

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



February 1997 — Issue #241

v1.23

Getting Started Finding Your Way in The Sky

by Wil Milan

Part I

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One of the most frustrating things for new (and often not-so-new) astronomers is being unable to find objects in the sky. You read about wonderful object XYZ and see it plotted on a sky chart, but somehow you just can't find it in the sky no matter how hard you try. Or XYZ is listed only by its coordinates, but you can't figure out how the heck to point your telescope at those coordinates.

Relax; it's not that hard. In Part I of this series I'll start by reviewing how things are mapped in the sky, then in Part II discuss some simple methods and a few tips to make finding things easier. Really, it's not that hard, but you do need to understand the basic principles—read on.

The Celestial Sphere

The ancients used to think the sky was a giant dome or sphere with us in the center. These days we know that's not the case, but for purposes of mapping the sky it's useful to think as if it is: Think of the sky as a huge globe with the Earth at the center.

The huge globe of the sky appears to be revolving from east to west: stars rise in the east, move across the sky, and set in the west a few hours later. But not all stars rise and set: If you look above the northern horizon you'll notice that some stars appear only to revolve around a point in the sky, and that stars at or near that point hardly move at all: That point is the celestial north pole. (That's assuming you're in the Earth's northern hemisphere. If you're in the southern hemisphere the point which doesn't revolve is above the *southern* horizon and is the celestial *south* pole.)

Just like the Earth's north and south poles are stationary as the Earth revolves, so the north and south cele-

Quick Calendar

SAC Star Party
Buckeye Hills Recreation Area
Saturday, February 1

SAC Meeting
7:30 PM, Friday, February 21

SAC Star Party
Buckeye Hills Recreation Area
Saturday, March 1

Arizona Messier Marathon
Arizona City Site
Saturday, March 8

Have You Renewed Your Membership Yet?

See the Membership Services
Form on the Back Page

tial poles (which are the points directly above the Earth's north and south poles) appear stationary as other stars revolve around them.

Halfway between the north and south celestial poles lies the celestial equator, a line which runs all the way around the sky dividing the dome of the sky into northern and southern hemispheres. The celestial equator is

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DIM MOMENTS
IN
**AMATEUR
ASTRONOMY**
by Paul Dickson

STAR HOPPING
WORKS BEST...

...IF YOU
START FROM
THE SAME
STAR ON THE
STAR CHART

not marked in the sky (too bad — it would be handy) but its general location is easy to find: In winter skies it runs through the top of Orion’s belt; in the summer it runs through the lower part of Ophiuchus. In fact, anytime you can see the north star you can find the equator: Look directly at the north star, then look 90 degrees away from it in any direction and you’re looking directly at the celestial equator.

Celestial coordinates

On the Earth any point can be located by its latitude and longitude. Latitude is a measure of how many degrees the point is north or south of the Earth’s equator; longitude is how many degrees east or west of an arbitrary starting point. (That arbitrary point is called the “prime meridian” and, because the British designed the system, it happens to run through Greenwich, England.)

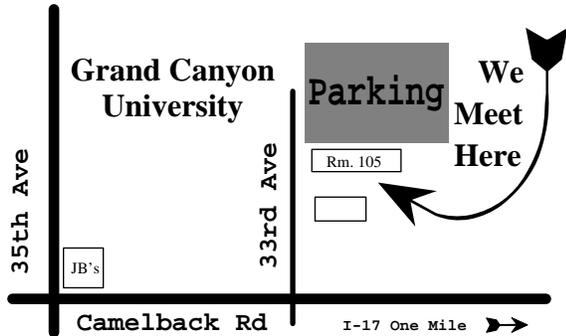
Sky coordinates are much the same: The location of

an object is specified in terms of how many degrees it lies north or south of the celestial equator and how far it lies east or west of an arbitrary starting point. In the sky, however, an object’s north-south position is known as its *declination* (instead of latitude) and its east-west position is known as its *right ascension* (instead of longitude). In charts and objects listings the right ascension is listed first and the two terms are often abbreviated as “RA” and “Dec.”

Declination is stated in degrees north or south of the celestial equator. If the object lies north of the celestial equator its declination is positive; if it lies south of the celestial equator its latitude is negative. Thus an object with a declination of 27 degrees (sometimes written as “+27 degrees”) lies 27 degrees north of the celestial equator, while an object with a declination of -54.5 degrees lies 54.5 degrees south of the celestial equator. The maximum dec-

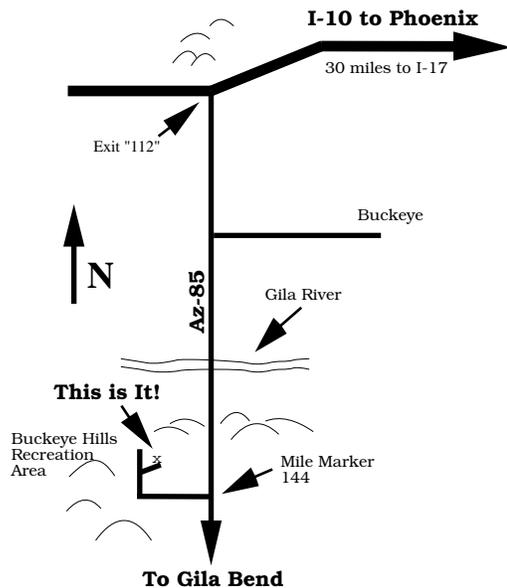
**Directions to
SAC Events**

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.



lination values are +90 degrees (the celestial north pole) and -90 degrees (the celestial south pole).

Right ascension and the “celestial clock”

Declination is simple; it’s just degrees north or south. Right ascension is a little trickier because it’s not stated in degrees but in hours and minutes. This does **NOT** directly refer to the time on your watch; it’s just another way of expressing degrees. To understand how this works, let’s go back to our sky dome.

Imagine yourself looking at the inside of the “sky globe.” Now imagine that someone has helpfully inscribed the line of the celestial equator in the sky. (I told you it would be helpful. We’ll put that in God’s suggestion box.) Now imagine that whoever inscribed the equator line has also put a hash mark every 15 degrees all around the equator. The equator, being a line which encircles the sky globe, spans 360 degrees and therefore there are 24 hash marks. (24 hash marks x 15 degrees each = 360

degrees.) We can only see about half the hash marks at a time because at any given time we can only see the portion of the celestial equator which lies above the horizon, but we know there are 24 hash marks all the way around.

Now an interesting thing happens: Because the Earth spins on its axis once every 24 hours, as you stare at the sky you’ll notice that for every hour that goes by the stars move across the sky the distance of one hash mark. 24 hours later, 24 hash marks have gone by and the sky looks like it did about 24 hours ago. In other words, the stars “move” across the sky at the rate of 15 degrees per hour, or approximately 360 degrees in 24 hours.

I say it’s “approximately” 360 degrees because there’s a little complication: The Earth not only spins on its axis in a period of 24 hours, it also goes around the sun in a period of 1 year. As it proceeds around the sun day to day, the Earth’s position relative to the stars changes, and therefore what we see in the night sky changes a little bit

Comet Comments

by Don Machholz

(916) 346-8963 CC222.TXT January 7, 1996
DonM353259@aol.com

1995 O1 (Hale-Bopp)					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-22	19h18.5m	+11°11'	34°	M	1.9
01-27	19h29.0m	+13°13'	36°	M	1.7
02-01	19h40.5m	+15°29'	38°	M	1.4
02-06	19h53.4m	+18°01'	40°	M	1.1
02-11	20h07.8m	+20°50'	41°	M	0.7
02-16	20h24.8m	+24°05'	43°	M	0.5
02-21	20h44.1m	+27°31'	44°	M	0.0
02-26	21h06.9m	+31°10'	45°	M	-0.1
03-03	21h34.1m	+34°57'	46°	M	-0.4
03-08	22h06.8m	+38°40'	46°	M	-0.6

Comet Hale-Bopp continues to brighten in the morning sky. It is an easy naked-eye object for early risers. You might want to start planning now on holding public star parties to show Comet Hale-Bopp. In February and early March the comet is visible in the morning eastern sky. Go ahead, schedule a morning star party! As March progresses the comet is better visible in the evening western sky. On the evening of Sunday March 23 a partial lunar occurs for the US, and Saturday April 12 is **Astron-**

omy Day. These nights, and those in-between, are good ones on which to show the comet. Then from after Full Moon (April 22) until the comet moves too far south to be easily visible (the first week of May) you’ll have your last opportunities to show Comet Hale-Bopp.

46P/Wirtanen					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-22	23h35.9m	-10°34'	49°	E	11.6
01-27	23h49.7m	-08°33'	48°	E	11.4
02-01	00h03.9m	-06°26'	47°	E	11.2
02-06	00h18.7m	-04°13'	46°	E	11.1
02-11	00h34.0m	-01°54'	45°	E	10.9
02-16	00h49.8m	+00°29'	44°	E	10.7
02-21	01h06.2m	+02°56'	44°	E	10.6
02-26	01h23.2m	+05°27'	44°	E	10.5
03-03	01h40.9m	+07°59'	44°	E	10.4
03-08	01h59.2m	+10°32'	44°	E	10.4

81P/Wild 2					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-22	08h06.5m	+18°27'	177°	E	10.9
01-27	08h02.3m	+18°54'	172°	E	10.8
02-01	07h58.2m	+19°22'	166°	E	10.6
02-06	07h54.3m	+19°49'	159°	E	10.5
02-11	07h51.1m	+20°16'	154°	E	10.4
02-16	07h48.5m	+20°40'	148°	E	10.4
02-21	07h47.0m	+21°02'	142°	E	10.3
02-26	07h46.5m	+21°21'	137°	E	10.2
03-03	07h47.1m	+21°37'	132°	E	10.2
03-08	07h49.0m	+21°49'	128°	E	10.2

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”:	-2.0/4.0	9.0/6.0	7.0/6.0

Fuzzy Spot

by Ken Reeves

Gemini

February 1997

Gemini is one of those constellations that is easy to learn, the two lead stars (Pollux and Caster) with the trail of stars that dangle down west from each star. Also Pollux is one of the stars of the winter hexagon (the others are Capella, Aldebaran, Rigel, Sirius, and Procyon). M35 is the show piece of the constellation and is visible to the naked eye from a fairly dark site.

All of the observations in this installment were taken at the Sun Valley Parkway (White Tanks West) site in the 10" $f/4.5$ scope on a night I rated 5 out of 10 for both seeing and transparency.

NGC 2129 (06 01.0 +23 18) This open cluster is a nice tight knot of stars at 70X with two pretty bright stars. I counted about 20 stars with 4 levels of brightness. On the east side is a nice double star. In the center is a bright star that I saw as yellow, all the other stars looked pretty much white.

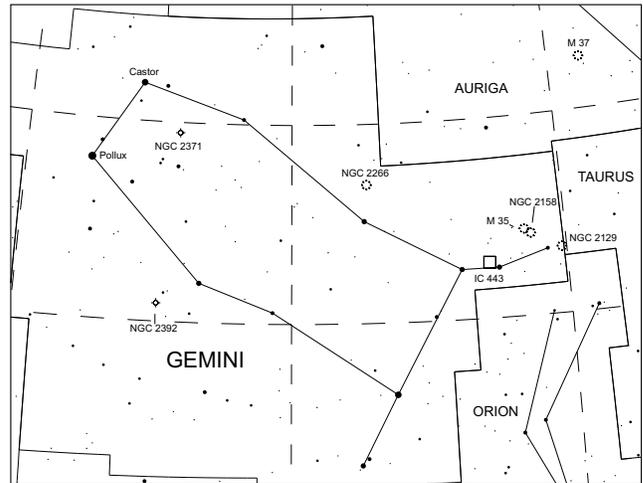
NGC 2158 (06 07.5 +24 06) This open cluster is dwarfed in size by M35 next door. This is a very distant and rich cluster and requires high power to resolve it. At 240X I saw about 18 stars over much haze with one very bright star at the east side. The overall shape of the cluster is triangular, pointing more or less to the south. After trying different powers, I decided that 170X was the best for that night, giving the best compromise between resolving stars and having the haze fade into the background.

NGC 2168 (06 08.9 +24 20) It's hard to discuss Gemini without talking about open cluster M35. This is a bright enough object to be seen naked eye as a fuzzy spot in the sky. A very large object that, unlike NGC 2158, is best at low power. Using 35X, I estimated about 100 stars with a very nice arc of 10 stars

from night to night. It's like looking out the rear window of a car which is going around in a circle: as you proceed around the circle, the view out the back window changes. So it is with the Earth: If the Earth's "windshield" faces the sun, then as we circle the sun the view out the "back window" (the side away from the sun, which is the night sky) changes from day to day. It doesn't change much, but it does change, which is why at different times of year different constellations are visible.

This small change from day to day results in the sky not being exactly the same from night to night. Let's say that at 9pm tonight you note that a particular star is directly overhead. When you go out tomorrow night, that star will be overhead again, not at 9pm, but at 8:56pm — it moved ahead by 4 minutes. The following night it will be directly overhead at 8:52pm — it moved ahead another four minutes. And so on: the star will be overhead earlier

across the middle and 4 levels of stars in this cluster. There were so many stars that I just drew the brightest ones, not wanting to spend the entire night on this one



object. I have yet to see a picture that does justice to this object, this one just seems to show more depth and detail than the pictures show. This is also one of those objects that can really be appreciated in binoculars.

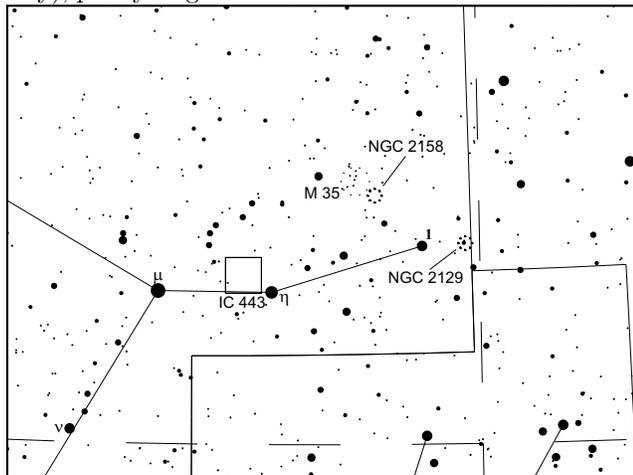
NGC 2266 (06 43.2 +26 58) This open cluster is roughly triangular with a bright star at the apex on the southwest side. The object is pretty bright and pretty small with 18 stars counted over a very granular haze with the stars just on the threshold of resolution. I am looking forward to observing this object in better conditions and see how much of that haze resolves.

NGC 2371 and **NGC 2372** (07 25.6 +29 29) This planetary nebula contains two very bright spots with an NGC designation assigned to each spot. At 170X I saw this a very bright, pretty small, and very elongated NE/SW with the SW spot as the brighter one. I didn't see color at any power, and using the UHC filter made the object brighter but didn't bring out any more detail. To me, I envision this object as a donut cut in half with the two bright spots being the cut ends of the donut.

and earlier each night. That means it's rising earlier and earlier and setting earlier and earlier, until one day when you go out at 9pm the star will already have set. Eventually that star will set before the sun has gone down and you won't be able to see it at all — until next year, when the star will repeat this cycle again.

That also means that as the months go by, the constellations visible at 9pm will change. Orion, for instance, is generally considered a winter constellation, because from about December to February it's high in the sky in early evening. But Orion is visible in late summer or early fall, it's just that it doesn't rise until the wee hours of the morning such as 3am or 4am. But as the months go by it rises earlier and earlier, until by November it rises in early evening and you can see it without waiting up all night. During the spring months Orion continues to rise and set earlier and earlier, until by late spring it's setting

NGC 2392 (07 29.2 +20 55) This planetary nebula is commonly known as the **Eskimo nebula**. At 70x, this is a small object (although large for a planetary), pretty bright with a star to the W which is a little



brighter, much brighter in the middle with the central star obvious. Both averted vision and the UHC filter makes it grow quite a bit. I noticed a slight blue color to it. At 170x, I saw a bright center, a dark ring surrounding the middle, then a bright ring around that. In Burnham's *Celestial Handbook* (by Robert Burnham Jr), he states "To the author of this book, the whole nebula irresistibly suggests the classic and unforgettable features

of W. C. Fields." Looking at the pictures in his book, I have to agree with him.

IC 443 (06 16.9 +22 47) This filamentary nebula next to Eta (η) Geminorum is probably a supernova remnant according to Robert Burnham Jr. I made a casual attempt to observe this object at the White Tanks West sight, but was unsuccessful. I couldn't find any observation notes in any references I have except the NGC reference which is very faint, very large, curved arc 25' x 5'. The pictures I have seen of this object remind me of the Veil nebula, so perhaps with the right condition and right equipment, this could turn out to be a nice visual object.

Castor (07 34.6 +31 53) is a multiple star included in the "Best Multiple Stars for the Saguaro Astronomy Club." At 240X from my back yard, I saw an equal and close white/white pair oriented NE/SW. A faint white star was noticed SE of the main pair. According to Burnham, each star is a spectroscopic binary, making this a 6 star system!

Herschel 400 Objects

2129, 2158, 2266, 2304, 2355, 2371
2372, 2392, 2395, 2420

SAC's 110 Best of the NGC Objects

2158, 2392

right after sunset and you don't get to see it for very long. Eventually it will set so early that the sky is still light and you can't see Orion anymore - until late summer or fall, when you can again see it if you're willing to stay up until 3 or 4 o'clock in the morning.

But back to right ascension: Because the sky dome above us appears to rotate over us every 24 hours or so, the sky can therefore be thought of as a giant clock, with those hash marks every 15 degrees marking out the hours. Stars and objects in the sky can therefore be assigned positions according to their position on this "clock." We'll arbitrarily pick one of the hash marks as 0 hour, the next one to the east as the 1-hour mark, the next one after that as the 2-hour mark, all the way around to the 23-hour mark, which is back next to the 0-hour mark. To help pinpoint locations a little more precisely, we'll subdivide the space between the hour marks into 60 divisions which we'll call — what else? — minutes.

Thus the right ascension of a star or other celestial object is stated in hours and minutes. The Pleiades star cluster, for example, has a right ascension of 13 hours and 45 minutes, which is typically written as 13h45m. The Pleiades are also 24 degrees north of the celestial equator, so they have a declination (the north-south position) of +24 degrees. In typical charts and listings you'll therefore find the coordinates of the Pleiades listed as "13h45m +24.0" (right ascension is always listed first, then declination).

That's not so hard, really. A celestial object's posi-

tion is given by its right ascension (which is equivalent to longitude on Earth) and its declination (which is equivalent to latitude on Earth). Just two coordinates define the position of any object in the sky, with the slight twist that unlike Earth, where we have east and west degrees of longitude, in the sky we express right ascension as hours and minutes on the 24-hour "celestial clock."

The tricky part is that, as we've seen, the "celestial clock" runs a bit faster than our common 24-hour clock, so you can't just look at your watch and know where an object is in the sky at any given time. So for a given date and time, how **DO** you know what the "celestial time" is so you can point your telescope at an object? That's what I'll talk about in Part II, and I'll also provide you some simple procedures for making all this very easy.

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.

1997 Arizona Messier Marathon

Saturday, March 8, 1997

Saturday, March 8

6:29 PM Moon set, New Moon
 6:30 PM Sunset
 7:52 PM Evening Twilight Ends

Sunday, March 9

5:25 AM Morning Twilight Begins
 6:45 AM Sunrise
 7:11 AM Moonrise

Webster defines a marathon as a long distance race. Well the Messier Marathon is long all right; not in distance but in time. It is a one night observing session intended to view as much of the Messier Catalog as permitted by the evening, your observing skills and stamina!

The Saguaro Astronomy Club, of Phoenix Arizona, is pleased to sponsor the Fifth Annual Messier Marathon, coordinated by AJ Crayon, SAC Deep Sky Chairman and David Fredericksen. This is the largest observing session, as far as people and telescope counts, in Arizona and may well be the largest Messier Marathon!

The date is **Saturday, March 8, 1997** at a dark sky site south of Arizona City, AZ. The road from Arizona City to the site is dusty; but at the site itself is pretty well hard-packed. The site is private property, so we should give a special note of thanks to Ray Farnsworth for allowing us to use it.

As far as weather is concerned there have been times when it was cloudy and raining in Phoenix but clear at the site. You must guide yourself accordingly. See attached map for details.

If you are going to attend it is suggested that you arrive at the site at sunset at the latest. Observing times for the marathon are from sunset to sunrise.

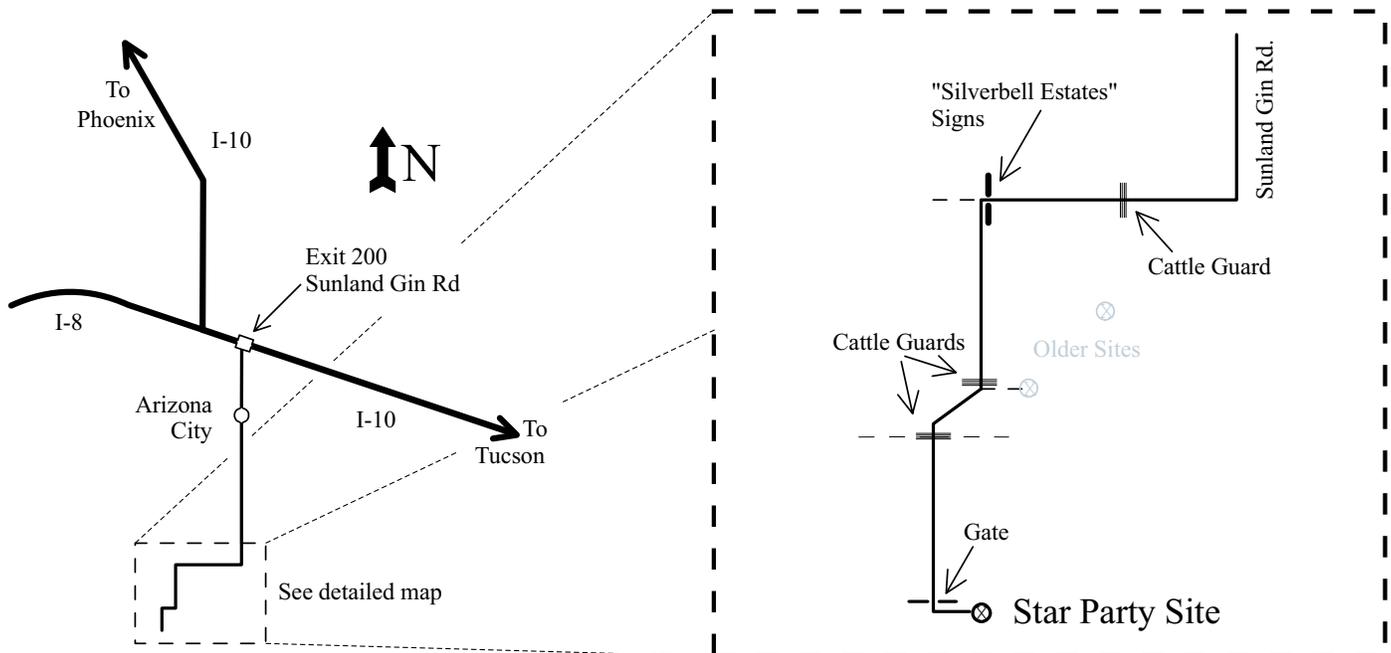
Evening objects that are hard to find will be M74 and M77. Amongst morning objects that will be difficult to get are M2, M72 and M73. Impossible will be M30 for it will not rise until well after morning twilight.

Awards —plaques suitable for mounting on a telescope— will be given for first, second and third highest totals. Certificates will be awarded to all bagging 50 or more! In order to qualify you need to get a check off list from one of the coordinators and fill it out. Since the price of the plaques can be significant for an otherwise free event we will depend on your club to pay for the awards won by its members.

For your comfort there will be a port-a-potty for those who prefer its comfort to that of the open desert.

Finally, for those who aren't interested in the marathon; come anyway! From counts of past years about half of the attendees do the marathon, the others observe, photograph or just relax and enjoy the night sky!

— A.J. Crayon, SAC Deep-Sky Chairman



Take I-10 to exit 200 (Sunland Gin Road.) 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 1/4 mile to the site.

Bits and Pieces

Western Regional Astronomical League Star Party

by Bob Gent
W.R.A.L. Representative

Greetings from the Western Region of the Astronomical League!

We have made great progress in our first Western Regional star party and convention. The city council of Yucca Valley, California has approved our request and is very enthusiastic about the first annual **Starry Nights Festival**. Please mark your calendars for Friday and Saturday, October 24–25, 1997.

We will have access to Yucca Valley's fantastic community services center with lots of space for astronomical workshops, speakers, and vendors. In addition, for dark sky observing, we are planning to have a national park campground reserved which is about five miles from the community center.

Within the next few weeks, we plan to release additional information on motels, agenda, and registration instructions.

Please forward this message widely to all astronomy clubs and members. Although this will be a Western Region Astronomical League event, everyone is invited.

Thanks to all the volunteer Western Region Astronomical League officers and the communities services staff in Yucca Valley for making this event possible.

I've been told by Bob Gent that this site is actually nearer to Phoenix than the Riverside telescope Makers Conference (RTMC). — Paul Dickson

SAC Archives on the World Wide Web

by Steve Coe

74040.2071@compuserve.com

<http://www.primenet.com/~dickson/sac.html>

Folks, the Saguaro Astronomy Club Archives are on The Web. The SAC databases are available for downloading and some photos of folks and scopes are also ready for viewing. A variety of text files are also on this archive site. There are links to the SAC newsletter home page that Paul Dickson maintains so well. The URL is "<http://www.psiaz.com/sac/home.htm>."

This site needs your input. We need photos, files and any other input that you think should be available on a

site that shows the world what the Saguaro Astronomy Club provides for amateur astronomers. Prints can be scanned into the system and files should be plain ASCII text. Your observations need to be organized by constellation.

Other interesting addresses:

Paul Dickson:

<http://www.primenet.com/~dickson/>

Tom Polakis:

<http://www.psiaz.com/polakis/>

Chris Schur:

<http://pulsar.la.asu.edu/~chris/>

Grand Canyon Star Party '97

7–14 June
South and North Rim

Well boys and girls, it is time once again to make plans for that perfect summer getaway—the Grand Canyon Star Party! Where else can you go to keep the family happy and occupied all day, and the dark nights will keep even the most jaded of astronomers smiling all night long? We have plans to continue last year's successful North Rim version as well, so you have your choice of rims, though as it is closed over the winter, its organization is somewhat less complete.

What is the Grand Canyon Star Party?

Its current revision started in 1991 as the first anniversary of Dean and Vicki Ketelsen's honeymoon there. It was noticed that a telescope set up looking at the Canyon or sky soon gathered a crowd, so a public oriented event was planned. Though tens of thousands visit every day, a small fraction stay overnight to be treated to the spectacular views of the night sky there. The appreciative tourists tend to leave early, leaving the astronomers in solitude for observing far into the night.

The Grand Canyon Star Party originally started much earlier as a function of the San Francisco Side-walk Astronomers who made annual pilgrimages to several western National Parks in the late '70s and '80s, spending several weeks at each stop. The latest version of the star party has been readily endorsed by several of their members who have become regular attendees.

What is there to do there?

Well, the Grand Canyon offers world class hiking through Earth's largest canyon system. Even those less physically inclined can spend days exploring the scenic vistas offered from every bend of the rim trail, or from the roads from their cars or park shuttle buses. The place offers lots to explore for the history buff with many original structures preserved and a nearly century old train making daily runs to the rim. The area offers astronomical day trips to Lowell Observatory or Meteor Crater, as well as scenic drives through Monument Valley, the Painted Desert, Flagstaff and Oak Creek Canyon. One could easily spend a couple action packed days or the entire week without repeating yourself.

How is the observing at the Canyon?

Conditions are excellent. The nearest town, Flagstaff—population 45,000, is 80 miles away, while Las Vegas and Phoenix are both about 170 air miles away making for very dark skies. Elevation at the South Rim is about 7,000 feet with the North about 8,000 feet. Seeing conditions are usually very good with the exception of very still nights when pockets of cold air move through slowly disrupting the seeing. Early June is Arizona's clearest time of year. We have lost only one night to clouds in 4 years (32 nights) of observing!

Where would we set up our scopes?

We set up and observe from the parking lot at Yavapai Point. There are two options for you. Traditionally, the San Francisco group would set up in the parking lot for viewing. The big advantage is that is where the people are and you are sure to attract a crowd, and after all, this is supposed to be a public event. The problem is that, especially early in the evening, there are lots of headlights, and parking around sunset is impossible to find. The second option is that there is an observing field behind a locked gate just off the parking lot. You avoid the headlight problem as it is perhaps 10 meters below the level of the parking lot. The locked gate also serves as a security device and, particularly if your scope is large or setup is involved, you can leave it set up for the duration of your stay. The disadvantages are that not as many public make it down to the observing field, and you lose about 10-15 degrees of southern horizon, though you can still get down to Scorpio and Sagittarius. Over the years we had slowly been migrating to the observing field, but last year we reversed the trend and most set up in the parking lot. It is a pain to set up/tear down every night, but the rewards of more public interaction really helps make up your mind. Power is available in the restrooms, but is a pain as well as a trip hazard in the dark and I would prefer you run off batteries and inverters. Unfortunately, in the National Park, camping is not allowed anywhere but the campgrounds, so the options are to pack up your scope every night or leave it up in the observing field. Yavapai Point is close to everything, about 3/4 mile from the campground (Mather) and about 1/2 mile from Yavapai Lodge (Fred Harvey, Inc).

Where would we stay?

That is the big question for every Canyon visitor during the summer. By anyone's opinion, the Canyon is overcrowded in June and most housing has been booked up months in advance. If you need a room to stay in, you had best start NOW (I'm writing this at Thanksgiving). Even by March you will likely have to search around for a room. If you can tolerate a 7 mile drive to Tusayan, there are also a number of motels there. Check out the list below. The campground is very nice if you enjoy roughing it a little. It is amazing how well you sleep on the ground when you are up all day and most of the night! Campsites are generally available a day or two ahead of time (\$12/night). The Park Service also gives us a few complimentary campsites which we make available first come, first served after March 1st. RV parking with a full hookup is available in Trailer Village (\$18/night). Again, early reservations are advised.

Any special activities planned?

I'm glad you asked that. As part of our program, we offer a twilight talk every evening to entertain the folks while it gets dark. We always need volunteers to give these talks, so step up especially if you have an astronom-

ical story to tell and have worked with crowds before. Last year, we ground and polished a mirror and made a telescope, donating it to the local grade school at the end of the week. We don't have plans for that this year, though we are open to suggestions. One of my great joys every year is to set up a scope or big binoculars on the rim to show visitors canyon views or sunspots, while telling them about the viewing later in the evening. It is great fun to be one of these "static displays" during our week there. We generally have a couple of social cook-outs to get to know the astronomical folk who come volunteer. These are great fun and you get to actually see the faces of the guy you have set up next to the last 4 nights! Last year's day trip to Lowell Observatory and Meteor Crater seemed successful too, so we may repeat that midweek again. Otherwise there is plenty to do

Sounds great! How do I let you know I'm coming?

If you need further information, or to let us know you would like to volunteer by bringing a telescope, PLEASE let us know at the address below. The space in the observing field is limited and we need to know how many folks we have coming that are bringing scopes. Be sure to have some housing plans before you let us know you are coming! Of course, there has never been a registration fee for this event.

For South Rim information, write: Dean Ketelsen, 1122 East Greenlee Pl., Tucson, AZ 85719 (520) 293-2855 ketelsen@as.arizona.edu.

For North Rim information, write: Deloy Pierce, P.O. Box 674, Farmington, UT (801) 451-8215.

South Rim Facilities:

South Rim Lodging:

All rim lodging or Trailer Village (Fred Harvey, Inc) (303) 297-2757. This number is often very busy, FAX them at: (303) 297-3175.

South Rim Lodging includes: Yavapai Lodge (modern facility, closest to Yavapai Point) El Tovar (victorian era lodge right on the rim, but high prices) Bright Angel Lodge (newer facilities—also operate Thunderbird Lodge and Katchina Lodge on the rim) Maswik Lodge (Newest facility, about a quarter mile from rim).

Trailer Village (RV park with full hookups)

All above lodging is operated by Fred Harvey, Inc. at above number! Expect long telephone waits—try them early in the morning, 7 AM Mountain Time is the best I can suggest.

Campsites (Destinet—no more than 8 weeks in advance) (800) 365-2267.

Housing in Tusayan (7 miles south of Grand Canyon): Squire Inn (520) 638-2681, Moqui Lodge (520) 638-2424, Quality Inn (520) 638-2673, Red Feather Lodge (520) 638-2414, Seven Mile Lodge (520) 638-2291.

There has been a boom in motel construction in Tusayan and the above may not be your only choices. Rooms are generally a little less expensive than those at the South Rim, and it certainly is easier to make reservations than waiting for Fred Harvey, but then you are not walking distance to one of the seven wonders of the world!

North Rim Facilities:

North Rim Lodging:

Grand Canyon Lodge and Cabins—(303) 297-2757 (Fred Harvey, Inc. again) North Rim Camping (Destinet—no more than 8 weeks in advance) (800) 365-2267.

Kaibab Lodge (just outside park boundaries) (800) 525-0924.

February 1997

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<div style="border: 1px solid black; padding: 5px; display: inline-block;">All Times are Mountain Standard Time</div>						SAC Star Party Buckeye Hills (members&guests) 1
		Clyde Tombaugh Born 1906		PAS Meeting Brophy Prep. Physics Lab	TAAA Meeting (Tucson)	Yesterday New Moon 8:07 A.M.
2	3	4	5	6	7	8
		Scheduled Launch of Second HST Servicing Mission	EVAC Meeting (SCC: Rm. PS172)	First Meeting of a Group that Became the Saguaro Astronomy Club (1977)	First Quarter Moon 1:58 A.M.	Tomorrow Jupiter 0.2° of Uranus (morning)
9	10	11	12	13	14	15
Yesterday Sun entered Aquarius 10 P.M.			Mir Space Station Launched (1986)		SAC Meeting Grand Canyon University, Fleming Rm. 105	Full Moon 3:27 A.M.
16	17	18	19	20	21	22
Anniversary of Supernova 1987A				Second Meeting of a Group that Became the Saguaro Astronomy Club (1977)	Tomorrow Last Quarter Moon 2:38 A.M.	
23	24	25	26	27	28	

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
- CCD 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:

David Fredericksen
SAC Secretary
6222 W Desert Hills Dr
Glendale AZ 85304

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

Inside:

- Getting Started by Will Milan
- Dim Moments by Paul Dickson
- Comet Comments by Don Machholz
- Fuzzy Spot by Ken Reeves
- 1997 Arizona Messier Marathon
by A.J. Crayon
- Cruise to '98 Eclipse by Steve Coe
- Western Region A.L. Star Party
by Bob Gent
- SAC Archives on W.W.W. by Steve Coe
- SAC Meeting — February 21

**This is Your Last Newsletter
If You have Not Renewed.**

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