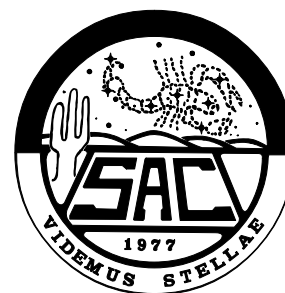


# Saguaro Astronomy Club

Metro Phoenix, Arizona

## SACNEWS



January 1999 — Issue #264

v1.19

## Vekol Lions

by Marjory Vin Williams

margewms@netzone.com

Scientific discussion, regarding the Leonid Meteor Shower, conducted the night of November 16th and early morning of the 17th, at Vekol Wash, Arizona, among members of the Astronomical Society of Kansas City, Missouri, and Arizona's East Valley Astronomy Club and Saguaro Astronomy Club:

"What are they going to do over there? Putting sun glasses on?" (In response to seeing flare after flare being set off at the Barry Goldwater Air Force (bombing) Range,

### "... That one hit the North Star."

near the Sentinel site.)

"Wooooooowwwww!" (To a 100 degree plus meteor luminosity early on.)

"The Taurids are beating the Leonids." (Cheering for one of the underdogs.)

"It's funny. That one hit the North Star."

"That one went through Leo's butt."

"The last 15 minutes of each hour they die." (Perceptions die hard.)

"We're breathing meteor dust." (As in, Just think,...)

"Meteor showers come each year like birthdays." (As is, isn't that great.)

"There's one going the wrong way." (Cheers for the maverick.)

"See the satellite." (When a meteor came almost directly toward us.)

"I'm going to start watching variables." (In response to the beauty of R Leporis.)

"There are no stars in China. The sky is white as milk on an extremely good day." (From the extensive pollution.)

"Right through Canopus."

"Where is comet Tempel-Tuttle?"

"What is that!" (In response to the moon's strong earthshine in the early dawn as it came over the top of

## Quick Calendar

SAC Meeting

Speaker: Glen Sanner

7:30 PM, Friday, January 29

SAC Deep-Sky Meeting

November and December *Fuzzy Spot* Objects

7:30 PM, Thursday, February 4

SAC Star Party

Buckeye Hills Recreation Area

Saturday, February 6

## 1999 Dues are Due

See Membership Services Form on the back page.

the desert hills, a testimony to the superiority of Arizona's viewing which we tend to forget.)

Our not so scientific count on Tuesday, November 17th:

Interval	Count
01:00 to 02:00:	110
02:00 to 03:00:	191
03:00 to 04:00:	257
04:00 to 05:00:	275
05:00 to 06:00:	308

Given the nasty consequences of a one km plus impact at Meteor Crater, a few hundred miles to the north, one would wonder at the enthusiasm for more meteors, especially the intense shouting to top 300 per hour occurring just before a 6:00 a.m.

Who were in this group roaring back at Leo? EVAC: Ken Tullis, Shirley Tullis, Aaron McNeely, Dave Rainey, Pamela Hallows, Forest Hallows, Joe Larkin, Bill Peters. SAC: Jack Jones. ASKC: Kathy Machin, Gil Machin.

Kathy, by the way, is the Astronomical League's national Observing Awards Coordinator and heads the Messier, Sun Spotter and Meteor clubs. She is co-author of Messier Objects - A Beginner's Guide, which you can buy at Marilyn Unruh's Book Nook in Prescott.

Note to Regina Lawless: If you prefer a quieter viewing, I suggest a visit to Hazel Lawler's observatory in Arizona City.

On to November 17, 1999.

# 1998 Leonid Meteor Shower Report from Florence Junction, AZ by Bernie Sanden

besanden@hotmail.com

A friend I work with is such an avid meteor observer that a condition for taking the job we offered him was that he could be assured of having time off for the 1999 Leonids. That was in 1994. This year, Bob and I considered driving NW of Wickenburg to view the Leonids just in case this turned out to be THE YEAR. However, as the day approached, and the realities of having to work the next day restricting my freedom to view the shower from a distant location, I had to settle on a site nearby. I heard that Don Wrigley was planning to watch from the Florence Junction site, so after a call to Don, I and a few others met up at Don's place to gather before heading out to the site. While viewing Saturn in Don's backyard using his 6" refractor and 10" reflector, the show was already underway. As the radiant rose, we saw two bright meteors skimming overhead a full 120 degrees within 15 minutes of each other. Before the night was out, we had witnessed perhaps the best meteor shower we ever will...that is, unless we are fortunate enough to be at the right place at the right time to observe the 1999 Leonid "storm" should it occur. As far as this year's Leonids, the drama of the

night and the blaze of scores of roman candles lighting the night sky are still etched in my memory as if it happened last night. The event was a heck of a lot of fun, as well, thanks to the group I was fortunate enough to share the unfolding events with.

Upon returning home from work the next day, I sent a quick summary out to the AZ-Observing E-mail astro newsgroup. Six weeks later, I don't think I have anything to add. It pretty much sums up my observations for the night:

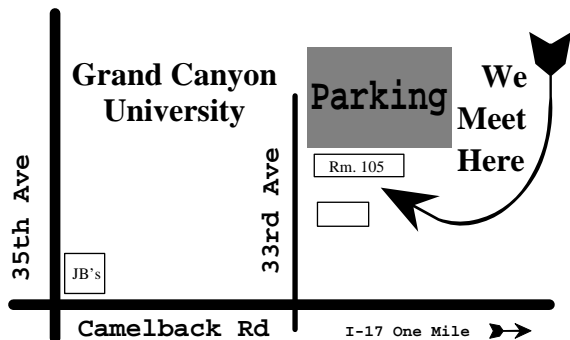
Amazing how much variance there is between meteor count reports within the state. Anyhow, here's the numbers from the Florence Junction site about 30mi east of Phoenix. Limiting magnitude varied drastically across our sky due to Phoenix light pollution to the west and intermittent cirrus. Best part of sky was probably about 6.5 mag, worst about 4.5. Observers Don Wrigley, Frank Kraljic, Chris MacFarland, Tom Polakis (between 3:30 and 5:30am), and myself. Frank took the "group" count, I did an individual count:

Local Time (-7hrs UT)	Indiv.	Group
1AM - 2AM	78	88
2AM - 3AM	110	148
3AM - 4AM	114	196
4AM - 5AM	164	236
5AM - 6AM	109	—

No group count between 5 and 6am, Frank was content to sit back and watch the show. My proportionally lower count (relative to the group count) between 3 and

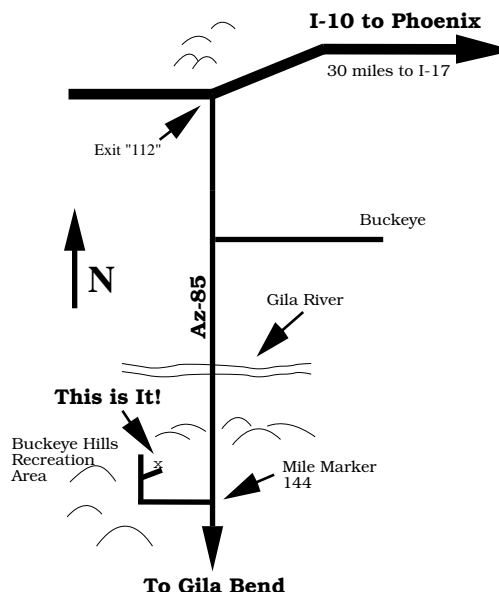
## Directions to SAC Events

**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.



4am is partly due to the direction I was facing and my obsessive involvement with a Thermos full of hot chocolate.

Main impressions:

- -5 or brighter meteor every 10 minutes or so, at least 4 very bright (ground-lighting) meteors left visible trains that lasted over 5 minutes. The “best” of these occurred at about 5:45am towards NE approx magnitude -12, leaving a train that lasted over 15 minutes in the twilight sky, eventually forming an inclined ring 5 degrees long. The trains that persisted were great binocular objects, being distorted in the upper atmosphere. Big ‘ol false-Veil Nebulae.

- Spurts and lulls, sometimes saw a dozen in a couple minutes followed by only a few in the next few. Many simultaneous meteors. My favorite in this regard were three that shot out near the Sickle of Leo in different directions, all within about 2 seconds, clearly identifying the radiant. The spurts really got the group whooping. We were all a bunch of adrenaline junkies by dawn.

- Unlike other Leonid showers I’ve seen, in which green was the color I most often recalled, most of these appeared yellow and orange (could it be due to the fact that I have historically observed the Leonids above 5000 ft elevation?).

- Lots of background meteors (not reflected in the above counts). Most appeared to radiate from Pleiades/Hyades area, so we assumed they were Taurids. We counted 12 per hour between 1am and 3am.

- Meteors screaming down the length of the zodiacal light cone was something I’ve never seen before. Something very aesthetic about it.

- Although the count rose as the radiant did, the number of long, slow meteors decreased. It was a trade-off - either proportionally more of the “knock-your-socks-off” kind, or a lot of frenzied activity mostly involving short and quick ones. In fact, two of the best meteors we saw were observed from Don Wrigley’s backyard in Apache Junction around 11:00 PM, which seemed to skim for over 120 degrees of the sky, nearly overhead.

- Saw two distinct glints in the sky between clouds on the drive back to Phoenix, about 20 minutes before sunrise. Hated to think so much was still going on and we were missing it. All and all the best meteor shower I’ve ever observed, but can only imagine how the “storm” might look. Be prepared, 33 years will be here before you know it...

## Dues are Due

It’s time to renew your SAC membership for the upcoming year. Dues are still \$28 (\$42 for the whole family) for the year. **See the Membership Services Form on the back page of this newsletter.**

Magazine renewals have changed slightly. While *Sky & Telescope* is still \$27, *Astronomy* has gone up to \$29.

In other news, the 1999 R.A.S.C. Observer’s Handbooks have arrived! They will be available at the Christ-

mas party in December and on into 1999 until they run out. They are \$12 a copy.

Orders will be taken for the 1999 Astronomy WALL Calendar at the club discount price of \$10.00. (We need 10 minimum.)

We will also take orders for 1999 Year In Space DESK calendars at the club discount price of \$10.00. It’s 172 pages, See at <http://www.YearInSpace.com> (We need 10 minimum.)

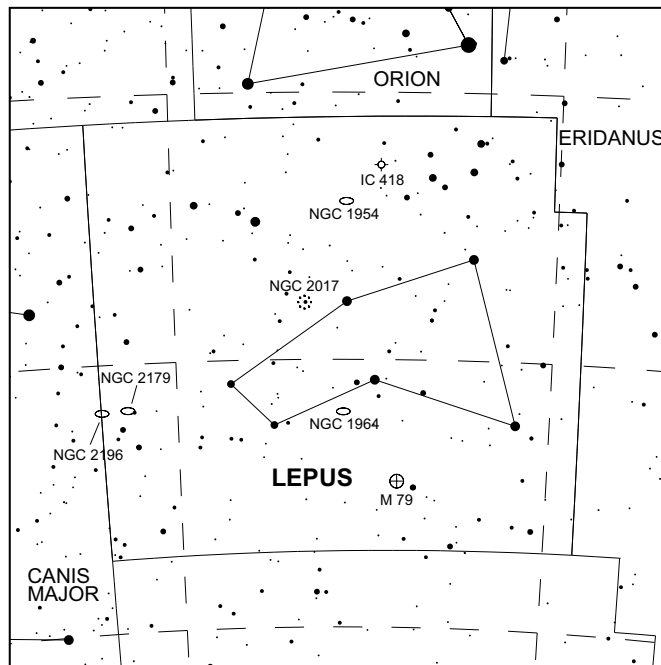
# Fuzzy Spot

by Ken Reeves

Lepus

January 1999

Lepus is a small constellation just under the feet of Orion. The Rabbit or Hare is hard to distinguish, I see it as a lopsided and smaller version of Hercules with Alpha, Beta, Mu, and Epsilon making the keystone. Also, don’t confuse this with Lupus, the Wolf near Scorpius. Since the names are so similar, I am always getting the two mixed up.



The Rabbit contains the nice globular cluster M 79 which is quite removed from the other Messier clusters, but other than this, there are not a lot of deep-sky objects. You’ll mostly be looking at faint galaxies. Some of my observations were taken in the 20” scope, but don’t worry, I made sure that these objects were listed in Luginbuhl and Skiff’s book (*Observing Handbook and Catalogue of Deep-Sky Objects*, unfortunately out of print), so they should be accessible to most scopes.

NGC 1904 (05h24.5 –24°33’) The first object is M 79, a remote globular cluster and not to be skipped over! At 100X in the 10” scope, it is very bright, pretty large, with

a bright middle. The straggler stars spread out pretty far, and the center is very condensed. By cranking the power up to 170X, the middle is still unresolved, but there are many stars spread over the central haze. At 240X a lot of the stars pop out using averted vision and the central haze is definitely granular.

IC-418 (05h27.5 -12°42') I have yet to observe this planetary nebula. According to Skiff, "This planetary is clearly visible in 6 cm, appearing as an undistinguished mag. 9 star: longer focal lengths are required to show its nebular character.... With 30 cm the central star is prominent, especially at high power. Here the nebula shows a slight elongation N-S."

NGC 1954 (05h32.8 -14°04') This is the brightest galaxy in a group of 4. According to Skiff, "e.g. 1954 is the brightest of this small group of galaxies. It is faintly visible in 15cm, which shows a small patch elongated roughly E-W with two mag. 12.5 stars involved on the NW side." The other 3 galaxies are listed as IC 2132, NGC 1957, and A0530-14. IC 2132 is visible in 15 cm, the other two are only visible in 30cm.

NGC 1964 (05h32.8 -14°04') This galaxy was observed in the 10" scope as pretty small, fairly faint, containing a very much brighter middle, and there is either a star involved or perhaps it is a stellar nucleus, and there is another bright star or stellaring seen in the galaxy. The galaxy is elongated NNE/SSW. To the W of the galaxy is an isosceles triangle of stars. These nearby stars do interfere with the viewing.

NGC 2017 (05h39.4 -17°51') This open cluster is probably better classified as a multiple star. It is very bright, pretty small, extremely poor, but the few stars are condensed. There are 2 levels of stars, with a total of 6 stars counted.

NGC 2179 (06h08.0 -21°44') This galaxy was observed in the 20" at 160X. I saw it as little faint, somewhat small, very elongated 3:1 N/S with a star on either end. These stars may enhance the elongated appearance. I felt the stars were what made this observation interesting.

NGC 2196 (06h12.2 -21°47') The last galaxy was also observed in the 20" at 160X. Seen as somewhat bright and pretty small, it contained a much brighter middle, but no nucleus. The object is round with some sort of mottling going on, possibly a spiral structure. Using averted vision on this object helped a lot. There is a star to W which may just be involved, and several other stars nearby form

a nice string.

Herschel 400 Objects 1964 SAC's 110 Best of the NGC Objects none

Herschel 400 Objects  
1964

# Comet Comments

## by Don Machholz

(530) 346-8963 CC245.TXT December 8, 1998  
<http://members.aol.com/cometcom/index.html>  
 DonM353259@aol.com

21P/Giacobini-Zinner						
Date	RA-2000-Dec	Elong	Sky	Mag		
01-07	00h38.0m -23°33'	74°	E	10.4		
01-12	01h00.5m -22°58'	75°	E	10.7		
01-17	01h21.8m -22°11'	75°	E	11.0		
01-22	01h41.8m -21°16'	76°	E	11.2		
01-27	02h00.8m -20°13'	76°	E	11.5		
02-01	02h18.8m -19°06'	76°	E	11.8		
02-06	02h35.8m -17°56'	76°	E	12.1		

With a moderate-sized telescope, you could view a half-dozen comets on most nights during the next few months. As predicted here last month, **Comet Linear (1998 U5)** outburst by nearly three magnitudes. It, and **Comet Linear (1998 M5)**, both pass north of the sun and from the evening to the morning sky. **Periodic Comet Giacobini-Zinner** fades in the evening sky while **Comet Williams** fades in the morning sky. **Comet Jager** and **Periodic Comet Harrington-Abell** remain within fifteen degrees of each other as they pass through opposition on favorable visits through our part of the solar system.

**C/1998 W1 (Spahr):** Found on Nov. 16 by Timothy Spahr using a 16-inch Schmidt as part of the Catalina Sky Survey, this faint comet will be closest to the sun next month at 1.7 AU and orbits the sun every 6.7 years.

**C/1998 W2 (Hergenrother):** The same Catalina equipment was used to find this comet on Nov. 21. It remains faint.

**C/1998 W3 (LINEAR):** The LINEAR program found this faint comet on Nov. 25. It has a retrograde orbit and will be closest to the sun in Feb. 1999 at a distant 4.9 AU.

**C/1939 TN (Vaisala-Oterma):** A strange case of an object being discovered in 1939 which was treated as an

### Orbital Elements

Object:	Giacobini-Zinner	Williams	LINEAR (M5)	LINEAR (U5)	Jager	Harrington-Abell
Peri Date:	1998 11 21.32107	1998 10 17.838	1999 01 24.5733	1998 12 21.8912	1999 03 07.7714	1999 01 27.8772
Peri Dist:	1.0337095 AU	1.14674 AU	1.742213 AU	1.235763 AU	2.152631 AU	1.755993 AU
Arg/Peri (2000)	172.54569°	294.473°	101.2873°	051.2248°	179.4942°	138.8996°
Asc Node (2000)	195.39930°	156.379°	333.3766°	066.6346°	303.8178°	337.2882°
Incl (2000):	031.85856°	145.730°	082.2285°	131.7425°	019.0944°	010.2186°
Eccentricity:	0.7064344	1.0	1.0	0.983362	0.652672	0.542909
Orbital Period:	6.61 years	Long Period?	Long Period?	Long Period	15.4 years	7.53 years
Reference:	NK 629	MPEC 32410	MPC 32410	MPEC 1998-W45	MPC 32866	MPC 32595
Epoch:	1998 11 21	1998 10 17	1999 01 22	1998 01 22	1999 03 08	1999 01 22
Absol Mag/"n":	9.0/6.0	6.5/4.0	5.5/4.0	8.0/4.0	6.5/4.0	8.6/4.0

asteroid but long suspected of being a comet. Recent observations show it is diffuse with a short tail; it is now classified as a comet. It orbits the sun every 9.5 years with a perihelion distance of 3.4 AU.

COMET HUNTING NOTES: Father Leo Boethin of the Philippines passed away on Sept. 15. He was the discoverer of Periodic Comet Boethin (85P/) on Jan. 4, 1975. It orbits the sun every eleven years.

C/1998 P1 (Williams)					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-07	12h34.7m -00°30'	98°	M	9.3	
01-12	12h21.2m +03°34'	108°	M	9.3	
01-17	12h04.7m +08°13'	118°	M	9.3	
01-22	11h44.9m +13°22'	130°	M	9.4	
01-27	11h21.7m +18°49'	141°	M	9.4	
02-01	10h55.4m +24°13'	151°	M	9.6	
02-06	10h26.8m +29°08'	159°	M	9.7	

C/1998 M5 (LINEAR)					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-07	18h59.9m +43°03'	65°	M	9.3	
01-12	19h02.9m +44°45'	67°	M	9.3	
01-17	19h06.2m +46°41'	68°	M	9.2	
01-22	19h09.6m +48°53'	70°	M	9.2	
01-27	19h13.1m +51°21'	72°	M	9.1	
02-01	19h16.9m +54°07'	75°	M	9.1	
02-06	19h20.7m +57°12'	77°	M	9.0	

C/1998 U5 (LINEAR)					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-07	21h09.7m +16°33'	48°	M	10.1	
01-12	21h08.7m +15°46'	44°	M	10.3	
01-17	21h08.1m +15°07'	40°	M	10.5	
01-22	21h07.6m +14°37'	37°	M	10.7	
01-27	21h07.3m +14°14'	34°	M	10.9	
02-01	21h07.1m +13°57'	31°	M	11.1	
02-06	21h06.9m +13°44'	30°	E	11.2	

C/1998 U3 (Jager)					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-07	06h33.4m +36°46'	164°	E	10.5	
01-12	06h29.3m +35°44'	160°	E	10.5	
01-17	06h25.7m +34°38'	156°	E	10.5	
01-22	06h22.8m +33°28'	152°	E	10.5	
01-27	06h20.6m +32°17'	147°	E	10.5	
02-01	06h19.3m +31°05'	142°	E	10.5	
02-06	06h19.0m +29°53'	137°	E	10.5	

52P/Harrington-Abell					
Date	RA-2000-Dec	Elong	Sky	Mag	
01-07	07h15.3m +40°20'	162°	M	10.6	
01-12	07h12.0m +39°46'	162°	E	10.5	
01-17	07h09.0m +39°03'	159°	E	10.5	
01-22	07h06.4m +38°13'	156°	E	10.5	
01-27	07h04.6m +37°16'	153°	E	10.6	
02-01	07h03.7m +36°13'	149°	E	10.6	
02-06	07h03.8m +35°07'	145°	E	10.7	

# Bits and Pieces

## Minutes from the December Party

Thank you Steve Dodder and Rosie Cruz (and dogs & cats) for hosting our SAC Christmas Party on December 5th. About 30 of us made the trek out to the Maricopa backwoods to celebrate, eat, chat, eat, and star gaze and eat and eat. We basked in the nearly full moonlight and looked at Jupiter, Saturn, and the Andromeda Galaxy from Steve's observatory. He has a wonderful setup and a dark yard along with all the comforts of home. He offered an invitation to stop by anytime. If you have plans to build a backyard observatory, this one is definitely worth checking out.

—Jennifer Keller, SAC Secretary

## 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.

## 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 Orrt 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 November Deep-Sky Meeting we will discuss the objects in Ken Reeves' September and October *Fuzzy Spot* columns (Sagittarius and Pegasus), which total 17 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.



## Chris Schur's Astrophoto

### January: Horsehead Nebula

The photo was taken with a 12.5"  $f/5$  homemade newtonian telescope on Kodak Pro 400 PPF film. Two 45-minute exposures were combined in the digital darkroom to make one equivalent 90 minutes exposure with less grain. The photo was from Payson, AZ. by Chris Schur. This image seen here is the red channel image of the color shot and is the same as a red light image with a filter.

Also see Chris Schur's Astrophotography web page at: [pulsar.la.asu.edu/~chris](http://pulsar.la.asu.edu/~chris)

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## Speaker for the January SAC Meeting

The main speaker for the January meeting will be Glen Sanner, co-author of the two volume book *The Night Sky Observer's Guide*. This book could possibly replace Luginbuhl and Skiff's book as a reference as to what objects look like in the sky. Especially now that the latter book is out of print.

# January 1999

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>					Full Moon 7:51 P.M.	
					1	2
Quadrantid Meteors Peak: 10 A.M. Z.H.R.: 120 			Mercury at greatest elongation 23° (morning)	<b>PAS Meeting</b> Brophy Prep. Physics Lab	<b>TAAA Meeting</b> (Tucson)	<b>SAC Star Party</b> Buckeye Hills (members&guests)
3	4	5	6	7	8	9
			<b>EVAC Meeting</b> (SCC: Rm. PS172)			
10	11	12	13	14	15	16
New Moon 8:48 A.M.	Tomorrow Neptune at conjunction with Sun	Sun enters Capricornus 10 A.M.				
17	18	19	20	21	22	23
Full Moon 9:08 A.M.	Yesterday First Quarter Moon 12:17 P.M.			Uranus at conjunction with Sun	<b>SAC Meeting</b> Grand Canyon University, Fleming Rm. 105	
24/31	25	26	27	28	29	30

## SAC Information

Area Code (602)

President & SACNEWS Editor	Paul Dickson Ans. & FAX: 841-0509 dickson@primenet.com
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Public Events	Rich Walker 997-0711 rhwalker@aztec.asu.edu
Public Events	Wil Milan 8am-6pm: 996-8329 wmilan@airdigital.com
Deep-Sky Group	A.J. Crayon 938-3277 acrayon@primenet.com

## E-Mail Mailing Lists

**SAC-mls** is a mailing list for club announcements and quick notification of astronomical events.

**SAC-Board** is for SAC business. All club members are welcome to participate.

**AZ-Observing** is a fairly general mailing list about observing in Arizona. Where the star parties are and who's going, as well as what's up.

To join, send E-mail with the Subject: **subscribe** to the **"-request"** mailing address at [psiaz.com](mailto:psiaz.com). For example, you would send the request for AZ-Observing to [AZ-Observing-request@psiaz.com](mailto:AZ-Observing-request@psiaz.com).

## SAC Web Sites

[www.accessarizona.com/groups/group-access.html](http://www.accessarizona.com/groups/group-access.html)  
[www.primenet.com/~dickson/sac.html](http://www.primenet.com/~dickson/sac.html)

# 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.....\$29.00 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.

### 1999 SAC Meetings

Jan. 29  
Feb. 26  
Mar. 26  
Apr. 30  
May 21  
Jun. 25  
Jul. 23  
Aug. 27  
Sep. 24  
Oct. 22  
Nov. 19  
Dec. 4 Party

### 1999 SAC Star Parties

Date	Sunset	Moonrise
Jan. 9	5:41PM	1:24AM
Feb. 6	6:07PM	12:08AM
Mar. 6	6:31PM	10:51PM
Apr. 10	6:57PM	3:21AM
May 8	7:18PM	1:59AM
Jun. 5	7:37PM	12:38AM
Jul. 3	7:44PM	11:17PM
Aug. 7	7:25PM	2:55AM
Sep. 4	6:52PM	1:46AM
Oct. 2	6:14PM	12:40AM
Oct. 30	5:41PM	11:45PM

## SACNEWS

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

Stamp

First Class Mail

### Inside:

- Vekol Lions by Marjory Vin Williams
- Leonid Meteor Shower by Bernie Sanden
- Fuzzy Spot by Ken Reeves
- Comet Comments by Don Machholz
- Chris Schur's Astrophoto

SAC Meeting — January 29

Deep-Sky Meeting — February 4

SAC Star Party — February 6

SAC Meeting — February 26