

# Saguaro Astronomy Club



# Sacnews

Issue 275

Feb 2000

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## In Memorium

### Pete Jurca, 1942-1999

Pete Jurca a founding member of Saguaro Astronomy Club died November 9, 1999 in a motorcycle accident. Pete was our Vice President in 1978 and continued the club as a charter member until his death. He is survived by his brother, Joe Jurca and his sister, Josephine Bushley. His telescope lives on at Carson Jr. High in Mesa where he was an English teacher. Joe Jurca tells me Pete truly en-

joyed astronomy. Reading through the early newsletters and considering he was a club member for 40% of his life I'd tend to agree!

Thanks to Joe Jurca, Pete's collection of Sky & Telescope is now a part of our SAC library.

Jennifer Keller,  
SAC Secretary



*Pete is the 2nd person from the right in this picture standing behind the tri-pod. Do you recognize yourself, anybody else, or the location?  
Photo Courtesy of Jennifer Keller, SAC Secretary*

# **SAC Observing Programs**

## **Part One, Shallow Sky and Basic Deep Sky**

### **By AJ Crayon, SAC Deep Sky Group Coordinator**

After having been the Deep Sky chairman for a long time, the time has come for an article about SAC observing projects. Some of which have been around for over 20 years and as club members should know what is available.

This article discusses all SAC observing programs. For a list of objects in most of these see the SAC web site at <http://www.saguaroastro.org> or the author for a list. The only exception is the 1000 New Objects program.

If you have asked yourself or others what can I look at in a telescope then this article will provide the answer. There are a number of programs available to SAC members many being added during the 1990's. These programs are designed to help us improve our observing skills and enjoy the wonders of the night sky.

To receive an award for completing a program, marathons excluded, all entries must be recorded and turned in to the Deep Sky Chairman. The recording involves a description for the observation of each object along with the location, date, sky conditions, telescope and magnification used. The award is a plate with the observers' name and program that is mountable on the telescope; it is presented at one of our meetings. A future article will list recipients of all awards through 1999.

There are two major categories of programs, one for solar system objects and one for objects beyond the solar system. Shallow sky is a term sometimes used to refer to solar system objects and there are two in this area that were started last year. One is for observing the moon and the other for remainder of the solar system.

The "110 Best Lunar Objects" has been setup for those who observe from relatively brightly lit sites, like a backyard, or who prefer observing the moon. There are individual entries for naked eye, binocular and telescopic observations for various lunar phases.

The "SAC Solar System" project contains objects like the sun, planets, asteroids, comets, meteors, glows and sunspots. Parts of this program can be done from backyard sites, but others, like Pluto, need a dark site. Observations of the sun cannot be done from a dark site under any conditions.

The other category refers to objects beyond the solar system and referred to by the name deep sky. There are several and can be generalized as follows, initial, double stars, advanced and marathons. These observing programs will be covered in increasing relative difficulty.

The initial deep sky programs include the Urban List, Messier Catalog and the 110 Best NGC and have been selected because they contain the showpieces of the night sky. The "Urban List" is not yet complete as an observing program; but is included for completeness sake, as it should be ready by the end of this year. There are two reasons for this program; first it is for telescope owners who have difficulty traveling to a dark sky observing site and second, for observers to compare with observations from dark skies in other programs. It is for this second reason that all of the observations for this program must be done from sites that are too bright to see the Milky Way with the unaided eye. Currently the list includes entries from the Messier Catalog, NGC and the Washington Double Star Catalog.

*(Continued on page 3)*

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The ever-popular "Messier Catalog" is the product of the famous French comet hunter Charles Messier and came from his observations during the 1700's. While searching for a comet in September of 1758 he ran across an object above the southern horn of Taurus which looked like a comet but unlike a comet, didn't move. So he decided to catalog observations like this, so others looking for comets wouldn't be confused. We now know this object today as M1 or the Crab Nebula and the rest is history. Since Messier's telescopes were far inferior to the ones used by amateurs today, he found only the biggest and brightest in the night sky. This, therefore, puts them in the "showpieces of the night sky" category; which makes them easy targets to locate from a dark-sky observing site. This program is the oldest award in SAC and is an excellent place to start a deep-sky observing career. I often wonder what Charley would say if he could see what his catalog means today!

The early awards included a certificate of 75 for observers completing 75 objects. This process appears to have been discontinued during 1983.

The "110 Best NGC" was updated from the Royal Canadian Astronomical Society Observer's Handbook that had the original title "100 Best NGC". In 1989, Steve Coe and I decided to add 10 more entries, out of respect for the number of entries in the Messier Catalog, remove some of the mundane more northerly entries and add some southerly ones. For example the entries in Centaurus were added to the list. The entries in this program, for the most part are not quite as bright as the Messier Catalog, are a little harder to find and observe; but be careful there are some spectacular surprises in this list. The Deep Sky Group suggests doing this program after the Messier Catalog.

There is only one double star list and that is the "110 Best Double Stars." It came in part from the RCAS Observer's Handbook and a list titled Chaple Double Stars, after the double star observer Glen Chapple. In 1985 Steve Coe and I replaced some entries with ones of our own choosing to add a greater flavor of color contrasting doubles. Many of the doubles are so widely separated that they can be resolved or split from a backyard.

Observations made from a dark sky site for the Messier Catalog, 110 Best NGC and 110 Best Double Stars are not usable for Urban List observations and vice versa. Instead the observation from diverse sites can be used to see the differences between a bright sky and dark sky observing sites.

*(Ed note: Due to the many programs available to SAC members, I did not have room to run AJ's Article in its entirety. I will publish the conclusion, Advanced Deep Sky Programs next month. Till then, Clear Skies, Rick)*



*AJ Crayon: SAC Deep Sky Group Coordinator.  
Rick Tejera photo, taken at the 1999 All Arizona Messier Marathon.*

## Fuzzy Spot, Cancer

### By Ken Reeves

We've looked at a couple of zodiacal constellations in the past months, let's continue this month with Cancer, the Crab. Cancer is one of the less prominent constellations in the sky and is probably best spotted by looking for the hazy naked eye spot which is the Beehive Cluster, or M-44. This cluster has been known since ancient times. Aratus and Pliny both stated that invisibility of this object in otherwise clear skies was considered to forecast the approach of a violent storm. Hipparchus in 130 B.C. referred to it as the "Little Cloud", and Aratus (about 260 B.C.) called it the "Little Mist."

With the exception of this cluster and M67, most objects in Cancer are faint galaxies as we are starting to head away from the Milky Way. Only one of these galaxies, NGC 2775, is in the Herschel 400 list. Even so, Sky Atlas-2000 lists 7 galaxies, all of which should be visible in small scopes. So make sure you are well dark adapted and that the twilight is gone away (My general rule of thumb is to wait until the twilight is dimmer than the brightest light dome on the horizon before doing any serious deep sky observing).

**NGC 2545 (08h14.2 +21 21):** At 100x, I saw this galaxy as pretty small, not very bright, a little elongated, and containing a slightly brighter center. Using averted vision did make it grow somewhat. This is not an easy object.

**NGC 2608 (08h35.3 +28 29):** This galaxy is not very bright at 70X, pretty small, kind of elongated, and has a brighter center. Using averted vision makes it grow. At 100X, the elongation is roughly N/S, and at either power, no nucleus was noted.

**NGC 2623 (08h38.4 +25 46):** I have no observation of this galaxy. Here is the observation from the Night Sky Observer's Guide (by George Robert Kepple and Glen W. Sanner) for a 12-14" scope range: "This galaxy has a very faint, circular 1.5' halo and is slightly brighter in the center."

**NGC 2632:** (no, I'm not going to give you this one, you have to find it for yourself!) This is the Praesepe or the Beehive cluster, M-44. A naked eye object which to me is an unresolved haze. Looking in 10x50 binoculars (hand held), I counted about 50 stars with the cluster making a beautiful field. In

the 10" scope at 35X, the star count was about 150, but the cluster is so large, it fills the full field of view. There are a few chains and 3 very nice triangles of bright stars. There are several very faint galaxies within the boundaries of M-44, but I have never seen any of them.

**NGC 2672 (08h49.3 +19 04):** Here we have a galaxy which is not too big, somewhat elongated NW/SE, and forms a triangle with 2 bright stars. At 100X, there is a star just NW of the galaxy, increasing power to 140X makes the halo disappear, but an occasional stellar nucleus is seen.

**NGC 2682 (08h50.4 +11 49):** The second open cluster in Cancer, M-67, is a very fine sight. It is obvious in either a finder scope or binoculars. At 70X, it fills about 1/2 field of view, and is pretty condensed, pretty bright, and the star brightness is pretty even. I counted about 75 stars plus 1 bright star to NE. It has an unusual shape, kind of like a glass with a base, stem, and bowl.

**NGC 2749 (09h05.4 +18 19):** Back to galaxies, this one is not real bright, not too big, no elongation noted, has a bright middle, with a possible nucleus at 100X. The halo fades evenly, using averted vision makes it grow somewhat. There is a nice arrangement of stars on NE.

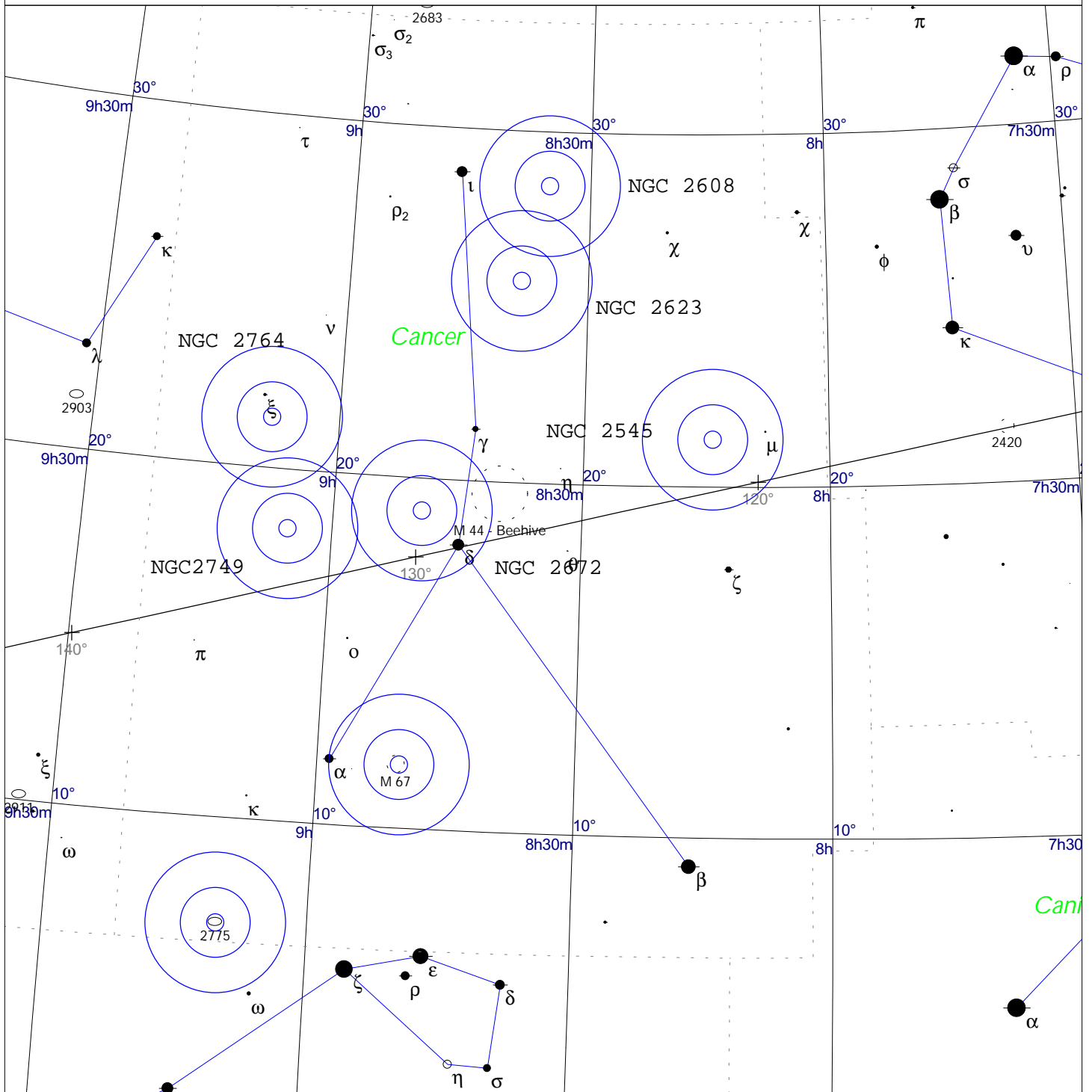
**NGC 2764 (09h08.3 +21 27):** As with NGC 2623, I have no observation of this galaxy. Again, here is the observation from the Night Sky Observer's Guide for a 12-14" scope range: "This galaxy is 1/2 degree SSW of the wide pair of bright stars Xi = 77 Cancri (m5.14) and 79 Cancri (m6.01). NGC 2764 has a fairly faint, circular 1' diameter halo, slightly elongated NNE-SSW with a prominent core. A very faint star lies at the northern edge. A 10th magnitude star is 2' north and another star SE."

**NGC 2775 (09h10.3 +07 03):** We'll finish off this month with the best galaxy in the constellation, and the only Herschel 400 object. I saw it as very bright, pretty big, with the halo being pretty dim and the middle being very bright, containing a possible stellar nucleus. There is a slight elongation E/W.

**Herschel 400 Objects : 2775**

**SAC's 110 Best of the NGC Objects: None**

# Fuzzy Spot Cancer



<p><b>STARS</b></p> <ul style="list-style-type: none"> <li>● &lt;3</li> <li>● 3.5</li> <li>● 4</li> <li>● 4.5</li> <li>● 5</li> </ul>		<p><b>SYMBOLS</b></p> <ul style="list-style-type: none"> <li>● Multiple star</li> <li>○ Variable star</li> <li>☄ Comet</li> <li>☉ Galaxy</li> <li>□ Bright nebula</li> <li>⊞ Dark nebula</li> <li>⊕ Globular cluster</li> <li>⊙ Open cluster</li> <li>⊕ Planetary nebula</li> <li>⊞ Quasar</li> <li>△ Radio source</li> <li>× X-ray source</li> <li>○ Other object</li> </ul>		<p>Limiting magnitude 5.5</p>
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Local Time: 21:00:00 14-Feb-2000      UTC: 04:00:00 15-Feb-2000      Sidereal Time: 06:07:23  
 Location: 33° 16' 1" N 112° 37' 59" W      RA: 8h34m33s Dec: +18° 06'      Field: 30.9°      Julian Day: 2451589.6667

# COMET COMMENTS FOR FEBRUARY 2000

By Don Machholz

No bright comets are in our skies these nights so this Comet Comments contains no ephemerides or orbital elements. This gives us the opportunity to look back at 1999 and to discuss the comets we hope to see this year.

Amateurs Gary Hug and Graham Bell of Eskridge Kansas discovered a new comet on CCD images they took through a 0.3-meter Schmidt-Cassigrain reflector on Dec. 10. The comet was magnitude 19 and near the Beehive cluster when found. Comet 1999 X1 (Hug-Bell) has a seven year orbital period and stays outside the orbit of Mars.

The LINEAR program found its final comet of the year on December 20. Comet 1999 Y1 is more than a year from its perihelion, which is a distant 3.2 Astronomical Units.

Fifty-six comets were discovered in 1999. Only 7 of them are periodic-returning in fewer than 200 years.

Who made these discoveries? The LINEAR project in New Mexico, designed to find asteroids and comets that may hit the earth, found 20 comets. Many of them were first thought to be asteroids before closer examination (often by others) detected a coma or short tail.

The SOHO program found 19 comets. SOHO is a spacecraft in solar orbit, about a million miles from the earth. It constantly monitors the solar region and has taught us a great deal about the sun. SOHO's comets are very bright and are often part of the Kruetz sungrazer family. Most of the SOHO comets are seen entering, but not exiting, the solar region. It is believed that they disintegrate as they pass near the sun.

Amateurs visually discovered three comets. All were Australians: Tillbrook, Lee and Lynn. All three comets were found south of the equator.

Four other amateurs, in two teams of two, used their own CCD's to discover comets.

Korlevic and Juric found a comet in February, while Hug and Bell found one in December.

The remaining twelve comets were found by those using professional equipment, often in the search for hit (or near-miss) asteroids and comets. Incidentally, for each comet they find there are hundreds of asteroids found.

The year 2000 doesn't line up to be a great year for comets, but you never know when a bright one will be discovered. Comet LINEAR (1999 S4) was expected to reach magnitude 3 in July when it will be placed in the northern polar region. However, recent observations show that the comet is slow to brighten as it moves toward the sun, and during one stretch the dust production decreased rather than increased. Now at 14th magnitude, it will be interesting to see what happens before we lose it in the solar glare in early April. Comet McNaught-Hartley (1999 T1) may reach magnitude 6 late this year, but it is within 70 degrees of the sun and far south until then. Finally, Periodic Comet Encke will be briefly visible from each Hemisphere late in the year.

**COMET HUNTING NOTES:** The first visual telescopic comet discovery was in 1680. In the 1760's Charles Messier and others competed to visually discover new comets. The first photographic comet find was in the 1890's. For one hundred years these were the two chief methods of finding comets. So what happened in 1999? 56 new comets were discovered. Three were visual. Two were photographic. Fifty-one were found by CCD's.

CC258.TXT 01-10-00 Don Machholz  
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# February 2000

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29				

## *Schedule of Events for February 2000*

- Feb 5th** New Moon at 0603 mst. Apollo 14 Lands on the moon near Fra Mauro, 1971
- Feb. 6th** Uranus in Conjunction with the Sun at 0001 mst.
- Feb. 7th** Sir William Huggins born in 1824 Pioneer in Astronomical Spectroscopy. Knighted in 1897 and served as President of the Royal Astronomical Society.
- Feb. 12th** First Quarter Moon at 1621 mst.
- Feb. 14th** Mercury at greatest Eastern Elongation (18 deg.) at 1800 mst.
- Feb. 15th** Galileo born in 1564.
- Feb. 16th** Moon at perigee (226,486 miles from earth)
- Feb. 18th** **SAC General meeting 1930 at Grand Canyon University**  
**Guest Speaker;** Bob Erdmann on "The NGC Project"
- Feb. 19th** Nicholas Copernicus born in 1473. Full Moon at 0927 mst.
- Feb. 24th** Supernova 1987A Discovered in the Large Magellanic Cloud in 1987.  
Deep Sky Subgroup Meeting
- Feb. 26th** **SAC Star Party at Buckeye Hills:** Sunset 1824, Moonrise 0131.  
Third Quarter Moon at 0853 mst.
- Feb. 28th** Moon at apogee (251,416 miles from Earth).

# 2000 ARIZONA MESSIER MARATHON

By A.J. Crayon

The Messier Marathon is designed to encourage Deep Sky observing. By joining in with other marathoners you will enjoy companionship of those also involved. It will test your observing skills. If you are a club member in good standing then join in and do so just for the FUN OF IT.

If you decide to participate then be sure to read ALL of this information.

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

Although it is possible to do the marathon with a 4" telescope I wouldn't suggest this unless you are an experienced observer. Don't forget to check off each object as it is observed.

Plan on arriving at the site early enough to set up the telescope and allow it to reach thermal equilibrium. Be sure to fill out the heading of the attached form!

The Marathon this year affords the optimum conditions of finding 107 objects. The three most difficult to impossible ones are M33, M74 and M77. Next in line for difficulty are M31, M32, M110, M30 and M76.

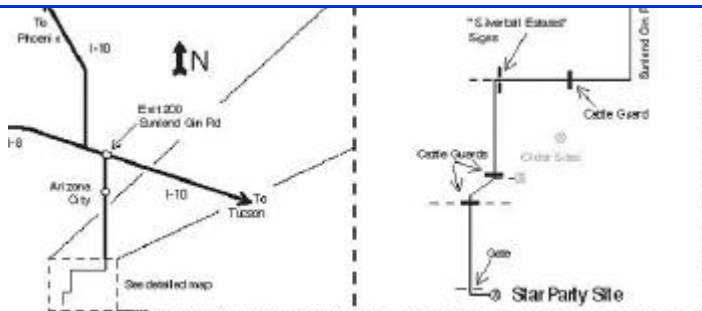
If you plan on participating in the Marathon then doing some homework ahead of time will pay dividends. If interested the check off list can be made available prior to the marathon. Study the catalog along with your star atlas to develop your own process. Be prepared in case it becomes cloudy and the sequence has to be altered.

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

Not interested in the marathon? Come anyway, you are also invited for deep sky observing, planetary observing, astro photography or just plain old relaxing under a dark sky!

## Solar Data

	April 1	April 2
Moonset:	3:57 pm	Ast twilight: 4:50 am
Sunset:	6:49 pm	Moonrise: 5:14 am
Ast. Twilight:	8:11 pm	Sunrise: 6:11 am



Take I-10 to exit 200 (Sunland Gin Road). From here it is about 29 miles to the site. Turn right (south) after exiting the freeway. After about 15 miles, the pavement ends and about one mile further, the road turns sharply to the west. After another four miles, the main road will turn south just after the "Silverbell Estates" signs. Three miles past the signs, the road will veer off to the west, and five miles further, the road will pass through a gate. Turn left immediately after the gate and continue for another 2/3 of a mile, driving over a fence. The site is to the right.

## Small Meade Equatorial Mounts: Old & New

### A Product Review By Curtis Taylor

**Old:** I purchased this mount (along with a splendid 8"f/6) in 1984 from Meade/Crown Optics. All of the bearings were sloppy, so I had Connie Steigerwald (retired Master Machinist from Honeywell) rework the mount and replace all of the bearings. The mount then ran like a Rolex...only off a minute or so every day. It was able to carry a very heavy (30 lbs.) folded refractor and accurately track at high powers

**Flat Saddle Plate & Clamp Rings:** The old mount came with a nice set of clamp rings (either for 6" or 8" OTA's). The saddle plate was flat with holes at each end for the mounting bolts of the clamp rings.

**Power & RA Control:** The original drive required 60 cycle 110 volt AC. Field operation required the use of a 12-volt inverter (12 volts to 110 volts) which also had a variable frequency control that allowed fast and slow adjustments in Right Ascension. The clock drive was frequency sensitive so the normal 60-cycle output of the inverter could be adjusted  $\pm 10\%$ , either speeding up or slowing down the clock drive. This provided a very smooth and precise way for centering objects and adjusting for the different speeds of some objects.

**Hardware:** I replaced the leg bolts with heavier hardware and made it so one of the legs was easy to remove and replace. The equatorial head could be rotated in azimuth so that aligning the mount on Polaris was a simple matter of releasing the setscrews and turning the head to bring it into alignment. Replacing the original Allen set screws with Cap screws made this a little easier to do.

**Helpful Hint:** Allen wrenches that are silver/white or have handles on them are easier to find under **red light** when you drop them (in the dark), than the black wrenches. It is useful to carry a second set of backup wrenches.

Some scopes cannot be taken down without them.

**New (Meade Starfinder German Equatorial 6, 8, 10).** I purchased my second mount about a year ago. This new mount has a number of improvements; and, unfortunately lacks some features that were useful on the earlier version. I think all of these mounts are the same with the only differences being the strap size and the different counter-weights. I purchased the 10" model with the 25-lb. counterweight. Ordering the 10" mount provided me with the largest counterweight without any additional charge. My scope weight in at about 21 lbs. and the 25-lb. counterweight is set 1/3 down the length of the Dec shaft. This combination is very compact and shows little sign of ringing or vibration under windy conditions. It was necessary to remove the ring gear to get exact balance on the scope. There was too much drag in the mechanism even after the clutch had been completely released.

**Saddle plate & straps:** The new saddle does not have any OTA boltholes in the plate, so I had a machinist drill mine to match up with the adapter plate on my Maksutov-Newtonian. Two holes were drilled, one at each end of the saddle plate (just where the old ones would have been, oh well). I consider the felt lined straps are pretty much of a quality drop considering original heavy-duty rings Meade used to use.

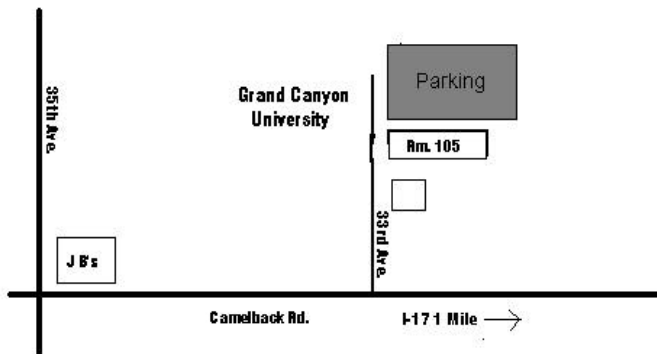
**Head, Pier & Legs:** The equatorial head is adjustable in azimuth in 120-degree increments (yes you guessed it, another **improvement**). Rather than threading the pier assembly with setscrews, the base of the head is now threaded. The old assembly could be rotated to align with North, now you get to lift and scoot the whole kit and caboodle, if you want the scope to track. The mount has a protract-

*(Continued on page 10)*

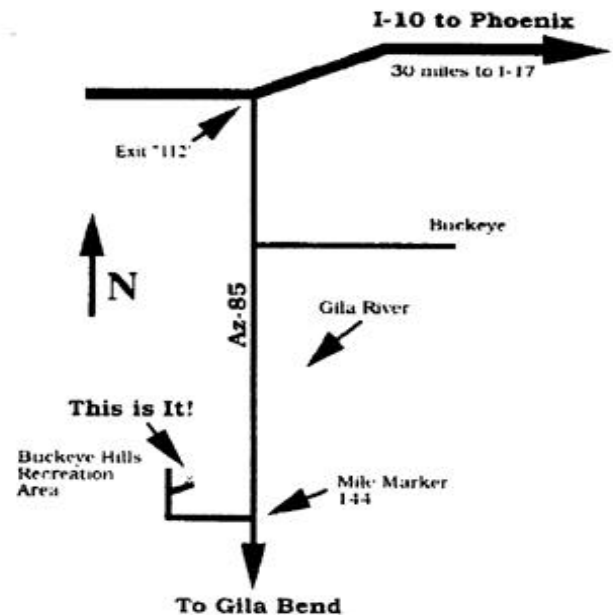
# SAC Meeting and Observing Sites

## General Meetings

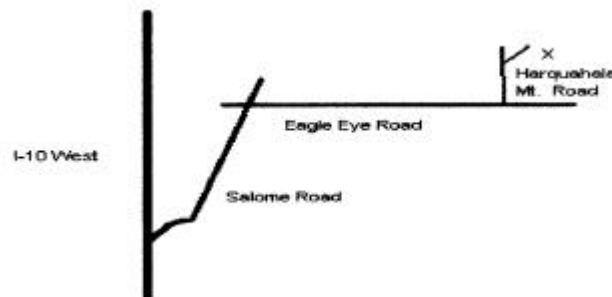
7:30 p.m. at Grand Canyon University, Fleming Building, Room 105: 1 mile west of I-17 on Camelback Rd., North on 33rd Ave., Second building on the right. Note: The I-17 exit at Camelback Will be Closed through October due to construction.



## Buckeye Hills Star Parties



## Eagle Eye Star Parties



(Continued from page 9)

tor at the polar axis pivot point and there is no place for a polar alignment scope. When I doubled checked the setting with an inclinometer on the dec. axis it was right on. I have bolted two of the legs on with standard nuts and washers, and use the originally supplied butterfly nuts on the leg that is removed and replaced each time I go out observing.

**RA Drive:** The drive runs on many AA batteries. Costco will sell you a millennium supply for a nominal charge. According to Consumer's Report all of these batteries are very close in quality, so let price be your guide and

store them at room temperature (refrigeration is a waste of time). Unfortunately, the only non-mechanical way to make fine adjustments in RA now requires the use of the very expensive Magellan II Digital Setting Circles. The creepy-cheapy plastic battery door is easy to lose (so check it each time you move the scope).

**Safety:** The lack of a power cord to trip over in the dark is a welcome improvement. A safety washer bolted at the end of the Dec shaft is a safety improvement over the old mount (an easy and worthwhile upgrade to any mounting

(Continued on page 11)

## SAC Membership Services

### Membership

Memberships are for the following calendar year and are pro-rated as follows:  
Jan.-Mar. 100%, Apr.-Jun. 75%; Jul.-Sep. 50%, Oct.- Dec, 25%

\$ 28.00	Individual Membership
\$ 42.00	Family Membership (one newsletter)
\$100.00	Business Membership (includes advertising)
\$ 14.00	Newsletter only
\$ 4.00	Nametag for Members

### Subscription Services

The following magazines are available to members. Subscribe or renew by paying the club treasurer. You will receive the discounted club rate only by allowing the club treasurer to renew your subscription.

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

**Please Print**

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

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

**Phone:** \_\_\_\_\_

**E-mail:** \_\_\_\_\_

Make Checks Payable to SAC

Mail Completed form to:

**Peggy Kain**  
SAC Treasurer  
4030 E Windrose Dr  
Phoenix AZ 85032-7435

*(Continued from page 10)*

system). The heavy (25 lbs.) counterweight uses a bolt rather than a setscrew, making it much easier to place the proper tension on the shaft. I use a 1-inch locking collar is to mark the balance point; which in turn allows rapid removal and replacement of the counterweight without having to re-balance each time.

**Meade Owner's Manual:** Very well written and easy to follow. Fight the temptation, read it first and maybe get another astronomer friend to help you double check everything on your first set up. I suggest that you do your first run

through at home and not at a remote site.

**Meade Customer Support:** Very good, tech support got back with me immediately with the solution to a problem I was having. I had called and left a voice mail, they returned my call within 48 hours.

**Who you gonna call?** Want more information... [www.meade.com](http://www.meade.com) (lots of neat photos and information)

[curttaylor@uswest.net](mailto:curttaylor@uswest.net) (always glad to help)

# SAGUARO ASTRONOMY CLUB

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*Videmus Stellae*

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

## SAC Schedule of Events

### SAC Meetings

January 21, 2000	July 14, 2000
Feb 18, 2000	August 11, 2000
March 17, 2000	September 15, 2000
April 14, 2000	October 13, 2000
May 19, 2000	November 10, 2000
Jun 16, 2000	December 9, 2000 (Holiday Party)

### Deep Sky Group Meetings

February 24, 2000	August 17, 2000
April 20, 2000	October 19, 2000
June 22, 2000	December 14, 2000

### SAC Star Parties

Date	Sunset	Astronomical Twilight Ends	Moonrise
1/29	1759	1924	0245
2/26	1824	1947	0131
3/25	1846	2010	2320
4/22	1907	2036	2350
5/27	1932	2111	0224
6/24	1944	2126	0056
7/22	1937	2114	2329
8/19	1911	2040	2204
9/23	1825	1948	0244
10/21	1750	1912	0141
11/18	1727	1853	0039
12/16	1725	1854	2336