



# East Valley Astronomy Club

April 2003

www.eastvalleyastronomy.org

Scottsdale, Arizona

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## From the Desk of the President

by

**Peter Argenziano  
2003 EVAC President**

Large scale science: that's the term that kept occupying my thoughts throughout the afternoon of Saturday, March 8th. That was the day that a group of EVAC members and guests, 18 strong, trekked down to the Old Pueblo for a tour of the Steward Observatory Mirror Lab. Our host and tour guide, Peter Wehinger, met us in the lab's parking lot on an afternoon when attendees would have to vie for precious parking spaces with those seeking entertainment from the U of A Wildcats. Luckily our tour was scheduled early enough that campus security had not yet cordoned off the convenient parking area. Once inside, our tour began with some history of the lab and an informal question and answer session.

Once it was determined that all that were going to participate had arrived, the grand tour began. And grand it was; a tour initially scheduled for 45 minutes lasted a little over two hours. I was most impressed with our level of access to the workings of the lab. Large scale science, up close and personal. For those not familiar with the lab, it is located under the east wing of the U of A football stadium and employs a team of scientists and engineers making giant, lightweight mirrors of unprecedented power for a new generation of optical and infrared telescopes. These mirrors are a radical departure from conventional solid-glass mirrors. They are honeycombed on the inside; made from borosilicate glass that is melted, molded and spun into shape in a specially designed rotating oven. These honeycomb mirrors offer the advantages of their solid counterparts - rigidity and stability - but they can be made significantly larger and dramatically lighter. The Mirror Lab team has also developed a revolutionary new method to polish the honeycomb mirrors with a deeply curved, parabolic surface that gives them a focal length much shorter than conventional mirrors. The resultant fast mirrors not only improve telescopic performance, but they can fit into a much shorter telescope body that requires a smaller, less expensive enclosure.

The pioneering work being done today at the Steward Observatory Mirror Lab had its beginning around 1980 with a backyard experiment by Dr. Roger Angel, the lab's founder and director. Curious about the suitability of borosilicate glass (the kind used in glass ovenware) for making honeycombed structures, he tested the idea by fusing together two custard cups in an improvised kiln. The experiment was a success and led to a series of bigger kilns and small furnaces. This eventually led to the construction of the largest mirrors ever made from a single piece of glass: the 8.4 meter mirrors that will be housed in the Large Binocular Telescope on Mount Graham.

Our first stop on the tour was also our introduction to the scale of this lab. There, behind the glass from our second-story perch, technicians worked on the new dual polishing stations. These enormous structures, riding on massive I-beams, can be retrofitted for other applications as research dictates. Next, we adjourned to a conference room to view a video which presented a high-level overview of the spin-cast mirror process. We also got a chance to inspect one of the special ceramic inserts that make up the honeycomb structure. A specimen of the glass used to make these mirrors was also available for examination. This glass, labeled E6 borosilicate, is manufactured in Japan by the Ohara Corporation using sand imported from Florida. Each of the 8.4 meter mirrors is comprised of 20 tons of this glass; each 5 pound chunk undergoing careful

*contd. on p.2*

*contd. from p.1*

inspection prior to placement in the mold.

Next up was the main production area of the lab; a cavernous room housing the rotating furnace assembly. A large, circular platform serves as the base for the mirror's mold. It also serves as the base of the furnace, and a pair of overhead 45-ton cranes facilitate placement of the top half of the furnace assembly. On this day a 6.5 meter mirror blank rested atop the platform. We joked that EVAC might consider raising the annual dues so that we could purchase such a mirror.

It is upon this platform that the mirror mold is constructed, an intricate honeycomb of interconnected ceramic pylons. Technicians carefully inspect and categorize box after box of E6 glass, before carefully placing each piece (by hand) into the mold. After the furnace top is securely positioned, the furnace is started. Backup diesel generators ensure the process is not interrupted by power failures. Incidentally, it will be several months between the time the furnace is started and the mirror blank has cooled sufficiently to be moved to the cleaning station where the refractory honeycomb material is removed by high pressure water jets.

After the mirror blank has been cleaned, the grinding process begins. The back and sides are completed first. This is an area of the project where the technologies developed at the lab come to the forefront. Conventional mirror-making techniques would require significant grinding, removing many tons of glass, to achieve the desired rough parabolic figure necessary at this stage. In the Steward's process the centrifugal force generated during the spin casting process does a lot of this work, negating the need

to remove as much glass from the sagitta of the mirror prior to polishing. At this stage the mirror surface is accurate to within a small fraction of an inch. A sophisticated milling machine, equipped with diamond-impregnated spinning tools, will then improve the surface accuracy to somewhere around 50 microns (two thousandths of an inch). The mirror is then ready for polishing.

The final shape of the mirror is polished to an accuracy of better than 25 nanometers (one millionth of an inch). This level of precision is necessary to collect enough light from very faint objects, and focus it into very sharp images.

The next tour stop was the testing area, where we were treated to a personal audience with the two 8.4 meter mirrors which will form the Large Binocular Telescope. One was face-up and the other face-down, indicating their relative stages of completion. Everyone stood in awe at the sheer size of these mirrors! While I know that this article could not even attempt to explain the manufacturing process of these great mirrors, I hope that it served to document our field trip and maybe inspire you to visit the Steward Observatory Mirror Lab yourself. Then, you too, can contemplate large scale science.

Please visit the EVAC website's Photo Gallery for a photographic journal of this tour:  
<http://www.eastvalleyastronomy.org/EVAC/photos.html>

EVAC Events Coordinator, Howard Israel, tells me that another tour is tentatively scheduled for the fall.

## **If it's clear... by Fulton Wright, Jr. Prescott Astronomy Club for April 2003**

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 arc minutes in diameter. All times are Mountain Standard Time unless otherwise noted.

Every month there are interesting events with Jupiter's moons. Here are some of them this month:

- Apr 2 10:50 PM Callisto appears from Jupiter's shadow
- 11:10 PM Io appears from Jupiter's shadow
- Apr 3 9:03 PM Io goes in front of Europa
- Apr 8 8:05 PM Europa kisses Ganymede
- Apr 10 7:55 PM Io's shadow falls on Jupiter
- 8:24 PM Io goes behind Callisto (both in front of Jupiter, very hard to observe)
- 9:00 PM Io moves from in front of Jupiter
- 9:31 PM Callisto moves from in front of Jupiter
- 10:11 PM Io's shadow leaves Jupiter
- 11:11 PM Io moves in front of Europa
- Apr 18 11:19 PM Ganymede's shadow falls on Io

On Friday, April 4, about 7:20 PM, you can see the Moon and

Mercury near each other. With binoculars look 5 degrees above the west horizon for the very thin crescent Moon (on the left) and Mercury (on the right) about 4 degrees apart. After they set, turn your attention the other direction to...

On Friday, April 4, around 8 PM, you can see an asteroid near a star. With binoculars look 25 degrees above the east horizon for 4 Vesta (mag 5.9) and 20 Virginis (mag 6.3) 10 arc minutes south of it. If you watch for a few days before and after, you should be able to notice Vesta's motion. If your eyes are sharp and your sky is dark, you might be able to see the asteroid with your unaided eye.

On Wednesday, April 16, at 7:15 PM you can watch the full Moon rise in the east. It will be close to its nearest point to Earth in its orbit, so it ought to look especially big. After it is up, turn you attention the other direction to ...

On Wednesday, April 16, about 7:30 PM you can see Mercury at its best. With binoculars or a small (3 inch) telescope look 13 degrees above the west horizon for the mag 0 planet. It should be easy to spot for a week around this date.

# All About Telescopes (Part 1 of Many?)

by  
Silvio Jaconelli

**INTRODUCTION:** It may be that getting several skilled Astronomical writers to focus on a single task is a bit like herding cats! My request was surely modest. All I asked for was, **The Concise, Comprehensive, Illustrated Encyclopedia of All Astronomical Telescopes**—preferably, in two pages or less! But, don't despair. I really do expect future articles to reveal many mysteries of those instruments with which we are all obsessed.

John Matthews - ed.

It seemed like President's Alumni Day (or an Italian Mafia meeting – take your pick!) when Peter Argenziano, Martin Bonadio and Silvio Jaconelli met one morning recently at McDonalds for breakfast. However, John Matthews was also there, adding some balance to the proceedings. We were there to talk about the merits of various kinds of telescopes. Peter was a Newtonian enthusiast, Martin was a SCT enthusiast, and Silvio was a refractor enthusiast.

Silvio committed the first faux pas at the very beginning of the meeting – he was lavish in his praise of Jim Gutman's equipment set-up, which was an 11" SCT; but Silvio did manage to save the day by emphasizing that the key part of Jim's set-up was the Tele Vue 76 refractor (which he used as a finder-scope) – needless to say, the audience was amused to see him squirm! In all seriousness, though, Jim does have a marvelous set up with top-notch equipment (11" aperture, binoviewers, eyepieces, GPS, etc.) – excellent stuff! He has stated in the past that he uses his SCT for Deep Sky Objects and NOT for objects that he can see with the naked eye (e.g. Stars) – I can tell where Jim's biases lie!

Martin was the first person to talk about his favorite instrument – the SCT. He stated that SCTs were renowned for their portability, and then he immediately proceeded to relate how he fell flat on his derriere the first time he tried to set up his new 12" SCT because it was so heavy – a touch of self-contradiction there, I think! Martin turned his attention to refractors at this point, stating that they were the ultimate in portability since where else could you spend several thousand dollars on a telescope that you can fold up and put in your pocket at the end of an observing session – Silvio was definitely NOT amused. The audience then turned its attention back to SCTs - it was conceded that SCTs were very good at keeping observers warm in the wintertime due to the long cool down periods for these scopes. Martin countered with the fact that SCTs were the only scopes that used beauty accessories – hair dryers to prevent the front corrector plates from dewing up.... The audience grudgingly agreed with this observation.

Peter was next up in the group's crosshairs. When he stated that Newtonians were the least expensive design per inch of aperture, he was asked what else would you expect from a telescope that was built from parts bought at Home Depot. Peter kept on digging his hole deeper, stating that Newtonians don't have any chromatic aberration; well, if you can't keep the scope properly collimated, chromatic aberration would be the least of your worries! It was pointed out that when pointed at zenith, it would be easy to mistake a white sonotube for a water heater. Peter was getting somewhat perplexed at this point. But the group was prepared to extol the benefits of the open tubes of Newtonians – Martin stated

that they were pet-friendly instruments, his cat having chosen to make a nest for itself in his mirror box. Then the story was recounted of an observer that swore he observed life forms on Mars. It turned out that spiders had made a home for themselves in his sonotube and these were the life forms that were observed. Poor Peter.

The cost of premium refractors was the next topic to be discussed. The argument that top quality came in little packages cut no ice with this lot! Martin recalled the night that Silvio's wife made her one and only visit to an EVAC meeting several years ago – Tom Polakis was addressing the room and happened to mention how much Silvio had spent on his APO – Margaret was NOT amused, Silvio never having shared this information with her. To paraphrase Humphrey Bogart in the movie Casablanca – “of all the Meetings over all the years, she had to pick that night to attend an EVAC Meeting .....”. Peter stated that his second mortgage on his home was less than what that APO had cost. No quarter was being given by this group.....

John tried to get the group to be more positive in their comments, and asked each person to please say something nice about the other telescope types. Peter started off by stating that when pointed at zenith, the secondary mirror holder for an SCT made an excellent coaster for a large can of beer – and did not intrude into the light path in the process; continuing the culinary theme, SCTs also made excellent coffee grinders. John turned to Martin in exasperation and pled for something genuinely positive, Martin replied that Refractors made excellent finder scopes. Ouch – that hurt Silvio, who took a shot at Martin by stating that stars in SCTs looked like golf balls, thereby appealing to the more sports minded observers. Peter's laughter was abruptly halted when he was told that stars – and planets for that matter – in Newtonians looked like punk rockers' spiked hair styles. Peter was also asked whether he felt personally height-challenged when observing through his Newtonian – after all, you need to be 7 feet tall when observing at zenith, otherwise you have to resort to using a ladder to get to the eyepiece. This is where my extensive business travel helped me out – I spent so much time in airplanes that I was once able to perch without fear on top of a 15 feet ladder when observing through a 36" Dob.

The real victim of all of this was John – he had wanted a factual discussion on telescope types, and all he got was the stuff described above. By this time it was obvious that absolutely nothing positive was going to come out of this get-together. Martin stated that he had to take his cat to the vet (probably the same one that nested in his mirror box), Silvio stated that he had to go work out at the gym (well, those GEMs do get quite heavy....), Peter had to “go write code” (whatever that meant), and John said that he needed to go back to the drawing board (wherever his drawing board was located). And thus ended the meeting of four great minds.....

In all seriousness, it should be concluded that telescopes are like cars. There is no perfect telescope, and they all have their pros and cons. Stay tuned for further (next time, serious) articles from the group.



# The Backyard Astronomer

By Bill Dellinges  
(3/16/03)

## Astronomy Quiz # 2

I received so much positive feedback from my Quiz #1 last September (a total lie), I've decided to do another! Put on your thinking caps guys.

1. How much more massive does Jupiter have to be to be a star?
2. Who created the Flamsteed number system in star atlases?
3. Who created the now defunct constellation, Felix the cat?
4. Regarding the HST photo of MyCn 18, the "Hour Glass Nebula": Who named it? Where is it? What is it?
5. What is the biggest and smallest constellation in degrees of sky?
6. Who named the Martian rover "Sojourner"?
7. Who coined the term "Black Hole"?
8. Who discovered Mars' two moons Phobos (fear) and Deimos (terror)?
9. Who "predicted" Mars had two moons?
10. Who discovered the Rings of Saturn and Cassini's Division (Cassini's Division? That's like asking who's buried in Grant's Tomb!).

### ANSWERS

1. About 80 times more massive for fusion to start.
2. French Astronomer J.J. LaLande, 1783, in a French version of Flamsteed's Atlas Coelestis.
3. Same guy! LaLande: "I'm very fond of cats".
4. Margaret Mayall and Annie Jump Cannon, #18 in their 1940 catalog. Musca. Planetary Nebula.
5. Hydra, 1302.84 sq. degrees (3.158% of sky). Crux, 68.45 sq. degrees (0.166% of sky).
6. 12 year old Valerie Ambrose in a JPL contest after Sojourner Truth, an ex-slave, black activist, and suffragette.
7. American physicist John Wheeler in 1968.

8. Asaph Hall in 1877 with the Naval Observatory 26" refractor and encouragement from his wife Chloe Angeline Stickney.
9. Fictional astronomers in Laputa, in Jonathan Swift's "Gulliver's Travels (1726).
10. Dutch astronomer Christian Huygens in 1655 (plus Titan). Italian astronomer Giovanni Cassini in 1675 (plus 4 more moons). I'll grade on a curve.

## Riverside Telescope Maker's Conference May 23, through 25, 2003

(Memorial Day weekend)

<http://www.rtmc-inc.org/>

The 35th Annual RTMC Astronomy Expo will be held Friday, May 23, through Sunday, May 25, 2003 (Memorial Day weekend). It will be held at the YMCA Camp Oakes, five miles southeast of Big Bear City, CA on State Route 38 at Lake Williams Drive between mileposts 44 and 45. This location is about 50 miles northeast of Riverside California in the San Bernardino mountains.

Excellent maps and directions are available at:

<http://www.rtmc-inc.org/Maps%20and%20Directons.htm>


Location

Longitude 116° 45' 15" West

Latitude 34° 13' 50" North

Altitude 7,600 Feet

The theme for 2003 is "Building Your Own Observatory."



# Mr. Telescope

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# On The Horizon Comming Astronomical Events and Activities

## Lowell Observatory Star Party June 5-8, 2003

Lowell Observatory will host its first-ever multi-day Star Party, where enthusiasts from around the country will gather for world-class telescope viewing and other adventures in astronomy.

Held June 5-8, 2003, the Lowell Star Party will feature some of the best that Flagstaff has to offer: a heritage rich in astronomical discovery, clear skies, and access to tourist attractions, restaurants, shopping, and more.

Lowell Star Party sponsors include some of the biggest names in astronomy, including Astronomy Magazine, Celestron, and Meade Instruments Corporation. "Star party attendees have an opportunity to interact with some of the heaviest hitters in astronomy," says Russell Tweed. "Several sponsors also will be donating products to be given away to lucky star party participants."

Evening viewing parties will be based at the Arizona Snowbowl ski resort, Highway 180 and Snowbowl Rd. "Situated at an elevation of 9,300 feet, Snowbowl is an ideal location for night sky observing," says Tweed. "The high-elevation observing area coupled with Flagstaff's reliably clear skies will make for an exciting event."

During the day, star party participants can choose from a variety of activities including tours of Meteor Crater, the U.S. Naval Observatory, the new Shoemaker Astrogeology building at the U.S. Geological Survey, and Lowell Observatory's own Anderson Mesa research site. Attendees also may attend daytime scientific presentations in the Steele Visitor Center and the Rotunda Library at Lowell Observatory's historic campus, 1400 W. Mars Hill Rd.

Many recreational activities also are available to those wanting to explore Flagstaff and the surrounding area. Nearby attractions include the Grand Canyon, Oak Creek Canyon, the Museum of Northern Arizona, the Riordan Mansion, the Arboretum and many more.

During the star party, attendees also may participate in "Astronomy Safaris," exclusive, behind-the-scenes tours and events only for small groups. The daytime safari, called "Behind the Scenes at Lowell," gives participants access to areas of the observatory's historic campus not ordinarily available to the public.

Nighttime "Astronomy Safaris" allow participants to choose between a private viewing session on Mars Hill or research observing at Anderson Mesa. The "Private Viewing" safari includes 90 minutes of exclusive telescope viewing through the historic 24-inch Alvan Clark refractor led by an experienced member of the Lowell staff. During the "Research Observing" safari, groups will join professional astronomers as they gather

images and data using one of many research telescopes on Anderson Mesa. Both nighttime safaris are risk-free; fees will be refunded if it is cloudy and observing is obstructed or telescopes are not in operation for any reason.

A number of lodging options are available. For those interested in staying at the observing site, Arizona Snowbowl has 130 camping/telescope spaces, which can be booked on a first-come, first-served basis with the online registration. Little America Hotel, La Quinta Inn and Sleep Inn are offering discounted accommodations for Lowell Star Party registrants; when making a reservation, ask for the Lowell Star Party room block.

The registration fee for the Lowell Star Party is \$60 (\$40 for Friends members) for the full 4-day event and \$30 for single-day registration (\$20 for Friends members). Star party attendees will also receive a 20 percent discount in Lowell Observatory's gift shop.

For complete event information and to register for the Lowell Star Party, visit <http://www.lowell.edu/Public> then click on "Lowell Star Party" at the top of the page.

**Note:** For general information, please contact Russell Tweed by phone at (928) 774-3358 ext. 267 or via email at [tweedr@lowell.edu](mailto:tweedr@lowell.edu). For questions or problems regarding online registration, please contact Jeff Hall by phone at (928) 774-3358 ext. 227 or via email at [jch@lowell.edu](mailto:jch@lowell.edu).

## Grand Canyon Star Party 21-28 June 2003 South and North Rim

web site: <http://www.tucsonastronomy.org/gcsp.html>

Further Info:

For South Rim information, write to:  
Dean Ketelsen  
1122 East Greenlee Pl.  
Tucson, AZ. 85719  
520-293-2855  
[ketelsen@as.arizona.edu](mailto:ketelsen@as.arizona.edu)

For North Rim information or registration, write to:  
Deloy Pierce  
P.O. Box 674  
Farmington, UT. 84025-0647  
801-451-8215  
[grndcnynstarsnr@utah-inter.net](mailto:grndcnynstarsnr@utah-inter.net)

South Rim Lodging:  
All Rim Lodging or Trailer Village (Xanterra) 303-338-6000  
This number is often very busy, FAX them at 303-338-2045 or  
online at: <http://xanterra.com/>

# Satellite Orbital Mechanics 101

## (part 1)

by

John Matthews

“I feel the need—the need for speed!” Was one of the more memorable lines spoken by Tom Cruise in the movie Top Gun.

For an earth orbiting satellite the need for speed is absolutely essential. In fact, if an object is high enough to be substantially free of atmospheric drag and has a horizontal speed in the range of 5 miles per second, an orbit is automatic. The orbit itself, is not, as they say, Rocket Science, although getting an object to that altitude and speed certainly is!

Let’s consider the basics. In the early days of space travel the more descriptive term “Free Fall” was frequently used as a synonym for orbit. And that is exactly what is happening. A satellite is constantly falling toward the earth, but because of its speed and the fact that the earth is a sphere, the earth is also constantly dropping away beneath the satellite. To those of you saying, “Yes, but.....”; imagine yourself hitting a golf ball horizontally out to sea from the top of a high cliff. If you get a solid hit, where will the ball be at the end of one second? Depending on your drive it may be several hundred yards out over the ocean and because of gravity it will have also have fallen some 16 feet. The two forces acting together will produce a nice gentle curve. Now if your cliff were high enough to put you above the atmosphere, say 200 miles, and if your drive were fast enough, say 4.79 miles per second, you would orbit a golf ball. At the end of one second although your ball fell 15 feet, (remember, gravity decreases with altitude) it also traveled just under 4.8 miles, far enough for the earth to also drop away an equal distance. Your ball falls and falls yet it gets no closer to the earth—you’ve achieved an orbit! Here’s an equation:

$$v = 4.91\sqrt{(R/r)}$$

In the above equation,  $v$  is the velocity in miles per second,  $R$  is the earth’s radius (3960 miles) and  $r$  is the satellite’s distance from the earth’s center (3960 + 200 in the above example).

If we know the speed, we can find the time required to complete a single orbit; the satellite’s orbital period. Another equation:

$$T = 84.4(r/R)^{3/2}$$

In the above equation,  $T$  is the orbital time (or period) in minutes. And the values for  $r$  and  $R$  are the same as in equation for velocity.

Now, I can hear some of you objecting that orbits are rarely circular and that the earth is not a perfect sphere, so just which  $r$  are we talking about? You’re objections are correct and a more precise equation for the speed  $v$  at any point in an elliptic orbit is:

$$v = 4.91\sqrt{(2R/r) \square (R/a)}$$

In the above equation  $a$  is the average distance of the satellite from the earth’s center,  $v$  is the speed at any point in an elliptic orbit where  $r$  is the chosen distance from the earth’s center.

It’s fun to put these equations into a spread sheet with different values for altitude and see just how speed and orbital period vary. Here is an example using the equation for  $T$ , or orbital period.

Altitude	r (R+Alt.)	R (earth)	T (period)
0	3,960	3,960	84.4
100	4,060	3,960	87.6
200	4,160	3,960	90.9
300	4,260	3,960	94.2
400	4,360	3,960	97.5
500	4,460	3,960	100.9
600	4,560	3,960	104.3
700	4,660	3,960	107.7
800	4,760	3,960	111.2
900	4,860	3,960	114.8
1000	4,960	3,960	118.3
245,000	253,960	3,960	42,072.1

Yes, the value shown for zero altitude would be an orbit at the surface of a perfectly spherical and airless earth—watch out for those! And yes, the last value is an approximate Lunar distance and gives an approximate value for a Lunar cycle (divide the value by 1440 (the number of minutes in a mean solar day).

In a future article I hope to discuss how a satellite’s launch inclination effects the rotation of its orbital plane about the earth’s axis and how the inclination relates to the rotation of the orbital ellipse in its own plane.

I gratefully acknowledge that most of the material in this short article is based upon, and was in some cases, borrowed wholesale, from the excellent book, *Satellites and Scientific Research* by Desmond King-Hele, Principal Scientific Officer, Royal Aircraft Establishment, Farnborough, England. The book was first published in 1960 in London by Routledge & Kegan Paul and later in the United States by Dover Publications, Inc.

I hope to obtain a copy for the EVAC Club Library.



**STARIZONA**  
ADVENTURES IN ASTRONOMY & NATURE

**5201 N. Oracle Rd.  
Tucson, AZ 85704  
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# EVAC Meeting Minutes

## March 12, 2003

### Tom Polakis, Secretary

A room full of 80 people was greeted by president Peter Argenziano, who began the meeting with Board and visitor introductions. Treasurer Stanley Bronstein solicited membership renewals. AJ Crayon followed with an announcement of the All-Arizona Messier Marathon for March 29, now in its tenth year. Marilyn Unruh followed by announcing the new Northern Arizona Star Party (<http://www.pacorg.net/2003nasp.htm>), which will be held on May 30 and 31.

Howard Israel brought up the next EVAC meeting, which will be a special event held at the Arizona Science Center on April 9. Jeff Hester will be the speaker. Attendance requires an RSVP to Howard ([howmad1@cox.net](mailto:howmad1@cox.net)).

Peter briefly discussed the Boyce Thompson Arboretum star party site rules, most significantly arriving after 5:30 p.m. Howard then talked about the club calendar events, including a tour of the U.S. Naval Observatory on May 10. Tom Mozden talked about the

state's lighting bill #1218; he encouraged writing your congressional representatives. Martin Bonadio announced the Adopt-a-Highway on April 19 east of the Valley.

After a break, Howard Israel solicited a membership volunteer. Any interested parties should contact him. For show and tell, Joe Orman displayed slides of Leonids by moonlight and planetary groupings. Peter Argenziano followed with a presentation about building his 13" Newtonian kit telescope.

The main speaker was Adam Block, from Kitt Peak National Observatory, whose talk was entitled "The Accessible Universe." He has been Lead Observer for six years now, and has amassed great images in running the Advanced Observing Program. Adam uses the same processing technique on all images, resulting in colors that are neither exaggerated or enhanced. His images scale is an impressive 0.4" per pixel, resulting in images that wowed the EVAC audience.

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## International Dark-Sky Association an editorial by John Matthews

I recently received the notice that my membership in the International Dark-Sky Association was due for renewal. And I considered it for a minute or two. Like all Amateur Astronomers, I would like a really dark sky. How nice it would be, to just set up my telescope in the backyard of my home in Phoenix and enjoy the kind of sky views I usually have to drive an hour or more to achieve. And after all, I've been a dues paying member of IDA for two years now. So where's my wonderful dark sky?

We all know it's not that easy. But, I do admit to wondering, what have these guys done for me lately? As it happens, they (or we, after all, I *am* a member) have done a lot. Many Austrian towns are changing their outdoor lighting. A new 356 page book, *Light Pollution and the Protection of the Night Environment* is now available for free download from the Internet. There are new road lighting standards in Australia. Three bills have been introduced in the Connecticut legislature which recognize the dark night sky as a natural resource and seek to educate the public about light pollution. Additionally, they require controls on light pollution and trespass to be implemented for new lighting at state-owned facilities. A Texas Dark-Sky section has been formed. The U.S. Border Patrol has shielded and redirected lights along the Arizona border. IDA has collaborated with groups addressing related research, monitoring, and educational needs (for example, the USA's National Park Service Night Sky Team and the National Parks Conservation Association). National Dark-Sky Week is April 1-8, 2003. And the list goes on

Well, I renewed my membership, and I encourage you to visit the IDA at: <http://www.darksky.org/> Maybe, you'll want to help also. J.M. ed.

## Miscellaneous Announcements

### Free Classified Ads (Wanted or For Sale)

Non-commercial advertisements for Astronomical equipment, books, computers, or software — Wanted or For Sale — will be accepted from current EVAC members, (another good reason to renew your membership, if you have not already done so).

Ads will be run on a "space available basis" and may be edited slightly to best fit the space. Ads should consist of a brief text description and must include a current member name and an evening phone number. You may include your email address if you wish. Ads will be run until canceled or until they have appeared in three issues of the newsletter (whichever occurs first). Ads will be "tagged" with the first issue in which they appear.

**For Sale: Bogen 3-way Pan Tilt Head model 3029. Wt 2.2 lbs. Can support 13.2 lbs. New 11/02. Used once. \$35.  
Televue 20mm 1 1/4" Plossl. New in box, never used. \$80.  
Bill Dellinges 480 983 6651. (March, 03)**

Ads can be emailed to: [john-cathy@cox.net](mailto:john-cathy@cox.net)  
(this address may change in the future)

or send by U.S. Mail to:

EVAC PO Box 2202

Mesa, AZ 85214

Please mark the subject line of the email or the envelope, "EVAC Newsletter Ad."



# East Valley Astronomy Club Membership Form

Please complete this form and return it 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 December 31, of each year.

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

- \$20.00 January – March
- \$15.00 April – June
- \$10.00 July – September
- \$25.00 October – December & Next Year

**Membership Renewals:**

- \$20.00 January – December

**Name Badges:**

- \$7.00 each Name: \_\_\_\_\_

**Magazines:** if renewal, customer # \_\_\_\_\_

- (New) (Renewal)
- \$29.00 /yr Astronomy Magazine
- \$30.00 /yr Sky & Telescope

**Newsletter delivery option, check one:**

- Email (saves club printing & postage)  U.S. Mail

**Total enclosed \$**

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

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

\_\_\_\_\_

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

Email: \_\_\_\_\_

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

**Local Star Party Sites**

**# 1: Florence Junction Site**

**General Information:** The Florence Junction site is one of the two official sites for the East Valley Astronomy Club's Local Star Parties, 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. EVAC's Land Use Permit #26-104528 applies to this site.

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

**# 2: Boyce Thompson Arboretum Site**

**General Information:** The Boyce Thompson site is very new. As of this writing only one Star Party has taken place there as a second local site, although EVAC members have held Star Parties there at the request of the Arboretum on a twice yearly basis. The site is still being evaluated and seems to have some privacy advantages over the FJ site.

**Location:** N 33° 16' 52" W 111° 09' 35"

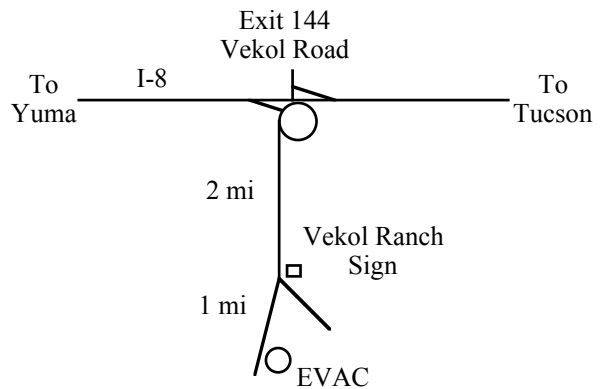
**How to get there:** Drive East on US 60 past Florence Junction for both sites. About 3.7 miles East of Florence Junction (after crossing railroad tracks) you will see a (second) flagpole on your right. Turning right (South) here and following the dirt road for 0.6 miles you will reach the FJ #1 site (marked by an old corral on your left). Continuing past the flagpole turn-off on US 60 and over Gonzales Pass will bring you to the Boyce Thompson Arboretum just before you enter the town of Superior. The Arboretum is marked with a large brown and white State Park Sign and there is a right turn lane.

**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 90 minutes 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 small road (now paved) 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.



## **EVAC Officers**

### **PRESIDENT**

Peter Argenziano  
(480) 633-7479

### **VICE PRESIDENT**

Diana Jane  
(480) 833-2002

### **TREASURER**

Stanley Bronstein  
(480) 922-3845

### **SECRETARY**

Tom Polakis  
(480) 967-1658

### **PROPERTIES**

Gary Finnie  
gfinnie@kam-az.com

### **NEWSLETTER**

John Matthews  
john-cathy@cox.net

### **COORDINATOR**

Silvo Jaconelli  
(480) 926-8529

## **East Valley Astronomy Club**

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

**Membership & Subscriptions:** \$20 per year, renewed in December. Reduced rates to *Sky & Telescope* and *Astronomy* available. Contact Stanley Bronstein. PO Box 2202 Mesa AZ 85214-2202.

**Address Changes:** Contact Stanley Bronstein. PO Box 2202 Mesa AZ 85214-2202

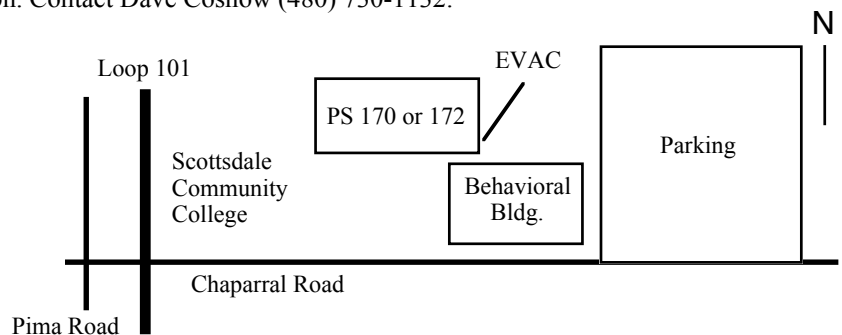
**Club Meetings:** Second Wednesday of every month at the Scottsdale Community College, 7:30 p.m. Normally Room PS 170 or PS 172 in the Physical Sciences Building. See map below.

**Newsletter:** Email John Matthews at: john-cathy@cox.net The newsletter is mailed out the week before the monthly Club meeting. An electronic version is available in Adobe PDF format in lieu of the printed copy. Please send your contributions to John Matthews at: john-cathy@cox.net Contributions may be edited.

**EVAC Library:** The library contains a good assortment of books, downloaded imagery, and helpful guides. Contact Gary Finnie a: gfinnie@kam-az.com

**Book Discounts:** Kalmbach and Sky Publishing offer a 10% discount to EVAC members on books and other items from their catalog. 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 club 10%.

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



**East Valley  
Astronomy Club**

**EVAC**  
PO Box 2202  
Mesa, AZ 85214

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

**Reminder: Next EVAC Meeting  
Wednesday, April 9, 2003**

Location: Dorrance Planetarium  
Arizona Science Center @ 7:30PM