

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



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v3.25

1997 Arizona Marathon

by A.J. Crayon

This year's Marathon was held on March 8th at a site south of Arizona City, AZ. It was attended by 66 telescopes and an assortment of anxious observers. This, the fifth consecutive Marathon, was attended by members of four of the more active astronomy clubs in Arizona: East Valley Astronomy Club, Scottsdale; Saguaro Astronomy Club, Phoenix; Tucson Amateur Astronomical Association and the astronomy club at the University of Arizona.

1997 Messier Marathon Results

Count	Name	Optics	Club
109	The Alber's	8" f/6N	EVAC
	Carl Anderson	8" f/6N	UofA
	Steve Bell	8"SCT	EVAC
	Paul Dickson	8" f/4.5N	SAC
	Flynn Haase	8" f/4.5N	UofA
	Bill Peters	8" f/4.5N	SAC
	Bernie Sanden	12" f/5.1N	EVAC
	Bruce Walsh	14.5"	TAAA
	Charles Whiting	13" f/4.5N	SAC
108	Joe Goss	10"SCT	SAC/EVAC
107	Bob Gardner	10" f/4.5N	SAC
	Jack Jones	10" f/4.5N	SAC
	Wayne Thomas	?	SAC
101	Marcel Geltner	8"SCT	UofA
83	Rick Rotramel	16" f/4.4N	SAC
67	Steven White	12.5" Dob	UofA
51	Miwa Morita	8"?	UofA
26	Tom McGrath	8"SCT	SAC

Arrival time was around 5pm and there were already over a dozen scopes set up — waiting. Some had even been setup the night before! Those observers were boasting that there were no clouds then, as there were alto cumulus clouds currently in the sky.

I was met by a number of SAC observers, including Brian Workman and Ken Reeves. I also spent some time talking to old acquaintances Diane and Manfred Alber as well as Sam Herchak and Anne Beebe, all from EVAC. Meandering around the field I spoke with UofA Marathoners Carl Anderson, Marcel Geltner, Flynn Haase, Miwa Morita and Steven White; who all finishing quite well.

As the sun set, clouds exited the sky in many directions; much to the delight of all in attendance. As

Quick Calendar

SAC Star Party
Buckeye Hills Recreation Area
Saturday, March 29

Sentinel Star Gaze
Sentinel, Arizona
Saturday, April 5

SAC Meeting
7:30 PM, Friday, April 25

SAC Star Party
Buckeye Hills Recreation Area
Saturday, May 3

darkness began to fall Tom Polakis came over to show Comet Hale-Bopp, very low in the northwestern sky, to Rich Walker, several others and myself.

As darkness descended, the Marathon began in earnest! Zodiacal light up through the Pleiades, at the zenith, couldn't stop anybody's observing. One quickly heard calls of "I got M74" along with a thanks for the disappearing clouds!

Around midnight to 1 AM many took breaks in preparation for the morning rush.

Around 3 AM the visitor, Hale-Bopp, began with its tail rising over a mountain to the northeast. As time went on, more and more scopes were turned its way for a quick

SAC Officers

Area Code (602)

President	Adam Sunshine	780-1386 asunshine@netzone.com
Vice President	Gerry Rattley	892-5698
Treasurer	Regina Lawless	
Secretary	David Fredericksen	979-0513
Properties	Jack Jones	944-5488 jack.jones@cas.honeywell.com
Public Events	Rich Walker	997-0711
Deep-Sky Group	A.J. Crayon	938-3277 a.crayon@az05.bull.com
SACNEWS Editor	Paul Dickson	862-4678 FAX: 841-0509 dickson@primenet.com

peek. Simultaneously marathoners were scurrying to keep from falling behind. I succumbed, attached camera to scope and wasted film on the comet! As of the writing of this article the film hasn't been developed, so I don't know if I had a good time or not!

Meanwhile, the aftermath of the Marathon. We had the largest number of first place finishers with nine, new member Joe Goss captured second place all to himself and three SACers owned third. Certificates for 50 or more will go to five others. Long time SAC member Tom McGrath finished with 26. His lifetime high is 106 at a SAC Messier Marathon held in 1983.

A Marathon Experience

by Bernie Sanden

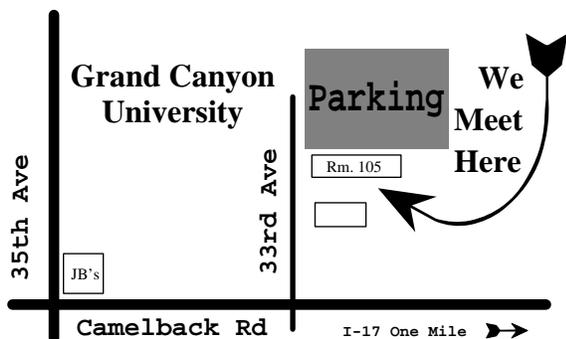
As A.J. Crayon, organizer of the SAC-sponsored 1997 Arizona Messier Marathon, handed me a form and walked off into the sunset, I was undecided about attempting the event this year. After all, there were plenty of other distractions tonight at the Arizona City site, such as Don Jones' 30" Obsession set up ten yards away and my newly-found need to photograph comet Hale-Bopp rising. For that reason, I had done nothing to prepare for a marathon session. Last year, the Marathon had a special lure, as the sun position in the sky allowed all 110 of the Messier objects to be seen in one night. You can well imagine the inward struggle as I wrestled with the idea of cutting my Australia observing trip short last March in order to get

back and attempt that Marathon (yeah, right). The two previous years I "raced" in the marathon my total count was a disappointing 106, stunted by persistent evening and morning clouds and the less favorable sun position. Although I knew M30 was out of the question this year, there was no such limitation in sky transparency, as the evening clouds effectively retreated beyond the southeastern horizon just as the zodiacal light began to stretch towards the Pleiades above. This particular dusk held a special meaning for me, as I managed my first naked eye observation of Hale-Bopp in the evening sky. After checking M 31 and it's companions M 32 and M 110, it became apparent to me that most of the Messier objects were accessible this night, so off I went "to the races." Adopting a self-rationalizing stance, I decided it was probably a good idea to look at all the M-objects at least once a year anyways.

Picking off the tougher evening objects was relatively routine, as the sky darkened and the last trace of clouds dissipated. The seeing settled down after an hour or so (mirror equalizing?) allowing quality views of most objects. I used a 32mm Plössl exclusively in my 12.5" f/5.1 Newtonian, yielding about 50X and a bit over one degree field of view. Although most M-objects are plainly visible in a 60mm finder, those that aren't are better hunted down with wide-field aid. After 40-something Autumn and Winter objects, it was time to wait for the Virgo galaxies to rise. Joining others warming up in Sam and Anne's camper, I realized a large percentage of the group were not 'running the marathon' but instead were content to catch some Winter deep-sky views, some rest, and wait

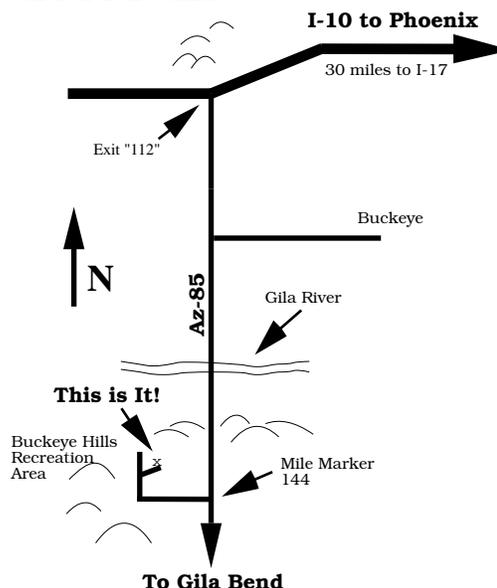
Directions to SAC Events

SAC General Meetings 7:30 PM at Grand Canyon University, Fleming Building, Room 105 — 1 mile west of Interstate 17 on Camelback Rd., north on 33rd Ave., second building on the right.



SAC Deep Sky Subgroup Meeting at John & Tom McGrath's, 11239 N. 75th St., Scottsdale, 998-4661 — Scottsdale Rd. north, Cholla St. east to 75th St., southeast corner.

SAC Star Parties at Buckeye Hills Recreation Area Interstate 10 west to Exit 112 (30 miles west of Interstate 17), then south for 10.5 miles, right at entrance to recreation area, one-half mile, on the right. No water and only pit toilets. Please arrive before sunset; allow one hour from central Phoenix.



for the comet to rise.

After an hour or more, I returned to my scope and navigated the Virgo galaxies. I found Vickers' *Deep Space CCD Atlas* instrumental in confirming many of them. Coming upon the Messier globulars of the Spring sky, I impatiently picked them off low in the east. Others were snatched out of the glow of Tucson, which made a 5 degree high light dome to the southeast. Again, it was time

to take a break and allow Earth's rotation to bring the summer objects into better position. With heavenly timing, Hale-Bopp's tail suddenly appeared from behind a mountain to the east. The bright dust tail provided a sharp, silhouetted view of the mountain's rugged profile through the scope. A long episode of photography and comet-watching ensued, as I took in spectacular views care of Rick Rotrammel's 11X80 binoculars, Gerry Rat-

Comet Comments

by Don Machholz

(916) 346-8963 CC224.TXT March 9, 1997
DonM353259@aol.com

1995 O1 (Hale-Bopp)					
Date	RA-2000-Dec	Elong	Sky	Mag	
03-23	00h20.2m	+45°46'	45°	E	-1.1
03-28	01h10.4m	+45°38'	44°	E	-1.2
04-02	01h57.5m	+44°11'	42°	E	-1.1
04-07	02h38.9m	+41°43'	41°	E	-1.0
04-12	03h13.8m	+38°38'	39°	E	-0.8
04-17	03h42.9m	+35°16'	37°	E	-0.6
04-22	04h07.0m	+31°53'	35°	E	-0.3
04-27	04h27.2m	+28°34'	33°	E	-0.1
05-02	04h44.2m	+25°23'	31°	E	-0.4
05-07	04h59.2m	+22°25'	29°	E	-0.1
05-12	05h12.4m	+19°38'	28°	E	0.1

Comet Hale-Bopp continues to put on a spectacular display. The inner coma shows fountains and hoods while both the gas and dust tails are prominent. By late March the comet is well-placed in the evening sky and no longer visible the morning sky. The evening viewing "season" for Comet Hale-Bopp begins with the partial lunar eclipse on March 23 (the moon will be in the evening sky before that date), and continues through the first week of May. Most comet watchers will have their last view of the comet as it slips southward in the western evening sky in early May.

Many astronomy clubs are taking the time to show the comet to the public. **Astronomy Day** (April 12) provides an opportunity to show the comet and the crescent moon in the west, and a bright planet Mars in the east.

A few more faint comets have been discovered recently. **Comet C/1996 R3** was found on plates taken

last autumn, it will remain faint. **Comet C/1997 D1 (Mueller)** was found by Jean Mueller as she worked on the Second Palomar Sky Survey. It will be closest to the sun late this year (at 2.24 AU) and may then be visible in amateurs' scopes. Finally, the Spacewatch program on Kitt Peak picked up an object first believed to be an asteroid but now showing a coma. **Comet C/1997 BA6 (Spacewatch)** is presently 8.8 AU from the sun and won't reach perihelion (3.45 AU) until Dec. 1999-nearly three years away. The coma is showing a slight amount of activity, and it is possible that the comet will be visible in amateur instruments deep in the Southern Hemisphere in 1999.

46P/Wirtanen					
Date	RA-2000-Dec	Elong	Sky	Mag	
03-23	02h58.6m	+17°55'	45°	E	10.3
03-28	03h19.9m	+20°10'	46°	E	10.4
04-02	03h41.9m	+22°16'	46°	E	10.5
04-07	04h04.5m	+24°10'	47°	E	10.6
04-12	04h27.6m	+25°50'	47°	E	10.8
04-17	04h51.1m	+27°16'	48°	E	10.9
04-22	05h14.8m	+28°25'	48°	E	11.1
04-27	05h38.6m	+29°17'	49°	E	11.3
05-02	06h02.5m	+29°54'	49°	E	11.5
05-07	06h25.7m	+30°14'	49°	E	11.7
05-12	06h48.4m	+30°18'	50°	E	12.0

81P/Wild 2					
Date	RA-2000-Dec	Elong	Sky	Mag	
03-23	08h01.7m	+21°59'	115°	E	10.1
03-28	08h08.2m	+21°54'	112°	E	10.1
04-02	08h15.6m	+21°43'	109°	E	10.1
04-07	08h23.9m	+21°28'	106°	E	10.1
04-12	08h33.0m	+21°07'	103°	E	10.2
04-17	08h42.8m	+20°41'	101°	E	10.2
04-22	08h53.3m	+20°09'	98°	E	10.2
04-27	09h04.2m	+19°32'	96°	E	10.3
05-02	09h15.7m	+18°50'	94°	E	10.3
05-07	09h27.4m	+18°02'	92°	E	10.4
05-12	09h39.5m	+17°10'	90°	E	10.4

Orbital Elements

Object:	Hale-Bopp	P/Wirtanen	P/Wild 2
Peri Date:	1997 04 01.13453	1997 03 14.14299	1997 05 06.62789
Peri Dist:	0.9141030 AU	1.0637469 AU	1.5826156 AU
Arg/Peri (2000)	130.59083°	356.34322°	041.77000°
Asc Node (2000)	282.47069°	082.20387°	136.15458°
Incl (2000):	089.42936°	011.72255°	003.24276°
Eccentricity:	0.9950969	0.6567490	0.5402220
Orbital Period:	~4700 years	5.46 years	6.39 years
Reference:	MPC 28052	MPC 27080	MPC 28272
Epoch:	1997 03 13	1997 03 13	1997 04 22
Absol Mag/"n":	-1.5/4.0	9.0/6.0	7.0/6.0

tley's 14" Newtonian, and Pierre Schwaar's 8" binocular chair. The unofficial consensus seemed to be that the "bow shock" structure emanating south of Hale-Bopp's core was actually a helical coil of jet material ejected and left behind from the rotating comet. Pierre's binocular chair view seemed to crystallize for me a 3D image suggesting depth — the 'helicoil' appeared to project straight back from the nucleus as we viewed it from an oblique angle. Had anyone present tonight ever witnessing comet dynamics having this magnitude of complexity? I was in awe. But now it was time to get back to the Marathon, as there were nearly twenty objects down the homestretch.

While hunting for one particular globular, a trio of satellites in a stable arrangement drifted through my eyepiece field. I had never seen anything like it, three satellites within a degree field of view, moving in what appeared to be a locked formation. Observers in the immediate vicinity that witnessed my surprise (that is, a couple of yelps) were treated to the same view. Back to the deep-sky, M55 was somewhat difficult low in the southwest, as dawn approached. It took some celestial fishing to locate M72 as, by then, dawn was underway. I located M73 — a quartet of stars just to the west — by allowing the sky to drift as my Dobsonian sat motionless. I called over Bill Peters to verify both objects. With that I was finished, knowing that M30 was still below the horizon and the sky now brightening rapidly. I continued to observe Hale-Bopp as dawn came on strong, satisfied that I had filled the Marathon night with all it had to offer. Once again, the lure of the hunt caught up with me and I had been drawn in. 109 objects was the final count, and I never felt the slightest bit rushed. A good, clear night is all we ever ask...oh, except maybe a fighting chance at 110 objects. That chance will come again.

Ramsden Eyepieces

by Jay Reynolds Freeman

freeman@netcom.com

I was at Fremont Peak State Park, near Salinas, California, on September 7–8, 1996. I did something I had been meaning to do for a while, but had kept forgetting: I brought along a set of Ramsden eyepieces, one each of inch, half-inch, and quarter-inch focal length.

The Ramsden is a quite old design; it was first described in a 1782 paper by its inventor, Jesse Ramsden. In simplest form, it comprises two identical plano-convex lenses, both made of any garden-variety crown glass (such as a good grade of window glass), separated by their focal length, with the convex sides facing each other. Such a simple device is inexpensive: I bought several Ramsdens new in the early 1980s, at prices of about ten dollars each. Recently I obtained some used ones at comparable cost. And when I was a kid, I even made a few, using cheap lenses from Edmund Scientific.

Ramsdens have several flaws, compared to modern designs. First, the apparent field of view is quite narrow; 35 degrees is typical. For many people, that's about two hand spans at arm's length — no porthole to the heavens, this.

Second, in the classic design, the front lens ("field lens") of the eyepiece is at the focal plane of the back lens ("eye lens"); thus when you look through the eyepiece, any bits of dust on either surface of the field lens will be in reasonable focus, and will be very annoying. For this reason the Ramsden was never very popular for terrestrial viewing, with brightly-lit fields, but the problem is less noticeable when most of the background is dark sky. Variations of the design, in which the two lenses have different focal lengths and are separated by half the sum of their focal lengths, reduce this problem.

Third, Ramsdens do not work well at the fast f numbers that characterize an increasing number of modern telescopes. I once did comparison testing with my set on a variety of Schmitt-Cassegraine Telescopes, long-focus Newtonians, and fast Dobsonians, at a star party, and confirmed this assertion. Much below about $f/7$, forget it!

On the other hand, the design has some often-unappreciated virtues, even beyond low cost. There are only four air/glass interfaces, and many of the Ramsdens on the market a generation ago were made from military-surplus lenses, which often had very high standards for quality of polish. Thus scattered light is often very low, even compared to the best of modern eyepieces. If such a Ramsden is coated (I have never seen or heard of one being multicoated) and its interior is well-blackened, the view is then remarkably glare-free.

Furthermore, Ramsdens have superb color correction, often much better than newer designs which use several glass types and achromatic lenses. Just how one gets superb color correction out of two identical hunks of window glass, I will leave as an exercise for the reader, whose successful solution will demonstrate that there is a good deal more to optical design than picking wild glass types out of a manufacturer's catalog. Jesse Ramsden was a smart man.

Anyhow, the proof of the pudding is in the eating, and what prompted this report was one particular test. One local observer was at the Peak with his six-inch $f/9$ Astro-Physics refractor. He had expressed curiosity about my Ramsden set in the past, so I asked if he would like to try one out. Seeing was okay — diffraction rings continuously visible and occasionally steady, good enough that later in the evening we successfully elongated gamma-two Andromeda in this instrument, at 560x. So we pointed the six-inch at Saturn. The owner was using his Takahashi 7.5 mm eyepiece (186x). I don't know for sure what design the Takahashi uses, but it was certainly a nice view — the Cassini division and the crepe ring were visible, as were two broad, shaded bands in the north and south temperate zones of the planet's disc.

Fuzzy Spot

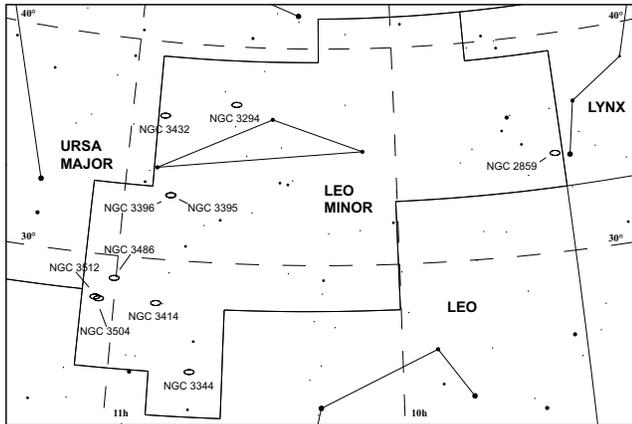
by Ken Reeves

Leo Minor

April 1997

This time of the year brings us away from the Winter Milky Way with its clusters and nebulae and into the Spring "Galaxy Zoo." For example, the SAC Deep-Sky Database contains 69 objects in Leo Minor of which only 3 are not galaxies (and these are listed as non-existent NGC objects).

Leo Minor is a small constellation in an area north of his big brother (or perhaps her big sister) and just below the hind feet of the big bear. The leading stars (α , Mag 3.9, β , Mag 4.4, and γ , Mag 4.5) form a flattened triangle. Surprisingly, I could not find an Alpha star in any of the references I have.



This constellation contains quite a number of *Herschel 400* and *SAC Best of the NGC* objects, and although it doesn't have many bright stars, I found it pretty easy to star-hop around here. So let's delve into Leo Minor and see what is available.

NGC 2859 (09h24.3 +34°32') This galaxy appeared as pretty small, somewhat bright, a slightly brighter middle with a very prominent stellar nucleus, and round. Averted vision helped bring out the halo a little. The galaxy forms a shallow triangle with stars to the W and S.

NGC 3294 (10h36.3 +37°20') This is a nice elongated galaxy WNW/ESE, somewhat bright, fairly large, little brighter in the middle, but without a nucleus identified. Averted vision helps bring out the middle. I also saw some possible mottling on this galaxy.

Then I put in my quarter-inch Ramsden (6.35 mm, 220x). I was gratified to hear the owner of the six-inch make the unsolicited comment that the view through the Ramsden was excellent. I myself thought so — to me, the planet appeared at least as sharp and perhaps a tad more glare-free with the Ramsden than with the Takahashi eyepiece, but the owner knows his own equipment better than I do, and is more into planetary work than I am. (He has a lot of first-rate equipment that he uses regularly, includ-

NGC 3344 (10h43.5 +24°55') This is a very interesting galaxy with two stars involved. The galaxy itself is pretty large, somewhat bright, and a possible nucleus seen to the W of the stars. It appears to be elongated E/W, but this is very hard to tell due to the stars. Averted vision brings out some possible mottling.

NGC 3395 (10h49.8 +32°59') and **NGC 3396** (10h49.9 +32°59') This pair of elongated galaxies forms a backward "L" shape. 3395 is the brighter of the two, I called it pretty small, pretty faint, brighter in the middle, no nucleus seen, and elongated N/S. 3396 is a little bit smaller and fainter than 3395, is also brighter in the middle, but, unlike 3395, has a nucleus that comes and goes. It is elongated E/W. The galaxies are almost touching.

NGC 3414 (10h51.3 +27°59') This round galaxy sits in a nice field of stars (which, at least at my aperture, is more interesting than the galaxy). The galaxy is somewhat bright, somewhat small, has a slightly brighter middle and a definite stellar nucleus. Averted vision helps bring out the halo a little.

NGC 3432 (10h52.5 +36°37') This is a beautiful edge on galaxy which is large, a little faint, and extremely elongated WSW/ENE. It is pretty even with no brightening towards the middle noted, but some possible mottling seen. On the W end of the galaxy there are 2 stars and another star on the E side, not quite at the end. I thought the star on the E was a double, but investigating photos show that there is only 1 star. The combination of the stars and the edge on galaxy definitely makes this my favorite of the galaxies seen so far in Leo Minor.

NGC 3486 (11h00.4 +28°58') Though this round galaxy is pretty large, it is somewhat faint with a little brighter middle and contains an nucleus that is only occasional seen. Nearby stars include one to the N and a second fainter one to the S which is just within the halo.

NGC 3504 (11h03.2 +27°58') This galaxy is fairly bright, fairly small, elongated WNW/ESE, much brighter in the middle with a non-stellar nucleus. Just to the E is galaxy **NGC 3512** (11h04.0 +28°02') which is pretty faint, pretty small, round, with a slightly brighter middle. Averted vision really helps with this one (until the clouds move in, then it doesn't help at all!)

Herschel 400 Objects

2859, 3245, 3277, 3294, 3344, 3395
3414, 3432, 3486, 3504

SAC's 110 Best of the NGC Objects

3344, 3423

ing several refractors of the same quality as the six-inch, and a box full of eyepieces comparable to the Takahashi.)

Thus we ended up concluding that at least at $f/9$ and slower, a ten-dollar eyepiece made to a design two centuries old is a first-rate ocular for work that does not require a wide field of view, such as observation of planets or double stars. It is a sad testimonial to the stupidity of telescope marketers and the gullibility of us, their customers, that such eyepieces have all but vanished from

catalogs. If they were still available, and properly appreciated, the market for entry-level telescopes would surely be larger, and the supply of new customers greater, for beginners on a budget would no longer believe that they had to spend more on a collection of whizzy eyepieces than on their telescope itself. They would no doubt learn about the legitimate virtues of fancy, expensive equipment later.

Ramsden Eyepieces How They Work

by Jay Reynolds Freeman

The problem with color correction which Ramsden eyepieces address so well, so simply, is chromatic difference of magnification, also known as lateral color or lateral chromatic aberration. The issue is, that if the focal length of an eyepiece is different in different wavelengths of light, then the magnification it produces will similarly vary with wavelength. What one sees will be a superposition of images of different colors, which have different sizes! Thus, anywhere away from the optical axis, colored fringes will be present wherever there is an abrupt change in brightness or color, because the “different images” don’t line up exactly.

Many binoculars have lateral color. Point one at something like a dark-colored telephone pole in silhouette against either the white wall of a building or a cloudy sky. Sweep the binocular so that the pole is at the edge of the field, then look for color at its edges, red on one side and blue on the other.

Simple lenses have focal lengths that vary with wavelength, and in crown glass, the difference is something like 1.5 percent between blue and red. Thus if you use a simple lens as a telescope eyepiece, the magnification will vary by 1.5 percent between blue and red, and you will see colored fringes to things whose widths are something like 1.5 percent of the distance the object is away from the center of the field of view. If we take the resolving power of the eye to be three arc minutes (your mileage may vary), then in order for the fringes not to be noticeable, we must restrict the apparent field of view to a radius of 200 arc minutes, so that the whole field may not exceed 6.6 degrees in apparent diameter. That is about the width of three fingers at arm’s length — tunnel vision indeed.

Now consider an eyepiece made with two lenses, whose focal lengths are F1 and F2, separated by distance D. From simple lens theory, the focal length of the combination is $(F1 \times F2)/(F1 + F2 - D)$. And now we can see how a Ramsden eyepiece works. For definiteness, suppose that F1 and F2 are both exactly 10 mm in red light, and that D is also exactly 10 mm. The combination will have a focal length of $(10 \times 10)/(10 + 10 - 10)$ mm, or 10.0000 mm, in red light, so that if we use it on a telescope of one meter focal length, the red-light magnification will be 100.000. Now if the lenses are “typical”

crown glass, each will have a focal length of 9.85 mm in blue light, so that the eyepiece focal length in blue will be $(9.85 \times 9.85)/(9.85 + 9.85 - 10)$ mm, or $(97.0225)/(9.7)$ mm, or 10.0023 mm, and the magnification with our one-meter focal-length telescope will be 99.977; and similarly for other wavelengths.

Do you see what has happened? Because of the way the formula for the combination of two lenses works, a focal-length difference of a percent and a half between red and blue for each lens separately has become a difference of only 2.3 HUNDREDTHS of a percent for the combination, and for its lateral color. Our eyepiece will not have its usable apparent field limited by fringes—some other aberration (and there are plenty) will have to do the job...

If you play with the formulae algebraically, you find that for lateral color to be corrected through first order, D must be half the sum of F1 and F2, a condition that is also met by several common variants of the Huygenian eyepiece design. Common variants on the Ramsden have F1 somewhat different from F2, but with D still equal to half their sum, which gets the field lens out of sharp focus but preserves the excellent correction of lateral color.

Much less desirable variants use F1 equal to F2 but reduce D, which gets the field lens out of sharp focus but at the expense of increased lateral color. For example, reducing D to 0.8 of F1 (which still equals F2) brings the lateral color back to about half a percent in the sample eyepiece described, which is noticeable at an apparent field of about twenty degrees. (It also changes the focal length of the eyepiece, of course.)

Newsletter Deadline

Mail items for Such-a-Deal at least two weeks before the end of the month. Articles that need to be published in a timely fashion must be submitted or the newsletter editor notified of the article at least 6 weeks before month they are published. Items arriving too late for an issue will be included in the next newsletter.

Bits and Pieces

Cruise to '98 Eclipse

Steve Coe

As many of you know, there is an excellent solar eclipse on Feb. 26, 1998 near the Caribbean island of Aruba. Princess Cruises is planning a week long cruise into the path of the eclipse and you can join in with the Arizona eclipse chasers. There are 15 double occupancy cabins now available and they will go quickly on the sparkling new ship, Dawn Princess.

A deposit of \$200 will be required to confirm and hold your space on the cruise, with the total amount due by Nov. 1, 1997.

Welcome Aboard agency is holding three cabin types: 8 are BB category, which are outside/balcony cabins @ \$2,172 per person; 1 is F category, which is an inside cabin @ \$1,846 per person; 6 are JJ category, which are inside cabins @ \$1,712 per person.

This price includes round trip air fare to and from San Juan, Puerto Rico and all applicable port taxes for stops in St. Thomas, Dominica, Grenada and Caracus.

Our travel agent for this darkness at noon rendezvous is Biff Treston at Welcome Aboard in Scottsdale, Arizona. He is not an astronomer, but is learning by being around me for several hours. Biff can certainly answer any questions you might have concerning the cruise ships or accommodations. You may reach him at 946-5333 during the day, or 486-2819 at home; speak to Biff or Hymie.

I know that this seems very distant, but putting a group of this size together requires advance planning. I have no doubt that a winter eclipse in the Caribbean will attract large numbers of observers, so get on the phone to Biff or Hymie if you are interested in sailing to an eclipse.

Being an active Arizona astronomer for 20 years, I

know for a fact that there are lots of interesting, exciting, knowledgeable and fun-loving folks around here. That is really the motivating factor about trying to get this together, an opportunity to meet and spend some time with a fun bunch under the Moon's shadow!

Minutes from the January Meeting

The January meeting was called to order by Gerry Rattley at 7:30.

Any guests were asked to introduced themselves and we had 4 guests in attendance. Gerry spoke about being the president for 1997 since we didn't have one elected in November. Jack Jones volunteered to become the Properties Director so that Adam Sunshine could be the president for 1997. He will take over in February. The vote was unanimous.

Regina gave the treasurers report. She reported that the Observers Handbooks were in and could be picked up.

Rich Walker talked about some public events. It was suggested we do a public event for Hale-Bopp. We are going to have the event on March 23 at Thunderbird Park.

The 1997 Sentinel Star Gaze

April 5, 1997

This is the sixth annual Sentinel Star Gaze, sponsored by SAC's Deep Sky Group. Sentinel is a remote site situated between Gila Bend and Yuma (about 100 miles southwest of Phoenix) making for a very dark sky. On the day of the event sunset is just before 7 PM, with twilight ending at 8:20. Those staying the entire night can expect twilight to start at 4:50 AM, the Moon to rise at 5:48, and sunrise at 6:14 AM. For those of you with computers, the Sentinel site is at 32° 49.7' North by 113° 12' West, at 625 feet above sea level.

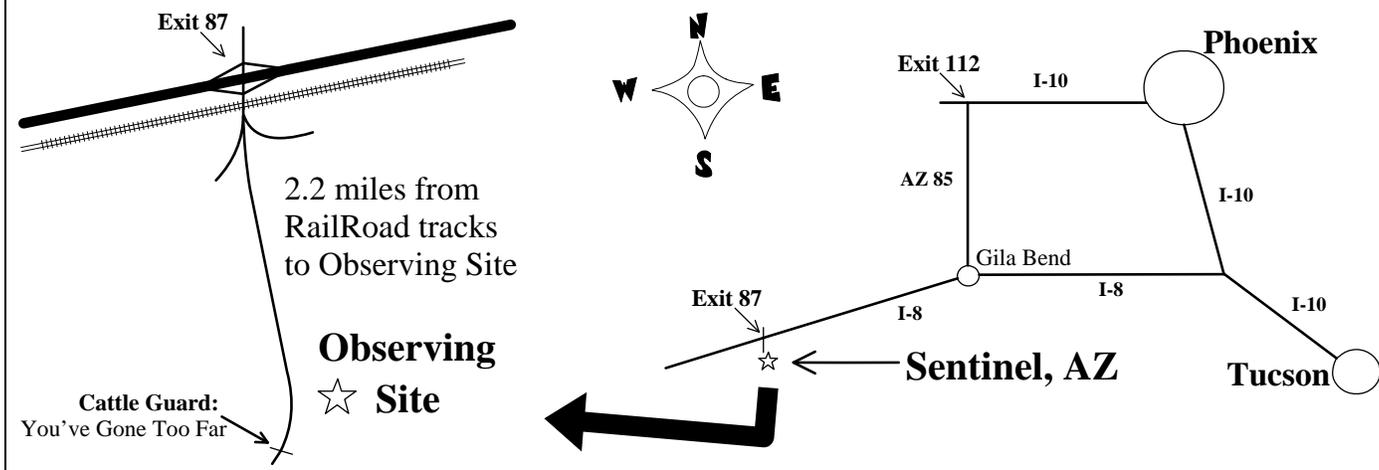
Although this is officially a one night event, frequently observers get a head-start by arriving the night before, to get an extra night of observing.

Sentinel is a good two hours drive southwest from down-town Phoenix. Please try to arrive before sunset.

A Port-a-Pottie will be provided, but there are no other facilities. Expect cold weather and hungry flying insects during twilight — let's hope we get neither.

Star Party Etiquette

1. **Do Not Litter!** If you bring it with you, please take it when you leave.
2. **No White Lights after Dark!** Use only dim red lights after sundown.
3. **Park Based on Your Observing Plan. Plan Your Departure.** Park facing towards the exit to avoid using your backup lights.
4. **Bring Observers Only.** Please leave small children and pets at home.
5. **Keep Noise to a Minimum.**



There will be a partial lunar eclipse also on this night as well as other things going on. It could be a big event for SAC. Our regular Public Star Party will be on May 10 at T-bird Park. Our Reach 11 Public Star Party is being set for April 12.

Paul Dickson showed us the finished Messier Logbook that he put together. They are \$15 each. He also had the charts for the Herschel 400 list.

A.J. Crayon discussed the Deep Sky Meeting coming up on Jan. 30. They will discuss the things in the Fuzzy Spots column. The Messier Marathon will be on March 8 at the Arizona City site.

Steve Coe talked about our 20th Anniversary party and the possibility of getting a room somewhere where we could show slides, etc. He also discussed the Eclipse Cruise. There were 5 rooms left out of the original 15 cabins.

We had several people for Show and Tell. Gene Lucas discussed the asteroid occultation that was done last December. Dean Ketelsen showed some slides of the making of the 8.4 meter $f/1.15$ mirror at the Steward Mirror Lab.

At the break there were 45 people at the meeting.

Due to the length of the meeting before the break, it was decided to postpone Gerry's talk until next month on supernovae. Steve Coe will be the March speaker and he will talk about Mars.

After the meeting, we adjourned to JB's for food and more astronomy stories.

—*David Fredericksen, SAC Secretary*

Minutes from the February Meeting

The February meeting was called to order by Adam Sunshine at 7:30pm.

Adam asked any visitors to stand and introduce themselves. We had around 7 visitors at the meeting.

Regina gave the treasurers report. She also reported that she has another 30 Observers Handbooks to sell so if you or anyone else wants one, let her know.

A.J. Crayon talked about the Deep Sky Group that meets at the McGrath's house. The Messier Marathon will be on March 8. A.J. awarded Jack Jones his Messier award for handing in his observations. Congratulations, Jack!! A.J. talked about a limited edition T-shirt. They will be \$12 each, so sign up now.

Rich Walker talked about a public event at Garden Lakes School and he would like to get 3 other people to help him. There is also the special public star party at Thunderbird Park on March 23. There will be lots of things happening that night. On April 12 we will be at Reach 11 and on May 10 back at Thunderbird Park.

Paul Dickson talked about the 110 Best of SAC and the Messier Book. He is now working on the Herschel 400 book.

Steve Coe discussed the 20th Anniversary banquet at Bud Brown's Barn on May 30. Give Regina your money

and the information for the night. There were maps to the Sentinel Star Party on April 5.

At this time, we had a slide show. Steve showed some astrophoto slides from Sentinel. A.J. also showed his pictures from Sentinel. Chris Schur showed us some great shots of the comet.

At the break, we had 53 people present.

After the break, Gerry Rattley gave a talk about supernovae. Gerry discussed the kinds of supernovae and how the types differ from each other. SUPER talk, Gerry!

The meeting was adjourned and we continued our discussions at JB's.

—*David Fredericksen, SAC Secretary*

An Astronomical Banquet

Celebrating 20 Years of the Saguaro Astronomy Club

On Friday, May 30th there will be a dinner banquet to celebrate the 20th year since the formation of the Saguaro Astronomy Club. The party is from 7 P.M. to 12 at Bud Brown's Barn, 909 E. Northern Avenue in Phoenix. It is east of 7th Street and Northern, just over the canal, watch for the sign on the right (south) side. The good news is that we will have the place all to ourselves, the place will be full of astronomers.

Several large tables will be set up to show off lots of photos of astronomical events, folks and scopes, deep sky astrophotography and anything else that could help celebrate all the fun that SAC has generated over the years. Those photos need to come from the participants, so bring that box or album of shots along to the party. A slide projector and video tape machine will provide the party goes an opportunity to show off their best images from 20 years of fun. With all the great photography, video and drawings that Arizona astronomers have generated, here is a great opportunity to be creative with your presentation. Arizona's largest astronomical show and tell, sounds like lots of fun.

The Anniversary Committee is trying to contact any past members of SAC who might wish to attend. So, if you know the whereabouts of folks who would be interested in coming to this celebration of 20 years of SAC, please let them know.

The banquet will cost \$20 per person and there will be a cash bar available. There are two meals to choose from: A 10 oz. Top Sirloin Steak or BBQ Chicken. All meals come with salad, bread, coffee or tea and dessert of either "double barrel" chocolate brownie or Arizona lemon cake. Hors d'oeuvres of salsa and chips will be served before dinner.

Please give your check to Dave Fredericksen at a SAC meeting or send it to her at: 6222 W Desert Hills Dr., Glendale, AZ 85304.

Getting Started Equipped and Organized

by Wil Milan

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As you become more involved with astronomy you soon end up with more and more, well, gadgets. At the outset perhaps you only had some binoculars, then perhaps you bought a small telescope. With the telescope there are of course multiple eyepieces and perhaps a Barlow lens, a diagonal, finder scope, mount, and for the mount perhaps a separate tripod, drive motors, batteries, cables, nuts and bolts, and more.

Everything becomes more complicated when you get a telescope. But it doesn't end there: You also have sky charts, probably some books and a current magazine or two that are useful to have when observing. And of course—I'm always forgetting this—the red flashlight. I'm so paranoid about forgetting a red flashlight that I have three of them stashed in different equipment packs so I'll always have one along.

The Problem

That burgeoning list of gadgets is not a problem for the fortunate few who live under dark skies and thus never have to travel with their equipment. The rest of us, however, face the very real logistical problem of how to pack up all the loose parts and equipment, travel to a dark site, set it all up, then later take it down and return, all in a short enough time to make the trip worthwhile. After all, no one wants to spend three hours packing, unpacking, re-packing if all that will leave only a half hour in which to observe. The trick is to streamline your packing and unpacking so it will take you no more than a few minutes to pack, unpack, and repack for return. How to do that? Herewith some effective ways to do that:

- The first thing you need is a set of high-tech, high-capacity, dust-resistant, padded and temperature-insulated equipment cases made for transporting expensive scientific equipment. Expect to pay several thousand dollars for these—or you can buy the scientific equipment cases sold in department stores as “picnic coolers.” No scientific expedition is complete without a few Igloo and Coleman “equipment cases.” Size up the equipment you'll bring, size up a few coolers, and for less than the price of a cheap eyepiece you'll have the same high-tech containers that are used to transport science gear to Everest and living human hearts to recipients. You might also buy one in which to store drinks; they work OK for that too.

- Get some foam padding. You can spend a small fortune buying expensive photo cases with foam padding, or for a few dollars you can buy a big block of foam which will serve to hold all those small gadgets and components

safely nestled and padded.

The important thing is to get the right kind of foam. Upholstery shops and some fabric stores sell foam by the block, but most of what they carry is yellow or white foam rubber for padding furniture. Never, ever use that kind of foam to store optical equipment: as it ages and dries it becomes crumbly and dusty, which will lead to your optics being covered with a fine coating of foam rubber dust.

The right kind of foam to use is what is used in camera cases. This is a porous gray foam (often called “charcoal gray foam” in the industry) which lasts much longer and is not prone to shedding dust. If you can't find it in upholstery or fabric stores try a camping-supply store; that kind of foam is often used for sleeping pads. If you see tiny silver-gray flecks shimmering within the foam as you view it, that's the right kind of foam.

I won't go into detail on how to cut the foam to fit the cases and the equipment because that will depend on the equipment you have. I find it helpful to cut out shaped holes for each item; that not only holds everything in place but I can glance at the holes in the foam and immediately tell if anything is missing.

- Last of all, make a list of what goes in each container and tape it to the inside of the lid. Not only does that jog your memory, but by having the list you can enlist helpers: “See that list? When you're done packing, everything on that list should be in there.”

What about the telescope?

Some telescopes either come with their own cases (in which case you're set) or are small enough to fit in a padded cooler (in which case you buy another cooler). But many scopes come in a throwaway packing box, yet are so large then don't fit in any cooler. (Though I wouldn't be too sure: Igloo makes some coolers so large that they look like white picnic coffins. Check around.)

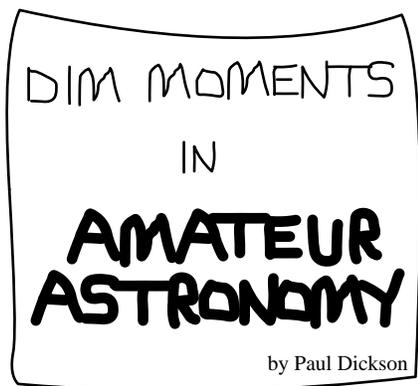
If you have a bigger-than-a-cooler homeless telescope, consider not packing it in anything at all. My two main scopes have traveled many, many miles strapped on the seat of my pickup or minivan, safely restrained and padded in the same manner as my own tender parts.. When in the minivan they even enjoy the protection of an airbag, something even the Hubble Telescope on the Shuttle does not enjoy.

The point is that you should have a safe and simple means to transport your scope. That includes the mount, of course, though mounts are typically quite sturdy and do not need as much pampering when traveling.

The other things

In addition to the telescope, mount, eyepieces, and other scope components and accessories (remember, you're going to make a checklist), there are a few other things you should take along which may not be obvious until you forget them:

- Spare batteries for the red flashlight
- Spare bulb for the red flashlight (unless it's the type which uses an LED, in which case the LED bulb will outlive you)



- A regular white flashlight: when you drop a small screw into the dirt, if you can't find it with the dim red flashlight often a bright white light will reveal it in an instant. It should be a last resort, but better to bring it than to wish you had it with you.

- A warm jacket. Even summer nights can turn chilly, no matter what the weatherman says. Be prepared.

- Insect repellent. In field astronomy the only thing worse than a swarm of clouds is a swarm of insects. Bring bug juice.

- Basic tools: screwdrivers (both Phillips and flat-blade), a small adjustable wrench and, most of all, a set of hex wrenches (also known as Allen wrenches). Most telescopes today are held together and/or adjusted with hex wrenches, and you would not want a tiny loose screw to ruin a whole trip. Bring whatever tools your scope and mount require.

- Sturdy shoes: Most dark-sky sites are in relatively primitive areas. Walking around in the dark it is very easy to step on rocks, roots, and thorns which can cause serious injury if you are wearing sandals or thin-soled shoes which do not provide much protection for your feet. In the dark you won't be able to see everything you're stepping on, so give your feet a little extra protection.

- Water: Take some water to drink, of course, but in addition take enough water that if you car didn't start you'd have enough water to last until someone finds you. This is particularly important in desert areas, where you can dehydrate in a few hours and where it can take gallons of water to stay hydrated. However much water you bring, make sure it's in containers which won't spill when jostled, squeezed, or tipped over on bumpy roads.

Some food is a good idea too; a little late-night snack makes it easier to stay awake.

- Toilet paper: When a trip to the restroom would require an hour of disassembly and packing plus a 40-mile drive, it pays to be prepared.

- Telephone: If you have a cell phone, bring it. Many remote areas are well served by cellphone service, and having a phone handy can often resolve an emergency faster than anything else. It can also have more mundane uses, such as calling a friend to look up something for you. And of course a cell phone is the quickest way to report that new comet you're bound to discover in the boonies.

Last but not least, always let someone know where you're going and when you'll be back. That's a basic rule to follow anytime you leave paved roads.

Practice makes, well, better

If the above seems too much or too cumbersome, be assured that it is not. Tens of thousands of astronomers spend millions of hours in the field every year, enjoying the clean air and dark skies. You can too, but a little preparation can minimize the work and maximize the enjoyment and safety.

The first time you go out you'll feel a bit overwhelmed and everything will take a lot longer than you thought. But you'll learn from the experience and each time you go out it will be easier and things will go quicker. Soon you'll have worked out a system and a routine that allows you to enjoy nights under dark rural skies with little fuss or effort—and then you can truly enjoy the best that astronomy can offer.

Large Crowd at Public Star Party

by Steve Coe

Well, we certainly had a lot of people who wanted to see Comet Hale-Bopp, a lunar eclipse and Mars, all in one night. Just as twilight started I walked around and counted 40 scopes set up and ready. At least another 5 or so arrived during twilight. People to use those telescopes started coming during twilight and seemed to never stop!

I estimated 800 people from the length of the lines at the scopes and the length of time that they persisted. When I got to work the next day at least one co-worker said that they gave up walking to the scope area because they could see the comet from where they were on top of the hill overlooking the crowded viewing site.

All in all, a large, but well behaved group and I certainly want to pass on a lot of "thank you's" from the people who attended.

Kevin Gill counted more than 600 people took a look through his scope. Apparently, even with all the large holes recently dug in the observing field, no one was lost.

— Paul Dickson

April 1997

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
All Times are Mountain Standard Time			Venus at superior conjunction (moves into evening sky)	PAS Meeting Brophy Prep. Physics Lab	Tomorrow Mercury at greatest elongation 19° (evening)	Sentinel Star Gaze Sentinel, AZ.
		1	2	3	4	5
Rest of U.S. goes crazy and moves their clocks forward one hour. Daylight-Savings Time starts	New Moon 4:03 A.M.		EVAC Meeting (SCC: Rm. PS172)			Astronomy Day
6	7	8	9	10	11	12
	First Quarter Moon 10:00 A.M.				Sun enters Aries 12 P.M.	
13	14	15	16	17	18	19
		Full Moon 1:35 P.M.		Mercury at inferior conjunction (moves into morning sky)	SAC Meeting Grand Canyon University, Fleming Rm. 105	
20	21	22	23	24	25	26
		Tomorrow Last Quarter Moon 7:37 P.M.				
27	28	29	30			

Magazines & Discounts

Club members may subscribe to astronomical magazines at reduced rates through the club Treasurer. See the Member Services Form on the back page of this newsletter. Furthermore, club members are encouraged to align their subscriptions with the Jan.–Dec. calendar year. This eases the burden both on the Treasurer and the Publisher by permitting a single Group Renewal to be placed in the autumn for the upcoming calendar year.

Those members who experience problems with their subscriptions to *Astronomy* magazine may call Kalmbach Publishing Customer Service at (800) 446-5489.

Those members who experience problems with their subscriptions to *Sky & Telescope* magazine may call Sky

Publishing at (800) 253-0245.

Besides the club discount on *Sky & Telescope* magazine, Sky Publishing offers club members a 10% discount on all other Sky publications. This means books, star atlases, observing aids, Spotlight prints, videos, globes, computer software, and more.

Club members who subscribe to *Sky & Telescope* through the Club Discount Plan may order Sky publications directly, at the above toll-free number, without going through the club Treasurer. Simply mention the Club Discount Plan and give the Saguaro Astronomy Club name to receive the discount. Sky Publishing will check their records to verify that you are eligible to receive the discount.

Saguaro Astronomy Club Member Services Form

Membership

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

- \$28.....Individual Membership
- \$42.....Family Membership (one newsletter)
- \$100.....Business Membership (includes advertising)
- \$4.....Nametag for members
- \$14.....Newsletter Only

Subscriptions

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.

- Sky & Telescope.....\$27.00 for one year
- Astronomy.....\$20.00 for one year

Write your name, address, phone number, and E-mail address in the space below.

Make checks payable to SAC.
Mail the completed form to:

Regina Lawless
SAC Treasurer
5808 E Turquoise
Scottsdale AZ 85253

SAC and SAC Meetings

Saguaro Astronomy Club (SAC) was formed in 1977 to promote fellowship and the exchange of scientific information among its members — amateur astronomers. **SAC** meets monthly for both general meetings and star parties, and regularly conducts and supports public programs on astronomy.

SAC meetings are usually held on the Friday nearest the full moon. This means that over the course of the year, meetings are not held on the same week of the month. The same is true of the club's star parties. Star parties at Buckeye Hills Recreation Area are mostly held on the Saturday of the third quarter moon.

SAC General Meetings: 7:30 PM at Grand Canyon University, Fleming Building, room 105 — one mile west of Interstate 17 on Camelback Rd, north on 33rd Ave., second building on the right. See inside for a map to the meeting location.

1997 SAC Meetings

Jan. 24
Feb. 21
Mar. 21
Apr. 25
May 16
Jun. 20
Jul. 18
Aug. 22
Sep. 19
Oct. 17
Nov. 14
Dec. 13 Party

1997 SAC Star Parties

Date	Sunset	Moonrise
Jan. 4	5:37PM	3:50AM
Feb. 1	6:03PM	2:35AM
Mar. 1	6:28PM	1:23AM
May 31	7:34PM	3:01AM
Jun. 28	7:44PM	1:43AM
Jul. 26	7:34PM	12:25AM
Aug. 30	6:58PM	4:56AM
Sep. 27	6:20PM	3:46AM
Oct. 25	5:46PM	3:33AM
Nov. 22	5:25PM	1:18AM
Dec. 27	5:31PM	6:22AM

SACNEWS

c/o Paul Dickson
7714 N 36th Avenue
Phoenix AZ 85051

Stamp

First Class Mail

Inside:

- 1997 Arizona Marathon by A.J. Crayon
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- Comet Comments by Don Machholz
- Ramsden Eyepieces by Jay Freeman
- Fuzzy Spot by Ken Reeves
- Ramsden Eyepieces — How They Work by Jay Freeman
- Getting Started by Will Milan
- Dim Moments by Paul Dickson

Sentinel Star Gaze — April 5
SAC Meeting — April 25