

East Valley Astronomy Club

November 1998

www.goodnet.com/~rkerwin/evac/evac.html

Scottsdale, Arizona

The Caldwell Catalogue

A Good Idea Gone Bad—Besides, Several Good Ideas Already Exist

Alister Ling

It cannot be argued that there is a need and a place for deep-sky references to go beyond the Messier list. The Caldwell Catalogue however, should definitively not be one of those references, for reasons stated farther below.

Most newcomers to deep-sky who have seen a majority of M objects typically fall into one of two classes: 1) Where do I go for more? 2) I need help in going deeper; can you show me?

My favorite references (not an exhaustive list, just the ones I have seen and liked):

◆ The Finest NGC Objects. 110 objects, chosen by Alan Dyer, are published in a small section in the fantastic annual observing reference Royal Astronomical Society of Canada's "Observer's Handbook". The list is also available at <http://planet10.vwave.com/rasc/finengc.html>. There are a couple of paragraphs of observing hints that accompany the List.

◆ A 600 strong list of brightest deep-sky objects, including doubles and interesting variables compiled by Brian Skiff, is an integral part of Wil Tirion's Bright Star Atlas.

◆ The Herschel 400 is a post-Messier handbook promoted by the Astronomical League, honoring the first true deep-sky observer, William Herschel, who discovered

some 2,500 galaxies, nebulae, and clusters! These are the top 400.

◆ Star-Hopping for Backyard Astronomers, by Alan MacRobert. (Sky Publishing). This is a collection of absolutely outstanding observing articles, the benchmark to which I compare any other observing reference for the newcomer. One cannot say enough good things about MacRobert's starhops. Some experienced observers may point out that the starhops don't go really really deep, but I'd say these observers have forgotten to check out the interesting flora between the roses and the lichen!

Although it is very laudable of Moore to encourage amateurs to look past the Messiers into the greater—and occasionally more interesting—depths of the night sky, his method is quite inappropriate. If it was simply "Moore's Favorites" or "Moore's Top 100", then fine. What really bugged me was a combination of numerous sloppy errors in the data table and what I personally read as apparent presumptuousness, and apparent self-

EVAC & Other Events: 1998

	Mtng	Local	DS	Other
Jan	14	17	24	
Feb	11	21	28	
Mar	11	21*	28*	21: EVAC Cookout* 28: Messier Marathon*
Apr	8	18	25*	19-26: Texas Star Party 25: Sentinel Star Gaze*
May	13	16	23	2: Astronomy Day 22-25: Riverside TMC
June	10	20	27	13-20: Grand Canyon SP 19-20: Verde Valley AF 27-28: Universe '98 24-25: Stellafane
July	8	18	25	
Aug	12	15	22	
Sep	9	12	19	11-13: Astrofest 18-19: N AZ Star Party
Oct	14	10	17*	16-18: Starry Nights Fest 17: All-AZ Star Party*
Nov	18	14	21	
Dec	9	12	19	

aggrandizement, on Moore's part. I hope it was unintentional.

My disbelief and distaste grew as I continued to read Moore's article. "Caldwell 11, the Bubble Nebula..." Who is ever going to remember the Bubble Nebula as a new number? Who needs to? "The Hyades...appears here as C41." The Hyades sparkle just fine by themselves thank you very much.

Sure, it's a great idea to popularize some lesser-known objects, but did Roger Tory Peterson rename birds in his Field Guides? "The Bald Eagle here appears as Peterson 42..." What would people think of you if you tried that? Where's the promotion here, the objects or him? "Moore, like Messier, begins with 'M.' Fortunately, my surname is actually hyphenated—Caldwell-Moore. So let us use C for my catalog."

Moore took most of the favorite non-Messier NGC objects, like the North American, the Eskimo, the Cocoon, the Rosette, the Veil, and rechristened them with C-numbers. Excuse me, did he say "lesser known"? They've got names, man! Even Hubble's Variable Nebula has been renamed! 31 objects on that list have familiar names. 25 other objects have well-known NGC numbers, like 891, 2419, 4565 or IC entries like 342. You don't see Houston, MacRobert, Webb, or Smyth objects in magazines. William Herschel did not recatalog the Messier list when he published his catalog

of deep-sky objects, including 1,000 new discoveries—he left the Messiers with their familiar names. While Moore may be a veteran amateur astronomer and a dynamic television personality, one must wonder how much deep-sky experience he really has. He lists IC 405, the Flaming Star Nebula, as "bright", and at 6th magnitude! Obviously it looks interesting in pictures but he either hasn't seen it or made a double typo with the magnitude and with the associated word.

I'm surprised that Moore (and the editors at *Sky & Telescope*) perpetuated an historical myth by stating "Yet there are many other objects of equal or greater interest...that Messier did not include, perhaps because there was little chance of confusing them with his beloved comets." The Messier catalogue is not a "could be confused with a comet" list, although non-comets were the driving force behind Messier's compilation. The proper (translated) title is "Catalogue of Nebulae and Star Clusters." Without exception, all open star clusters were resolved and correctly identified as such by Messier. Granted many objects listed by Moore are more interesting than Messier's, but they are definitely not as bright. He seems unaware of the poor optical quality and light grasp of Messier's telescopes: the Great Hercules globular cluster was described as a "nebula without a star." All the northern objects in the C-list (except for the Hyades) are too faint for Messier to have found with his little telescope.

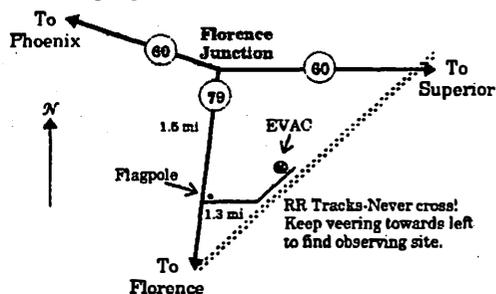
EVAC Star Parties

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.

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

How To Get There: Take US 60 east to Florence Junction. At Florence Junction, turn right (south) on SR 79. After 1.5 miles, you will see a tall steel flagpole and a dirt road to the left. Turn left onto the dirt road and continue for another 1.3 miles. Drive with caution as the road is rough in some areas. To the left there will be a large open area.

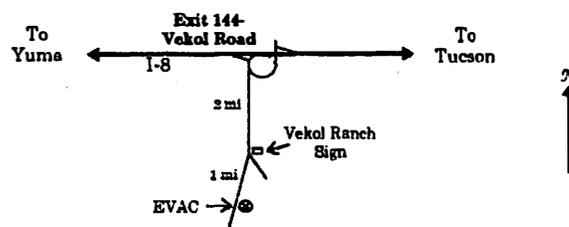


Deep Sky Star Party: Vekol Road Site

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.



Moore claims to present interesting objects for the observer that are neglected because they are not on the Messier list. Southern hemisphere observers must be shaking their heads in disbelief since magnificent objects like Eta Carinae and Omega Centauri on "his" list make any Messier object pale by comparison. All southern objects in Moore's list would have been easy targets for Messier—alas he did not observe the southern skies at the time. Southerners hardly need to be told by a northerner to seek out "neglected" objects, of which 13 of the 32 (below France's horizon) are visible to the naked eye! After that insult, imagine how they must feel to see both Magellanic Clouds missing from the Caldwell Catalog; the Large Cloud alone contains more interesting stuff in it than all of Cygnus but packed into an area the size of the Scutum starcloud!

The Caldwell Catalog also contains errors too numerous to mention here. A couple of examples will suffice: the very bright Eta Carinae Nebula is given a magnitude of 6.2, while the Tarantula Nebula is listed at first magnitude! The size column, labeled arcminutes (') at the top, actually contains a hodgepodge of object sizes in degrees, arcminutes, or arcseconds. Many of the planetary nebulae have (unexplained in the text) a secondary size on that list, the one measured on long exposure photographs, invisible even to large scope visual observers. I'm at a loss to understand how this shoddiness happens with the current quality and accessibility of measurements in machine readable databases.

The goal of getting observers to look past the Messiers is a good one, but my reception, and perception, of Moore's approach left me reminiscing of a Douglas Adams line from Zaphod Beeblebrox in "A Hitchhiker's Guide to the Universe": "He's so unhip it's a wonder his buns don't fall off." Thankfully C-numbers will be difficult to memorize—let us bury them deep where the stars do not shine, and promote the already excellent deep-sky references noted at the top of this article.

Backyard Astronomy

Light Pollution Musings

Bill Dellinges, EVAC
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Bad lights kill me. I die a little every time I see one. As I drive along US 60 and see thousands of lights out there, I wonder, why I should see them at all? In a perfect world, they would all have full cut-off shields directing all their light downwards from the horizontal. The only lights we should see are lights coming out of

EVAC on the Internet

EVAC Homepage

www.goodnet.com/~rkerwin/evac/evac.html

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.

windows and, unfortunately, signs and car headlights. (I wonder how much light pollution is generated at night by the millions of vehicles on the road? That's a source of light pollution (LP) not usually addressed when discussing LP issues.)

Another alarming trend I've noticed is the penchant for new home owners to install the gold and glass lantern type of lights on their front door and sides of the garage door. They may look flashy at the store but are a terrible choice of light for that purpose as they produce a lot of glare. I often wonder how those people avoid driving over their kids or through their garage door at night because of those blinding lights. I don't like seeing them either when I step outside to enjoy the night. I've gone from almost no such lights when I moved here (5 miles east of Apache Junction) a few years ago to about a dozen as new homes sprout up, and it's getting worse all the time. It doesn't help that a lot of these folks also opt to install the popular double spotlights on every corner of their house and leave them on all night!

Because these lights are probably under 150 watts, there's not much you can do about them since lights in that range are not covered by state lighting ordinances. However, if one of those lights was a real problem for you, you could, of course, talk to your neighbor about it and work something out (turning it off after a certain hour or adjusting it so it doesn't shine your way). I did just that with my neighbor whose spotlight blasted my observatory. When I explained the problem and asked if he could perhaps aim it a little more downward, he insisted on unscrewing it completely! What a guy!

November 1998

All Times MST

First Aries, glorious in his golden wool,
Looks back, and wonders on the mighty bull.
—Manilius

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Discovery of Chiron, 1977	2 Moon near Saturn	3  Full Moon 10:18 pm	4 High tides	5 Moon near Aldebaran	6 SAC Mtng	7
8 Edmond Halley b. 1656	9	10  Last Quarter 5:28 pm	11 Mercury at greatest evening elongation	12	13 Moon near Mars	14 EVAC Local Star Party
15 William Herschel, b. 1738	16 Moon near Spica	17 Leonid Metecors	18  EVAC Mtng 7:30 pm at SCC	19	20 Moon near Mercury	21 EVAC Deep Sky Star Party
22	23 Sun enters Scorpius	24	25	26  <i>Thanksgiving</i>	27 Moon near Jupiter	28 Tomorrow: Sun enters Ophiuchus
29 Moon near Saturn	30 Pluto in conjunction with sun					

There is good news too. As Sam Herchak recently pointed out to me, the sale of the infamous mercury vapor light has been banned in Arizona (1986 I think) and their use banned in 2011. Great news. Also I've noticed that virtually all new street lights and a lot of parking lot lighting are of the shoebox or full cutoff type. Again, great news, but the war is far from over.

Let us not fall into a false sense of security. There are always going to be persons or businesses who will try to put up a bad light! Most of the time it will probably be due to ignorance. That's where WE come in. You may have seen recently a letter to the editor in *Sky & Telescope* where the question was asked, "If there are 300,000 amateur and professional astronomers out there, why is the membership in the International Dark Sky Association only 2000?" That's a good question. Would it not be impressive when going up against some LP problem to tell them you represent an organization of 300,000 members rather than 2000? Well then, come on, join the IDA! It also would not hurt if every backyard astronomer became a LP watchdog. Think of it. Every few square blocks there is an astronomy lover watching and waiting for that bad light to go on-line (hopefully before it's installed). He or

she then pounces on the perpetrator using the law and diplomacy to correct the transgression!

I have been an IDA member for a number of years now and must admit not too active this past year insofar as the battle against LP is concerned. But I hope to gear up soon and go on the attack, as I see some things out

Lunar Almanac: 1998

	FQ	Full	LQ	New
Jan	5	12	20	27
Feb	3	11	19	26
Mar	5	12	21	27
Apr	3	11	19	26
May	3	11	18	25
June	1	9	17	23
July	1	9	16	23
	31			
	Full	LQ	New	FQ
Aug	7	14	21	30
Sep	6	12	20	28
Oct	5	12	20	28
Nov	3	10	18	26
Dec	3	10	18	26

there that I don't like, too many photons from too many lights.

For information about the International Dark-Sky Association—set your Internet browser to <http://www.darksky.org>. To learn more about the Arizona statutes, and other EVAC member's participation in light pollution issues, see Sam Herchak's "Say No to NEMA" in the July 1998 EVAC Newsletter.

The Old Farmer's Almanac, 1999

M. Aaron McNeely, Editor
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Established in 1792, The Old Farmer's Almanac is the oldest continuously published periodical in America. At first glance, it may seem to be of little interest to the astronomy enthusiast, yet each issue usually features a number of articles concerning astronomy.

I started reading the Almanac soon after I became an amateur astronomer. My mother purchased one for me after noticing that it contained some astronomy information. Since then, I have been a regular reader and fan of the periodical.

The 1999 issue contains the following major articles on astronomy: The Oldest (Surviving) Photograph of the Moon; The Year of the Shooting Stars; The Astonishing Lunar Illumination of December 22, 1999; In Search of New Year's Eve, AD 999. In addition, the Almanac prints annual astronomy information such as "The Visible Planets", "Eclipses for 1999", "Bright Stars", and "Where the Sun Rises and Sets". The calendar pages feature short descriptions of monthly astronomy events, the same text that is printed under Heavenly Details in this newsletter.

The Almanac also specializes in articles about weather, history, and various cultural minutia. For example, the 1999 issue features the following: A Brief History of Briefs; Weather Rules of Thumb; How to Predict the Weather Using a Pig Spleen; The Great Arctic Outbreak of 1899; Why Elvis Presley Carried His Own Utensils; "Alcatraz Was Never No Good for Nobody"; "General Washington Is Dead!"

The Almanac features much more than I have listed, and I encourage the interested to look it up. Besides where else in the same covers can you find a list of the angels nearest to God, and a list of the gentlest dog breeds?

Heavenly Details

courtesy of
The Old Farmer's Almanac 1998
www.almanac.com

November 1998
The Eleventh Month

(all times EST)

The full **Moon** on the night of the 3rd-4th is the closest Moon of the year, passing just 216,000 miles from **Earth**. This will produce a dramatically large range of high and low tides. Any storms at sea at this time will produce coastal flooding. The Moon passes near a brightening but still unspectacular **Mars** on the 13th. Look for the ultrafast **Leonid meteors**, which may put on a good show this year on the nights of the 17th and 18th. Moonlight will be absent, offering optimal conditions for this sometimes spectacular shower. The Moon returns to pass **Jupiter** on the 27th and **Saturn** on the 30th.

FULL MOON: 4th day, 0 hour, 18th minute
LAST QUARTER: 10th day, 19th hour, 28th minute
NEW MOON: 18th day, 23rd hour, 27th minute
FIRST QUARTER: 26th day, 18th hour, 23rd minute

Maybe we're moonstruck, but we humans seem never to tire of watching the amazing spectacle of the sky. For your interest and edification, The Old Farmer's Almanac provides the dates and locations of solar and lunar eclipses for the year, as well as the days of the full moon for seven years. Check it out at www.almanac.com, then go outside and look UP!

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If it's Clear...

November 1998

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

On Saturday, November 7, from dusk till 10 PM, you can see 7 events with Jupiter's satellites. With a

medium (6 inch) telescope, look 40° above the southeast horizon for Jupiter. Here is the schedule of events:

6:05 PM Io disappears behind Jupiter
 6:49 PM Ganymede disappears in Jupiter's shadow
 7:04 PM Europa's shadow falls on Jupiter
 7:29 PM Europa moves from in front of Jupiter
 9:27 PM Io appears from behind Jupiter
 9:43 PM Europa's shadow leaves Jupiter
 9:58 PM Ganymede appears from Jupiter's shadow

On Friday, November 13, around 11:30 AM, you can see the Moon occult Mars. With a medium sized (6 inch) telescope look 40° above the west to southwest horizon for the crescent moon. Look for Mars near the bright limb of the moon (to the left), somewhat north (up) of the Moon's equator (thickest part of the crescent). This is a daylight event and I am not sure how hard it will be to see Mars. The moon should cover Mars about 11:31 AM and uncover it about 12:37 PM as seen from Prescott.

On Saturday, November 14, from dusk till midnight, you can see 8 events with Jupiter's satellites. With a medium (6 inch) telescope, look 40° above the southeast horizon for Jupiter. Here is the schedule of events:

7:16 PM Europa moves in front of Jupiter
 7:55 PM Io disappears behind Jupiter
 9:07 PM Ganymede appears from behind Jupiter
 9:40 PM Europa's shadow falls on Jupiter
 9:56 PM Europa moves from in front of Jupiter
 10:52 PM Ganymede disappears in Jupiter's shadow
 11:22 PM Io appears from Jupiter's shadow
 12:18 AM Europa's shadow leaves Jupiter

On Monday, November 16 or Tuesday, November 17, you have a small chance of seeing a spectacular meteor shower. With your unaided eye, under a dark sky, look anywhere in the sky for the Leonid meteors, radiating from a spot in Leo. In general, meteors are seen best after midnight, but the peak activity of this shower may be brief (one hour?) and that is when you want to be looking. We aren't sure when the peak will be. We aren't even sure there will be a peak worth watching. However, it is somewhat like the lottery: you probably won't win, but if you do, WOW! Any chance you get to check the sky Monday or Tuesday night might pay big dividends.

On Saturday, November 21, around 9:30 PM, you can see 3 of Jupiter's satellites disappear in 10 minutes! With a small (3 inch) telescope, look 40° above the

southwest horizon for Jupiter. Here is the schedule of events:

9:37 PM Ganymede disappears behind Jupiter
 9:45 PM Europa moves in front of Jupiter
 9:47 PM Io disappears behind Jupiter

On Friday, November 27, around 6:30 PM, you can see Jupiter near the Moon. With your unaided eye or binoculars look about 45° above the south horizon for the Moon. Jupiter will be about 1° (2 moon diameters) above it.

In addition, you have 3 chances to observe a complete transit (moon and shadow) of Io in front of Jupiter. November 6 starts at 8:51 PM, November 22 starts at 7:02 PM, and November 29 starts at 8:56 PM.

EVAC Meeting Highlights

October 14, 1998

Don Wrigley, Secretary
 donwrig@juno.com

President Sheri Cahn called the meeting to order at 7:36 PM with 62 members present, including one guest. Sheri's list of upcoming events included a reminder that November's meeting will be held on the third Wednesday of the month because of a conflict with Veteran's Day. Also, Tom Polakis will host an EVAC Christmas party at his home on December 5th at 6:30 PM.

Under new business nominations were held for November's election of club officers. Those nominated were:

PRESIDENT	Silvio Jaconelli
VICE PRESIDENT	Pedro Jane'
SECRETARY	Tom Mozdzen
TREASURER	Kathy Woodford
PROPERTIES	Enrico Alvarez
BOARD OF DIRECTORS	Steve Bell, Sheri Cahn, Joe Goss, Lika Romny

Show and Tell

Rick Scott and Joe Orman presented a slide show set to music featuring an impressive array of astronomical and meteorological events. Images included various shots of rainbows, sunrise and sunsets, star trails, fireballs, lightning shows, comet Hale-Bopp, and a

use of two slide projectors to produce a seamless transition from image to image.

Chris Schur showed his latest batch of deep sky photographs that continue to push the envelope for what can be imaged using amateur equipment. This months images included mostly Sharpless or undesignated emission nebulae from Cygnus to Cepheus. Other images were comet Giacobini-Zinner, Col. 399, nebulae above Deneb and Chi Cygni, IC 1318 near Gamma Cygni, IC 1390 in Cepheus and NGC 7830 and 7822 in Cepheus.

Paul Dickson provided a video slide show with images from his digital camera of the making of the 8-meter Magellan mirror at the mirror lab in Tucson.

Laurice Dee set up another poster display on the Galileo project.

Main speaker: Television and radio personality "Dr. Sky", Steve Kates, presented and slide show and a video on his appearances on Channel 3 to illustrate ways to promote Astronomy to the public.

The New EVAC Party Line

The EVAC Party Line has served as a resource for club members wishing to rendezvous with other members for astronomical observing. Of late the Party Line has been ably administered by Robert Kerwin. Robert has elected to pass the duty on to Stan Ferris. Stan's telephone number is 602/831-7307, and this will be the new EVAC Party Line.

In Astronomical History

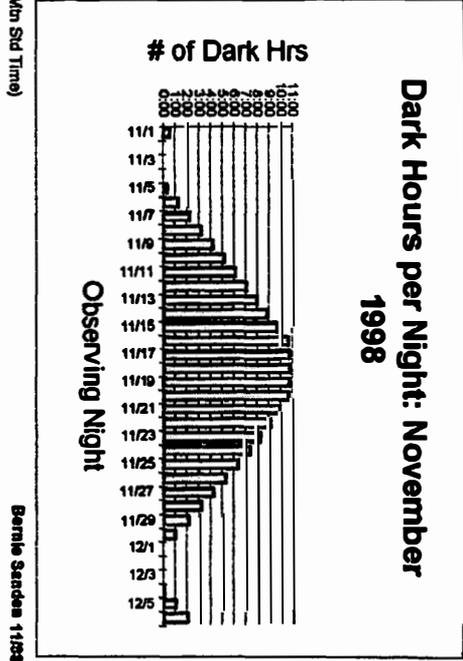
November

- Nov. 1, 1977: Charles Kowal discovered asteroid/comet Chiron.
- Nov. 13, 1577: Tycho Brahe first observed great comet of 1577, eventually used observations to prove that comets exist beyond earth's atmosphere.
- Nov. 14, 1680: Gottfried Kirch made first telescopic discovery of a comet.
- Nov. 30, 1954: Mrs. E. Hulitt Hodges of Sylacauga, Alabama injured while napping by a meteorite that penetrated the roof of her house.

Dark of the Moon Table -- November 1998

OBSERVING NIGHT	START OF DARK	END OF DARK	TOTAL DARK	OBSERVING NIGHT	START OF DARK	END OF DARK	TOTAL DARK
SUN/MON	11/2 4:51 AM	11/2 5:24 AM	0:33	THURS/FRI	11/19 6:50 PM	11/20 5:39 AM	10:48
MON/TUES	none	none	-	FRID/SAT	11/20 6:54 PM	11/21 5:39 AM	10:45
TUES/WED	none	none	-	SAT/SUN	11/21 7:40 PM	11/22 5:39 AM	9:59
WED/THURS	none	none	-	SUN/MON	11/22 8:30 PM	11/23 5:40 AM	9:10
THURS/FRI	11/6 6:57 PM	11/6 7:18 PM	0:21	MON/TUES	11/23 8:24 PM	11/24 5:41 AM	8:17
FRID/SAT	11/6 6:57 PM	11/6 6:13 PM	1:16	TUES/WED	11/24 10:21 PM	11/25 5:42 AM	7:21
SAT/SUN	11/7 6:58 PM	11/7 8:10 PM	1:14	WED/THURS	11/24 11:20 PM	11/25 5:42 AM	6:22
SUN/MON	11/8 6:55 PM	11/8 10:08 PM	3:14	THURS/FRI	11/27 12:22 AM	11/27 5:43 AM	5:21
MON/TUES	11/8 6:55 PM	11/8 11:08 PM	4:13	FRID/SAT	11/28 1:35 AM	11/28 5:44 AM	4:18
TUES/WED	11/10 6:54 PM	11/11 12:06 AM	5:12	SAT/SUN	11/29 2:30 AM	11/29 5:45 AM	3:15
WED/THURS	11/11 6:54 PM	11/12 1:02 AM	6:38	SUN/MON	11/30 3:37 AM	11/30 5:46 AM	2:09
THURS/FRI	11/12 6:53 PM	11/13 1:57 AM	7:04	MON/TUES	12/1 4:46 AM	12/1 5:48 AM	1:00
FRID/SAT	11/13 6:53 PM	11/14 2:52 AM	7:59	TUES/WED	none	none	-
SAT/SUN	11/15 6:52 PM	11/15 3:45 AM	8:53	WED/THURS	none	none	-
SUN/MON	11/15 6:52 PM	11/16 4:38 AM	9:48	THURS/FRI	12/4 6:48 PM	12/4 6:52 PM	0:04
MON/TUES	11/16 6:51 PM	11/17 5:31 AM	10:40	FRID/SAT	12/5 6:48 PM	12/5 7:52 PM	1:04
TUES/WED	11/17 6:51 PM	11/18 5:36 AM	10:45	SAT/SUN	12/6 6:49 PM	12/6 8:53 PM	2:04
WED/THURS	11/18 6:50 PM	11/19 5:37 AM	10:47	SUN/MON	12/8 6:49 PM	12/8 8:53 PM	2:04

EO = End of Astronomical Twilight MR = Moonrise SOT = Start of Twilight MS = Moonset NOTE: Applies to Phoenix area (Mtn Std Time)



Barrie Sandeen 11/28

Don't Forget: Leonid Meteors on November 16-17!

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Valued member since 1/17/92
Next EVAC Meeting — Nov. 18th 7:30 pm

Apache Junction, AZ 85220



East Valley Astronomy Club
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East Valley Astronomy Club—1998

Scottsdale, Arizona

EVAC Homepage—<http://www.goodnet.com/~rkerwin/evac/evac.html>

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TREASURER
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602/982-2428

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—ariz.kat@juno.com

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 M. Aaron McNeely, 4402 North 36th Street, #22, Phoenix, AZ 85018, 602/954-3971. Email—amcneely@primenet.com
Contributions may be edited for length or clarity.

ADDRESS CHANGES: Contact Bill Smith, 1663 South Sycamore, Mesa, AZ 85202, 602/831-1520. Email—bsmithaz@aol.com

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

BOOK DISCOUNTS: Great savings through Kalmbach and Sky Publishing. Contact Don Wrigley, 423 West 5th Avenue, Apache Junction, AZ, 602/982-2428. Email—donwrig@juno.com

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

