



East Valley Astronomy Club

September 1999

www.eastvalleyastronomy.org

Scottsdale, Arizona

EVAC Meeting Highlights

August 11th, 1999

Tom Polakis, Secretary
Polakis@sprintmail.com

Call to Order:

The August was attended by roughly 50 people. President Silvio Jaconelli missed getting it started at its advertised time of 7:30 by a scant 4 minutes. It was pointed out that the next two nights would feature the Perseid meteor shower. Those two nights were remarkably dry and clear for this state.

Kathy Woodford put a copy of Starry Night Deluxe up for raffle, with proceeds to go to the club. The raffle will carry into the next meeting, so bring your dollars for tickets. She also mentioned that the astronomical calendars will be available at next month's meeting.

The main speaker for the night was Bob Denny of Mesa, who discussed his efforts in making astronomy software available and accessible for the beginner. In particular, Bob's main message was that the only way that amateurs will be able to do quasi-professional work in the future will be with automation. This is where his software comes in, which controls telescopes and improves their pointing accuracy markedly. The scope controller software and astrometric engine can be reached at Bob's site at <http://www.dc3.com>

After the main speaker, Tom Polakis showed slides of his tour of Yerkes Observatory in Wisconsin. Joe Orman then presented slides of recent conjunctions of the Moon with other bodies, including Venus and Regulus. Joe is a regular contributor to Astronomy Picture of the Day. Laurice Dee followed with a poster presentation about the Cassini mission to Saturn. This was timely, considering the craft's recent close flyby, which by a stroke of luck did not contaminate all vulnerable Earthlings with deadly Plutonium.

The meeting adjourned at 9:23.

September's Speaker

Our main speaker, Paul Comba, will speak on: "Observing, Measuring and Discovering Asteroids".

Biographical Note:

A.B., Bluffton College, 1947
Ph.D., Caltech, 1952 (math. and aeronautical eng.)
Fellow, A.A.A.S., 1958

Paul grew up in Italy and came to the U.S. as a student. After completing graduate work, he was assistant professor and later associate professor of mathematics at the University of Hawaii (1951-1960). He worked at IBM as a scientist (1960-1991) doing software R&D in many areas including computer languages, data base management, geometric modeling, elasticity and cryptography. He has taught courses in mathematics or computer science at ULCA, NYU., Boston U. and Princeton.

He was an active amateur in his teens and seriously considered a career in astronomy. Later, his interest in astronomy lay dormant for many years. In 1976 he started doing visual observations of asteroids, and after he moved to Prescott in 1992 he took up astrophotography and astrometry. Since 1996 he has done CCD astrometry of asteroids almost full time.

EVAC & Other Events: 1999

	New Moon	Mtng	Local	Deep Sky	Other
Jun	13	9	5	12	12-19: Gr Canyon SP
July	13	14	3	10	1-7: Universe '99
Aug	11	11	7	14	13-14: Stellafane
Sep	9	8	4	11	10-11: N AZ Star Party 17-19: Astrofest
Oct	9	13	2 nd & 30 th	9*	9: All-AZ Star Party* 4-10: Okie-Tex SP 8-10: Starry Nights
Nov	8	10	(oct)	6	
Dec	7	8	11	4	

Message from the President

by Silvio Jaconelli

The rainy season has really hit with a vengeance - a few months back I thought that we'd have a mild season but the last several weeks have proved me wrong ! I doubt if there has been much serious observing done these last six weeks or so.

There are a couple of interesting topics coming up in the September EVAC meeting that you don't want to miss.

Firstly, Anne Beeby will be showing some real neat (and I do mean NEAT !) clothing with the EVAC logo on it - caps, T-shirts, sweatshirts, etc. These will be for sale at very competitive prices. I have seen some of the material that she has pulled together and I am impressed. So please come along and see what Anne has put together. Thanks, Anne, for all your efforts on this.

Also, don't forget that we will be having a raffle of Starry Night Deluxe software which was very kindly donated to the club by Kathy Woodford. Tickets will be a dollar apiece (or \$5 for 6 tickets !) so please plan on participating in this raffle - you will have the chance to help out the club financially, as well as winning an excellent software program.

Pedro will be presiding over the September EVAC meeting as I will be on a business trip - Pedro will do a great job.

Until next month

Silvio Jaconelli.

SETI @home Update

by Tom Mozdzen

The EVAC club members are grinding away looking for ET and have made tremendous progress since last month (~80 units processed). We are now at 11 members and have processed over 800 units of data! We have surpassed SAC by a fairly large amount, but we need to get to ~5000 units to be one of the top 100 clubs.

I'm sure we have more computer users out there who can join our group and enhance the prestige of our club. Here are the stats directly off the web page at:

http://setiathome.ssl.berkeley.edu/cgi-bin/cgi?cmd=team_lookup&name=East+Valley+Astronomy+Club

Description	We need one
Web site	click here
Members	11
results received	866
total CPU time	24554 hr

Top Members:

	Name	Results received	Total CPU time
1)	Dan Hawrylkiw	344	7879 hr
2)	Bob Brazeal	340	7344 hr
3)	Kirk	69	1737 hr
4)	Jason B. Nelson	54	2116 hr
5)	Marcia Collette	44	2025 hr
6)	Martin Bonadio	36	1623 hr
7)	Ron Williams	32	1877 hr
8)	Don Tellis	14	674 hr
9)	Wes Edens	13	539 hr
10)	Tom Mozdzen	11	549 hr
11)	Rick Scott	9	251 hr

Rick just recently joined but is going to surpass me within days. I'm going to have to get a faster computer to move up in the ranks quicker!

The main SETI web page is located at:

<http://setiathome.ssl.berkeley.edu>

Stay tuned to see how many more units we can process in September.

For Sale

Centurion Ultma 2000 fully computerized, 8 inch Schmidt with all accessories. Tripod, many eyepieces, camera mount, filters, gel cell battery and much more. I also have a set of three Brandon eyepieces in a wood presentation case. I'm asking \$350 for the eyepieces.

The scope has not been out more than four or five times and is in perfect condition.

I will take the best offer for the telescope and accessories.

Don Farley: 480-981-7046

Cell phone: 602-499-9911

Internet Astronomy Resources

by Martin Bonadio

I just want to share with everyone a few Internet resources that I've used in the past to enhance my enjoyment of my astronomy hobby. Not only have I learned a lot this way, it's been an excellent way to tide me over while the monsoon interferes with my observing time.

First, there is a really great Internet newsgroup: SCI.ASTRO.AMATEUR. This is a very active newsgroup with many great people who participate in the discussions daily. I can't even keep up with the volume of messages there. The conversations range from how to get started in amateur astronomy to what eyepieces get the best contrast on an SCT, etc. I've even made some great friends there, some of whom I've had the opportunity to meet because they came to AZ to observe and I volunteered to take them to a few of our great observing locations. I highly recommend that you visit this newsgroup if you can. Ask any questions or even add your own ideas to keep the conversations going!!

Next, there is the AstroMart (<http://www.astromart.com>). What a great resource!! I recently sold my LX-10 telescope on this forum in 5 hours. I posted a classified ad looking for an AZ sale, and received a phone call from a gentleman from Prescott who drove down later that evening to pick up the scope. This Internet site also has auctions, listings for astronomy vendors, more discussion forums, etc. This is definitely a good place to go if you have equipment questions, or needs that you are trying to fulfill.

And of course I can't resist getting a plug in for my own web-site. If you have time please stop by (<http://members.aol.com/mabastro>). I've tried to include material for everyone, and keep updating when time permits. Hopefully there is something there for everyone. My favorite part: the featured deepsky objects section.

Hopefully I've helped you find some new ways to learn more about our exciting hobby. The Internet can certainly be a great place to spend your time while you watch the annual monsoon roll through, or in the day when the Sun is the only usual subject. Don't let that stop you from enjoying the wonders of our universe. Get out there and "surf" too - I for one know I can use the exercise!!

If it's clear...

by Fulton Wright, Jr.
Prescott Astronomy Club for August 1999

Shamelessly stolen information from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find data.

On Thursday, September 2, at about 8 PM you can see a planet near a star. With binoculars or a small (3 inch) telescope look 25 degrees above the southeast horizon for Uranus (mag 6) and Theta Capricorni (mag 4) 1/8 of a degree apart. They will be close for a day or two on either side of this date.

On Saturday, September 4, after midnight you can see 3 of Jupiter's moons dance near each other. With a small (3 inch) telescope look 30 degrees above the east horizon for Jupiter. At about 12:30 AM Io, Europa, and Callisto form an almost equilateral triangle. At about 2:05 AM they form a diagonal line. Ganymede watches the show from a distance.

On Monday, September 6, at about 8 PM you can see a planet near a star. With your unaided eye, binoculars, or a small (3 inch) telescope look 20 degrees above the southwest horizon for Mars (mag 0.5) and delta Scorpii (mag 2) a quarter of a degree apart.

On Wednesday, September 8, between 2:40 and 2:45 AM you might see an minor planet occult a star. Kuiper Belt Object (like an asteroid but beyond the orbit of Pluto) 1995 WY sub 2 might pass in front of GSC 1848 0430 for up to 16 seconds, blocking the light of this 11.5 mag star. See Sky and Telescope September 1999 p. 115 for details.

On Wednesday, September 15, at about 8 PM you can see a planet near a star. With binoculars or a small (3 inch) telescope look 20 degrees above the southwest horizon for Mars (mag 0.5) and Rho Ophiuchi (mag 5) 1/6 of a degree apart.

Opportunities for watching a complete passage of a Jupiter satellite in front of the planet are given in the table below. See Sky and Telescope, September 1999, p. 114 for details. (Subtract 7 hours to convert from UT given in the S&T table to Mountain Standard time.)

Date	Satellite
1-2	I Io
5-6	II Europa
17-18	I Io
29-30	III Ganymede

OSLO LT

(Optics Software for Layout and Optimization)

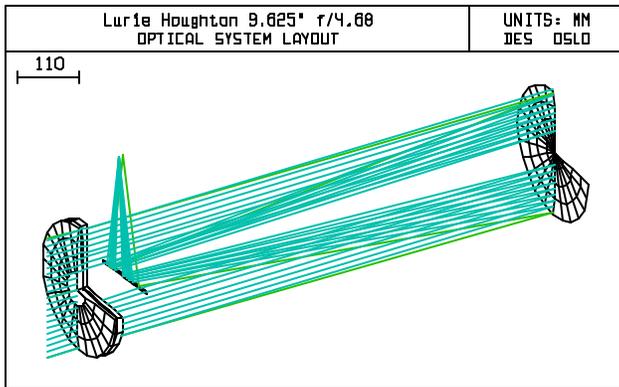
Review by Rick Scott

Has anyone out there tried to raytrace a telescope design? How about analyzing the performance of their scope or maybe one they would like to build. Raytracing software works by analyzing the path that light takes to traverse the optical system. Many paths are traced and these are referred to as rays. As each ray passes through or is reflected by an optical surface, the program changes the direction the ray travels using optical principles such as Snell's law. Rays can be blocked by an obstruction or even pass outside the boundaries of the optical surface. If the optical system focuses the light, the rays that make it through the system will converge at the focus. The pattern these rays make is called the spot diagram and can show the effects of aberrations such as coma and astigmatism. By counting the number of rays that make it to the focus and dividing by the number of total rays used in the analysis, the percent transmission can be calculated. This is useful to plot the vignetting of the system.

Recently, I've been working on the design of a telescope and during the initial stages I spent some time perusing the Amateur Telescope Making Archive web site :

<http://www.system.missouri.edu/atm>.

I was looking for information on the telescope type I've chosen and found discussions on various raytracing programs. The one that seemed to have the best performance (i.e. accuracy) was OSLO LT from Sinclair Optics (<http://www.sinopt.com>). I downloaded the software, which is a free version of their high-end optics design tool. The limitations in the LT version are, the number of optical surfaces is limited to 11 plus the image plane and only 50 variables may be used in the optimization engine. For most telescope designs, these are not a concern.

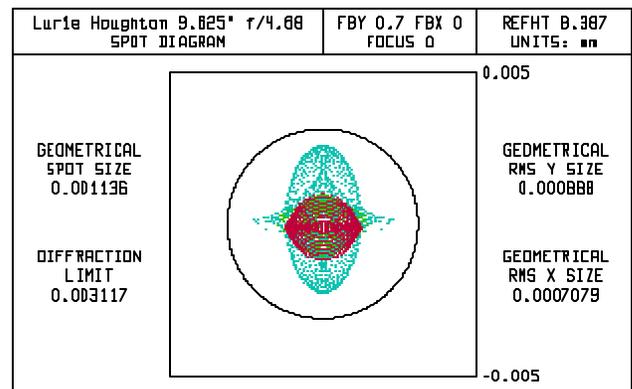


I was able to do some analysis after a couple of days, but it took me about a month of reading the user guide and help file to figure out most of the program. The learning curve was worth every minute. OSLO LT can

analyze just about anything you could want besides performing raytracing. You can generate the following analysis both on and off axis:

- Spot Diagrams (with or without a diffraction limit circle)
- Point Spread Function
- Optical (Modulation) Transfer Function
- Wavefront Analysis (peak-to-valley and rms)
- Diffraction and Geometric Energy Distribution
- Diffraction and Geometric Line Spread/Knife Edge Distribution
- Beam Footprint
- Distortion
- Ray Intercept Curves
- Longitudinal Spherical Aberration
- Astigmatism
- Chromatic Focal Shift
- Lateral Color
- 2-D and 3-D (from any angle) drawings of the optical system
- And much more!

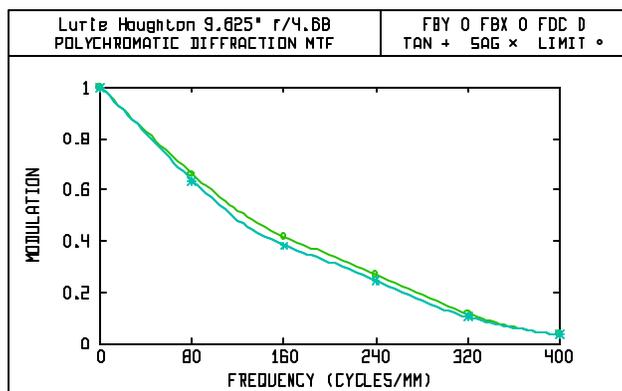
OSLO LT keeps track of the optical path length each ray travels, so it knows the phase relationship of the light as it travels through the telescope. It uses this information to calculate diffraction related effects and aberrations. It can overlay a circle on the spot diagram that shows the diffraction limit (or Airy disk) for the particular optical system. If all of the rays fall within the circle, the performance of the scope is considered to be diffraction limited. One thing I learned in studying various telescope configurations is that fast Newtonian scopes, even with textbook perfect paraboloidal mirrors, are diffraction limited for only about a 4 arc-minute diameter field of view!!



The data for each surface of the design is entered in a spreadsheet format for radius of the aperture, radius of curvature of the surface, thickness (or spacing), surface type (air, type of glass or reflection), type of aperture, (round, square, transmit or obstruct) and special attributes such as ideal lens, aspheric coefficients, diffractive surface or gradient index of refraction. All of the surfaces can also be tilted or decentered, so making a Newtonian or Schiefspiegler

configuration is easy. High order surfaces can be entered which allows for the analysis of designs using Schmidt correctors. Besides surfaces of revolution, OSLO LT also has cylindrical, toroidal, spline, fresnel and other surfaces, for those with a different bent! The image surface can also have a radius of curvature to investigate the effects of field curvature.

The analysis can be performed for any single or combination of wavelengths of light by entering the wavelength in microns or selecting from a pull-down table. The table contains standard wavelengths that are commonly used in optical design along with their light source type if applicable, such as He-Ne laser, Argon, Hydrogen, etc. OSLO LT contains an extensive library of glass types to choose from for lens elements, or you can make up a custom glass type. It also contains a large library of common lenses available from some commercial optical companies. Sample files that come with the program cover a wide range of optical systems, including a Schmidt camera and the Hubble Space Telescope.



In addition to generating all sorts of graphical output, various textual analysis can also be generated. Some of the useful data from these include the actual working focal ratio, percent ray transmission (great for making vignetting curves), Strehl ratio, and the Seidel aberration coefficients.

I was able to use OSLO LT to replicate the graphs and data in the telescope design bible, *Telescope Optics, Evaluation and Design* by Harrie Rutten and Martin van Venrooij (<http://www.willbell.com/tm/tm6.htm>). The software runs on Windows 95 and up, and is very well behaved. Many of the functions are written in the SCP (Star Command Programming) language, the OSLO macro programming language, which is very much like C. This allows advanced users to modify existing functions or to write their own routines to add functions that currently don't exist. Any of the text or graphics output can be printed or captured to the clipboard to paste into other applications.

Through the use of OSLO LT, I've been able to refine the optical design of the telescope I'm working on (the subject of a future article). Many what-if's can be

checked by varying the curvatures, spacing, tilts and centering of the surfaces to determine how sensitive the design is to variations. After extensive analysis and just fooling around, I now feel very confident that when my new telescope is completed, it will work very well.

I highly recommend that you download and learn OSLO LT if you're interested in some truly graphic demonstrations (pun intended) of optics or just want to learn more about optical design through computer based experiments. Best of all, this software is extremely useful if you're designing or modifying a telescope.

NASA News

Collected by Martin Bonadio

Nasa Selects Miniature Spacecraft

They're each about the size of a large birthday cake, weigh about as much as a desktop computer, and are smart enough to fly in formation far from Earth while they test new technologies. They are three very small satellites, called the Nanosat Constellation Trailblazer mission, and today NASA selected them as the agency's latest New Millennium mission. The mission will validate methods of operating several spacecraft as a system, and test eight technologies in the harsh space environment near the boundary of Earth's protective magnetic field, or magnetosphere. Each Trailblazer spacecraft will be an octagon 16 inches across and 8 inches high, and each will have booms and antennas that will extend after launch. The mission will cost \$28 million and will be launched in 2003 as a secondary payload on an expendable launch vehicle. NASA's Goddard Space Flight Center, Greenbelt, MD, will manage the mission. Results will be used to design future missions using constellations of lightweight (about 44 pounds), highly miniaturized autonomous spacecraft. One proposed mission involves of up to 100 spacecraft positioned around the Earth to monitor the effects of solar activity that can affect spacecraft, electrical power and communications systems. Other suggestions have been made to study global precipitation and the atmospheres of other planets.

Galileo Survives Unexpected Whopper Dose of Radiation

NASA's Galileo spacecraft survived an unexpected whopper dose of radiation on August 16th -- the strongest it has experienced since its closest-ever approach to Jupiter in 1995 -- before completing the third in a series of flybys of Jupiter's moon Callisto. The radiation bombardment occurred as Galileo headed toward its Callisto encounter, when the spacecraft flew within 452,000 kilometers (281,000 miles) of Jupiter's cloud tops at 3:59 a.m. Pacific Daylight Time on Thursday, August 12. Only 300 to 400 pulse counts of radiation were expected, however instruments showed 1,400 pulse counts! The cause of the outburst is unknown, but several factors may have played a role. First, at the time the spacecraft was near its close approach to Jupiter and its high radiation environment. Second, it was also near a "plasma sheet," crossing, an area brimming with charged particles trapped in a thin disc that rotates with Jupiter's magnetic field. In addition, it took place one week after the largest heat output since 1986 from Jupiter's volcanic moon Io. The Io heat output was measured by ground-based infrared telescopes and may coincide with an increase in volcanic activity. The radiation level endured by Galileo during this flyby was many times higher than the levels engineers expect the spacecraft will encounter during its flybys of Jupiter's volcanic moon Io in October and November. "This was a great dress rehearsal for the Io encounters," !" said Galileo Project Manager Jim Erickson. "We've been wondering how the spacecraft might hold up when it gets close to Io. This latest brush with radiation makes us think that the odds of survival may be fairly good."

Planet Discovered Orbiting 2 Stars

Astronomers may have discovered a Jupiter-sized planet that orbits two stars, the first time this has been seen.

It was found by a team from the USA, Israel and Australia using a telescope at the Mount Stromlo observatory in Australia. The discovery was made thanks to a "micro-lensing" event. These occur when an object like a dim star or a planet passes directly between Earth and another star. The gravity of the intervening star or planet acts like a magnifying glass, improving the view of the more distant star. On 19 June astronomers saw such a brightening which lasted 100 days. After only a few days, however, they realized the specific pattern of light they saw could not be due to just one star - they needed two stars and a planet to explain it. They suggest that the two stars are both smaller and dimmer than our Sun and orbit each other at a distance of about 150 million miles.

Outside this a Jupiter-sized planet orbits the pair of them at a distance of about 650 million miles.

Nasa Unveils First Images From Chandra X-Ray Observatory

Extraordinary first images from NASA's Chandra X-ray Observatory trace the aftermath of a gigantic stellar explosion in such stunning detail that scientists can see evidence of what may be a neutron star or black hole near the center. Another image shows a powerful X-ray jet blasting 200,000 light years into intergalactic space from a distant quasar. Released this month both images confirm that NASA's newest Great Observatory is in excellent health and its instruments and optics are performing up to expectations. Chandra, the world's largest and most sensitive X-ray telescope, is still in its orbital check-out and calibration phase. The first Chandra images will be posted to the Internet at: <http://chandra.nasa.gov> and <http://chandra.harvard.edu>"

The Backyard Astronomer

by Bill Dellinges
(Two recent starparties)

Boyce Thompson

The May 15th public star party at the Boyce Thompson Arboretum was a great success. As usual, there must have been close to 200 people there, so I was delighted to see 9 telescopes set up by our club members-we needed everyone of them with a crowd like that! Forgive me for not knowing their names, but perhaps a list of the scopes might shed light on their owners? I brought my C8 and Astroscan, there was also an Odyssey 13", ETX3.5", another C8, Meade LX200 12" and 10", and two large white Dobsonians. A lotta fire power! We were blessed with a perfect night, warm and clear. The crowd was enthusiastic and polite during the evening and I believe they truly had a great time and left with a wealth of astronomical knowledge and general excitement about their evening's experience-thanks to a dedicated bunch of E.V.A.C. members, I was proud to see so many club members volunteer their time to this event.

Grand Canyon Star Party South Rim

My wife Lora and I attended the south rim Grand Canyon Star Party June 12-15. Wow! Everthing about this event is big. A lot of people and a lot of scopes. I estimate the minimum number of scopes there set up at one time was perhaps 20? The maximum perhaps 50? I get the feeling, from previous visits, that there are more scopes there every year. This year I noticed another trend-to set up scopes not on the sidewalk of the Yavapai parking lot, but in the STREET. That is, next to or behind the participants cars. I had a bad feeling about that for two reasons, 1) scopes next to cars occupy a parking space-and they are in short supply at this parking lot. 2) Scopes set up behind their owner's cars made for a VERY narrow passage way through the

parking lot for patrons to drive through, let alone the Park BUS(!) which at times had to stop in order to re-navigate through this "forest" of scopes. I'm really surprised persons or equipment were not run over. I think in the future, park staff and amateurs will have to address this problem if the G.C.S.P. (south rim) is to survive. Seeking safer haven, 10-15 scopes were set up in that dirt area just below the parking lot, where shelter from lights, wind, and traffic can be had.

That being said, let me say that the event is a blast. You get to see so much equipment there and meet really interesting people. It's fun to introduce yourself and check out all the nifty scopes and accessories you've had your eye on and evaluate them. I was especially attracted to an astro-Physics 5" F6 starfire on a tall A/P pier with a #900 Eq head-very nice. The 5" F8 A/P I brought has been discontinued, so I was interested in this little puppy: M13 looked wonderful in it. I also saw a ton of sunspots through its white light filter. The first two nights were perfect-clear and comfortably cool. The crowds were huge. The last two nights were cloudy-bummer! I'm not sure what the remaining 3 nights were like (we had left). The infamous two mercury-vapor like lights at the top of the lot weren't turned off till the third night! Dennis Young (?) of Sedona and his 28" Dobsonian were a big hit, always a long line of folks at it as you'd expect. I saw M27 and NGC 6543 ("cat's eye" planetary in Draco) through it, and also the Veil nebula (need I say they were spectacular?). Used to sloppy star images in big scopes and surprised at the nice looking stars in his scope, I asked him who did the mirror. He said Galaxy Optics (I believe a well respected firm which explains the its fine performance).

June is not the time to visit the Canyon! It's a zoo. Tons of tourists. Only the star party brings me there. I wonder if it would be better to hold in the Spring or Fall? To get away from people, simply hike down one of the trails into the canyon a ways-most folks just look into it from above and are not too keen on hiking. Well, that's about it. Next year I'll report again from the North Rim, as I like to rotate my G.C.S.P. venues between the two sites. See you then!

Raffle Notice

Here's your chance to obtain a copy of 'STARRY NIGHT DELUXE' for only \$1 !!! Our club secretary, Kathy Woodford, recently was sent a complimentary copy of 'STARRY NIGHT DELUXE'. The Board agreed that we would raffle the program at the September Club Meeting, to be held on Wednesday, September 8th. Tickets will cost \$1 each, and each member can purchase as many tickets as they wish ! So please come to the September club meeting prepared to help supplement the club funds !!!

Night of the Shooting Stars

by Joe Orman

What I bring to the night:

Eyes (wide open) and binoculars ...
Video camera and the hope of catching a falling star ...
The patience that it takes to catch one ...
Cookies and a cooler - plenty of caffeine to stave off slumber ... A pillow for my head ...
A cot to lie upon (not to sleep, but perchance to dream) ...
Enya on the headphones ...
The mental baggage of the day just done, which soon falls away ...

What the night brings to me:

Escape from city lights' glare ...
A cool breeze, respite from asphalt's stored heat ...
Stillness, peace ...
A coyote howling to keep me company ...
Flying bugs, just annoying enough to remind me I'm alive ...
Surrounding saguaros, sentinels of the sky ...
Nary a cloud (until just before twilight) ...
A sky painted with stars ...
A magnificent Milky Way, arching above ...
Orion rising over distant low hills ...
Meteors -- celestial fireworks -- each one precious in its transience ...

What I take from the night:

The memory of another night well spent, to see me through my day.

Custom Club T-Shirts & Hats

by Anne Beeby

This month you can order a variety of shirts and a ball cap with the EVAC logo. The T-shirts will feature photos from club members Joe Orman, Rick Scott, and Chris Schur. The images will be sent by email about the same time the electronic version(.pdf) of this newsletter is sent. They should also be posted to the EVAC website.

There is something for everyone! Bring your check and order blank (included in this newsletter) to the September meeting or mail it before the end of the month. Make all checks payable to EVAC.

EVAC CUSTOM SHIRTS/HAT ORDER FORM

Bring the completed form with your check/money order made payable to "EVAC" to the September meeting OR mail it to:

**Anne Beeby
145 S. Norfolk Cir.
Mesa, AZ 85206-1123**

MUST BE RECEIVED NO LATER THAN SEP 30th. Delivery Oct meeting.

Description of items:

- Long sleeved, button down, 100% cotton, blue denim shirt; embroidered logo on chest
- White T-shirt, super heavyweight, 100% cotton with EVAC logo on back. Either Joe Orman/Rick Scott or Chris Schur image on front (see images on EVAC website)
- 100% cotton pique Polo; embroidered EVAC logo on chest
- 9oz. 90% cotton sweat shirt; embroidered logo on chest
- Ball Cap, low profile, denim khaki sandwash w/navy suede brim; embroidered logo

Put # of shirts ordered in size boxes	Sm	Med	Lrg	XL	XXL +\$2.00	XXXL +\$3.00	\$\$\$\$\$\$ Amount
Denim shirt \$27						xxxxxxxx	
T-shirt- Hyakutake \$10							
T-shirt-Lagoon/Trifid \$10							
Heather Grey Polo \$20							
Steele Blue Polo \$20							
Maroon Polo \$20							
Cypress (dark olive) Sweatshirt \$24							
Sand Sweatshirt \$24							
Steele Blue Sweatshirt \$24							
Hat (one size) \$13	xxxxxxxx	xxxxxxxx	xxxxxxxxxxxxxxxx	xxxxxxx		Qty?	

Name:
Phone:

Total Cost \$ _____



East Valley Astronomy Club

East Valley Astronomy Club

Membership Form

EVAC on the Internet

EVAC Homepage:

www.eastvalleyastronomy.org

E-mail Mailing Lists

EVAC-mls is a mailing list for club announcements and quick notification of astronomical events.

EVAC-Board is for EVAC business. All club members are welcome to participate.

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 the "request" mailing address at psiaz.com.

For example, you would send the request for AZ-Observing to AZ-Observing-request@psiaz.com

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.

Please complete the information on the form and return to the address below along with a check payable to EVAC for the appropriate dues amount. Allow 3 mos. leadtime for magazine renewals. See below:

Kathy Woodford
 EVAC Treasurer
 PO Box 213
 Apache Junction, AZ 85217

Enclosed:

- ___ \$20 Annual
- ___ \$10 July—Dec
- ___ \$29.95 *Sky & Telescope*
- ___ \$29 *Astronomy Magazine*
- ___ \$ 7 EVAC Nametag
- ___ Total

Circle: New Member Renewal

Please Print (indicate confidential information)

Name _____
 Address _____
 Phone _____
 Email _____
 URL _____

How did you hear about EVAC? _____

Major areas of interest (circle): General observing; Lunar/Planetary;
 Deep Sky; Telescope making; Astrophotography; CCD/Computer;
 Archaeoastronomy; Other: _____

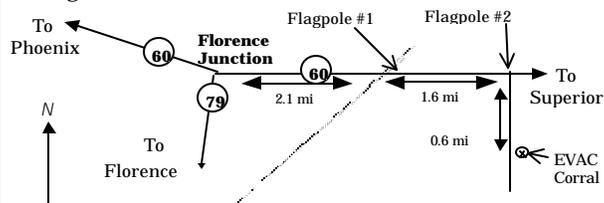
EVAC Star Parties

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 right before a gas-line sign.

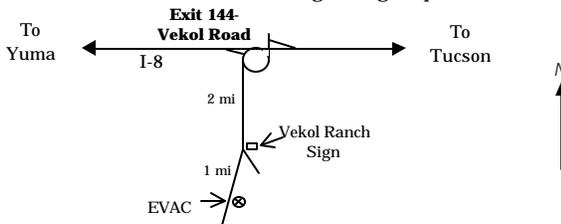


Deep Sky Star Party: Vekol Road Site

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 skyglow 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.



East Valley Astronomy Club—1999

Scottsdale, Arizona

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

EVAC Officers

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 602/857-3438

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PROPERTIES
 Enrico Alvarez
 602/837-0486

Membership & Subscriptions: \$20 per year, renewed in December. Reduced rates to *Sky & Telescope* and *Astronomy* available. Contact Kathy Woodford, P.O. Box 213, Apache Junction, AZ 85217, 602/857-3438. Email—arizkat@psn.net

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

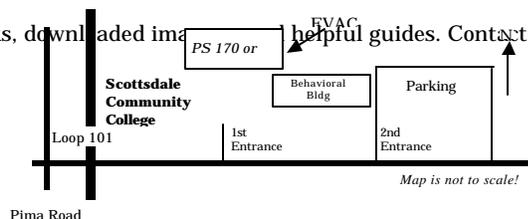
Newsletter: Mailed out the week before the monthly Club meeting. Send contributions to Tom Mozdzen, 1532 West Sherri Drive, Gilbert, AZ 85233. Email—tjmozdzen@worldnet.att.net. Contributions may be edited.

Address Changes: Contact Bill Smith, 3430 N. Mountain Ridge Unit 32, Mesa, AZ 85207, 602/854-8071. Email—bsmithaz@aol.com

EVAC Library: The library contains a good assortment of books, downloaded images, and helpful guides. Contact Enrico Alvarez for complete details, 602/837-0486.

Book Discounts: Great savings through Kalmbach and Sky Publishing. Contact Kathy Woodford, PO Box 213, Apache Junction, AZ, 602/857-3438. Email—arizkat@psn.net

EVAC Party Line: Let other members know in advance if you plan to attend a scheduled observing session. Contact Stan Ferris, 602/831-7307.



Tom Mozdzen, Editor

1532 West Sherri Drive - Gilbert, AZ 85233

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Next EVAC Meeting Reminder:
 Wednesday, September 8th