

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



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Exploring the Sea of Clouds

by Don Wrigley

If you are looking for an area of the Moon that offers just about every type of lunar feature that you could ask for, why not try the Mare Nubium, an often overlooked mare that is surrounded by some of the most remarkable sights visible in amateur telescopes.

Look for the “Sea of Clouds” just south of the lunar equator, where it becomes visible sometime after the first quarter phase, placing it in an excellent position for study in the early evening hours. It is bordered on the east by four of the largest craters to be found in the central lunar highlands.

Ptolemaeus, the northernmost of the group, is a great walled plain some 95 miles in diameter, and is noted for its multitude of “ghost craters” that seem to cover its entire floor. The next crater in line, moving southward, is Alphonsus, whose floor contains many rilles, crater peaks, and a small central peak which has been the source of many reports of “lunar transient phenomena,” generally in the form of glowing gasses and strange colors. The crater Arzachel is next in our southward journey. It is a good example of a large (60 miles) impact crater with terraced walls, a flooded floor with rilles, and a good sized central peak that is unusually off centered. The last of the four craters is Purback, a rather ancient flooded crater, 62 by 73 miles across, with an elliptical shape that suggests that it was once two overlapping craters whose dividing wall melted down during the lava flooding process. Indeed, its western wall seems far more broken down and ancient in appearance than its eastern wall.

Moving northward again, and looking just west of the dividing wall between Ptolemaeus and Alphonsus, is the crater Davy. A rather small crater, it would be undistinguished were it not for a crater chain that bears its name, which lies just to the east. The Davy crater chain that is just visible in my 8” Newtonian, and is a fascinating example of a multiple impact of the sort that would originate from the breakup of a comet or asteroid. The explanation, which was not enthusiastically accepted at first,

Quick Calendar

SAC Meeting

Speaker: Steve Coe

7:30 PM, Friday, September 8

SAC Deep Sky Meeting

July and August *What's Up* Columns

7:30, Thursday, September 14

SAC Star Party

Buckeye Hills Recreation Area

Saturday, September 23

Public Star Party

Thunderbird Park

Saturday, September 30

has been greatly revived by the impact of the Shoemaker-Levy comet.

As we move northward from Davy we come across one of the most celebrated features for amateur observers, the straight wall. This 70 miles long “wall,” which runs nearly north to south lies just inside the eastern border of the Mare Nubium, is easily seen in the smallest of telescopes. Although it appears to be very steep precipice, its actual inclination is no more than 41 degrees, making it still one of the steepest features on the moon. A close examination under the right lighting conditions shows that it is actually the collapsed floor of an ancient unnamed crater, whose walls have been mostly obliterated by the flooding that

SAC Officers

Area Code (602)

President	Bob Gardner	274-5046
Vice President	Susan V. Pritchard	934-7496
	devrylib@pinyon.libre.com	
Treasurer	Adam Sunshine	780-1386
	sunshine@ensrv1.bcasd.az.honeywell.com	
Secretary	A.J. Crayon	938-3277
	a.crayon@az05.bull.com	
Properties	Pierre Schwaar	265-5533
Public Events	Rich Walker	997-0711
SACNEWS Editor	Paul Dickson	862-4678
	p.dickson@az05.bull.com	

created the Mare Nubium, and whose presence can only be detected in just the right lighting conditions as wrinkle ridges in the mare floor.

Just west of the straight wall lies the small (10 mile diameter) bowl shaped crater Birt, with its smaller close companion Birt A lying just off to the southeast. The two crater walls merge at one point, looking very much like a yeast cell with a bud attached! Just to the west of Birt is one of the more interesting lunar rilles, the Rima Birt, which seems to connect two very small craters, Birt E and Birt F, in such a way that one suspects that they, along with Rima Birt, are of volcanic origin. I find Rima Birt to be a useful test of seeing conditions: if it does not show clearly in my 8" Newtonian, I judge the seeing as being rather poor.

Moving westward across the center of the Mare Nubium, we come across the craters Nicollet (9.4 miles across) and Wolf, whose ancient walls just barely survived the volcanic flooding that created the mare floor, leaving behind a series of ridges and mountain peaks that make a true measurement of its diameter rather difficult, though the accepted figure is just over 15.5 miles.

As we near the western border of the Mare Nubium, we come across one of the most magnificent impact formations, the crater Bullialdus. At 38 miles in diameter, it is somewhat smaller than the "big name" impacts (Copernicus et al), yet its towering walls and rather unique radial ejecta pattern make it an awe inspiring sight nonetheless. Look for the strings of secondary craters that stretch out around it on all directions. Similar in size, but much more ancient than Bullialdus, are the flooded craters Lubiniezky, to the northwest, and Kies, which lies due south. They too, must have been a magnificent sight at one time, before the great floods of lava filled them nearly to the top. Look just to the west of Kies for one of the most easily seen lunar domes on the moon. Kies Pi, as it is called, is

quite prominent when the terminator is just to the west of Bullialdus, and possesses a neat little summit craterlet that is easily seen when seeing permits. If lunar domes are on your "must see" list, this is a good one to start with.

We are now near the western border of the Mare Nubium, and as we watch the terminator cross this area, we cannot help but notice the network of rilles that seem to crisscross the entire border. Most noticeable are the Rimae Hippalus, three parallel fault lines that look like marks of a giant cat that sharpened its claws on the lunar surface.

On the extreme southern border of the Mare Nubium lies the ancient crater Pitatus, whose flooded 65 mile diameter floor is covered with many rilles. High power and good seeing are required to see them, as they are rather difficult to detect. If you fail to see them don't despair — an even greater spectacle lies nearby. On the western side of Pitatus lies the broken walls of the very ancient, and the much smaller crater Hesiodus, whose southwest wall is just broken by one of the most intriguing craters on the moon. Hesiodus A is about 12 miles in diameter and would be quite unremarkable were it not for the inner wall with in its walls that is ringlike in appearance and definitely does not resemble anything associated with an impact crater. It is easily seen in an 8" reflector, and quite detectable in an 80mm refractor.

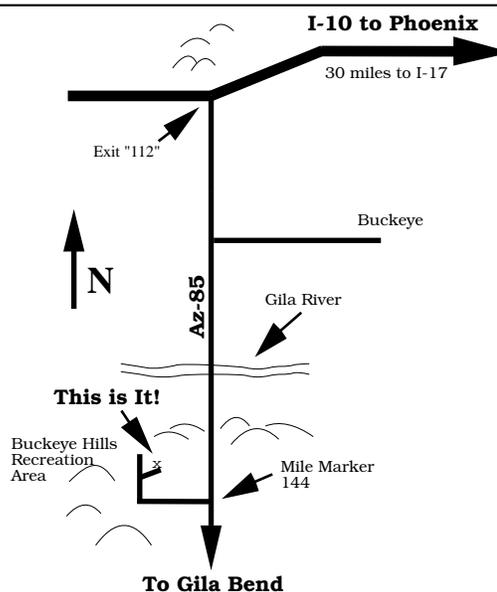
Many writers have suggested that the ring is the result of a second impact in the exact center of Hesiodus A. The only problem is that the ring does not look like the wall of an impact crater; it is rounder and smoother than an impact produced wall, and there is no evidence of any ejecta nearby. Still the apparent uniqueness of the formation lead many to insist that the feature had to be the result of some change encounter, and not a "naturally" occurring event, or there would be similar structures elsewhere on the moon. However and almost identical ring

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 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.

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.



structure was detected by an Apollo photograph, inside a small crater on the western floor of the great crater Humboldt, which lies just near the eastern limit of visibility for Earthbound observers. I am not aware of anyone having detected it from Earth, and it is likely that the effects of foreshortening preclude this possibility, even under the best conditions. This, of course, should not stop anybody from looking for it!

As to the cause of this feature, a satisfactory explanation has not yet been offered, and the situation is likely to remain that way until we return to the moon at some future date. In the mean time it seems only fitting that a cloud of mystery should still persist in that place we call

the "Sea of Clouds."

Bits and Pieces

Minutes of the August Meeting

Club President Bob Gardner opened the meeting and promptly asked for a Treasurers report from Adam Sunshine. At the end of the report Adam reminded members that next years dues and magazine subscriptions, increases and all, are renewable beginning in October. The cost for Sky and Telescope is \$24.00; Astronomy, \$20.00 and club, \$28.00 per year.

A total of five visitors introduced themselves.

Comet Comments

by Don Machholz

(916) 346-8963 CC205.TXT July 28, 1995

Periodic Comet d'Arrest dims while Periodic Comet Jackson-Neujmin brightens slightly. Meanwhile, a new comet has been visually found.

6P/d'Arrest				
Date	RA-2000-Dec	Elong	Sky	Mag
08-21	00h19.5m	-19°06'	146°	M 9.3
08-26	00h27.7m	-22°24'	147°	M 9.5
08-31	00h34.4m	-25°24'	147°	M 9.7
09-05	00h39.6m	-28°01'	147°	M 9.9
09-10	00h43.5m	-30°13'	147°	M 10.2
09-15	00h46.1m	-32°00'	146°	E 10.5
09-20	00h47.8m	-33°21'	145°	E 10.7
09-25	00h48.6m	-34°18'	144°	E 11.0
09-30	00h49.0m	-34°52'	142°	E 11.3
10-05	00h49.0m	-35°06'	140°	E 11.6
10-10	00h49.0m	-35°00'	139°	E 11.9

Comet 1995 O1 (Hale-Bopp): Alan Hale of Cloudcroft, New Mexico and Thomas Bopp of Glendale, Arizona discovered this comet while observing M 70 on July 23. Hale is a well-known comet observer who has done some comet hunting but was not actually searching for comets when he found this. At that same hour Bopp was observing M 70 through his friend's (Jim Stevens) 17" telescope when he noticed the comet nearby. He promptly drove home (90 miles) to report it. Bopp doesn't own anything bigger than a spotting scope, but has been involved in

astronomy for some 25 years, mostly in Ohio. Two days later Gerry Rattley of Gilbert, Arizona also discovered it. The orbit of this new object is difficult to determine, but the positions below should help you follow it through September. Early indications are that the comet is distant and will be around for a long time.

58P/Jackson-Neujmin					
Date	RA-2000-Dec	Elong	Sky	Mag	
08-21	21h35.2m	-03°28'	169°	M	12.0
08-26	21h38.2m	-05°34'	169°	E	11.9
08-31	21h41.8m	-07°53'	167°	E	11.7
09-05	21h46.2m	-10°21'	163°	E	11.5
09-10	21h51.7m	-12°52'	159°	E	11.4
09-15	21h58.2m	-15°20'	154°	E	11.4
09-20	22h05.8m	-17°40'	150°	E	11.3
09-25	22h14.6m	-19°48'	146°	E	11.3
09-30	22h24.4m	-21°37'	142°	E	11.4
10-05	22h35.1m	-23°06'	139°	E	11.4
10-10	22h46.6m	-24°13'	135°	E	11.5

1994 O1 (Hale-Bopp)					
Date	RA-2000-Dec	Elong	Sky	Mag	
08-21	18h25.8m	-31°07'	127°	E	10.4
08-26	18h23.7m	-30°53'	121°	E	10.4
08-31	18h21.8m	-30°40'	116°	E	10.4
09-05	18h20.3m	-30°26'	111°	E	10.4
09-10	18h19.1m	-30°11'	106°	E	10.3
09-15	18h18.2m	-29°57'	101°	E	10.3
09-20	18h17.6m	-29°42'	96°	E	10.3
09-25	18h17.4m	-29°28'	91°	E	10.3
09-30	18h17.5m	-29°14'	86°	E	10.3
10-05	18h17.9m	-28°59'	81°	E	10.3
10-10	18h18.6m	-28°45'	77°	E	10.3

6P/d'Arrest
1995 July 27.36197
1.34587 AU
178.0504°
138.9874°
019.5232°
0.6140404
6.51 years
MPC 20122

Orbital Elements
Perihelion Date
Perihelion
Argument of Perihelion
Ascending Node
Inclination
Eccentricity
Period
Source of 2000 Elements

58P/Parker-Neujmin
1995 Oct. 06.61876
1.381125 AU
200.3470°
160.7177°
013.4779°
0.6614285
8.24 years
MPC 20123

Rick Walker announced a public star party for September 30th to be held at Thunderbird Park. More information will be available at the next meeting.

For Show-n-Tell Pierre Schwaar discussed the newly discovered comet Hale Bopp and Kodaks new print film Royal Gold 400 which returns good results for piggy back photography. He also discussed preliminary results in testing some commercially made thin mirrors made of plate glass - they are not encouraging. An offer was made to club members to test their mirror—free of charge.

After the break Vice President Susan Pritchard announced that there was no scheduled speaker but that a number of club members had volunteered to speak. To that end the following members spoke on indicated topics.

Stan Student renewed his project of showing slides of the Messier Catalog taken with the CCD camera. He covered entries from M11 to M51—a great slide and great place to stop.

AJ Crayon spoke on keeping warm while observing—in the winter.

Paul Dickson showed a video of rocket launches; only one was a real lawn dart.

Tom McGrath showed slides from a observing trip to Chile.

Steve Coe, finally, showed slides on eye piece projection photography of the moon and sun.

—A.J. Crayon, SAC Secretary

Observer Notes: July Star Party by Jack Jones

The I-17 interchange to the I-10 West freeway was closed to our surprise due to a spill, so we had the adventure of taking good old Buckeye Road all the way out to US 85-South to get to the Buckeye Hills Recreation Area. We shouldn't have worried; It was actually quite a nice drive, with much better scenery than the freeway. With a 55 MPH limit most of the way it took about the same amount of time, too.

Sunset was at 7:36 PM. There were eight telescopes ready to go, ranging from a 4-inch Takahashi APO to a 14-inch Newtonian. The usual newbie concerns about scorpions and snakes were again laid to rest, as at every desert star party held in the warmer months. There was speculation as to how many people escaped the desert heat and were enjoying the stars from possibly Dugas or higher elevation vantage points. Monsoon season star parties are usually clouded out, but tonight was very clear with low humidity. My fear of having to observe covered with sweat and mosquitoes was unfounded. It was quite pleasant, with light breezes strangely alternating hot and cool air throughout the night. This meant middling to mediocre seeing for us, though.

Tonight is going to be my attempt to become a member of the Nine Planet Club. No, I've already seen Pluto; I achieved that in May during its opposition. With my $f/4.5$ 10-inch equatorially-mounted Newtonian reflector, I barely picked it out of the starry background at magnitude 13.7 after much travail. What I have never gotten around to finding though, are Uranus and Neptune! This year they are both in the same part of the sky between Sagittarius and Capricornus, almost coming into the same finder field together. My Observer's Handbook plots them on a single chart and tells me they won't be together again until 2165, so now's the time for a two-for-one shot!

Uranus I bag first, searching at about 50 power with a Meade 24.5mm Super Wide Angle eyepiece, giving me a 1.4 degree field. I use the Handbook star chart and nearby globular cluster M75, but the planet is so bright in the telescope at magnitude 5.6, that I ignore it for a while, thinking it's a field star. A shouted "Oh #@%&, that IS it!" brings laughter from the darkness. High power (285x) then shows it to be the smallest of disks, a pale blue-green dot at 3.7 arc-seconds.

Finding Neptune becomes a real challenge, since it's one 8th magnitude point in a haystack of stars. I find it without a doubt though, the same way I found Pluto, with repetitious star hopping and star patterning until there can be no mistake: Hey, that star's not supposed to be there! Four light-hours away, farther out than Pluto, its size is only 2.3 arc-seconds. The poor seeing won't let me see a disk. I make a loud announcement, "Well, I have seen what I believe to be Neptune!" More laughter.

Most of the later evening is taken up observing within the rich Milky Way around Sagittarius. M24, the Scutum Star Cloud, M11, and many other naked-eye and binocular objects have to be re-visited and remarked upon. M22, just above the "teapot", stands out as an immense globular cluster that rivals M13, itself now almost straight overhead in Hercules. Burnham's Handbook says M22 is one of the nearest globulars at less than 20,000 LY, and holds a half-million stars (M13 has a million). This globular is one that is supposed to have a major axis, with a PA of about 25 degrees. I will have to try and verify that next time. Dave Clinton has brought over a massive 35mm Panoptic with a 2" OIII filter and has grafted it onto the side of Rich Walker's 8-inch Dobsonian, giving a huge 3-degree field. This also gives an exit pupil of over 8mm, a diameter my old eyes haven't been able to achieve for at least 35 years. I am looking at close to \$600 worth of equipment, and this is not even including the telescope! We are treated to full-field views of the North American Nebula and the Veil Nebula in Cygnus. The Pelican Nebula is also easily visible "in the Atlantic" near the N.A. Nebula, both of which show very dark areas around them due to the filter. The OIII filter seems to bring the telescope alive, showing an extensive curving Veil Nebula with long tenuous filamenting, while at the same time dimming an interfering bright star in the field. Rich states there is no way a photograph could show what

we are seeing with our eyes, since it is limited to one set exposure; over-exposing some features and under-exposing others. Other comments on the Veil range from “It looks like a double Aurora” to “Ooh, Egg Drop Soup!”

After midnight Saturn gets up high enough to show some steadiness in the telescope. Saturn is now oddly ringless, the rings being in the same plane as Earth, an event that occurs every 15 years. The planet now looks like a second-rate Jupiter with a black slit bisecting it, with only low-contrast gray banding to be seen. However, this is a good opportunity to go moon collecting, and I see 4 moons right away. Jerry Rattley picks out five moons with his 14-inch equatorial newtonian, and a hint of a razor-thin ghost ring (illuminated by light reflected up from the planet and light leaking through the rings) in moments of good seeing. After this education, I see the fifth tiny moon in my scope too. I catch a momentary glimpse of the ghost ring, but only on the right (east) side of the planet. What a test! Two of the moons are bright and are obviously the mighty Titan and lovely Rhea at magnitudes 8.3 and 9.7 respectively, on opposite sides of the planet, each about 4 diameters out. Inside of these on both sides of the planet are nestled 3 needle-sharp points of light that can just barely be seen. On the left side is 10.4 mag. Dione and on the right are 10.2 mag. Tethys

and feeble Enceladus at 11.7. We look for a sixth moon, Mimas, and a 7th, wide-ranging Iapetus, which should be visible, but no luck. The first Earth crossing was May 22, the next will be on August 10th, and a third will occur in February, so there are still good opportunities to see this remarkable event.

Jerry takes the opportunity to shine a red light on his mirror and show us the many mold-like splotches all over it. It’s a silvered mirror made by Pierre Schwaar, and the silver is slowly deteriorating. Even so, he says he’s only losing a few tenths of magnitude. The mirror has a good figure, but is a little rough still (under the silver), so he’s going to eventually get it recoated after a little more polishing by Pierre.

Our last excursion of the night is to locate incoming Comet d’Arrest, coming in at 20h 10m and 0.0 degrees. Being a member of the Nine Planet Club, my experienced eye locates it immediately at low power in my 10-inch light bucket as a large, round, diffuse, and transparent piece of fog superimposed on a parallelogram of ninth magnitude stars. It looks a lot fainter than its estimated 8.8 magnitude. This comet is supposed to reach naked eye visibility towards the end of August so, shall we say, “It’s got a long way to go.”



Peeling Away the Overcast

In case you ever wished you could peel back a stormy daytime sky to reveal the night sky behind it. Photo and image processing by Tom Polakis.

A Night of Discovery

Comet C/1995 01 (Hale-Bopp)

by Bernie Sanden

The last two July dark-of-the-moons have been unexpectedly favorable for observers in Arizona. July 1994 brought us a beautifully clear new moon weekend. Still etched clearly in my memory are the Veil, North American, and Pelican Nebulae overhead at Dugas meadows with a wide field OIII-filtered view through Gus Van Ness's Genesis refractor. You might recall, however, that the monsoon began abruptly a week later with the first impact of comet SL-9 into Jupiter, and our best cloud-dodging maneuvers were required once again. This year, the monsoon never really amounted to much in the Valley during the month of July. For that reason, emerging from work Saturday, July 22nd it appeared we had a chance for a good observing night ahead.

My observing friend Tom Polakis had expected monsoon-as-usual and planned his vacation back to his Midwest home-town starting that day so I called another observing friend, Kevin Gill, to see where he was heading for the evening. I was hoping his group was considering the north high country, as the visions of last year—with the Veil overhead at 4000 feet and crystal clear skies—were prompting me. He called me back to say Vekol Road was the place to be so I whipped out a computerized Voyager observing list of objects to view that night before I left home. Among them were some globulars in the southern part of Sagittarius.

Arriving just after sunset, I found that Kevin had already set up his 20" Obsession. Jim Stevens was ready and waiting with his 17.5" Newtonian Dob, and their friends Tom Bopp, who I'd not met up to that point, and Dick Jacobson were there as well. Tom currently does not own a telescope, but had spent a number of years involved in a club in Ohio that had a member-owned scope which he apparently made good use of. Also, Bob Erdmann (who helped get me started with the first scope I ever made) and George DeLange had come to partake of the sky and share a few stories. Bob brought his 16" Dobsonian "Cyclops II" (the now infamous Sentinel dust-devil magnet).

Bill Calvert showed up with his 10" Bigfoot Newtonian as dusk was ending.

My observing efficiency sometimes suffers when Kevin is around. Between stories of the Winter Star Party "asphal-ite" meteorite (ask him) and Marfa-light hysteria (ask me), I didn't get very far on my list by 11 PM. We did manage a couple of nice views through his 20". The crescent nebula in Cygnus (NGC 6888) was nothing short of astounding. The object is not a mere crescent but displays a complete ring, somewhat similar to the Helix nebula if inclined about 30 degrees from edge on (and moved a couple hundred light-years further away, perhaps). The "crescent" results from a large portion of the arc being much brighter than the remainder. We spent a good half-hour on that object alone.

Around 11 PM I was at my scope somewhat sluggishly working through my observing list. Tom Bopp was observing the globular M70 in Jim's scope when I heard Tom ask if there was another globular near M70 (their conversation caught my attention since I planned to observe in that region shortly). Moments before, Jim had gone over to the atlas to determine the location of the next object to view while Tom (according to his own account) had continued to observe M70 and noticed a fuzzy object apparently drifting into the field. I recall Jim replying to Tom that he didn't believe there were any other globulars close to M70, so they consulted the atlases. I really wasn't paying much attention for the next ten minutes or so until Tom got out a cellular phone and was trying to contact Lowell Observatory's Brian Skiff at Anderson Mesa. It was then that I realized they felt they might have chanced upon an undiscovered comet. I walked over to the assembling group and mentioned that Brian might still be in France. Kevin and I suggested contacting Brian Marsden. Though I was saying this, my gut cautioned me that I'd been through this before. Once I mistook Jupiter for a supernova, another time it was Sirius. I once thought I might have found a supernova in M49. I viewed the object in Kevin's and Jim's scopes. Yes, it did look like a comet. It was wispy and had a condensed, stellar nucleus at moderate power. But it was bright, probably greater than 11th magnitude. Comet d'Arrest was far to the east. Could it be Comet Clark, or maybe a more recent comet we had just not gotten word of? The night before had also been clear in Arizona; certainly if it were this bright last night and nearly at opposition, someone would have

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.

For Sale—Celestron 8, w/ equatorial drive, many optics 35mm camera adapter, also padded carrying case; \$500.00. Call Dick Northfield, 4827 W. Paradise Dr., Glendale, AZ 85304, or phone (602) 978-1409.

Public Star Party at Thunderbird Park

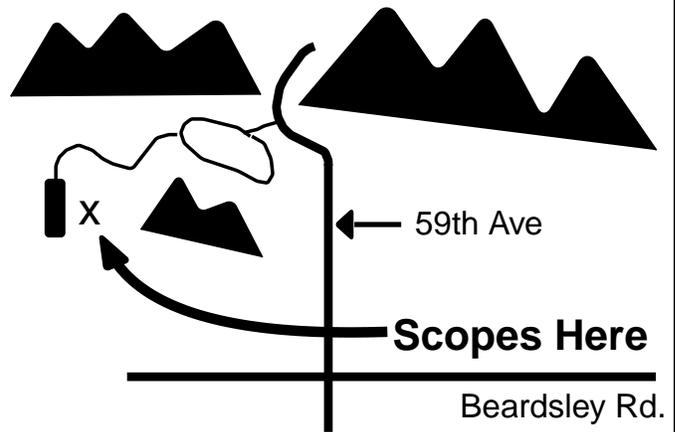
Saturday, May 6
Sunset to 10 PM*

Observe the Night Sky

Sponsored by
Glendale Parks Dept.

Telescopes by Saguario Astronomy Club
and other valley clubs

*Club members bringing scopes should plan
on setting up beginning at 6 PM



reported it if it were new. George and Bob, who had put away their scopes and were about to head back to town, also took a look, mentioning that were not sure what it was.

Kevin made a note of the coordinates off his telescope as I continued to view the object. While pondering, I decided someone better draw the thing with relation to the background star field (again “just in case” and maybe if only to convince myself.) I grabbed a scrap of paper off of Kevin’s chart table and carefully drew the field stars and an “X” for the original position of the unidentified object. I had no watch, but I now believe it was probably around 11:45 PM. So guarded was my thinking that I refused to entertain Jim Stevens’ contention a half hour later that he had detected movement. Kevin gave the coordinates to Tom who left the site just before 12:30 am to send the appropriate telegram. I thought to myself that it would be hard for me to pack up and leave a night of observing as good as this was on the slim chance the object was undiscovered. Perhaps I would have felt differently had I seen it first.

I returned to my scope for routine observing and as the night progressed, wondered whether Tom Bopp had succeeded in sending the telegram. I made a mental note to check the position of the new object one more time around moonrise. We witnessed an awesome meteor to the WNW about 50 degrees up. It was bright with perhaps a 20 degree trail, but it did something I’ve never seen before. Just when it seemed as if it would break up like most bolides do, it gave one final, bright FLASH and dissipated. It reminded me of a bright white firework — the kind that is so bright that it hurts your eyes — then gives a loud, delayed bang. In retrospect, we should have listened for a muffled bang a minute or so later. In any event, if there was to be no comet discovery that night, then this was the celestial highlight, I thought.

On nights prior to New Moon, I like to capture a view of the rising moon through my telescope or binoculars before I quit for the night. The silhouette of cactus,

mountains, or whatever foreground topography happens to be between myself and the moon often stamps one final serene image into my mental hard drive as I climb into the back of my station wagon and pass out. The moon rose at 2:30 AM, but it took another 10 minutes to clear the distant hills. During that time — and almost forgetting to — I took one last look at the fuzzy mystery object in Sagittarius. It was then that it hit home. There was no doubt it had moved. Now that my mind had become convinced, it “looked” more like a comet. I still couldn’t fathom that it hadn’t been discovered the night before or earlier, or that it might be a faint, catalogued comet undergoing some kind of brightening, but it was certainly a comet, in any case. Since I forgot to retrieve the original drawing off of Kevin’s table, and it appeared that Kevin was trying his best to sleep, I re-drew the field stars and both positions on another sheet of paper that I would not be so likely to lose. Walking over to Kevin and Jim, I announced my latest findings. Jim said, in effect, “I told you so.” I went back and watched it for a few more minutes, then wheeled around to get the rising moon over the hills (a non-event this night, due to location of some nearby creosote bushes obscuring the view). The “one last serene image” stamped into the mental hard drive this night would be the comet in its new position. Yes there was something deep down suggesting that I might possibly know a secret only a handful of people on the planet knew about yet.

On Sunday afternoon I received a call from Kevin. “We got it” he stated with some enthusiasm. “It’s called Hale-Bopp and Alan Hale in Cloudcroft, New Mexico saw it as well last night. The only thing left to determine is whether it’s a previously discovered periodic. In case it’s new, we’ll be considered part of the discovery team so you need to write your version of the event and e-mail it to me.” I was very happy, especially for Tom Bopp, who I figured had to be thrilled, but cautious as well because it might just be a returning periodic with someone else’s

Continued on page 9...

What's Up

by Steve Coe

September 1995

Cygnus

While some constellations have only a few deep sky objects worth chasing, some have much more than their share. It seems that Capricorn, Libra and Eridanus have few showpieces; while Sagittarius, Virgo and Cygnus are over-stocked. One or two good nights and a diligent observer has cleaned out one of the sparse constellations, but I can never seem to get to the bottom of the barrel for this month's treasure trove—Cygnus. Let's skip the obvious examples in The Swan and look over some of the less-observed goodies.

NGC 6819 is a bright, pretty large, much compressed and very rich open star cluster. Showing 92 stars counted at 165X in the 13"; there are many close groupings. A nice "oatmeal" background of un-resolved stars is seen, even at higher powers. A light orange star of 11th mag in on the east side. It is located at: 19 41.3 +40 11.

NGC 6834 is another nice cluster, at 19 52.2 +29 25. I described it as pretty bright, pretty small, pretty rich, compressed and somewhat triangular in shape at 165X. I counted 38 stars, including a nice dark yellow 10th mag star that is dead center.

NGC 6857 is a planetary nebula at 20 01.8 +33 31. My description reads: pretty bright, pretty large, irregularly round. Averted vision makes it grow at 165X. The 14th magnitude central star was pretty easy, I estimated it a full magnitude brighter than that the catalog value. This nice nebula is in a very rich star field.

NGC 6866 is bright, large, rich, considerably compressed, has 62 stars of mags 10 and dimmer, well resolved at 165X. This cluster is easily seen in the 11X80 finder. There are several nice triple stars involved in this star grouping. Located at 20 03.7 +44 00.

NGC 6871 is an open cluster at 20 05.9 +35 47. It is bright, pretty large, not compressed, and pretty rich at 100X. I observed 29 stars including at triple star on the northern edge with one white and two blue companions.

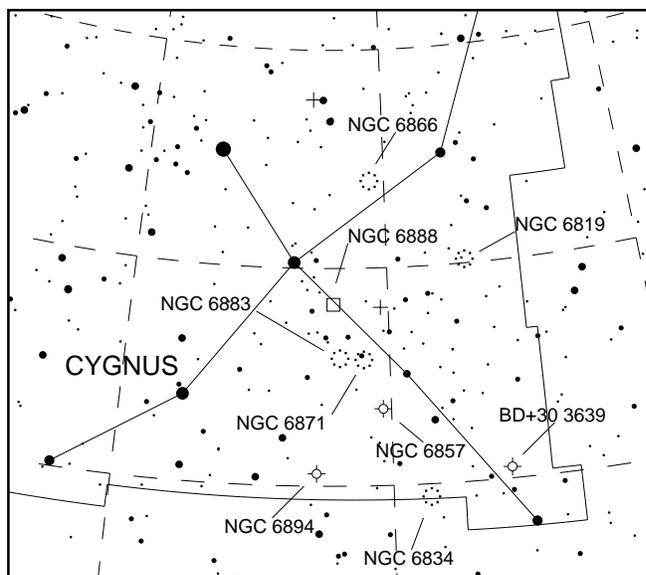
NGC 6883 is pretty bright, pretty large, pretty rich and not compressed at 100X. I counted 22 stars in 3 clumps that are broken up by dark lanes which criss-cross the field of this cluster. There is a nice yellow and white double star in one of the groupings. It is at 20 11.3 +35 51.

NGC 6884 is a planetary at 20 10.4 +46 28. I observed it as pretty bright, very small, round, little brighter in the middle; a grey tiny disk at 220X. It is about 4 times the size of the Airy disk. The central star was observed in good seeing. This is not an easy nebula to pick out of the Cygnus Milky Way, even on a 8/10 night.

NGC 6888 is a faint, large and irregular nebula at 100X. It looks like a donut with a bite taken out. It can just barely be seen without the UHC filter. The

filter helps this object a lot. There are 14 stars involved within the nebula. This observation was made using my old 17.5" from Sedona, in Maynard and Jean Clark's front yard. This nebula is at 20 12.8 +38 20.

NGC 6894 is a nice planetary which I called pretty bright, pretty large and annular at 220X. This planetary was recognized at 100X. However, the annularity was only seen at higher powers. On a night I rated 6/10 for seeing and transparency the annular structure was only seen with averted vision. On a much better evening at nearly 7000 ft. in the central mountains of Arizona, the ring feature of this nebula was immediately obvious. It is at 20 16.4 +30 34.



BD +30 3639 is Campbell's Hydrogen Star.

It was discovered by W.W. Campbell at Lick Obs. with a spectroscope on the 36" because it has a compact, bright line spectrum. At the telescope, it looks much like an 11 magnitude planetary about 5" in size. The problem is that it is embedded in a dense Milky Way field near Alberio. It looks easy, since it forms a triangle with 9 and 12 Cygni. However, that is the heart of the Cygnus Star Cloud and it will take a while to fish out this object. Because this is a Wolf-Rayet star with a shell and not a planetary it can be detected by its bizarre reddish-orange color. On a great night in the mountains of Arizona at 200X in the 17.5" it is obviously non-stellar and displays a reddish hue. This bizarre object was given another designation, used on Uranometria, that is **PK 64+5.1**, located at 19 34.8 +30 31.

Double Stars in Cygnus

h 1470 is an easy split at 100X, lovely dark yellow and deep blue, a dimmer version of Alberio. Located at 20 01.8 +38 11. The "h" designation stands of John Herschel.

Red Stars in Cygnus

U Cyg About 10th mag, but VERY RED, lovely field with a glowing coal embedded in a field of sparkling stars. At 20 18.1 +47 44.

September 1995

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>					TAAA Meeting (Tucson) 1	First Quarter Moon 2:04 A.M. 2
<div style="border: 1px solid black; padding: 5px;"> Eclipses of Saturn's Satellites Date Start End Event Dim 9-01 03:51.2 03:55.2 Tethys occults Rhea 29% 9-03 00:53.0 00:56.4 Tethys occults Dione 26% 9-20 20:11.2 20:17.9 Dione occults Tethys 31% Source: Astronomy, Sept. '95, pp. 72-75 </div>			Friday Full Moon 8:37 A.M. Mercury at greatest elongation 27° (evening) 6	PAS Meeting Brophy Prep. Physics Lab 7	SAC Meeting Grand Canyon University, Fleming Rm. 105 8	9
			EVAC Meeting (SCC: Rm. PS172) 13	SAC Deep Sky Meeting 7:30 P.M. 14	Yesterday Saturn at opposition (moves into evening sky) 15	Last Quarter Moon 2:09 P.M. Sun enters Virgo 10 P.M. 16
10	11	12	13	14	15	16
17	18	19	20	21	22	23
New Moon 9:54 A.M. 24	25	26	27	28	Mercury 4.5°SSW of Venus (evening) 29	Public Star Party Thunderbird Park 30

name attached. To be considered part of the discovery team was an unexpected bonus. I wrote a couple paragraphs jotting down my version of the events of the night before, and e-mailed it to Kevin. I was extremely busy the next week with work and only had time to check my e-mail a few times, hoping to find out if it was indeed a new comet. I still did not know as I left for a family vacation the week after, but when I returned I received word that it was. Not just that, but it might be spectacular. I almost immediately started thinking of Kohoutek and Austin, but am still —like everyone else that has been waiting long for a good one —hoping for the best.

Am I jealous that my name is not on it? NO! I never expected to make a mark discovering comets and never expect to. I was happy to be at Vekol Road that night and to

be a part of the event. I merely walked over and observed something Thomas Bopp had called to our attention. I did not know at the time I was one of the fortunate few to see a new comet ... maybe the fifth person on this planet to see it in 3000 years. It had a different name 3000 years ago and probably will have another one next time around. We gaze up at the wonders and see them come and go. Are we not wonders of creation ourselves? For that I am thankful. To me the lesson is simple...keep looking up and things will be revealed to you! Congratulations, Tom Bopp and Alan Hale for doing just that.

Elections Are Coming

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%.

- \$20.....Individual Membership (\$28 for '96)
- \$30.....Family Membership (one newsletter) (\$42)
- \$100.....Business Membership (includes advertising)
- \$4.....Nametag for members
- \$10.....Newsletter Only (\$14 for '96)

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.....\$24.00 for one year
- Astronomy.....\$20.00 for one year

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

Make checks payable to SAC.
Mail the completed form to:
Adam Sunshine
SAC Treasurer
20401 N 30th Drive,
Phoenix AZ 85027

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 same week of the month. The same is true of the club's star parties. Star parties at Buckeye Hills are mostly held on the Saturday of the third quarter moon.

1995 SAC Meetings

Jan. 13
Feb. 10
Mar. 17
Apr. 14
May 12
Jun. 9
Jul. 14
Aug. 4
Sep. 8
Oct. 6
Nov. 3
Dec. 9 Party

1995 SAC Star Parties

Date	Sunset	Moonrise
Jan. 28	5:56pm	5:15am
Feb. 25	6:22pm	4:00am
Mar. 25	6:41pm	2:50am
Apr. 22	7:05pm	1:30am
May 20	7:26pm	12:10am
Jun. 24	7:42pm	3:00am
Jul. 22	7:36pm	1:40am
Aug. 19	7:11pm	12:20am
Sep. 23	6:24pm	5:15am
Nov. 18	5:25pm	2:40am
Dec. 16	5:23pm	1:25am

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.

SACNEWS

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

Stamp

First Class Mail