



East Valley Astronomy Club

October 2004

www.eastvalleyastronomy.org

Scottsdale, Arizona

October 2004



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From the Desk of the President

by

**Peter Argenziano
2004 EVAC President**

Though it didn't produce the rain we desert-dwellers so desperately need, the monsoon season is winding down. This signals a return to our somewhat predictably clear night skies. Have you got your observing plans ready for the fall and winter constellations? Need a project to get back into the astronomical swing of things? I've got just the ticket for you.

On the evening of Wednesday, October 27th we will be treated to a total lunar eclipse. By all means, get outside and witness this wondrous event. Even better, consider participating in one of two club events organized around the eclipse:

EVAC, in association with the Riparian Institute, will conduct a public Lunar Eclipse Party at the Institute's parking lot, just east of the Southeast Regional Library in Gilbert. This is the same site used for the monthly Public Star Party.

On this date the Moon is on the opposite side of the Earth from the Sun and the three bodies are so precisely aligned that the Earth's shadow will fall on the Moon causing a lunar eclipse. The eclipse occurs at the ascending node of Luna's orbit in southern Aries. The Moon's trajectory takes it deep into the northern umbral shadow resulting in a total eclipse which will last for 81 minutes. At mid-totality, the Moon's southern limb is a mere 0.7 arc-minutes from the umbra's center. In contrast, the northern limb is 9.5 arc-minutes from the umbra's edge and 31.3 arc-minutes from its center. Since different parts of the Moon will probe radically different portions of Earth's umbral shadow, a large variation in shadow brightness can be expected. The totally eclipsed Moon should appear to have a bright rim along its northern edge.

Locally, we'll get to witness most of this event. The penumbral eclipse begins at 17:05, slightly ahead of the 17:32 local moonrise and 17:40 sunset. The partial eclipse begins at 18:14 and the total eclipse begins at 19:23. Greatest eclipse is at 20:04. Total eclipse ends at 20:44. Partial eclipse ends at 21:53. Penumbral eclipse ends at 23:02.

Or, if you're looking for an activity that offers a different participatory experience, consider partaking in a crater timing activity for the eclipse. It's easy, practically any telescope will suffice, and all you need is a watch with a second hand and a casual familiarity with some well-known lunar features. Timings are plus or minus 5 seconds, so a high degree of accuracy isn't required.

Crater timing is an activity in lunar observing where we note the exact time certain features on the Moon enter and exit the umbra (the darkest, center part of the Earth's shadow). The shape of the umbra is never exactly the same, due mostly to changes in the earth's upper atmosphere. These changes in shape relate to large-scale changes in the global atmosphere. This data has been collected for nearly 300 years, and with each new set of eclipse data, the information becomes more refined and better calibrated. The best way to measure the shape of the umbra is to have numerous observers stationed throughout the zone of the eclipse and to time the moment when certain standard features enter and exit the shadow.

Long before anyone was concerned about the condition of the Earth's upper atmosphere, these eclipse timings were used to try to calculate longitude for ships at sea. Before the invention of

contd. from p.1

accurate chronometers that would work aboard a tossing ship, astronomers worked desperately to come up with a method to measure longitude by sighting a set of fixed lunar features. It was proposed that a navigator would be able to take a sighting on a known feature and, knowing how long it had been since the last full Moon, identify his east/west location. This method proved too difficult in the end and too unreliable, but during the 17th and 18th centuries almost every astronomer applied himself to the solution. The motion of the Moon across the heavens is far more complex than it appears to the casual eye, and even the great Sir Isaac Newton, the inventor of calculus, gave up on the mathematics saying it made his head hurt!

The October issue of Sky & Telescope has an article on the eclipse with lots of activities, including this timing activity (page 74). The article also has a very small map with the features identified, but the map isn't much good because of its size. You may need to consult a better lunar map for identifying these features. The article identifies the 24 features used for the timings. Most are very bright but rather small. You don't need to get them all (practically no one does, which is why we like to have lots of observers), but try for as many as you can.

All of the features are well known, easily identified, and visible at full Moon. If you have a decent map, try to familiarize yourself with the following features prior to the actual eclipse:

Grimaldi, Billy, Kepler, Aristarcus, Campanus, Copernicus, Birt, Pytheas, Tycho, Timocharis, Harpalus, Manilius, Pico, Dionysius, Plato, Menelaus, Plinius, Cenorinus, Eudoxus, Aristoteles, Goclenius, Tarantius, Proclus, and Langrenus.

To assist with this activity, I have created a chart listing the features, the entrance and exit contact times, and space to record your timing. During the eclipse, the features will enter the umbra in the order shown starting at approximately 1:15 Universal Time (18:15 or 6:15 PM local), and the Moon will be in full eclipse about an hour later. They exit the shadow in a different order, of course. For the larger features such as Tycho and Plato, you estimate the time the shadow is in the center of the feature.

I think it would be fun to combine both of these activities – the public viewing event and the crater timing activity. We could have a couple of 'scopes set up with folks prepared to perform the timings and we would inform the public that these amateurs are collecting data.

Get a PDF timing form here:

http://www.eastvalleyastronomy.org/downloads/eclipse_timing.pdf

Observers can go to www.time.gov for the correct time.

Remember timings are ± 5 seconds, so don't be worried, just have fun! Whether you participate in a group or on your own, collecting the data is only part of the activity. The other part entails submitting the data to the Association of Lunar and Planetary Observers (ALPO). If you are a member, you can make your own submission. If not, I would be happy to submit the data on your behalf. This is one of the few scientific contributions left to our amateurs anymore! Hope you can join in.

Looking ahead a couple of weeks: EVAC will be sponsoring the annual All-Arizona Star Party! This year's big event is scheduled for October 15th and 16th at Farnsworth Ranch (south of Arizona City). This year's event actually begins on Thursday evening (October 14th) at 7:00 PM at the Arizona Science Center in downtown Phoenix. This is the revised date, time and location for the October general meeting, and we are quite pleased to have none other than noted author Phil Harrington as our guest speaker. Many of you are, no doubt, familiar with Phil's books – Star Ware; Star Watch; Touring the Universe through Binoculars; Astronomy for All Ages; The Deep Sky: An Introduction; and others – or his work as an associate editor and contributor for Astronomy magazine, or for his Talking Telescopes internet discussion forum. For more information on Phil, please visit his website at: <http://www.philharrington.net>. This is an event you don't want to miss!

I am planning to host an astro swap meet and weenie roast at this year's event. I'm tentatively planning this event for Saturday afternoon around 3:00 PM. Complete details about the 2004 All-AZ Star Party are available here:

<http://www.eastvalleyastronomy.org/aasp.htm>

Speaking of the All-Arizona Star Party, I have developed an observing list for those who are planning to attend on Friday night. All those who successfully complete the list will receive a free hot dog and soft drink at the swap meet and weenie roast the following afternoon. OK, the list will actually still work on Saturday night too... and everyone receives a free hot dog and soft drink at the swap meet and weenie roast on Saturday afternoon, but you get the idea.

The list contains 14 bright planetary nebulae (mag 9.9 or less) which are well placed for observing that evening. The list was distributed in the September newsletter.

Keep looking up!



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Hunting Gravitational Waves: Space Technology 7

by

Patrick L. Barry and Dr. Tony Phillips

Among the mind-blowing implications of Einstein's general theory of relativity, direct verification is still missing for at least one: gravitational waves. When massive objects like black holes move, they ought to create distortions in space-time, and these distortions should spread and propagate as waves--waves in the fabric of space-time itself.

If these waves do exist, they would offer astronomers a penetrating view of events such as the birth of the Universe and the spiraling collisions of giant black holes. The trick is building a gravitational wave detector, and that's not easy.

Ironically, the gravitational waves spawned by these exceedingly violent events are vanishingly feeble. Gravitational waves exert a varying tug on objects, but this tug is so weak that detecting it requires a device of extraordinary sensitivity and a way to shield that device from all other disturbances.

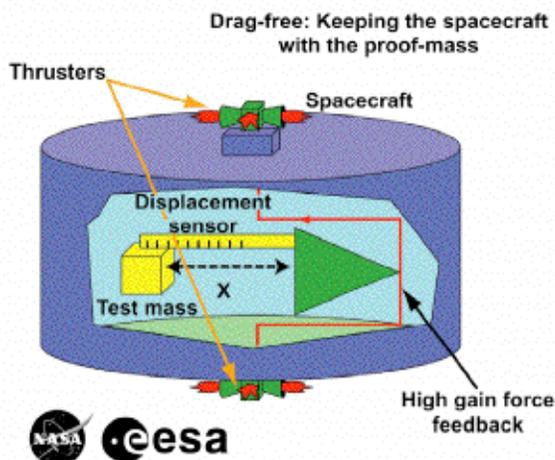
Enter Space Technology 7 (ST-7). This mission, a partnership between NASA's New Millennium Program and the European Space Agency (ESA), will place a satellite into a special orbit around the Sun where the pull of the Earth's and Sun's gravity's balance. But even the minute outside forces that remain -- such as pressure from sunlight -- could interfere with a search for gravitational waves.

To make the satellite virtually disturbance-free, ST-7 will test an experimental technology that counteracts outside forces. This system, called the Disturbance Reduction System (DRS), is so exquisitely sensitive that it can maintain the satellite's path within about a nanometer (millionth of a millimeter) of an undisturbed elliptical orbit.

DRS works by letting two small (4 cm) cubes float freely in the belly of the satellite. The satellite itself shields the cubes from outside forces, so the cubes will naturally follow an undisturbed orbit. The satellite can then adjust its own flight path to match that of the cubes using high-precision ion thrusters. Making the masses cube-shaped lets DRS sense deviations in all 6 directions (3 linear, 3 angular).

ST-7 is scheduled to fly in 2008, but it's a test mission; it won't search for gravitational waves. That final goal will be achieved by the NASA/ESA LISA mission (Laser Interferometer Space Antenna), which is expected to launch in 2011. LISA will use the DRS technology tested by ST-7 to create the ultra-stable satellite platforms it needs to successfully detect gravitational waves.

If ST-7 and LISA succeed, they'll confirm Einstein (again) and delight astronomers with a new tool for exploring the Universe.



Read more about ST-7 at <http://nmp.jpl.nasa.gov/st7> .

For kids in a classroom setting, check out the "Dampen that Drift!" article at http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml .

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Space Technology 7 will test a technology to be used in detecting gravitational waves in space

Backyard Astronomer

By Bill Dellenges (10/04)

Odds and Ends to Night Sky 1 & 2

In June and July, I talked about the night sky: how it “moves” and how it’s measured (right ascension, declination, meridian, etc.). There were several points omitted for brevity. Let’s address them here.

Seasonal Night Sky Changes:

Most people know star groups move westward during the night because Earth is rotating eastwardly. But how do you explain that several months later you’re looking at a completely different set of constellations? There is something else working here, something insidious.

Along with the nightly movement we’re accustomed to seeing is a very sneaky motion due to Earth’s revolution around the sun in its yearly journey. Since a year is 365 days long (thereabouts) and a roughly circular orbit has 360 degrees, the sun travels *about* one degree per day. The resulting effect is that each night, you’re looking off into space in a slightly advanced direction which causes the stars to rise 4 minutes earlier each night. Thus there is an ever progressing parade of stars bringing forth the next season’s constellations. So in one year we’ve seen all the constellations (that we can see from our latitude) and the whole process starts over.

Ecliptic:

Without getting into messy celestial mechanics, one will find that the ecliptic (Ed: *From the Earth, the apparent yearly path on the celestial sphere of the Sun with respect to the stars. Also, the plane of the Earth’s orbit.*) stands most upright, or steep, relative to the western horizon in spring evenings and the eastern horizon during fall mornings. Those would be the best times to view Mercury, Venus, or the Zodiacal Light.

Insofar as the “middle” of the sky is concerned, one will find the ecliptic low during summer nights, and high during summer days. It will be high during winter nights and low during winter days.

Star Nomenclature:

Looking in your star atlas, you see many numbers and letters assigned to the stars and deep sky objects. Johann Bayer, in his 1603 star atlas, *Uranometria*, gave a lower case Greek letter to each naked eye star in a constellation. They generally run from the brightest to the dimmest star: Alpha, Beta, Gamma, etc. An Example: Alpha Leonis (Regulus) - note the genitive or possessive case of the constellation is used to signify the star “belongs” to Leo. If he ran out of Greek letters, he used lower and upper case Roman letters.

John Flamsteed, first Astronomer Royal of England, in his 1725 star catalog, *Historia Coelestis Britannica*, assigned a number to every star in a constellation in order from west to east within that constellation. Like the Bayer Greek letter system, numbers were issued to primarily 2,682 naked eye stars. The highest number used in one constellation was 140 (Taurus). Example: 87 Tauri

(Aldebaran). Note the possessive case is also used with Flamsteed numbers.

German astronomer F. Argelander devised a system in 1862 for variable stars if they didn’t already have a Bayer or Flamsteed letter/number. They run from R to Z, then RR, RS, etc. Then SS, SR, etc. on up to ZZ. Example: RR Lyrae. If necessary, AA, etc. is utilized. R begins the system to avoid confusion with Bayer Roman letters which went as high as Q (also, J’s are omitted). After this series of letters is exhausted, variables are given numbers starting with V335 (!). Are we having fun yet?

In modern times many other star catalogs were created, like the SAO, BD, HD, GC, ADS and Struve (double stars) and Yale catalogs, among others. Each gave a new number to a star! So one star can have many numbers associated with it.

For galaxies, nebulae, etc., a Messier or NGC number will be shown next to the object. Charles Messier, a French astronomer and comet hunter, published a catalog of 109 objects during the years of 1781-84. He did so to avoid confusing them with the comets he sought. Thus we have M1, the Crab Nebula in Taurus through M103, a galaxy in Cassiopeia (104-110 were added after his death). No doubt Messier would find it ironic that he is famous not for the 12 comets he discovered, but for his list of objects which he found to be a nuisance!

By the 19th century, telescopes had developed beyond Messier’s 3” refractors and were discovering large numbers of more distant objects. In 1888, Danish astronomer J.L.E. Dreyer published the *New General Catalog* (N.G.C.), a list of 7,840 objects listed in order of right ascension (west to east, both hemispheres). This was a more scientific system/survey than Messier’s catalog. NGC numbers are assigned to Messier objects (M31=NGC 224). As more dim objects were discovered, two supplemental catalogs to the NGC were added. The first *Index Catalog* (I.C.) in 1895 added 1,529 objects. The second *Index Catalog* of 1908 added another 3,857 objects. It should be noted there are many other catalogs, but the average amateur can get by just fine using the familiar Bayer, Flamsteed, Messier, and NGC designations.

Precession:

It would be remiss not to discuss Precession in any night sky article. So here goes. We learned Earth’s rotational axis is aimed at Polaris currently (now there’s a clue to what’s coming!). So Polaris appears motionless as the night sky dome rotates about it. Matters would pretty much remain that way if for not one thing. Earth has an equatorial bulge due to its spin. Its equatorial diameter is 27 miles wider than its polar diameter. Our Moon does not like the bulge. It tugs on it trying to force Earth to be perpendicular to its orbit rather than the 23 degree tilt it has. To lesser extent, the Sun and planets also join in the fun. Earth opposes these forces. The net effect? Earth’s rotational axis wobbles like a top, making a 47 degree circle in the sky (note its radius = 23 degrees) over 25, 800 years. Right now it points to Polaris or nearly so, being 44’ (arc minutes) away from it, closing

to 28' in 2102.

When the pyramids were being built in 2832 B.C., the "North Star" was Thuban, in Draco (then about 10' from the celestial north pole). Alpha Cephei will be our North Star in 7500 A.D., and Vega in 13,000 A.D. (5 degrees from the celestial pole).

Amazingly, precession was discovered by the Greek astronomer Hipparchus in 130 B.C. He noted the Vernal Equinox had moved over the years, inferring a change must be taking place between the ecliptic and celestial equator. Indeed, the effect of precession is that the celestial equator slides along the ecliptic westwards at a rate of 50.3" (arc seconds) per year, or 1 degree every 71 years, or 30 degrees every 2150 years.

This slowly changes the right ascension and declination of the stars and is why their r.a. and dec. must be updated every 50 years (epoch 1950, epoch 2000, etc.). It causes all stars to move parallel to the ecliptic – with interesting results: around 3000 B.C., Crux (the Southern Cross and then part of Centaurus) could

be seen from mid northern latitudes. Midway through the precession cycle, about 13,000 years from now, Crux will once again be visible from mid-northern latitudes. Orion will be seen during summer nights (less its bottom half and Sirius) and Scorpius seen during winter nights.

Another consequence of precession is that the vernal equinox, or so-called "First point of Aries", slides westward through the constellations. Long ago the vernal equinox was located in Aries, entered Pisces in 69 B.C., where it remains today, and will enter Aquarius (the "Age of Aquarius") in 2597 A.D. These dates are based on the modern constellation borders created by the International Astronomical Union in 1930.

References: Star Tales by Ian Ridpath; Backyard Astronomy-Star Names by Alan MacRobert (1996 article in Sky and Telescope); Rambling Through November Skies by (The late) George Lovi (Sky and Telescope, November, 1982); The Facts On File Dictionary Of Astronomy, Ed. By V. Illingworth; Naked I Astronomy, George Reed.

October Classified Ads (Wanted & For Sale)

Noncommercial advertisements for Scopes or Astronomical equipment, books, computers, or software — Wanted or For Sale — will be accepted from current EVAC members.

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 are "tagged" with the first issue in which they appeared.**

Ads can be emailed to: 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."

Dobsonian Scope for Sale (Aug.)

8" Discovery Dob.
Custom Aluminum Bearing Wheels

DX-3 Crayford Focuser

Two finders: Quick Release Rigel & 8 X 50 Meade
Kendrick dew (or light) shield
ProStar secondary mirror mount
Many extras and special features -- call for details
\$650

Contact: Jerry Fryer @ (480) 990-7701

Astro-Imaging Group Forming In Fall Howard Israel

All indications point to a surge of interest in CCD imaging among amateur astronomers using digital cameras, as well as dedicated astronomical CCD devices. Based on the great images provided by acknowledged experts like Chris Schur and Tom Polakis, many EVAC members look on these works with great envy; wishing they could in some small measure, duplicate these images. Toward that end, your East Valley Astronomy Club will begin an Astro-Imaging User Group this fall.

The purpose of the group will be to call upon experts in the club to share their experience and expertise in astro-imaging using a wealth of different software and equipment including web and digital cameras and astronomical CCD imaging devices.

Planned are beginners' labs, workshops, field trips and extensive use of our web site to share experiences and images obtained through the User Group. Stay tuned for further information upon the conclusion of the monsoon season.

3 Month Event Schedule
Prepared
by
Howard Israel

Oct. Events			
Fri. 10/8	Public Star Party	Gilbert Library	7:00 PM Setup
Sat. 10/9	Local Star Party	Boyce Thompson	Sunset 5:58 PM
THURSDAY 10/14	General Meeting @ ASC	AZ Science Center	7:30 PM Spkr. Phil Harrington
Fri. & Sat. 10/15 & 10/16	All Arizona Star Party	Farnsworth Ranch (AZ City)	Sunset: 5:53 PM
Wed. 10/27	Total Lunar Eclipse Party	Gilbert Library	6:00 PM
Nov. Events			
Sat. 11/6	Local Star Party	Boyce Thompson.	Sunset: 5:20 PM
Wed. 11/10	General Meeting	SCC PS-172	7:30PM Spkr. Steve Coe
Fri. 11/12	Public Star Party	Gilbert Library	6:00 PM Setup
Sat. 11/13	FOTA Star Party & Potluck	Boyce Thompson	Sunset: 5:15 PM
Dec. Events			
Sat. 12/4	Local Star Party	Boyce Thompson.	Sunset: 5:20 PM
Wed. 12/8	General Meeting	AZ Science Center	Spkr. (TBD)
Fri. 12/10	Public Star Party	Gilbert Library	6:00 PM Setup
Sat. 12/11	Deep Sky Star Party	Vekol Road	Sunset: 5:15 PM

EVAC Meeting Minutes
September 8, 2004
Diane Cook, EVAC Secretary

President Peter Argenziano opened the meeting at 7:30 pm.

Announcements

REMINDER October Meeting is:

Thursday, October 14 – Arizona Science Center, 7:00 p.m.
Phil Harrington, Guest Speaker – “Nights of Future Passed” and
New Science Center Presentation: ***GALAXIES (15 min)***

All Arizona Star Party: October 15-16, Farnsworth Ranch,
Arizona City

Volunteer Opportunities: Gilbert Riparian and Arizona Science
Center October 27, lunar eclipse.
Halloween – October 31, Private gated estate in Paradise Valley,
100 kids.

Gilbert Observatory Groundbreaking – October 8, 6:30 p.m.

Reminder – EVAC’s Public Star Party is the second Friday of

each month at the Riparian Institute at Greenfield/Guadalupe.
October 8

Keymasters for Boyce Thompson Gate: Peter Argenziano, Bill
Dellings, Dave Shafer.

2005 Elections – There are several officer and Board Member
vacancies. See EVAC website for election process and vacancies.

Recognition

Joe Orman – Canyon Star Trails Photo

Member Presentations

Joe Goss – Arizona Sky Shots

Guest Presentation

*Tony Hallas – A Decade of Astrophotography –
Charting the Art of Recording Photons in the Last Ten Years*

EVAC is Your Club

by Peter Argenziano

We've all heard the old maxim that your vote counts. Yes, your vote does indeed count. Or, more correctly it *would* if there was an issue upon which to cast your vote. During the three years that I have served on the governing body of the East Valley Astronomy Club I have noticed a disturbing trend. In talking with others who have been affiliated with the club for a longer time, I've come to realize that this isn't a recent trend. In fact, it's not a trend at all – rather, it's come to be standard operating principle. What I'm talking about is, of course, the lack of volunteers to serve on the governing body of the club.

This club, like any other organization, will cease to exist without leadership. We cannot continue to rely on the same group of people to keep alternating positions, just to keep the club operational. After all, that is not a club. The governing body of EVAC has been scaled down to the smallest number of positions in an effort to make it easier to keep the positions filled, but this doesn't seem to be working. As this article is being written, we still have seven of thirteen positions for 2005 without a single nominee. I'd be curious to hear any suggestions as to how we should address this situation.

The club is governed, according to our constitution and bylaws, by a body of thirteen positions: four executive, four administrative, and five board members. The unoccupied offices for 2005 include:

- President
- Vice President
- Treasurer
- Newsletter Editor
- Events Coordinator
- Two Board Members

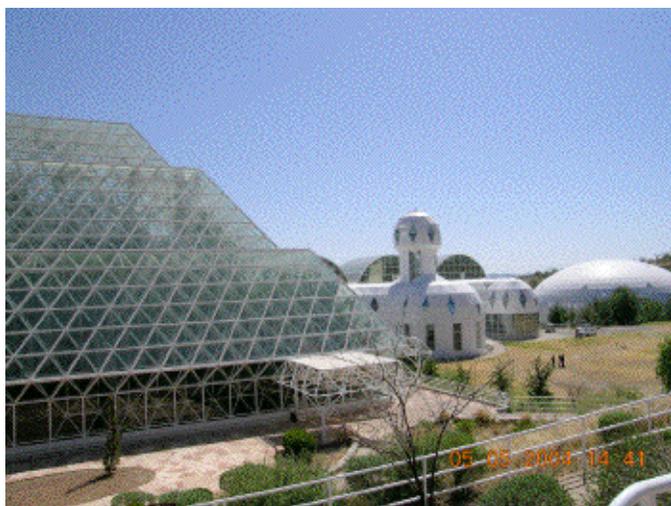
Historically, the Board positions have been the easiest to fill, the President and Treasurer slots have been the most difficult. No doubt this has to do with the responsibilities of the offices. I realize that everyone has busy schedules these days with many commitments. I further realize that volunteering to help run a club has a relatively low priority. But, without members stepping

forward and volunteering, there can be no club.

So, what do we do if we don't have volunteers? Initially we would have to curtail some club functions or services. Maybe the club can operate without a dedicated Events Coordinator. Personally, I think this is a necessary position for a club as active as EVAC. Realistically, this work would be shifted onto the President or Vice President. Without a Newsletter Editor there would obviously be no newsletter. That's not a situation that bodes well for a club. Perhaps the newsletter would shift from a monthly publication to bi-monthly or quarterly. The workload would be reduced from producing twelve issues to six or four annually. The Vice President is primarily responsible for securing guest speakers for the monthly meetings. Perhaps we would only have guest speakers on a bi-monthly or quarterly schedule. For that matter, perhaps the club need only meet on a bi-monthly or quarterly schedule. Such an action would reduce the workload of several positions. There is not much that can be done to reduce the workload for the Treasurer. This position is at the very heart of the organization, and literally keeps it afloat. Perhaps we could eliminate unnecessary transactions such as name badges, magazine subscriptions, and the occasional special offering (handbooks, calendars, software).

As you've no doubt surmised from the bleak picture painted in the preceding paragraph, if we, as a club, have to take such drastic measures to ensure our existence, there probably isn't a reason for existence. That is a scenario I would like to avoid. I really like this club and have met some truly remarkable people. Given that our membership numbers around 200, there is a need within the community for such an organization. The governing body represents slightly less than seven percent of the membership. Statistically that means that one in sixteen members should volunteer. Is that a realistic number? Only you can decide.

I welcome your comments. I welcome your suggestions. But mostly, I welcome your nominations! Thank you for giving consideration to getting involved in running this great club!



A space ship in the desert?

Well, not exactly. Actually, it's Biosphere II near Oracle, Arizona. A connected group of remarkable buildings, built with the idea of testing whether human beings could live in a completely sealed habitat such as might be constructed in outer space or on the Moon.

While the original experiment was not 100% successful, many lessons were learned which may prove very valuable on any long future space missions.

This remarkable facility is now open for public visits. You can explore it inside and out (for a reasonable fee).

On the Internet see: <http://www.bio2.com/index.html>

If it's clear...
by Fulton Wright, Jr.
Prescott Astronomy Club -- October 2004

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

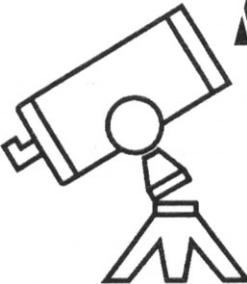
On Sunday, October 3, about 5:30 AM, you can see a planet and star close together. With binoculars look 30 degrees above the east horizon for **Venus** (mag -4) and **Regulus** (mag 1) only .2 degrees apart.

On Wednesday, October 20, in the early evening, you can see the **Moon's north pole** at its best. For a few days around this date, libration tips that area of the moon slightly toward us.

On Wednesday, October 27, you can see a **total Lunar eclipse**. This is a particularly convenient event for Arizona. Here is the time table:

5:05 PM Moon enters penumbra (unobservable)
5:33 PM Moon rises (a little north of east)
5:41 PM Sun sets
6:13 PM Moon enters umbra
7:22 PM Totality begins
8:45 PM Totality ends
9:54 PM Moon leaves umbra
11:02 PM Moon leaves penumbra (unobservable)

**The monsoon storms are over...
the skies are clearing again...
it's getting cooler...
It must be time for a big star party!
East Valley Astronomy Club invites you to attend
the annual
All Arizona Star Party
Friday, October 15th and Saturday, October 16th
Farnsworth Ranch, south of Arizona City
N 32° 27' 45.2" W 111° 43' 53.2"
32.46° N 111.72° W
Elevation: 1,800 ft. or 548.6 m**



Mr. Telescope

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20 E. Camelback Road
Phoenix AZ 85012
602/955-5521
Jack Johnston

TELESCOPES, ACCESSORIES, LITERATURE, BINOCULARS
ASTROPHOTOGRAPHY EQUIPMENT, ASSISTANCE, ADVICE

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

Newsletter delivery option, check one:

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

Total enclosed \$

Name: _____

Address: _____

Phone # (____) _____

Email: _____

URL: _____

Membership Renewals:

- \$20.00 January – December

Name Badges:

- \$7.00 each Name: _____

Magazines: if renewal, customer # _____

(New) (Renewal)

- \$29.00 /yr. Astronomy Magazine
- \$33.00 /yr. Sky & Telescope

**Local Star Party Site
Boyce Thompson Arboretum**

General Information: The Boyce Thompson site is still considered the **new** local site by some EVAC old-timers. However, it has now become our preferred nearby site. It has some privacy and possibly safety advantages over the older Florence Junction site. In addition, it is the location where EVAC provides star parties twice yearly for members of the Friends of The Arboretum (FOTA) -- an organization of members and supporters of the Arboretum. Some current EVAC members were first introduced to EVAC through these delightful evening potluck dinners and star parties

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

How to get there: Drive East on US 60 past Florence Junction. The Arboretum is located at Milepost #223, and is about an hour's drive from Phoenix. Just before you enter the town of Superior, the Arboretum's location is marked with a large brown and white State Park Sign and there is a right turn lane to exit the highway at the entrance. On local EVAC star party nights, please plan to arrive at the Arboretum **after** 5:30 pm -- to avoid being confused with regular Arboretum patrons who are required to leave the park at the regular 5:00 pm closing time.

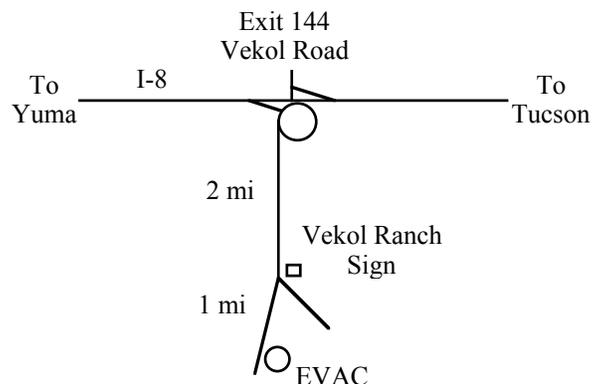
You can visit the Arboretum on the Internet at:
<http://arboretum.ag.arizona.edu/index.html>

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

Vacant, (duties being
shared by other officers)

TREASURER

Jack McEnroe

SECRETARY

Diane Cook

EV. COORDINATOR

Howard Israel
(480) 893-7523

PROPERTIES

Dave Williams

NEWSLETTER

John Matthews
(602) 952-9808

WEB MASTER

Marty Pieczonka

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 the Treasurer:
Jack McEnroe at: keystoneconsulting@earthlink.net

Address Changes: Contact: Jack McEnroe. PO Box 2202 Mesa AZ 85214-2202

Club Meetings: Second Wednesday of every month at the Scottsdale Community College, 7:30 p.m. Meet in Room PS 172 (Physical Science Bldg.).

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 Dave Williams at: davewilliams@cox.net
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 Star Party Line: Let other members know in advance if you plan to attend a scheduled observing session. Contact Events Coordinator Howard Israel at (480 893 7523).



**East Valley
Astronomy Club**

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

**EVAC Homepage:
www.eastvalleyastronomy.org**

Reminders:

**October EVAC Meeting
Thursday, Oct. 14, 2004**

Location: AZ Science Center
600 E. Washington St.
Phoenix, AZ 85004 @ 7:30PM

**November EVAC Meeting
Wednesday, Nov. 10, 2004**

Location: Room PS - 172
Physical Science, (SCC) @ 7:30PM

2004 All-AZ Planetary Nebula Observing List
 October 15, 2004

Sunset is at 17:58 Twilight ends at 19:15 Moonset at 19:03

Object	AKA	Con.	RA	Dec	Mag	Size	SBr	SC	Window
NGC 6210	PK 043+37.1	Her	16h44m40.1s	+23°47'34"	9.3	16"	15.1	12.7	19:03-20:06
Little Gem	NGC 6818	Sgr	19h44m13.3s	-14°08'35"	9.9	20"	16.1	15.0	19:03-21:09
Cat's Eye	NGC 6543	Dra	17h58m31.9s	+66°38'09"	8.8	20"	15.0	11.1	19:03-22:40
Blinking Planetary	NGC 6826	Cyg	19h44m55.3s	+50°32'23"	9.8	25"	16.5	10.4	19:03-23:55
Ring	M 57	Lyr	18h53m44.9s	+33°02'14"	9.7	1.3'	18.8	15.3	19:03-22:32
Campbell's Hydrogen	PK 064+05.1	Cyg	19h34m56.2s	+30°31'22"	9.6	7.5"	13.7	12.5	19:03-23:09
Dumbbell	M 27	Vul	19h59m48.2s	+22°44'09"	7.6	6.7'	20.4	13.9	19:03-23:18
Saturn Nebula	NGC 7009	Aqr	21h04m26.3s	-11°20'44"	8.3	29"	15.3	12.8	19:15-22:43
Helix	NGC 7293	Aqr	22h29m54.4s	-20°48'49"	7.6	16.3'	22.3	13.4	19:22-23:12
Blue Snowball	NGC 7662	And	23h26m08.1s	+42°33'48"	9.2	17"	15.1	13.2	19:15-03:21
NGC 246	PK 118-74.1	Cet	00h47m18.5s	-11°50'41"	8.0	4.1'	19.7	12.0	20:45-02:23
NGC 1360	PK 220-53.1	For	03h33m27.8s	-25°51'06"	9.6	6.4'	22.3	11.3	01:20-03:19
Cleopatra's Eye	NGC 1535	Eri	04h14m29.7s	-12°43'23"	9.6	21"	15.9	12.2	00:16-05:10
Eskimo	NGC 2392	Gem	07h29m27.2s	+20°54'15"	9.9	20"	16.1	10.5	01:48-05:10

Object = common name or designation AKA = alternate object designation Con. = constellation RA = right ascension
 Dec = declination Mag = magnitude SBr = surface brightness (mag/arc-sec²) SC = magnitude of central star
 Window = optimum observation window (object is above 30°)