

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



March 1998 — Issue #254

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M 102 Controversy by Hartmut Frommert

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This article is a text version of Hartmut's Web page <http://www.seds.org/messier/m/m102d.html>. It is printed here with permission. Hartmut requests comments, corrections or suggestions about his Web page.

Hartmut is the creator of the SEDS Messier Database which is at <http://www.seds.org/messier/>.

102. Nebula between the stars omicron Boötis and iota Draconis: it is very faint, near it is a star of 6th magnitude

Messier in *Connaissance des Temps* for 1784, p. 267

Charles Messier compiled his "Catalogue of Nebulae and Star Clusters" during the years 1758 to 1781 (or 1782 if one counts the last additions by his colleague Pierre Mechain, which are contained in most modern versions of the catalog). Contrary to prior and contemporary observers who had a large number of errors (nonexistent objects) in their lists, the entries of his catalog correspond to actual astronomical objects in all cases, perhaps with one exception, his entry number 102 (there were positional errors for 3 other objects, M 47, M 48, and M 91, which have been figured out.)

For this object (M 102), Messier gives above description together with M 101 and M 103 as communicated to him "through M. Mechain, which M. Messier has not yet observed." He gives no position for M 102 (and M 103) in the published version of the catalog (although he has added positions by hand in his personal copy, see below).

Shortly after the publication, about two years after the entry was made, Pierre Mechain retracted his discovery and claimed that the observation was an error, a duplicate observation of M 101, and a star chart error of Messier. In a letter to Bernoulli he wrote:

On page 267 of the "*Connaissance des Temps* for 1784" M. Messier lists under No. 102 a nebula which I have discovered between omicron Boötis and iota Draconis: this is nothing but an error. This nebula is the same as the preceding No. 101. In the list of my nebulous stars communicated to him M. Messier was confused due to an error in the sky-chart.

Quick Calendar

SAC Meeting

Eclipse Reports

7:30 PM, Friday, March 13

SAC Deep-Sky Meeting

Orion, Canis Major, and Monoceros

7:30 PM, Thursday, March 19

SAC Star Party

Buckeye Hills Recreation Area

Saturday, March 21

1998 Arizona Messier Marathon

Arizona City Site

Saturday, March 28

Kenneth Glyn Jones [1], and even more definite, Owen Gingerich in his contribution to *Sky & Telescope* [3] (reprinted in Mallas/Kreimer's *Messier Album* [2]) regard this issue as solved, in the sense that M 102 is a duplication of M 101. One could easily join this conclusion, as the discoverer himself admitted a fault and retracted.

However, there remain some doubts and arguments which still allow for other possibilities, as also Kenneth Glyn Jones admits. First of all, both Mechain and Messier

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DIM MOMENTS
IN
**AMATEUR
ASTRONOMY**

by Paul Dickson

FRUSTRATED
BY THE
GEGENSCHN
AND ZODIACAL
LIGHT...

AN OBSERVER
DECIDES TO
PACK UP AND
HEAD FOR HOME

were very careful observers, indicated by the fact that M 102 is the only possible “non-object” left in the catalog, and only for 3 further objects were there positional errors. Also, as the descriptions for M 101 reads:

March 27, 1781. 101. 13h 43m 28s, +55° 24' 25".
Diam. 7'.

Nebula without stars, very obscure and pretty large, between 6' and 7' in diameter, between the left hand of Boötes and the tail of Ursa Major. Difficult to distinguish when graticule lit.

it appears not necessarily obvious that this is the same object as M 102, with the description given above. Also, Mechain’s “retraction” occurred about two years after the “discovery,” giving room for speculations anyway, and it was never published in the **Connaissance des Temps**, where Messier’s catalog and supplements were first printed, although both astronomers became associate

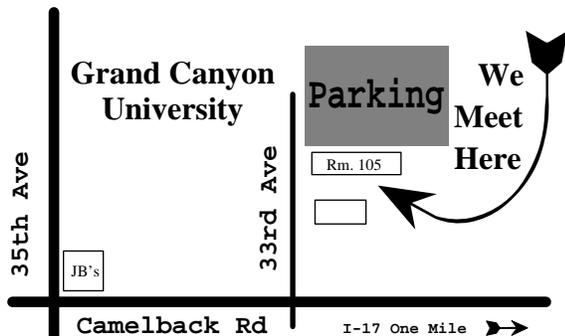
editors of this periodic publication, Messier in 1785 and Mechain in 1786.

Moreover, Messier had added by hand a position for M 102 to his personal copy of the catalog, which both Owen Gingerich and Kenneth Glyn Jones have claimed to be erroneous “because there is no obvious object.” As Messier was certainly a careful observer, it is probable that he has seen ‘something’, but maybe he did a reduction error again. The question arises did he find another object, either one of the candidates discussed below, a comet, or even something else entirely? We will come back to this question later, as it suggests a very interesting possibility.

At last, there are at least two candidates, the more probable being NGC 5866, near the position Mechain describes; if one didn’t know of his letter mentioned above, today’s astronomers would probably believe that this was the observed object!

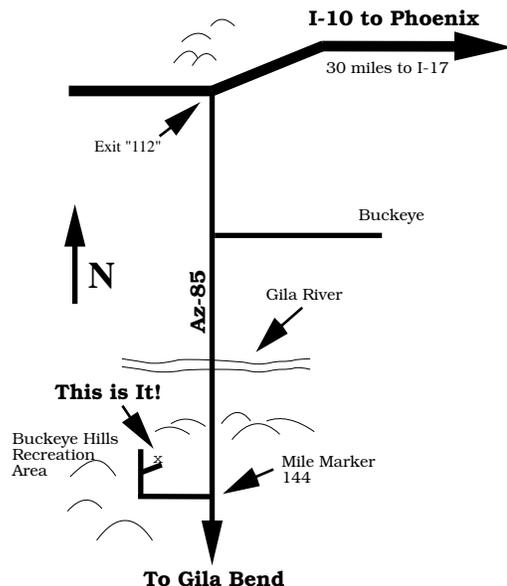
Directions to SAC Events

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.



To step the way down, note that omicron Boötis is about 40 degrees away and south of iota Draconis, thus (at least) one of them must be a mistype; Admiral Smyth in his 'Bedford' Catalogue suggests the obvious possibility that it must read 'theta' instead of 'omicron' Boötis. The other possibility would be, according to J.L.E. Dreyer in **Notes and Corrections to the NGC**, that iota Draconis was mistaken for iota Serpentis; then M102 would be situated near the position of the faint galaxy NGC 5928, at RA 15h23.9m, Dec +18°15' (1950).

However, Dreyer's proposition of NGC 5928 can be waived with great certainty for the obvious reason that it is only a 14th mag galaxy, according to the RNGC [4], so that both Mechain and Messier could hardly have seen it with their instrumentation, even under exceptionally good conditions. Thus we can also exclude Dreyer's assumption that iota Draconis was a mistake for iota Serpentis, since there's no sufficiently bright object in that region of the sky, and are left with the possibility proposed by Smyth, that omicron Boötis was mistaken for theta Boötis.

Between those stars, about 3 degrees SW of iota Draconis, is a small group of galaxies, the brighter of which could be viewed as candidates for M102:

- NGC 5866 (William Herschel's H I 215, John Herschel's 1909), the brightest of the group at 10.0 mag vis.
- NGC 5879 (H II 757, J.H. 1910), Smyth identified this as M102
- NGC 5907 (H II 759, J.H. 1917), a bright edge-on galaxy.

NGC 5908 (H II 760), too faint as a candidate.

Most probably is NGC 5866, as Shapley and Davis suggest in their contribution to the PASP Vol. 29 (according to Glyn Jones).

Another fact makes NGC 5866 a good candidate for M102:

Imagine you want to find NGC 5866 with a telescope, how do you proceed? I would look for the stars iota Draconis and theta Boötis and then locate the 5.21 mag star GC 20332 (=SAO 029402) which is little more than 1 degree south and almost exactly at the same right ascension. This star is one of 5 in the rectangular region between RA/Dec limits given by the two stars and listed in Becvar's catalog of stars brighter than 6.25:

	RA (1950.0)	Dec (1950)	Mag
23 theta Boo	14h23m48.8s	+52°04'52"	4.06
GC 19627	30 56.9	55 37 03	5.99
GC 19666	32 45.2	57 17 12	6.25
GC 19742	36 40.0	54 14 19	5.52
*GC 20332	15 04 59.9	54 44 53	5.21
GC 20641	18 36.8	52 08 16	5.52
12 iota Dra	15 23 48.8	59 08 26	3.47

(NGC 5866 is at RA 15h05.1m, Dec +55d57').

A misestimate of a 5.21 as 6th mag star would eventually be not too far off, so that the '6th mag star' in Messier's description might be GC 20332. Then the description matches well with that visually 10th mag lentic-

Comet Comments by Don Machholz

(530) 346-8963 CC235.TXT February 7, 1998
<http://members.aol.com/cometcom/index.html>
 DonM353259@aol.com

1995 O1 (Hale-Bopp)					
Date	RA-2000-Dec	Elong	Sky	Mag	
02-26	04h55.6m -58°08'	85°	E	8.8	
03-03	04h54.7m -57°20'	84°	E	8.9	
03-08	04h54.6m -56°33'	83°	E	9.0	
03-13	04h55.1m -55°48'	82°	E	9.0	
03-18	04h56.2m -55°04'	82°	E	9.1	
03-23	04h57.8m -54°22'	81°	E	9.2	
03-28	04h59.9m -53°43'	80°	E	9.3	
04-02	05h02.4m -53°06'	79°	E	9.3	
04-07	05h05.3m -52°32'	78°	E	9.4	

Only a couple of comets remain in our sky this month. **Comet Hale-Bopp** fades in our southern sky. **Comet Meunier-Dupouy** travels through our morning northern sky. The only new finds this past month was by the SOHO satellite, which monitors the solar vicinity. It discovered four more comets, it has now found forty in less than two years. Like most of the others, these four comets disappeared after going behind the sun.

COMET HUNTING NOTES: Forty-eight of the last 100 visual comet discoveries were made by amateurs using

reflectors. They range in size from 4" to 19.5". The most popular size (16" aperture) was used in 16 finds. They were also efficient, averaging 231 hours per find compared with 391 hours for all visual comet discoveries. All five accidental comet discoveries (Berger, Milon, Hale, Bopp and Tillbrook) were made with reflector telescopes

C/1997 J2 (Meunier-Dupouy)					
Date	RA-2000-Dec	Elong	Sky	Mag	
02-26	21h08.1m +33°17'	47°	M	11.7	
03-03	21h15.5m +32°56'	46°	M	11.7	
03-08	21h22.7m +32°37'	46°	M	11.7	
03-13	21h29.5m +32°21'	46°	M	11.7	
03-18	21h36.0m +32°07'	46°	M	11.7	
03-23	21h42.2m +31°54'	46°	M	11.7	
03-28	21h48.0m +31°44'	47°	M	11.7	
04-02	21h53.6m +31°35'	48°	M	11.7	
04-07	21h58.8m +31°27'	50°	M	11.7	

Orbital Elements

Object:	Hale-Bopp	Meunier-Dupouy
Peri Date:	1997 04 01.1370	1998 03 10.4365
Peri Dist:	0.914008 AU	3.051015 AU
Arg/Peri (2000)	130.5787°	122.6755°
Asc Node (2000)	282.4653°	148.8429°
Incl (2000):	089.4268°	091.2731°
Eccentricity:	0.995085	1.000760
Orbital Period:	~2500 years	Long Period
Reference:	MPC 30738	MPC 30738
Epoch:	1997 12 18	1998 03 08
Absol Mag/"n":	-1.0/4.0	4.0/4.0

ular galaxy, as it appears probable that Mechain perhaps wanted to describe a route to his newly ‘discovered’ object. Another possibility is that the star mentioned is the 6.8 mag star lying only 0.4 degrees NW of NGC 5866. The good match of Mechain’s description with this galaxy suggests that this may have been the object he had seen in his discovery observation.

However, as Mechain has disowned the discovery, one may keep the position that due to his claim, Mechain’s discovery was spurious and eventually a duplicate observation of M 101 as he claimed. As also Don Machholz admits, it may well be that he was correct with this statement, then there remains only the puzzle of Messier’s handwritten position.

For me, the author of this article, some light came into this mystery when Dr. Don Greeley communicated to me the handwritten positions Messier had added to his personal copy of the catalog printed in the *Connaissance des Temps* for 1784. He points out:

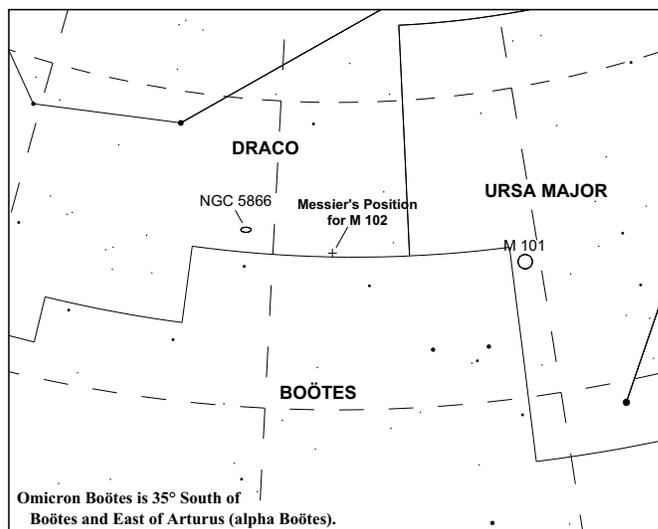
The positions in Messier’s catalog were very faded and difficult to interpret. It was necessary to make a copy of that page so dark that the printing on the page behind it showed through. I made a slide of the page and when projected on a flat white wall showed that M 102 was “14.40” in RA and “56.” in Dec. M 103 was much harder to see but is probably “1.20” in RA and “61.” in Dec. Now they must be corrected for precession for modern charts.

The accuracy of Messier’s values is probably indicated by the rough decimals, but for the following considerations I suppose they are more accurate than they really are. When precessed to modern times, there is little surprise that the position for M 103 becomes RA = 1:34.6, Dec = +62.1 (2000.0), close (little more than 1 degree north and very little east) to the correct position of this cluster, which is RA = 1:33.1, Dec = +60.7. Messier’s position of M 102 becomes:

$$RA = 14:46.5, Dec = +55.1 (2000.0)$$

In accordance to the claims of Owen Gingerich and Kenneth Glyn Jones, there is actually no striking object close to this position in the sky. It is however interesting that the position lies between the stars *iota* Draconis and *theta* Boötis (so that at least it is apparently validated that the “omicron” in the description is a “typo”). On a closer look, one also fails with a sign error in a positional difference, as it had occurred for M 47, or a parallel shift due to taking a wrong reference star or object as for M 91. But, and that is apparently most interesting, the position is almost exactly at the correct declination for NGC 5866 and M 101, and it is *almost exactly* 5 degrees (20 min) west (preceding) of NGC 5866 in right ascension (is also roughly 10 degrees east of M 101, but much less accurately; the 2000.0 position of NGC 5866 is RA 15:06.5, Dec +55.7, while that of M 101 is RA 14:03.2, Dec +54.3). The particular interest connected with this arises from the fact that another missing object, M 48, was also measured nearly exactly 5 degrees false (in that case in declination, though). A look in the sources suggests that

Messier has normally used sky charts with grids of lines every 5 degree, as e.g. his chart showing the path of the comet of 1779. Then a deviation of exactly 5 degrees may have several simple reasons: A wrongly labelled chart, an erroneous look on the neighboring label, a wrong count to an un-numbered tick, etc.



Therefore, in the opinion of the present author, it appears probable that Charles Messier has observed NGC 5866 when he measured the position of M 102 (which he could probably locate without much difficulty because of Mechain’s accurate description), but due to some reductional error, plotted it exactly 5 degrees west (preceding) of its correct position.

To summarize: The object that really deserves the designation “Messier 102” should be identical to one of the two observed by Mechain and Messier, may they be identical or not. As nobody is still alive who has witnessed them during their observation and recording, we can currently not reconstruct what they actually observed. Mechain’s description gives good evidence that the object M 102 could be NGC 5866, which most probably everybody would believe if he had not retracted the discovery in the letter mentioned, or if this letter had stayed forgotten. It may now depend on taste to speculate which was erroneous: The observation or the letter. Moreover, Messier has probably observed NGC 5866 and taken it for M 102, but again made an error in data reduction. Once more, it is a question of taste if these facts entitle the lenticular galaxy NGC 5866 to bear the designation “M102.”

At least, observers who want to go for sure that they observed all Messier objects should thus turn their telescopes to aim NGC 5866. They will be rewarded by quite an easy, beautiful object.

Messier 102 in the sources:

Sources claiming that “M102 = M101”:

- Gingerich [3] and Glyn Jones [1]
- Mallas and Kreimer’s Messier Album [2] (quoting Gingerich [3])

Messier Chart, Messier Poster and other recent products from Sky Publishing Corporation.

Becvar, see below.

Before the integration of this article, the SEDS Messier internet database had joined this view; now we have adopted the arguments of the discussion here.

Sources identifying M102 with NGC 5866:

Don Machholz in his Messier Marathon Observer's Guide [5]. Don Machholz also discusses the subject and comes to similar conclusions as the present author.

Antonin Becvar in his 'Atlas Coeli, Atlas of the Heavens — II, Catalogue 1950.0', 1964 gives in the 'Anagalactic Nabulae' section for NGC 5866 the alternative name M102 (p. 329 or S21). Oddly, in the 'Catalogue of Messier' section on p. 339 or M3, he gives

**M 102 = NGC 5866, Type S [galaxy],
[No other data], Notes: '=M 101'**

Perhaps this reflects the situation :-)

Hans Vehrenberg, in his Atlas of Deep Sky Splendors, claims that Owen Gingerich has added it, which I do not believe because Gingerich [3] claims the opposite.

RNGC [4], p. 273, gives M 102 as alternative name for NGC 5866.

Landolt/Börnstein, in their monumental encyclopedia, list NGC 5866 as M 102 in their Volume 6, 1, chapter 9, where they have a table of NGC numbers of Messier's galaxies.

Erich Karkoschka in his Atlas. Karkoschka states in the description to chart N16 (I must translate from the German edition):

"Messier's list contains as its object 102 a galaxy [it's the first time I hear that Messier did know that - hf] near the position of NGC 5866. However, his description points to a duplication of M101 [I cannot verify this, see both descriptions given above; my impression is more that NGC 5866 might match the description - hf]. Did Messier make a mistake of 1 hour in right ascension [How, as he gave no measured position - hf] ? Therefore, the designation M102 is nonunique."

J.D. Wray, The Color Atlas of Galaxies, Cambridge UP, 1988

NASA's extragalactic database (telnet ned.ipac.caltech.edu, login ned) has M102 as a name for NGC 5866.

Tony Cecce (cecce_aj@corning.com) in his "Twelve Month Tour of the Messier Catalog", May issue.

A data list from Finland, available on the internet via anonymous ftp: ftp://ftp.funet.fi/pub/astro/databases/deepsky/messier.dat.

Sources with other identifications:

Admiral Smyth proposes either NGC 5879 or NGC 5866. Kenneth Glyn Jones gives his description:

'A small but brightish nebula on the belly of Draco with four small stars spreading across field N of it. Doubt as to whether this is the nebula discovered by Mechain in 1781 since Messier describes it as "very faint," situated

between omicron Boötis and iota Draconis. If omicron Boötis should be theta Boötis, this is probably the object seen by Mechain and J.H.'s 1910, being the brightest nebula of five in that vicinity.'

The problem is that John Herschel's number 1910 is NGC 5879, which is however **not** the brightest of the group; the brightest is NGC 5866.

Dreyer (NGC) oddly proposes 14th magnitude galaxy NGC 5928.

References:

- [1] Jones, Kenneth Glyn. *Messier's Nebulae & Star Clusters, 2nd edition*. Cambridge University Press, 1991. *Practical Astronomy Handbooks Vol. 2, 1st edition 1968*. Faber.
- [2] Mallas, John H., and Evered Kreimer. *The Messier Album, 1st edition*. Sky Publishing Corporation, 1978 (Second revised printing 1979).
- [3] Gingerich, Owen. "The Missing Messier Objects." *Sky & Telescope*. Vol 20, October 1960.
- [4] Sulentic, Jack W., and William G. Tifft. *The Revised New General Catalogue of Nonstellar Astronomical Objects*. The University of Arizona Press, 1973.
- [5] Machholz, Don. *Messier Marathon Observer's Guide — Handbook and Atlas*. MakeWood Products, P.O. Box 1716, Colfax, CA 95713, USA. 1994.

Acknowledgements:

The author is grateful to all who have encouraged him to write this article and given helpful comments (especially Tony Cecce and Guy McArthur), and in particular to Dr. Don Greeley who communicated the handwritten positions of M 102 and M 103.

Bits and Pieces

March Club Meeting

The March SAC meeting will be a round up of the February 26th eclipse. Come see the photos and hear the stories from those who went on eclipse trips.

Minutes from the February Meeting

Vice president Gerry Rattley opened the February meeting in the absence of president Paul Dickson. He invited any visitors to sign the guest book and mentioned that they would receive a complementary issue of the next newsletter. There were a large number of visitors that introduced themselves.

Due to a case of laryngitis, the treasure was unable to give the report, so the secretary gave it for him. We are currently looking good in the financial department. The secretary also said that he would act as an alternate for the treasure in meetings where the treasure couldn't make it.

Continued on page 8...

1998 Arizona Messier Marathon

A.J. Crayon and Rick Rotramel

Saturday, March 28, 1998

Sunset: 6:47 PM Twilight Begins: 4:58 AM
Moonset: 7:45 PM Sunrise: 6:21 AM
Twilight Ends: 8:10 PM Moonrise: 7:39 AM

The Saguaro Astronomy Club is pleased to announce the 1998 All Arizona Messier Marathon. The date is Saturday, March 28, 1998 at a site south of Arizona City, AZ, the same place as the 1997 All-Arizona Star Party. See map for details.

By now we all know about this all night session to observe the entire 110 objects in the Messier Catalogue. This year the heavens are well placed to give us optimal chances to bag the entire catalogue!

This is the largest observing session in Arizona and has produced the best attended Marathons on record. Those of you with access to the internet can verify this by checking out the following site:

<http://www.seds.org/messier/xtra/marathon/results.html>

We looked at the possibility of setting a record for the Guinness Book of World Records, but encountered some problems. For instance, breaks had to be taken by all and at the same time. We thought that one port-a-john would seem to cause an undesirable bottle neck. Hence the record thought was dropped. But we will still have

the port-a-john for your relaxation. It can be used at your leisure.

A note about the site: It is managed by Ray Farnsworth and we should thank him for allowing us use of the site.

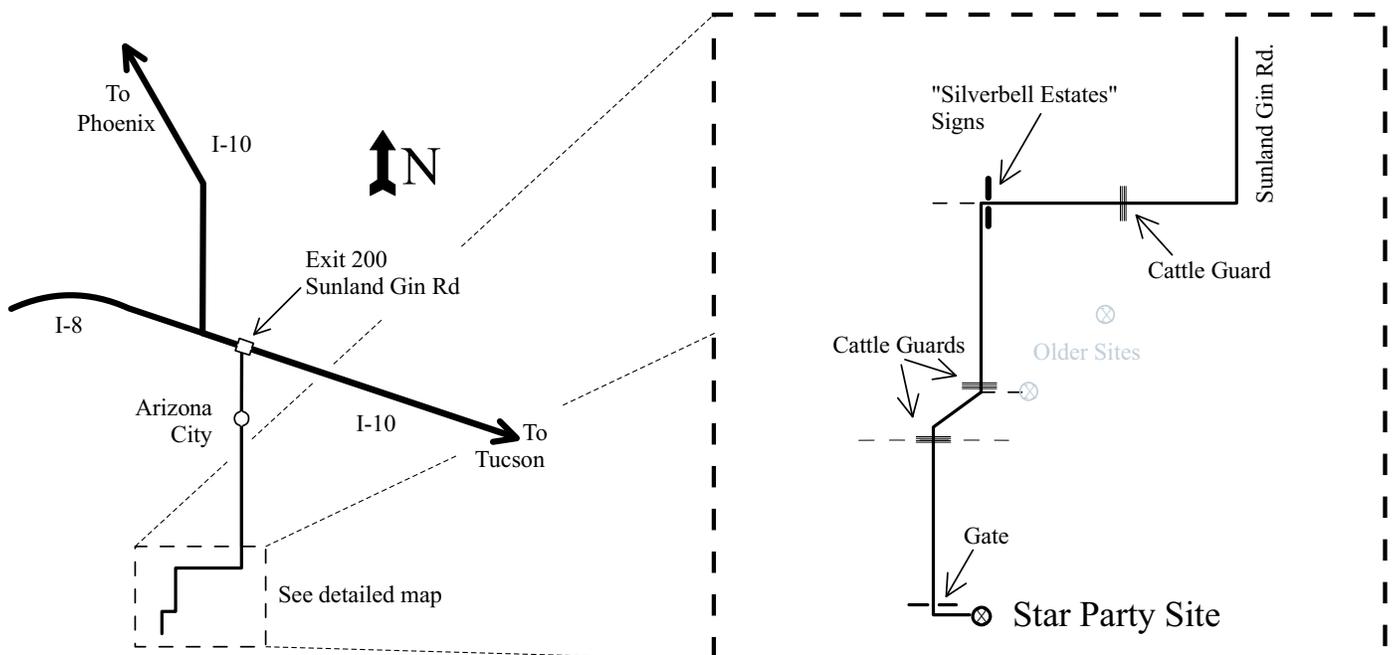
If you plan on attending, first watch the weather and plan to show up BEFORE sunset. Better yet, arrive well before sunset to give yourself more time to setup and visit with others.

Evening objects that are hard to find are M74 and M77. The most difficult morning object should be M30. This year we are blessed with the best chance of bagging all 110 objects. So be prepared with red flash lights, nourishing refreshments and an observing plan.

Awards, same as in the past. Plaques for mounting on telescope for 1st, 2nd and 3rd highest totals. Certificates for 50 or more seen. In order to qualify for awards you need to get an observing form, fill it out, check it off as you marathon along and turn it in before leaving the site. The cost of awards will have to be supported by your club.

Observing forms will be available at your club meeting or at the site from the coordinators.

Not interested in the marathon? Don't fret, come anyway! Many show up to gab, observe, or take astrophotographs. So don't miss this rare opportunity.



Directions to the site: 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.

Grand Canyon Star Party

by Dean Ketelsen

June 13 – 20, 1998

I clearly remember my first trip to the Grand Canyon 18 years ago. Yes, the Canyon was impressive and great and all, but what is most memorable about that trip other than the un-airconditioned trip thru Phoenix at 117 degrees was the collection of telescopes at Yavapai Point on the South Rim. You couldn't help but see them—a 24" *f*/6 scope is hard to hide—and there were a couple others taking up a few precious parking spots at the popular lookout. Yes, it was John Dobson and his fellow San Francisco Sidewalk Astronomers, set up for a couple weeks turning on the public to the stars at the national park. We sat on some logs while John himself gave the twilight talk in the falling dusk and I recall being about the last person in 200 lined up to see M13 thru the 24". It was an incredible sight, more breathtaking than any earthbound canyon.

John Dobson knew then what I know now—the Grand Canyon is a great place for a star party. The skies are great there of course—Phoenix and Las Vegas are far away to be virtually invisible and the sky glow from the growing civilization at Tusayan 7 miles to the south is not too objectionable yet. The site, too, is just about perfect—7,000 feet altitude in June makes for a delightfully comfortable place to observe in short sleeves or jacket. But what makes the event so special are the people who show up to see the universe thru your scope. The folks who have traveled for days and thousands of miles seem to be so open and vulnerable to being excited about what they see in the telescopes. The pace of life at the Canyon and the graciousness of the visitors just make it so memorable to all who choose to share the views through their telescopes. Don't forget also that it is the perfect star party for those with families or significant others—there are lots of activities that everyone likes to do—not just astronomy at night.

Of course, there is always a price to be paid for paradise. The Grand Canyon in June is rather crowded, parking is tough if not impossible to find, and most motel rooms filled up in February. But all these problems are minimized with a little planning, so that is why I am getting you to think about a June event in February! If you need a motel room to do something like this, you need to make plans and reservations NOW! If you would like to treat yourself and get a room at the rim, you need to call AMFAC (used to be Fred Harvey, Inc.) at (303) 297-2757. This is for all rimside motels AND for RV reservations at Trailer Village. I've stayed at many of these over the years and it is great for convenience, being right there with the Canyon view out your window. It is not much more expensive than staying in Tusayan, but they do book up fast. Call me if you would like recommendations, or if you would like phone numbers for motels in Tusayan. If you and the family would like to camp, have

I got a deal for you! The Park Service provides us with some complimentary campsites (16 of them last year) and we give them out as some small reward for helping out. To make it fair, I'll take names starting March 1st for these sites. Unfortunately, it is a real pain to keep track of the comings and going of attendees, and we oftentimes lose our campsites when some leave, so for now anyway, I am taking names ONLY for those staying the full 8 days, 13-20 June. Those staying part of the time can call me after April 15 for the campsites that remain. If you are only staying a couple days with us, please consider making your own reservations by calling the campground concessionaire (used to be MISTIX) at (800) 365-2267 NO MORE THAN 8 WEEKS IN ADVANCE (about April 15). Campsites are only about \$12 a day, so for those staying just a few days, it is a small price to pay rather than fight with the campground people when they give away a site when someone leaves.

If you've been to the South Rim and want to try something new, you might like to check out the North Rim version, started back in '96. Organized by some of our friends from Utah, Karen and Deloy Pierce, It offers a much slower paced, less crowded rim, but it is also much more scenic, higher elevation (about 8,000 feet) and a 4 hour longer drive for those of us to the south. You can contact the Pierces at grndcynstarsnr@utah-inter.net, or by standard mail at P.O. Box 674, Farmington, UT.

Even a year ago, I was trying to get people to come out because of the dark skies, and while they are spectacular skies, this is a public star party. If you want to do photography or CCD imaging, this is probably not the event for you. If you enjoy showing others the sky and the fellowship of observing with others, you will have a great time. Because this is a public star party and we are set up in a parking lot, there will be the occasional car or bus headlight, but they pass and we get back to the fun. If you have a larger scope you do not want to set up and tear down every night (we do not have the option that Dobson had back in the '70s and take up "valuable" parking spots) we have access to an "observing field" just off the parking lot that also misses the headlights, but you also miss out on much of the crowd that has a harder time finding you there. If you want a perfect observing site all to yourself, call me—I have some great sites for you. We have loads of fun in a parking lot with the public and truthfully, I would take that any time, sharing the views than off by myself with no one with which to share the majesty of the skies. I hope you will join us—give me a call for more info, or look to the next newsletter for timely, helpful hints. Bye for now...

—Dean Ketelsen (520)293-2855

ketelsen@as.arizona.edu

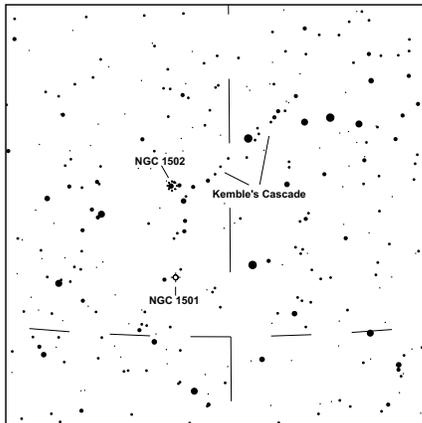
Fuzzy Spot

by Ken Reeves

Camelopardalis March 1998

Take a blank area of the sky, throw in a name that no one can pronounce, and what do you get? Camelopardalis. Most constellations don't look like their name-sake, this one's name is even all wrong... not a Camel, but a Giraffe.

Though pretty void in stars, this constellation contains some nice deep sky objects including an incredible galaxy and a few Milky Way objects.



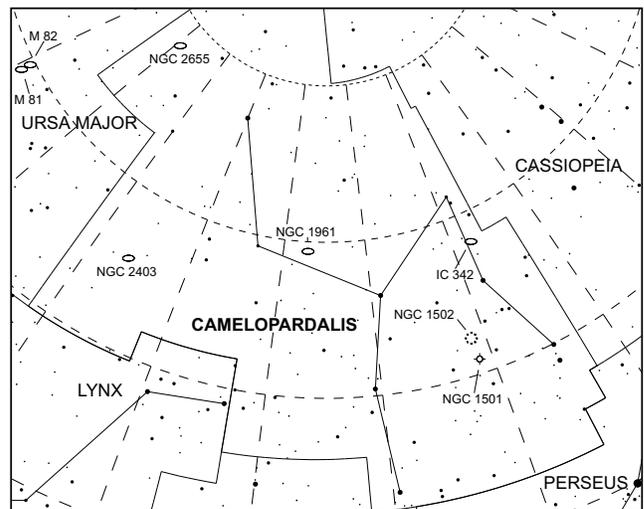
NGC 1501 (04h07.0 +60°55') Here is a small but bright planetary nebula. I considered it as not very big, pretty bright, and with the UHC it is very obvious. No central star is visible, but with averted vision, the annularity is visible.

NGC 1502 (04h07.7 +62°20') Here is a nice open cluster, at 100X it is very bright, very large, not at all concentrated, with 25 stars including some nice doubles. The double in the middle is much brighter than all the rest. The shape is kind of triangular. The open cluster sits in the middle of the asterism (or possibly another open cluster) called **Kemble's Cascade**. Definitely take a look at this in binoculars or the finder scope, it is a sight you won't forget.

NGC 1961 (05h42.2 +69°23') We've now moved out of the Milky Way and into the springtime sky of galaxies. This one is pretty faint, pretty large, brighter in the middle, and has a pretty faint halo. At 100X, it seems to have a stellar nucleus, but the halo becomes very faint. There are stars to west and southeast.

NGC 2403 (07h36.8 +65°37') Here is a great galaxy that is better than most Messier Galaxies. It is very large, pretty bright, has a very very large faint halo with a somewhat brighter middle. The galaxy is very elongated north-west/southeast. There is a stellar nucleus or perhaps a foreground star, and 2 more stars bordering the bright middle. Averted vision and moving the scope really makes the halo grow. The halo fills 3/4 field of view (about 25'). The middle is definitely mottled, I tried using the UHC filter to bring out hydrogen regions, but wasn't able to see any more.

NGC 2655 (08h55.6 +78°13') This last Herschel and Best of the NGC object is somewhat bright, somewhat small, a little brighter in the middle, contains a non-stellar nucleus, and is round. The galaxy is between 2 fairly bright stars that interfere somewhat with the viewing. The halo is pretty faint, but averted vision helps. There is a nice star pattern is around this object.



Here is the toughie of the month, Galaxy **IC-342** (03h46.8 +68°06'). This galaxy may be a member of the local group, pictures show it as a very large and loose spiral, oriented almost face-on. In the 10" scope on an 8 out of 10 night, I saw it as extremely faint and very large at 70X. I probably was only seeing the middle portion. With about 10 foreground stars, it looked like a faint unresolved open cluster. Some surprising thing about this observation is that the galaxy became harder to see at 35x, but using the UHC filter helped bring it out.

Herschel 400 Objects

1501, 1502, 1961, 2403, 2655

SAC's 110 Best of the NGC Objects

1501, 2403, 2655

Continued from page 5...

Next, AJ Crayon discussed the upcoming Messier Marathon on March 28, at the same site as last year. The porta-potty has already been ordered, so everything should be ready.

Steve Coe gave a final speech about the upcoming eclipse cruise, and mentioned that he had the tickets, which he distributed at the break.

Rich Walker talked a little about upcoming public events. There will be a public star party at Estrella Park on May 2nd, and a school star party at Challenger School on April 1st (no, it's not an April Fools joke). Any mem-

bers with scopes that can make it would be appreciated. **He then asked if he could get some help with organizing the public events, as he is extremely busy with his new job. Anyone that can help out, please call Rich or any of the board members.**

Adam mentioned that he has been viewing the Iridium flares, including a -6 mag flash! He provided a web site that will provide upcoming flashes for a given latitude and longitude. The web page is www.gsoc.dlr.de/satvis.

Gerry described his observation of the NEAR satellite passage. There was some discrepancy between his description and a video that Tom Polakis provided, where

Such-A-Deal

SUCH-A-DEAL is a place to advertise equipment, supplies, and services related to amateur astronomy. This is a free service for SAC members and friends. SAC is not responsible for the quality of advertised items or services. All insertions must be submitted in writing.

For Sale: 10" *f*/6 Meade Research Grade Newtonian telescope and mount. Mirror has been re-figured by Pierre. 7x50 finder, 2" focuser. No eyepieces. This is a well-used telescope but in good shape. \$800. 14 1/4" *f*/7 Coulter mirror, Novak 9-point mirror cell, 2.25" ma diagonal, curved spider. I have focalt report on the mirror. \$750 2.4" Unitron refractor tube assembly. \$100 or free with either of the above. Paul Maxson E-mail: sunspot@starlink.com or phone: 975-9232.

For Sale: Sonotube from 8" *f*/6 Dobsonian—\$10, Lumicon vinyl endcap for 13.1" Odyssey—\$10, White nylon thumbscrews (10-32 thread) to replace metal screws on celestron/meade/orion finderscope brackets—\$2/set, Kodak 140 Carousel slide trays (14 available)—\$5/each. Sam Herchak, 924-5981.

the satellite showed up as a barely visible star-like spot.

For Show and Tell, Chris Schur provided us with about 12 slides of his latest work. Steve Coe had several slides, including the planetary alignment from last year which was supposed to destroy the Earth. Visible in the slides was Mercury, Venus, Mars and Jupiter. Getting back to the eclipse theme, Gerry talked a little about shadow-banding which occurs in some total eclipses, and showed some slides of equipment used to detect the bands.

The secretary slipped up and forgot to do a count at the break (oops!), but I estimated about 50 people.

Following the break Vice President Gerry Rattley introduced Derald Nye who is an avid Eclipse Chaser. He had some beautiful slides of eclipses and of the many places he has visited while chasing eclipses. For annular eclipses, he recommends getting at the edge of annularity instead of the middle. From such points, very accurate solar diameter measurements can be made. He also provided many tips for eclipse photography.

Gerry adjourned the formal meeting and 23 people continued the informal meeting at JB's.

—Ken Reeves, SAC Secretary

Deep-Sky Group Meeting

The Deep-Sky Group is a Special Interest Group made up of people who like to discuss observing and observing techniques. They particularly like to observe objects out past the Ortt Cloud that's why they're called the Deep-Sky Group. The type of objects include stars, nebulae, and galaxies.

If you are interested in sharing your observations, or are interested in observing techniques, then by all means come join in. The meetings are held at John McGrath's house every other month on the Thursday after the SAC meeting; directions are found on page 2 of this newsletter.

Consider this to be an invitation to this meeting. This meeting is OPEN to all SAC members. All you have

to bring is an interest in what objects look like when view through a telescope.

For the March Deep-Sky Meeting we will discuss the objects in Ken Reeves' January and February *Fuzzy Spot* columns (Orion, Canis Major and Monoceros), which total 15 objects.

If you have new or old observations, bring them along. Even if you have no observations, come anyway. This is a good way to improve your observing skills.

Next Novice Group Meeting

The next Novice Group meeting is planned for the April club star party at Buckeye Hills on **April 18**.

A.J. Crayon and Steve Coe will again set up and run a new session for people new to amateur observing. The current plan is to have some planned observing and a twilight talk. Then just allow folks to ask questions from then on. Because the Sentinel Star Gaze will be next weekend, one of the subjects will be star party etiquette.

Assistant Public Events Coordinator Needed

Due to time constraints of a new job, Rick Walker needs help putting together the public events for SAC. The job of Public Events Coordinator consists of setting up the three star parties SAC has at Reach 11 and Thunderbird parks (which is mainly picking up the phone and deciding on a date) and the private star parties (which is mainly returning phone calls and notifying various SAC members where and when to show up.)

Coordinating these public events is very important, it is part of SAC's *raison être*. In the past has done numerous private star parties for schools and clubs. Our star parties are sometimes the first time these children and possibly even adults have really looked at objects in the sky.

The 1998 Sentinel Star Gaze

April 25, 1998

This is the seventh 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 after 7 PM, with twilight ending at 8:15. Those staying the entire night can expect twilight to start at 4:30 AM and sunrise at 5:45 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.

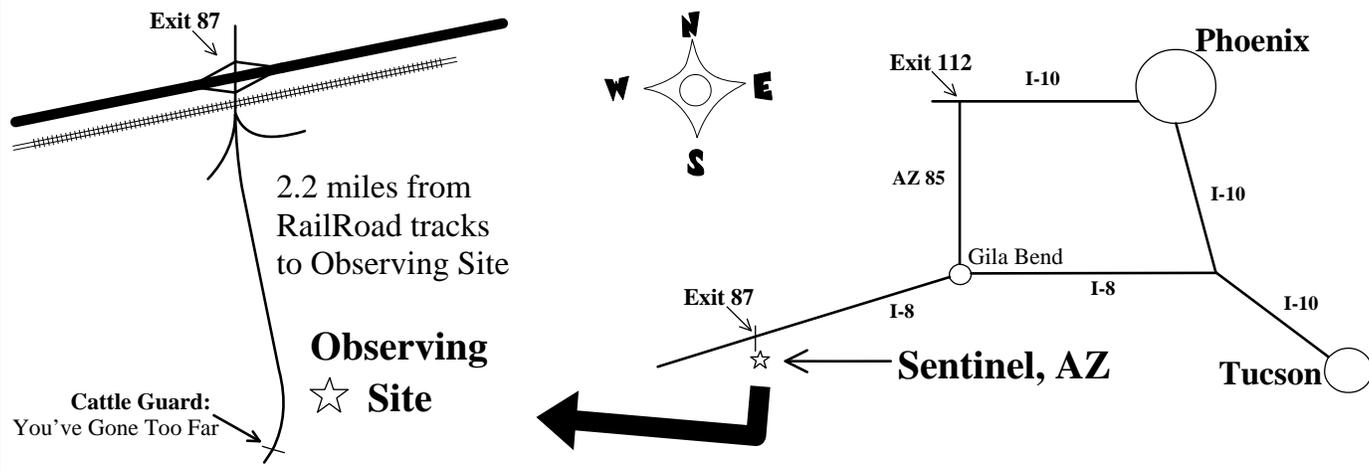
Although this is officially a one night event, frequently observers get a head-start by arriving the night before, to get an extra night of observing. If you decide to do this, bring plenty of shade and lots of water, it can get pretty hot.

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.**



Coming Events

Star Parties

Messier Marathon	Mar. 28
Sentinel Star Gaze	Apr. 25
RTMC	May 22-24
Grand Canyon Star Party	Jun. 13-20
Northern Arizona Star Party	Sep. 18-19
All-Arizona Star Party	Oct. 16-17
Starry Nights Festival	Oct. 16-18

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.

March 1998

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			Tomorrow First Quarter Moon 1:43 A.M.	PAS Meeting Brophy Prep. Physics Lab	TAAA Meeting (Tucson)	John Herschel's Birthday (1792)
1	2	3	4	5	6	7
	Wednesday Sun Enters Pisces 7 P.M.	Sun City West Astronomy Club Meeting	EVAC Meeting (SCC: Rm. PS170)	Full Moon 9:35 P.M.	SAC Meeting Grand Canyon University, Fleming Rm. 105	Prescott Astronomy Club Meeting
8	9	10	11	12	13	14
			Tomorrow Mercury at greatest elongation 19° (evening)	SAC Deep Sky Meeting 7:30 P.M.	Spring (Vernal) Equinox 2:55 P.M.	SAC Star Party Buckeye Hills (members&guests)
15	16	17	18	19	20	21
Yesterday Last Quarter Moon 12:40 A.M.					New Moon 8:15 P.M.	Messier Marathon Arizona City
22	23	24	25	26	27	28
			All Times are Mountain Standard Time			
29	30	31				

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:

Jack Jones
SAC Treasurer
2313 W Sierra St
Phoenix AZ 85029

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.

1998 SAC Meetings

Jan. 9
Feb. 13
Mar. 13
Apr. 10
May 8
Jun. 12
Jul. 10
Aug. 7
Sep. 11
Oct. 2
Nov. 6
Dec. 5 Party

1998 SAC Star Parties

Date	Sunset	Moonrise
Feb. 21	6:18PM	3:40AM
Mar. 21	6:39PM	2:23AM
Apr. 18	6:59PM	1:08AM
May 16	7:19PM	11:54AM
Jun. 20	7:37PM	3:27AM
Jul. 18	7:34PM	2:10AM
Aug. 15	7:12PM	12:57AM
Sep. 12	6:37PM	11:45PM
Oct. 10	6:00PM	10:32AM
Nov. 14	5:27PM	3:48AM
Dec. 12	5:22PM	2:35AM

SACNEWS

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

Stamp

First Class Mail

Inside:

- M 102 Controversy by Hartmut Fommert
- Dim Moments by Paul Dickson
- Comet Comments by Don Machholz
- Grand Canyon Star Party by Dean Ketelsen
- Fuzzy Spot by Ken Reeves

SAC Meeting — March 13

Deep-Sky Meeting — March 19

SAC Star Party — March 21

1998 Messier Marathon — March 28