees above the east horizon for the gibbous Moon. Jupiter will be about 1 moon diameter south of it.

Here are the times of some interesting events with Jupiter's moons:

Feb 3 8:12 PM Io disappears behind Jupiter	Feb 13 11:13 PM Europa moves in front of Jupiter
Feb 4 7:34 PM Io moves from in front of Jupiter	Feb 15 10:08 PM Europa appears from Jupiter's shadow
8:23 PM Io's shadow leaves Jupiter	Feb 16 8:28 PM Ganymede appears from Jupiter's shadow
Feb 5 7:54 PM Ganymede moves in front of Jupiter	Feb 18 8:56 PM Io moves in front of Jupiter
10:56 PM Ganymede moves from in front of Jupiter	9:58 PM Io's shadow falls on Jupiter
11:14 PM Ganymede's shadow falls on Jupiter	11:10 PM Io moves from in front of Jupiter
Feb 6 8:51 PM Europa moves in front of Jupiter	19 12:13 AM Io's shadow leaves Jupiter
10:33 PM Europa's shadow falls on Jupiter	Feb 19 9:35 PM Io appears from Jupiter's shadow
11:38 PM Europa moves from in front of Jupiter	Feb 23 7:53 PM Ganymede appears from behind Jupiter
Feb 7 11:14 PM Callisto disappears in Jupiter's shadow (rare)	9:17 PM Ganymede disappears in Jupiter's shadow
8 2:23 AM Callisto appears from Jupiter's shadow(rare)	24 12:28 AM Ganymede appears from Jupiter's shadow
Feb 8 7:31 PM Europa appears from Jupiter's shadow	Feb 24 7:52 PM Europa's shadow leaves Jupiter
Feb 10 9:59 PM Io disappears behind Jupiter	8:36 PM Callisto appears from Jupiter's shadow (rare)
Feb 11 8:03 PM Io's shadow falls on Jupiter	Feb 26 8:05 PM Io disappears behind Jupiter
9:21 PM Io moves from in front of Jupiter	11:30 PM Io appears from Jupiter's shadow
10:18 PM Io's shadow leaves Jupiter	Feb 27 7:28 PM Io moves from in front of Jupiter
Feb 12 7:40 PM Io appears from Jupiter's shadow	8:37 PM Io's shadow leaves Jupiter
11:24 PM Ganymede moves in front of Jupiter	

## Solar Eclipse on December 14

By Randy Peterson

The annular eclipse on December 14, 2001, was best visible from Nicaragua and Costa Rica. In an annular eclipse, the moon is a little farther away from the earth in its orbit, so it does not completely cover the sun when it passes in front of it. A total solar eclipse, on the other hand, happens when the moon is a little closer in its orbit to the earth, so it completely covers the sun if you are in the path of totality.

From the Phoenix area, the moon was predicted to cover only about 22% of the sun. This partial eclipse was to start about 1:23 p.m., with the moon covering the maximum amount of the sun at 2:30 p.m., ending at 3:30 p.m.

Not having the wherewithal to travel to Nicaragua, I did volunteer to travel to the Arizona Science Center to set up my telescope for the public to view the eclipse. Christine Shupla, the Planetarium Director, helped to clear our way to set up the telescopes near the Center. The Arizona Science Center is just north of the Bank One Ballpark in downtown Phoenix.

Joe Goss also volunteered to go, and we brought our solar filtered telescopes to the Center at about 12:30 p.m., and set up on the sidewalk area just north of the Center. Joe's solar filter is made of Mylar, which gives the sun a "white light" look. My filter is an Orion brand filter, which gives the sun a yellow color. Other kinds of filters can vary somewhat on the colors, with some even showing the sun as being blue. Each has its own advantages and disadvantages.

**Continued on Pg 4 See Solar Eclipse**

### Solar Eclipse cont'd from Pg 3

After we set up, it was still too early for the eclipse to start, so we were showing the curious passers-by sunspots, of which there were about 10 good sized ones scattered around the sun's disc, and so many small ones I couldn't count them all. Joe brought his 60mm Meade ETX. He leveled the unit, punched into the control box for it to track the moon, and once he had it aligned, it did an excellent job of keeping the sun/moon in view. I brought my 10" Newtonian reflector on a German equatorial mount, which has a simple clock drive. After adjusting the counterweight a few times, the clock drive finally took over the job of keeping the sun constantly in view. The motor is not very powerful, so the unit must be balanced within close tolerances in order for the clock drive to work properly.

We could see the moon start to "take a bite" out of the sun at about 1:24. It was fun to watch the eclipse progress, and most of the people who looked through the scopes were impressed with the eclipse, as well as the sunspots. Several of the employees and volunteers at the Science Center came out to take a peek at what was happening. Many people passing by acted like they didn't want to disturb us, but when we invited them over to look at the "eclipse", were thrilled to come see. Most everybody said they "didn't even know that there was an eclipse today!"

Everything was going great, but then the clouds came rolling in. They were at first pretty wispy, which didn't bother the seeing at all, but then they became thicker; at which point they totally blocked out our seeing. We waited around, and they would thin out a bit, so we could glimpse the sun for a few minutes before it would retreat again behind the thicker clouds. This happened a few times, and then the cloud cover became total. We waited awhile, but to no avail, so about 3:00 we packed up and left.

We had about 45 minutes or so of viewing the sunspots before the eclipse started, plus about a half-hour of good viewing of the eclipse. However, we missed the last hour and a half of the eclipse during which the moon covered the greatest amount of the sun's disc. Ironically, the eclipse was over at 3:30, and we noticed after we got back to Mesa that the clouds parted to let the sun shine through at 3:40 p.m.!

In spite of the clouds, Joe and I still had a lot of fun showing the eclipse, got to converse with some interesting people, and got a dose of sunshine to boot (at least for awhile)! The next solar eclipse from Phoenix will be on June 10 in the late afternoon, which will also be a partial annular eclipse. Hope you will consider volunteering to participate if we are fortunate enough to be able to set up for the public again! If you don't have a solar scope, that is OK, it is still nice to have extra help at an event like this.

## **Backyard Astronomy - Questar "fixes"**

By Bill Dellinges

Since the mid 1950's I had drooled at Questar ads in Sky & Telescope magazine. Finally, in 1991, I ordered one--I couldn't hold off any longer--I had to have this little jewel! I deserved it after all these years (I rationalized!). I went with a few options. I ordered the instrument with a Zerodur mirror, a glass ceramic with virtually zero expansion compared to Pyrex, broad-band dielectric coatings on the corrector lens instead of magnesium fluoride, silver coating--rather than aluminum--on the primary mirror (all of which, the company claims, increases total light grasp by 22%) a full aperture solar filter over the off-axis one normally supplied and finally, the self contained 9 volt drive Powerguide system over the standard 110 VAC, which frees you from dangling cords--a nice amenity.

All this, in addition to the scope's base price, made for a final price offensive to accepted standards of decency for a 3 1/2" aperture telescope.

Now, I won't discuss here whether the scope is worth the price--that argument could go on forever. I will say I believe the Questar, for its aperture, is probably the finest 3 1/2" scope on the planet, insofar as optical and mechanical aspects are concerned. I especially like its portability and quick set up properties. And of course it's a beautiful little creature--the first 2 weeks I had it, I just sat it on my desk and stared at it in wonder!

Now the "fixes". Funny thing about scopes: I don't care who makes it, how much it costs...I have found there is no such thing as the "perfect scope". Every scope I've owned had some little aggravating thing about it that drove me nuts. My Questar?

Yep. The Questar comes with 2 Brandon eyepieces (ep), 24mm and 16mm. While these ep's are considered high end, the Questar ones have some peculiar properties. The barrel ends are threaded on the outside to screw into the ep holder--I guess the idea being they can't fall out should a set screw come loose. They also do not accept 1 1/4" standard color filters even though they are 1 1/4" ep's. You have to buy Brandon filters. A set of 10 are sold for \$280 (Astronomics). Now, if all this isn't enough, not just any ep will work with the finder. Most other ep brands/focal lengths will not come to focus while the scope is in the finder mode (note the Questar has no

**Continued on Pg 4 See Questar**

#### **Questar Cont'd from Pg 4**

separate finder but is built into the eyepiece and body of the scope). If you prefer to observe with your glasses on you'll hate their eye relief. So the first thing I did was to retire the Brandons. Now, you

can drop any 1 1/4" eyepiece in the holder and let gravity keep it there. As noted above though, they may not work with the finder. Solution? Tele-Vue makes a nifty Questar adapter (about \$70) that replaces the stock eyepiece holder and has a set screw which will allow you to use any 1 1/4" eyepiece. Now you can use your regular filters in them. Experimenting, I found my older Tele-Vue 26mm and 17mm eyepieces worked fine in focusing on the finder views. So now I get 50x and 76x instead of 54x and 81x, a nominal difference.

Another "problem": I'll be the first to say the finder set-up on this scope is ingenious. Light is tapped off a small mirror under the scope, directed upward into the so-called "control box". A lever can be flipped to move the built-in diagonal out of the way to allow this light into the eyepiece for your finder view. BUT, that view will be mirror reversed-worse, the finder mirror is only about 20mm in diameter, so instead of say, an 8x50 finder, you have a 4x20 (12 degree field) finder which makes sweeping up faint objects very difficult. I have found it most frustrating, especially with people standing around waiting for me to find something, to be unable to find something other than a bright star or planet using the Questar finder. So, after deep soul searching, I decided to add a red dot finder to the scope. I know some will find this blasphemy! Tamount to gluing a gum-ball machine to the roof of your Rolls-Royce. God, please forgive me, I was desperate, I had a \$5000 telescope and couldn't find a damn thing with it! Thus I bought a Stellarvue red dot finder for \$30. I chose theirs because its mounting bracket was the smallest, only about an inch long. Using double stick foam tape, I attached it on a spot midway along the sliding dew cap. It's not very noticeable until, of course, you attach the finder to the bracket. Then it looks pretty silly! But it works! I can find stuff now.

The Questar's case, though attractive, is not very functional in two respects: 1) It provides no cushioning to protect the instrument. 2) It tends to be top heavy when stored in its upright position (which Questar recommends). Transporting it in my car, I must take care to shore it up against things so it won't fall over during stops or turns. I decided I needed a foam lined case and found it at Gemini Cases ([www.gemini-cases.com](http://www.gemini-cases.com)). I wanted the smallest case I could get, deep enough to accept the scope and a few accessories. They could provide a 13"x 18"x 9" case with a dice-cut foam interior, quite nice looking, for about \$100 (model GI 1318R-3). I used a glue gun to solidify the layers of foam after plucking out the shape of the scope. I now feel comfortable "throwing" the case in the car and taking off, confident that the scope is safe.

These few "fixes" have enhanced the enjoyment of using my "little jewel". Perhaps other Questar owners may borrow these ideas or have some of their own, I would like to hear from you if you do, either directly or in the club newsletter. (1/10/02).

## **A SHORT TOUR AROUND ORION FROM YOUR BACKYARD**

By Silvio Jaconelli

This month's observing session focuses on Orion and covers objects that are easily visible from urban areas using modest equipment -- in this case I used a 6" aperture telescope.

Refer to the attached diagram as a guide on page 8.

Look high in the south east in January/February and you cannot mistake the obvious shape of the constellation.

Let's start with Betelgeuse (Alpha Orionis), a huge red giant which has a volume of 160 million (no typo!) that of our Sun. This is a pulsating variable star (magnitudes 0.4 to 1.3) whose diameter ranges from that of Mars' orbit to that of Jupiter's orbit! Through a telescope, the color of this star is so obviously red. You should next immediately compare the color of Betelgeuse with the next target.

Rigel, on the other hand, is distinctly blue/white -- a very obvious color contrast to Betelgeuse. It has a magnitude is 0.1. Rigel's intrinsic brightness is 57,000 times that of our Sun - a true giant. Another very interesting feature of Rigel is that it has a 6.8 magnitude companion, a tiny bright dot off to the side of huge blazing Rigel that is a delight to spot through the eyepiece. I get a thrill out of finding these odd match-ups in sizes! The separation is 10", which means that a 4" telescope with decent optics in good seeing should show the faint companion. I've never failed to spot it with 6" of aperture any time that I've looked for it. Magnification of 80 power should be high enough to resolve Rigel, while higher powers make the separation more dramatic.

**Continued on page 6 See TOUR**

### **TOUR Cont'd from page 5**

Let's try another double star -- this time Zeta, which is the easternmost star in Orion's belt. The primary star has a magnitude of 1.9, and is 2.6" away from the 4.0 magnitude companion. Again, the unequal brightness of the two components makes it more challenging to split than it would be to split components that are equal in magnitude; I suspect that the brighter star just overwhelms the fainter star, washing it out. I encourage anyone interested in double stars to read (and thoroughly understand) Sissy Haas' article in the Jan 2001 Sky & Tel edition that goes into great detail explaining the interplay between separations, magnitude differences, atmospheric seeing, and optical quality, and how all these factors will determine which doubles can and cannot be split with your particular telescope. Using Sissy's charts, it will take a good telescope of at least 4" aperture to split this pair. Try using at least 150 power, while a clean split will be obtained at 200 power, and an easy separation will be resolved at 250 power. This double has a narrower separation than Rigel, and the differences in magnitudes is smaller.

Since this article is meant for backyard suburban observing, I will not go into detail on other very interesting deep sky objects very close to Zeta, but which are definitely worth observing from a dark sky site. Firstly, in the same eyepiece field of view is NGC 2024, the Flame Nebula, a beautiful nebula with extensive dark dust lanes. Then dropping south about a degree is IC 434, a fainter smaller nebula that looks like an out of focus star. Both of these are easy with 8" aperture from a dark sky site. However, less than a degree west of IC 434 is the very elusive Horsehead Nebula; this is where I must confess that in all my years at the eyepiece looking through a large number of telescopes, I have never clearly seen this object - even through 20" aperture in the desert. It's most likely the fault of the user (me) rather than the equipment; I just have never been able to see it.

Let me digress here; the belt stars of Orion are just south of the celestial equator - a prime location for geocentric satellites - if you happen to see a "star" that are slowly drifting against the rest of the stellar background, then you have probably stumbled across a geocentric satellite; switch off your clock drive and something interesting happens - these satellites will remain fixed in the field of view while all the other stellar objects will drift through the eyepiece - like a clock drive in reverse ! Several years ago Sam Herchak stumbled across a caravan of geocentric satellites passing very close to the Orion Nebula - and each night, this caravan appeared 4 minutes later than the other stars in the field - an interesting artifact of sidereal time versus Solar time!!

Let's drop a degree southwest of Zeta to Sigma, one of my favorite multiple stars. This star's magnitude is 3.7, easily naked eye visibility. Firstly look at it at 50 power and you will see that it is a multiple star that has 3 tiers to it, forming a peculiar looking asterism (an asterism is a grouping of stars that form an interesting pattern). But look at it at 150 power, and you will see that there are eight components to this one object. Firstly, there is the bright primary surrounded by three not so bright stars more or less all on the same plane that look like Moons surrounding the primary; the faintest companion has a magnitude of only 10, and lies 13" to the east - this is the toughest component to spot, while the other two companions shine at magnitudes 6 and 8, real easy to resolve. The 2nd tier consists of a very elongated triangle of 9th magnitude stars lying on it's side just off to the north. And finally the 3rd tier consists of an 8th magnitude star off to the south. That makes Sigma an 8 component multiple star. Remarkable.

Let's now go about 3 degrees northeast of Zeta to try for our first Messier object of the evening - M78. This is an 8th magnitude nebula that will be tough to spot from the suburbs with 6" aperture; the more aperture that you have, the easier it will be to see it. This nebula forms a 'V' shape with the 3 belt stars of Orion - see the accompanying diagram. From my backyard with 6" of aperture, I use low magnification - around 50 power - to find two very close stars that look slightly out of focus compared to the other stars in the field of view; then once I am sure that I am in the right place, the nebulosity itself can be just made out - a slight milky circle approximately a few arc minutes in diameter. Lesser experienced observers may have better luck getting a good star map and star hopping to M78 from Zeta Orionis. Nebula filters have not improved the views for me. The unusual feature of this nebula is that it contains two faint 10th magnitude stars 53" apart that seem to stare right back at you, a ghost-like phenomenon that has led me to call this the "Casper Nebula"! Probably invisible in the suburbs is a fainter third star in the north part of the nebula - I've only seen this third star from the desert with large apertures, but see if you can spot it anyway. This object, interestingly enough, lies right on the celestial equator.

Let's try yet another double star, this time a real toughie - 52 Orionis. This double has a separation of only 1.2", but is facilitated by the fact that they are both of 6th magnitude. Sissy's charts would suggest that this would need at least 5" of aperture to split, and indeed I find that it is a tough - though doable - split for my 6"; I get a 'figure 8' at 200 power, while a more obvious split is obtained at 300 power. The visual impact of this double is really neat - two tiny dots of equal brightness suspended in isolation against a starless background. If anyone can split this with a 4", please let me know. The feeling of accomplishment derived from splitting such tough doubles is wonderful, though it can be really frustrating to have to admit failure when you cannot get a clean split!

**Continued on page 7 See TOUR**

### **TOUR Cont'd from page 6**

Let's look at our second asterism of the evening which also an NGC object - NGC 2169. This is an open cluster of 6th magnitude. To find it, extend a line northeast from Zeta to Betelgeuse, and keep going about two thirds of that distance; you should see two 4th magnitude stars very close together in that vicinity. Just below these two stars and roughly midway between them you will find NGC 2169. I call this the 'Wrigley Cluster' after the club member who pointed out this cluster to me - I'll let that member remain anonymous for now!! So what is special about this cluster? Well, two things. Firstly, they form the outline of the number "37", engendering much discussion that it ought to be renamed NGC 37! And secondly, the end star at the top right hand side of the "3" (where it is closest to the top of the "7") is a tight double star - Struve 848 - a pair of 8th magnitude stars with a separation of 2.6". I must add that I get great pleasure from finding more than one aspect to study in an observing target.

Now for an easy double star at any magnification - Delta Orionis which is the westernmost belt star - this is a 2nd magnitude star with a 7th magnitude companion 1 arc minute to the north. Very easy. This double star looks similar to (although dimmer & wider than) Rigel in the eyepiece.

Then a few degrees to the south is Eta Orionis, a much more difficult split of a 4th and 5th magnitude pair at a separation of 1.5 arc seconds. Try this one if you managed to split Zeta Orionis - this one is slightly tougher than Zeta; they both look similar in the eyepiece. Again, 150 power is the minimum magnification required to split this pair.

A third asterism on tonight's tour in Orion is Lambda Orionis, or the head of Orion. To the naked eye it looks like a fuzzy star, and a look through the eyepiece will explain why - there are numerous stars here, not just one. And they form a shape similar to the bottom half of the constellation itself - three stars in a line (the 'belt stars') with two other stars supporting them ('Rigel' and 'Saiph'). Others have likened this asterism to resemble a picnic table. And there is more - the brightest star in this group is a double star, with components that are magnitude 4 and 6 with a separation of 4" - easily separated at 100 power. I found this image most pleasing, detecting a hint of blue in the fainter star, somewhat similar to Albireo. Tougher to split is double star Otto Struve 111. This star is in the same low power eyepiece field of view of the double star just discussed, located just 20' due north; it has components of 6th and 10th magnitudes with a separation of 3". I have split this one at 200 power - it is a challenge since the magnitude differences between the components is so great; the secondary star here was the merest of pinpoints - real tiny.

I always like to save the best for last, and in this case what a 'last' - the Orion Nebula, one of my all time favorite objects. This hydrogen gas cloud - the birth place of stars - contains enough material to make 1000 stars equivalent to our own Sun. I have shown the area separately in the attached diagram. Even from town, and even with the Moon in the sky, this object is just wonderful to look at. And all magnifications show different perspectives, so please take the time to start at low magnifications and work steadily higher. And don't rush it - savor each view before moving on. Even binoculars will show pleasing views. And at higher powers, the mottling caused by the dark dust patches become evident.

As an insert to the insert, there is an outline of the Trapezium, the newly born stars that illuminate the Orion Nebula. Any telescope at 50 power will resolve the four stars that make up this famous asterism, where the stars are between 5th and 7th magnitudes. It is worth noting here that the westernmost star is a variable star that decreases from 7th and 8th magnitudes for several hours every 65 days - it is easy to identify this star as it is exactly opposite the brightest star in the group. And for a real challenge, try to see if you can see stars 5 and 6 - I have tried to represent these as faint dots in the attached diagram, but I am not sure if the printer brought these out; you will need good optics and a steady atmosphere to resolve these, since they are both around 11th magnitude. Let me digress here - the reason that good optics and a steady atmosphere are important for resolving very faint stars is to keep whatever light is available tightly focused as a point source - fuzzy images will spread the light over a larger area to where the light will dim down below the threshold of visibility. For stars 5 and 6, try averted vision, putting the star in that area of the eyepiece that forces your glance to look over your nose; this technique forces the light to fall on the most sensitive part of your retina. Higher power works best for stars 5 and 6 - I suggest that you try 150 power, but do experiment to see what power works for you. My 6" gets these two stars around 50% of the time, achieving more success when the atmosphere is more stable and when Orion is near the zenith.

Almost touching the north tip of the Orion Nebula is another nebula called M43 (the Orion Nebula is also known as M42). This nebula is very easy to miss, being overshadowed by M42. It is actually a part of M42, and looks like a very small round ball, that is, if you can see it at all from your backyard. From a dark sky site this nebula is easily visible.

Now look about half a degree just above the Orion Nebula to find three bright stars lying east to west; the brightest star - 42 Orionis - is the star to the west and is a really tough double of magnitudes 4.6 and 7.5 with a separation of only 1.1". This is one of the toughest doubles for amateur telescopes to split, and I would like to know if anyone can split this one - please let me know. Moreover, these three stars lie embedded in another nebula - again probably invisible from the suburbs - called NGC 1977. But look for traces of this nebulosity anyway - I'd be interested to know if you can detect it from town.

Then about another half a degree further north is another triple star layout, this time oriented north/south and bigger than the previous triple. This trio is surrounded by about 10 other stars of fainter magnitude. But wait - the northern star of this triple is also a double star - Struve 750, magnitudes 6.5 and 8.5 with a separation of 4". Another easy double to split! This entire grouping of stars is called NGC 1981, a recognized and catalogued open star cluster.

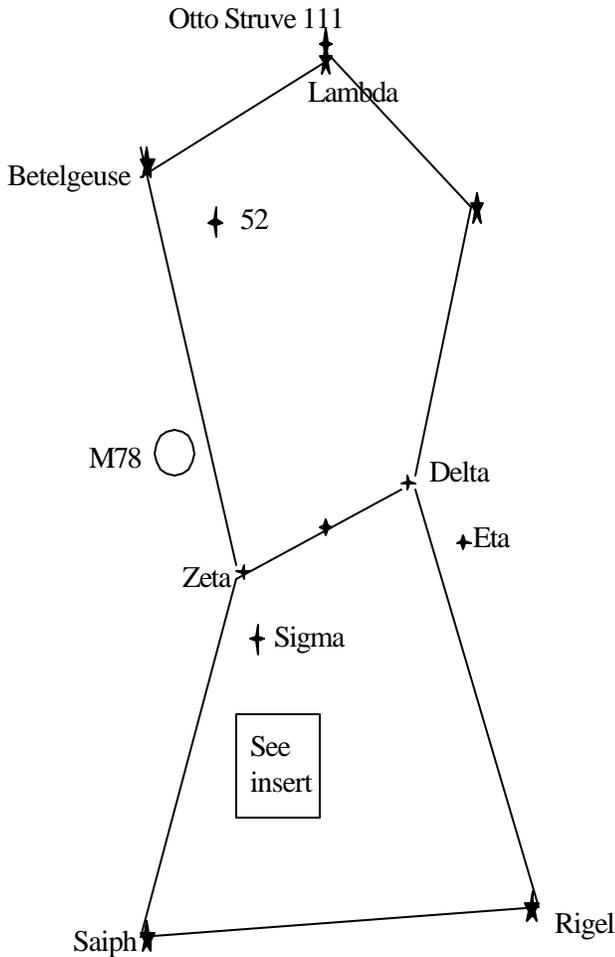
**Cont'd on pg 8 See TOUR**

TOUR Cont'd from page 7

To the south of M42 you will find a huge sparse cluster consisting of all different colors of stars of all different magnitudes. This area is a giant menagerie of all sorts of stuff - just spend time absorbing the views, especially at low power/wide fields. The brightest star in this field is Iota Orionis, with a 2.7 magnitude. A blazing beacon having an intrinsic luminosity of 20,000 times that of our Sun. Iota is actually a nice triple star for small telescopes, with a blue 7th magnitude companion 11" away, and an 11th magnitude companion 50" away - tough from town, but my 6" can spot it using averted vision. And if you feel like a challenge, get a detailed star chart and look for NGC 1999 (RA 05h 34m; Dec s 06.45); this is a peculiar low brightness nebula that is host to a 10th magnitude star south of the sparse cluster described above. From the desert this is an easy find, but from the suburbs it is a real challenge, looking like a fuzzy, out of focus star; I can get this with my 6" from the suburbs, but only because I know exactly where to look. Closer examination will reveal that this nebula has a dark interior, reminiscent of a donut.

Well, there you have it - double stars, triple stars, asterisms, nebulae, star clusters - all visible from your backyard with a telescope of modest aperture. Happy observing.

# ORION

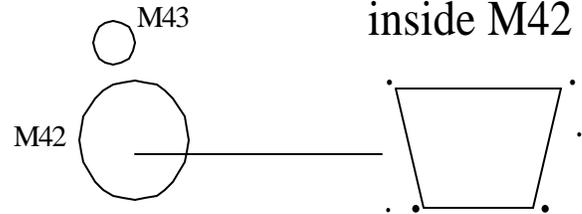


## Insert

- Cluster 1 (NGC 1981)

- Triple + NGC 1977

Trapezium  
inside M42



- Cluster 2

# Greetings From EVAC's Web Master

From Dave the Webmaster

As the new Webmaster for EVAC I am starting (ever so slowly) to enhance the site and capabilities for the members. The first and probably the most important is our new list server. Many of you know what a list server, or reflector, is. There are many free commercial versions, like Egroups and Yahoo that you may already be members of. I personally have a problem with those systems because of their marketing of email address and the constant ads that appear in the messages. Understandably, they have to pay for it somehow.

Our list server is private and will never have ads (unless a member is selling a scope for example) and the privacy of your email address is respected. Even to the point of having YOU subscribe and unsubscribe yourselves. This sure beats having everyone's email address in the TO line of a message as you'll see in this message.

The first mailing list is a general club communication list called EVAC. (catchy name, eh?) As you get used to the features and how it all works, keep in mind we can create as many lists as we need. So, special interest groups can have their own also...just ask.

Now, for those who haven't used a list server before it's really easy. You can go to this area in the EVAC web site-

<http://www.eastvalleyastronomy.org/EVAC/comcent.html>

and simply enter your email address and hit the button. This is also where you would unsubscribe if you're going on vacation or changing your email address. Once you subscribe you'll get an email confirming that you're now a subscriber of the elite EVAC list server.

Once you have subscribed you can send email to the entire group by addressing an email message to: [evac@presenceknown.com](mailto:evac@presenceknown.com)

That's it....So, you can ask questions, answer questions, or talk about pretty much anything related to 'things not of this earth' if you'd like. Try hard to stay on the topic of astronomy and the club of course....that's what the list is about and why others have subscribed. Enjoy....and if you have any questions at all, please feel free to let me know.

## **Boyce Thompson Night Under The Stars**

Boyce Thomson Arboretum will hold its spring "Night Under the Stars" buffet on Saturday, May 11, between 6 and 9 P.M. There will be a sign-up sheet at the next meeting for those interested in attending, or contact Don Wrigley by phone (982-2428) or email [DJWrigley@earthlink.net](mailto:DJWrigley@earthlink.net). If you haven't been to one of these yet, you are really missing a treat.

## **Treasurer's Report for the Fourth Quarter 2001**

By Randy Peterson – EVAC treasurer

During the fourth quarter our Income includes:

membership fees    \$1165 and  
shirts sold            \$ 343.

For magazine subscriptions, we ordered \$720 in "Sky & Telescope" and \$420 in "Astronomy" magazine subscriptions. For nametags there was \$84 in orders.

Our expenses includes:

Newsletter postage and printing costs (snail mail) - \$192  
Speakers Honorarium - \$50  
Dinner with the guest speaker - \$10  
All AZ star party - \$16  
General meeting refreshments - \$54  
Shirts - \$655  
Adopt-a-Highway lunch - \$168  
(See Pg 10 *Fourth Quarter*)

(Fourth Quarter Report cont'd)

At the end of the year our funds were \$5299, of which \$536 was in shirt inventory.

Significant items: On paper, we come out "even" for the year on our EVAC shirts, once our inventory is sold.

The majority of our costs for the All AZ Star Party were paid for in the third quarter. The \$16 was for some additional flyers, giving a total of \$145 paid for the annual EVAC sponsored event.

Over one third of our 200 members renewed their memberships by the end of the year. The overwhelming source of our income is from membership dues.

---

## Message From The President

By Martin Bonadio

This year has gotten off to a very busy start for me. I'm not sure what I was thinking when I decided to build a new house, get married, and take on more work at the office at the same time!! Regardless I still manage to find time to spend at least a few hours each week enjoying the sky and keeping up with what's going on in the world of Astronomy. In fact as I'm cooped up in my little apartment I've really enjoyed catching up on some really good articles in the last few editions of S&T and Astronomy Magazines. I have a laundry list of observing targets that I want to get started on and if I can ever dig out a telescope from the pile of stuff in my spare bedroom, I'll be out at the next star party trying to work through some of this.

One thing about this time of year that I really enjoy is the winter Milky Way and the constellations Orion and Canis Major. It seems like I'm drawn to that part of the sky like a magnet, and on almost every clear night I am caught pointing them out to my fiancé' who now responds by saying "I know, you tell me all the time". This is good – because now I know she is learning the constellations. (Grin).

There is good reason to focus on that part of the sky, because it is full of deep sky treasures. Each of us has our own set of favorites. For me it really varies, but let me share a few of my favorite observations and notes with you this month:

**Theta Orionis, [The Trapezium]** is possibly the most studied of all multiple star systems, and arguably the most visually provocative. It is certainly situated in the right spot for all the attention - right in the core of the **Great Orion Nebula**. This small group is actually part of a massive cluster consisting of about a thousand stars. Most are hidden from view by a vast amount of nebulosity and dust. When photographed in infrared, they present a sobering vista. These are some of the youngest stars in our galactic vicinity, at an age of only a million years or so. Our Solar System is 4,000 times older. How many of component stars can you find here? I've definitely Made out the A,B, C, D, and E starts, but never the F visually.

**M-42:** To the naked eye, the **Great Orion Nebula** looks like a tiny smudge. In binoculars it takes on the appearance of a gray sunlit blossom. Check out how nice it looks through binoculars on a clear winter night.

**NGC 1981** is the fuzzy patch that makes the handle of Orion's sword. It's composed of about a dozen icy-blue stars that are very young and very hot. It can be seen well in binoculars and finderscopes, and at darker sites it is visible to the naked eye. This neglected cluster makes a startling image in almost any telescope.

Yep, it really looks like this! **NGC 2169** is called the "37" cluster or the "XY" cluster. Some observers see the outline of a shopping cart. As you'd expect, Orion is loaded with double stars and clusters. This particular cluster is the home of *Struve 848*, a multiple star system containing 5 bright suns, which are easily resolved. Check it out!

**M-41** was independently discovered by *Flamsteed*, *Le Gentil*, and *Messier*, but was observed as early as 325 BC by *Aristotle*. It contains about 100 stars, and is visible to the naked eye. It is a spectacular 3-dimensional experience in large binoculars and at low power/wide field in my TV101. It is a stunning sight in any size telescope. There is a red star near the center of the group – a 7th magnitude K3 giant.

**Caroline's Cluster:** It is aptly named. I hold a special place of high regard for *Caroline Herschel*. Her accomplishments, contributions, and unwavering devotion to her brother and to science were achievements of profound inspiration. She discovered this cluster while finding comets to add to William's catalog. **NGC 2360's** field of view includes a 5th magnitude field star, and a curious orange/yellow background star, which seems to only show up in larger apertures. This neglected cluster

(See Pg 11 Message)

(Message cont'd from pg 10)

is a mass of knots, strings, chains, and loops. I believe I've noticed dark nebulae at three locations near the center while observing from a really dark site. I haven't been able to locate any good photos to bear this out. There are about 75 to 100 stars associated with this object.

**NGC 2362** is approximately 25 million years old, and consists of about 60 stars. The brightest star is ***Tau Canis Majoris***, a naked-eye star of spectral type O8 - extremely hot and very bright. Tau is a 4th magnitude supergiant, and one of the most luminous known (fifty thousand times brighter than the sun). It is a triple star, and under high power the bright primary can be easily separated from its two bluish companions. This cluster presents a really nice image in any telescope. The beehive of inhabitants around Tau can look nebulous at low power. But slip in a Barlow, and they pop into resolution.

Finally, I'm looking forward to the board meeting this coming Friday (As a write this). There are so many great ideas that I don't know if we can cover them all in one meeting. One thing that stands out is that we are probably going to focus on 4 key areas this year: web enhancements, newsletter and calendar improvements, events planning, and content/ideas for even more exciting meetings & SIG's. So stay tuned because I'll certainly be updating you on the outcome and the progress on these and other club related issues.

Clear Skies!!

## EVAC Board Meeting Minutes

by Tom Polakis, EVAC Secretary

January 25, 2002

❖ **The first** item on the agenda is Treasurer, Randy Peterson with a review of the 2002 budget. There are several outstanding features, not the least of which is a nearly \$1500 savings that was realized in 2000 and 2001 due to switching to an electronic newsletter. Some of this was offset in 2001 by club property purchases of items such as eyepieces for the loaner telescope. Even so, we find our funds with a potential increase in club surplus.

The review of membership numbers led to an observation by Howard Israel that the club loses roughly 50 people, or 25% of the membership at the end of each year due to attrition. The Board brainstormed ways to at least track reasons for this, if not actually reducing the rate. A greeter has been a positive step, but more frequent reminders of the club's existence may be an improvement. To that end, Howard Israel will send a heads-up on the Tuesday before the meetings. He will contact Dave Kelley to automate this process. It is thought that an end-of-year survey to determine why people leave may improve matters. Tom Polakis tentatively volunteered to design and administer this survey. Finally, the idea of signing in at meetings was discussed, perhaps by a laptop computer register. This item was left on the table.

Another budget observation is that the club may this year be able to afford one "big-name" speaker. More about that later in these minutes.

It was asked if the club advertises. EVAC advertises at the Science Center, but apparently needs to supply them with more of our cards. The club is also in with the Riparian Institute. It was pointed out that EVAC is a "private club" for amateur astronomers, and perhaps our slow upward trend in membership is satisfactory.

The budget was approved for 2002.

❖ **Next up**, Tom Polakis took an action item to renew insurance and incorporation for this year.

❖ **A big** topic of interest to the club is the proposed Vekol Road rest area. Martin Bonadio is fortunately on the mailing list of HDR Engineering, the contractors who would actually build the rest area and its associated lights. Martin will remain the point man with them and ADOT, if necessary. Tom Polakis will become educated and well-versed in the Maricopa County lighting code. He will present a summary of it along with IDA's stricter standards for the Board. Silvio Jaconelli and Diana Jane' will bring this issue up with local lighting activist Sam Herchak. It was agreed that the club should be represented on this matter by a very small team, and not a letter-writing campaign.

(See Pg 12 Board)

(Board Cont'd from pg 11)

**The next** subject was an idea, proposed by Tom Polakis, to look into moving EVAC meetings to Friday nights. The club would meet on the date nearest Full Moon that is not already taken by SAC, who get priority. The main argument in favor of such a move would be more relaxed meetings, in which the majority of attendees and the speaker would not feel pressure about the ensuing workday to follow. The immediate concern is the possible lack of a meeting place for Friday nights. Another is if we are "too successful", and need a larger room than the classroom. A larger room has already been pursued a few years ago with no resolution. The entire club is asked to help out on this matter: whether or not we move to Friday, we should have some ideas of a contingency meeting place. Can you help us? It was agreed that our possible big-name speaker meeting should be held in the auditorium, and it would be a Friday night meeting as a sort of pilot program.

❖ **Martin** brought up a few events, and determined their owners:

- Trip - Possibly Tucson attractions such as KPNO, Mirror Lab, Starizona to be headed by Gary Finnie.
- All-Arizona Star Party - Diana Jane' will retain this job.
- Adopt-a-Highway - Martin Bonadio will be king of trash.
- Astronomy Day (5/4, 5/5) at Science Center - Howard Israel.
- Holiday Party - Tom Polakis
- June 10 Solar Eclipse at Science Center - Randy Peterson
- The picnic has been discarded from the schedule to to lack of interest.

❖ **David Coshow** will take over the star party hotline. David noted that all schedule items for EVAC go through him. He holds the official EVAC calendar for the year.

Due to the presence of people not following star party etiquette at the Florence Junction and Vekol star parties, these will be taken off the Web site. The nominal introductory star party will now be in Gilbert.

❖ **Martin Bonadio** is making a slight modification to the meeting structure. Meetings will now have about ten "photo minutes" to guarantee that the membership will get a chance to see pretty pictures. It will become mandatory this year to call ahead to notify Martin of show-and-tell presentations, or you will not be on the agenda.

❖ **Jack Grbcich** has set up a club history committee. It is currently comprised of two members: himself and Tom Polakis. We are strongly soliciting participation from club veterans. You know who you are. The committee will have a collection of newsletters, names of officers for every year, and other points of historical interest about EVAC. Please think about joining this group; it is not suspected that it will be a difficult job.

❖ **Randy Peterson** would like somebody to pick up the small task of bringing club shirts to the meetings. He will announce this to general membership.

**The next EVAC Board meeting will be held in Summer, with the intent of holding three in 2002.**

## **Speaker For February Meeting**

The EVAC speaker for February will be Professor Jeff Hester from A.S.U. His topic will be the Crab Nebula in a talk entitled "The Gift That Keeps On Giving."

## East Valley Astronomy Club Membership Form

Please complete this form and return to the club treasurer at the next club meeting OR mail to EVAC, P.O. Box 2202, Mesa, AZ 85214, with a check or money order made payable to EVAC.

**IMPORTANT:**

ALL memberships expire on Dec 31 of each year.

**New Member Only - select month joining:**

- \$20.00 January – March
- \$15.00 April – June
- \$10.00 July – September
- \$ 5.00 October – December

**Membership Renewals:**

- \$20.00 January – December

**Name Badges:**

- \$7.00 each

Name: \_\_\_\_\_

**Magazines:**

(New) (Renewal) if renewal, customer # \_\_\_\_\_

- \$29.00/yr Astronomy Magazine
- \$30.00/yr Sky & Telescope

**Newsletter delivery option, check one:**

- E-mail (saves club postage/printing)  U.S. Mail

**Total enclosed \$** \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone # (\_\_\_\_) \_\_\_\_\_

E-mail \_\_\_\_\_

URL: \_\_\_\_\_

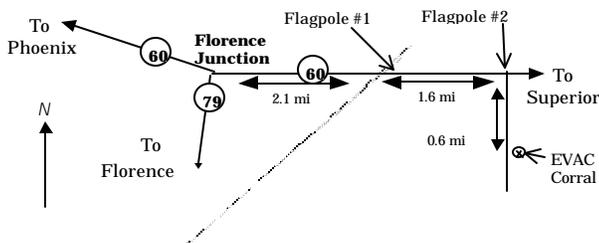
### EVAC Star Parties

**Local Star Party: Florence Junction Site**

General Information: The Florence Junction site is the official site for the East Valley Astronomy Club's Local Star Party, typically held on the Saturday closest to Last Quarter Moon. Florence Junction offers reasonably dark skies within a short drive of most east Valley locations. (Report gunfire or illegal activity: 800/352-3796; Land use permit number: 26-104528.)

Location: N 33° 14' 40"      W 111° 20' 16"

How To Get There: Take US 60 east to Florence Junction. Go past Florence Junction. 2.1 mi past FJ are railroad tracks, and on the right will be a flagpole. Do not turn there. Continue on for another 1.6 miles until you find the second flagpole on the right. This is your turn. Turn right, and continue on the dirt road for 0.6 miles. The corral is on the left, just before a gas-line sign.

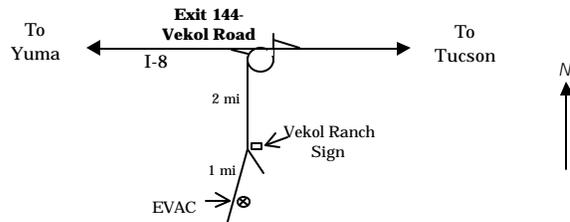


**Deep Sky Star Party: Vekol Road Site**

General Information: The Vekol Road site is the official site for the East Valley Astronomy Club's Deep Sky Star Party, typically held on the Saturday closest to New Moon. Vekol Road offers dark skies despite prominent sky glow from Phoenix to the north. The site is within 1½ hours drive time from most east Valley locations.

Location: N 32° 47' 55"      W 112° 15' 15"

How to Get There: Take I-10 south and exit onto Maricopa Road. Continue through the town of Maricopa to SR 84, about 25 miles from I-10. Turn right on SR 84, after about 5 miles the road merges with I-8. Continue west and exit I-8 at Vekol Road—Exit 144. Turn left and cross the highway overpass. Before looping back onto I-8 take the dirt road to the left. Go south for 2 miles. At the Vekol Ranch sign bear right and continue south for another mile until reaching a large, open area on the left.



**FOR SALE:** 8" Meade Equatorial Starfinder. Like new. Optics star test very good. Battery powered clock drive. Includes Telrad finder, 40mm, 25mm, 10mm eyepieces, 2X barlow, and 5 colored filters for planetary viewing. Scope alone costs 600 new. Selling for \$450. Call Sam 480-924-5981

**FOR SALE:** Meade LX5 10" SCT with Lumicon Sky Vector II, three eyepieces, plus extra accessories, \$1195, complete details and photos via e-mail, Pete in Wickenburg AZ [peteb@w3az.net](mailto:peteb@w3az.net) or 928-684-3635.

**EVAC Officers****PRESIDENT**

Martin Bonadio  
(480) 926-4900

**VICE-****PRESIDENT**

Diana Jane  
(480) 833-2002

**TREASURER**

Randy Peterson  
(480) 947-4557

**SECRETARY**

Tom Polakis  
(480) 967-1658

**PROPERTIES**

Gary Finnie  
(480)

**NEWSLETTER**

Kathy Woodford and  
Don Wrigley, Editor  
(480) 982-2428

Silvio Jaconelli,

Coordinator

(480) 926-8529

East Valley Astronomy Club—2002 Scottsdale, Arizona

EVAC Homepage—<http://www.eastvalleyastronomy.org/>

**Membership & Subscriptions:** \$20 per year, renewed in December. Reduced rates to *Sky & Telescope* and *Astronomy* available. Contact Randy Peterson. PO Box 2202, Mesa, AZ. 85214. Email: [rgp14159@aol.com](mailto:rgp14159@aol.com)

**Club Meetings:** Second Wednesday of every month at the Scottsdale Community College, 7:30 p.m. Normally Room PS 170 or PS 172 in the Physical Sciences Building. See map below.

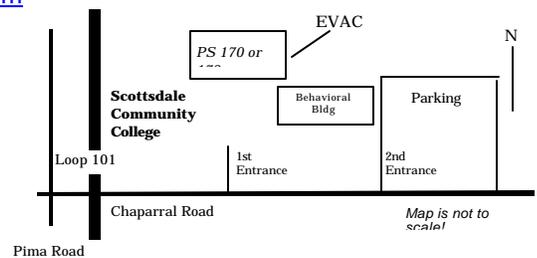
**Address Changes:** Contact Randy Peterson. Email: [rgp14159@aol.com](mailto:rgp14159@aol.com) or PO Box 2202, Mesa, AZ. 85214.

**Newsletter:** Contact Don Wrigley or Kathy Woodford, 423 W. 5<sup>th</sup> Ave, Apache Jct, AZ 85220. The Newsletter is mailed out the week before the monthly Club meeting. An electronic version is available in Adobe PDF format in lieu of a printed copy. Please send your contributions to Silvio Jaconelli [SilvioJ@msn.com](mailto:SilvioJ@msn.com) or Don Wrigley [DJWrigley@earthlink.net](mailto:DJWrigley@earthlink.net). Contributions may be edited.

**EVAC Library:** The library contains a good assortment of books, downloaded imagery, and helpful guides. Contact Gary Finnie for complete details [gfinnie@kam-az.com](mailto:gfinnie@kam-az.com)

**Book Discounts:** Kalmbach and Sky Publishing offer a 10% Discount to EVAC members on books and other items from their catalogs! When ordering, notify the person on the phone that you would like the "Club Discount." When ordering by mail, there is a line to subtract the 10% club discount.

**EVAC Party Line:** Let other members know in advance if you plan to attend a scheduled observing session. Contact Dave Coshow (480) 730-1132.



Articles for the March Newsletter should be sent or emailed to Don Wrigley by February 25<sup>th</sup>



## East Valley Astronomy Club

**Don Wrigley, Editor / Silvio Jaconelli, Coordinator**  
**423 W 5<sup>th</sup> Ave, Apache Junction, AZ 85220**

**EVAC on the Internet**

**EVAC Homepage:** [www.eastvalleyastronomy.org](http://www.eastvalleyastronomy.org)

**E-mail Mailing List:**

AZ-Observing is a fairly general mailing list about observing in Arizona. Included are star party information, who is going, as well as the latest observations and astronomical events. To join, send E-mail with the "Subject: subscribe" to [AZ-Observing@freelists.org](mailto:AZ-Observing@freelists.org)

Although EVAC is a private club not open to the public, we do encourage potential new members to initially join us at our club meetings and/or star parties to help them determine the suitability of the club to meet their needs.

**Reminder: Next EVAC Meeting**  
**Wednesday, February 13, 2002**