

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



January 1997 — Issue #240

v12.23

Old Moon Observation Attempt

by Pierre-Y Schwaar

November 10, 1996

It was a clear, chilly Sunday morning at the Empire Ranch, one of the TAAA's observing sites about 50 miles southeast of Tucson. Set up that morning were six of us: Marjory Williams, Glenn Nishimoto, Hazel Lawler, Bill Waltz, Steve Redman and myself, waiting for an Old Moon to rise, just 14.2 hours from New. The purpose was not to try and break a record, but, if found, to follow it for as long as possible into the brightening dawn and verify whether Jim Stamm of Tucson could have spotted a nearly identical but opposing crescent on the evening of last January 20, 11 minutes after sunset with an 8" SCT at 60X.

We had telescopes from 6" to 14" set up for this attempt.

Searching for this particular Old Moon was made easier by the fact that Spica would rise 2° north of it about 1 hour and 20 minutes earlier. As we watched the star rise around 5 A.M., we noticed that the seeing was very turbulent near the horizon. As it climbed higher, it quickly brightened and settled down, although at 5° of elevation, the seeing was still far from perfect.

At the predicted time of moonrise, dawn was already well underway, and the sky color on the horizon was a light, tawny orange, somewhat like the "salmon" color of the Martian sky seen by the Viking landers. But no one could come up with a moon. The minutes passed by and still nothing.

Someone then came across one of those border surveillance balloons.

At approximately 7 minutes into the viewing period, a possible "hit" was reported by Hazel through the 6", but I could not verify her find.

Twenty-five minutes into the window, 5° up, the sky was a clear and definite blue color, which would have made a white crescent easier to see than in the "colorless" sky that Stamm reported at his first sighting. (It stayed blue

Quick Calendar

SAC Star Party
Buckeye Hills Recreation Area
Saturday, January 4

SAC Meeting
7:30 PM, Friday, January 24

SAC Deep-Sky Meeting
7:30 PM, Thursday, January 30

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Form on the Back Page

to within 2.5° of the horizon.) However, the elusive arc remained undetected, the delicate thread of light apparently smeared beyond recognition by the atmospheric turbulence.

No firm conclusions can therefore be drawn from this attempt, except to reinforce the significant discrepancies between Stamm's and our observations, in particular those concerning the colors of the sky background, which I have found in the past several years to be highly consistent.

I sincerely thank those who participated in this endeavor.

SAC Officers

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Vice President	Gerry Rattley	892-5698
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SACNEWS Editor	Paul Dickson	862-4678
		FAX: 841-0509
	dickson@primenet.com	

How to Better Use Comet Comments

by Don Machholz

Comet Comments is a monthly column that I've been writing since 1978. I started writing it to inform other amateur astronomers of new comet discoveries and to provide information so that they can find the brighter comets. Carried in only one newsletter (the San Jose Astronomical Association's "Ephemeris") for the first two years, the column is now carried in some three dozen newsletters. It also appears on the Internet: America-On-Line displays it in their astronomy department (Keyword: Astronomy), and it can be downloaded from a page located at "members.aol.com:/Makewood". Each issue of Comet Comments is written three weeks before the "due" date, giving time for it to be distributed to the editors and placed into the newsletters.

Comet Comments contains information about new comet discoveries. This is followed by comet news and observing tips for the comets currently visible. Next I provide ephemerides (predicted positions) for bright comets (usually all those brighter than magnitude 11) so that amateurs can find them. This is how to read these tables:

Date: This is the Universal Time for the comet's position. The positions are for 00 hr UT. The United States is a few hours earlier than this, so for a comet viewable in the evening, look for it on the night preceding the indicated date. For morning viewing the comet has already passed

the position indicated for 00hr UT position, so the comet has passed that point and moved on.

RA. and Dec: Right Ascension and Declination in 2000 equinox coordinates. These can be plotted on a star chart and found by star-hopping, or by using setting circles.

El: The elongation of the comet — the number of degrees it is from the sun as seen from the earth.

Sky: Morning (M) or evening (E) sky.

Mag: The predicted magnitude or brightness of the comet. The brightness of a comet is difficult to predict so this is only a guess based upon past performance and comet theory.

The last item I include is the elements of the orbits. This information can be entered into most comet orbit computer programs to further project the comet's positions.

Peri. Date: The date the comet is closest to the sun. Year is followed by month and day.

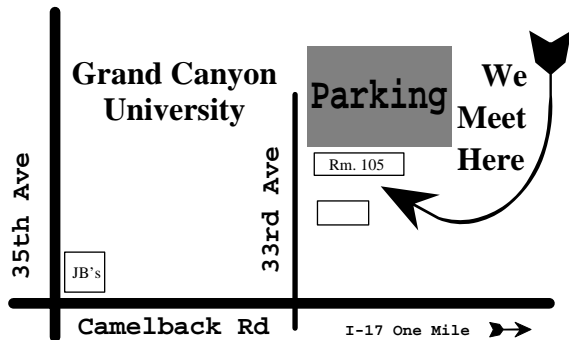
Peri. Dist: The distance from the comet to the sun at perihelion in Astronomical Units.

Arg/Peri, Asc. Node, Incl: These define the angle of the comet's orbit. The Arg/Peri is the Argument of the Perihelion, the Asc. Node is the Ascending Node — if this figure is under 180 the comet reaches perihelion north of the ecliptic. The Incl is the Inclination of the comet's orbit. If it is under 90 degrees indicates the comet is in a direct orbit, while over 90 degrees means it is in a retrograde orbit.

Eccentricity: This is the shape of the orbit. A "1.00" is a parabola, while "0.00" is a circle. An eccentricity of greater than 1 is a hyperbola orbit — the comet will never

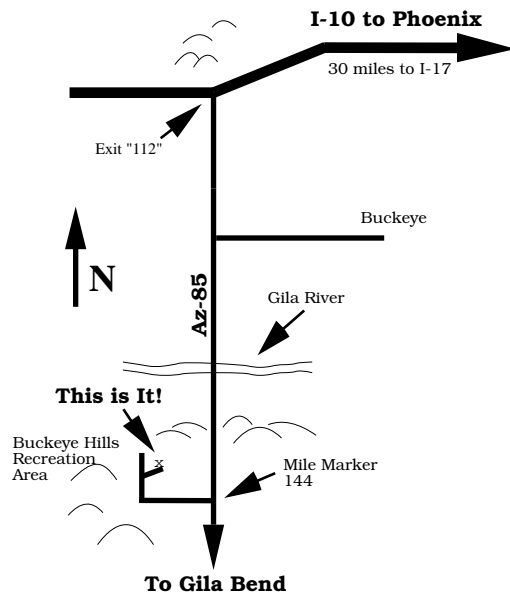
Directions to SAC Events

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.



return.

Orbital Period: The length of time it takes for the comet to orbit the sun.

Ref: The source giving the elements. MPC indicates Minor Planet Circulars by the Smithsonian.

Epoch: The time for which the orbit is most accurate. The orbit is generally accurate enough for visual location of the comet for several months on either side of this date.

Absol. Mag/“n”: This is the absolute magnitude—the brightness of the comet if it were 1 AU from both the earth and the sun. The average comet is about 7.0. The “n” value is the rate of brightening as the comet nears the sun, or dimming as it leaves the sun. The average is 4.0. The “n” value presented here may have to be multiplied by 2.5 to enter into some computers.

Comet Comments

by Don Machholz

(916) 346-8963 CC220.TXT November 6, 1996
DonM353259@aol.com

Comet Hale-Bopp passes north of the sun and into the morning sky on Dec. 31. Observers with a low eastern horizon should be able to pick it up again by the third week of January.

other than an 8.5 magnitude star. Other similar objects that I've seen on Internet images appear to be out-of-focus images of bright stars. In all respects Comet Hale-Bopp is behaving as an average comet. It is bigger than perhaps any comet we have seen, but its variable brightness, tails and jets are normal. If anything mysterious truly appears, you will find it reported in the mainstream press, and in most cases be able to go outside and see it yourself through your telescope.

Meanwhile, **Comet Tabur** dims in our morning sky. Its magnitude has been unpredictable lately. **Periodic Comet Wirtanen** is returning. The Hubble Space telescope imaged it in August 1996 and “measured” the nucleus' diameter to be 1.16 km. Finally, **Periodic Comet Wild 2** should be visible for several months.

1995 O1 (Hale-Bopp)					
Date	RA-2000-Dec	Elong	Sky	Mag	
12-23	18h29.9m	+02°49'	27°	E	3.3
12-28	18h36.7m	+03°51'	27°	E	3.1
01-02	18h44.0m	+05°01'	28°	M	2.9
01-07	18h51.7m	+06°18'	29°	M	2.7
01-12	19h00.0m	+07°45'	31°	M	2.5
01-17	19h08.9m	+09°22'	32°	M	2.2
01-22	19h18.5m	+11°11'	34°	M	1.9
01-27	19h29.0m	+13°13'	36°	M	1.7
02-01	19h40.5m	+15°29'	38°	M	1.4
02-06	19h53.4m	+18°01'	40°	M	1.1
02-11	20h07.8m	+20°50'	41°	M	0.7

46P/Wirtanen					
Date	RA-2000-Dec	Elong	Sky	Mag	
12-23	22h23.1m	-20°37'	59°	E	12.8
12-28	22h34.1m	-19°11'	57°	E	12.6
01-02	22h45.5m	-17°40'	55°	E	12.4
01-07	22h57.4m	-16°02'	53°	E	12.2
01-12	23h09.8m	-14°19'	52°	E	12.0
01-17	23h22.6m	-12°30'	50°	E	11.8
01-22	23h35.9m	-10°34'	49°	E	11.6
01-27	23h49.7m	-08°33'	48°	E	11.4
02-01	00h03.9m	-06°26'	47°	E	11.2
02-06	00h18.7m	-04°13'	46°	E	11.1
02-11	00h34.0m	-01°54'	45°	E	10.9

C/1996 Q1 (Tabur)					
Date	RA-2000-Dec	Elong	Sky	Mag	
12-23	16h09.5m	+15°19'	48°	M	11.5
12-28	16h11.8m	+14°07'	50°	M	11.8
01-02	16h13.8m	+13°02'	53°	M	12.0
01-07	16h15.4m	+12°05'	56°	M	12.2
01-12	16h16.4m	+11°13'	59°	M	12.4
01-17	16h16.9m	+10°27'	62°	M	12.6
01-22	16h16.9m	+09°47'	66°	M	12.8
01-27	16h16.2m	+09°11'	70°	M	13.0
02-01	16h14.7m	+08°39'	75°	M	13.1
02-06	16h12.5m	+08°11'	80°	M	13.3
02-11	16h09.5m	+07°46'	85°	M	13.4

81P/Wild 2					
Date	RA-2000-Dec	Elong	Sky	Mag	
12-23	08h22.7m	+16°41'	147°	M	11.9
12-28	08h21.7m	+16°49'	153°	M	11.7
01-02	08h19.9m	+17°02'	158°	M	11.6
01-07	08h17.4m	+17°18'	164°	M	11.4
01-12	08h14.3m	+17°38'	170°	M	11.2
01-17	08h10.6m	+18°01'	176°	M	11.0
01-22	08h06.5m	+18°27'	177°	E	10.9
01-27	08h02.3m	+18°54'	172°	E	10.8
02-01	07h58.2m	+19°22'	166°	E	10.6
02-06	07h54.3m	+19°49'	159°	E	10.5
02-11	07h51.1m	+20°16'	154°	E	10.4

In the past few weeks stories of “mysterious” objects in the vicinity of the comet have circulated. The most popular—a Saturn-like Object (SLO) imaged on Nov. 14 by an amateur astronomer—turned out to be nothing

Orbital Elements

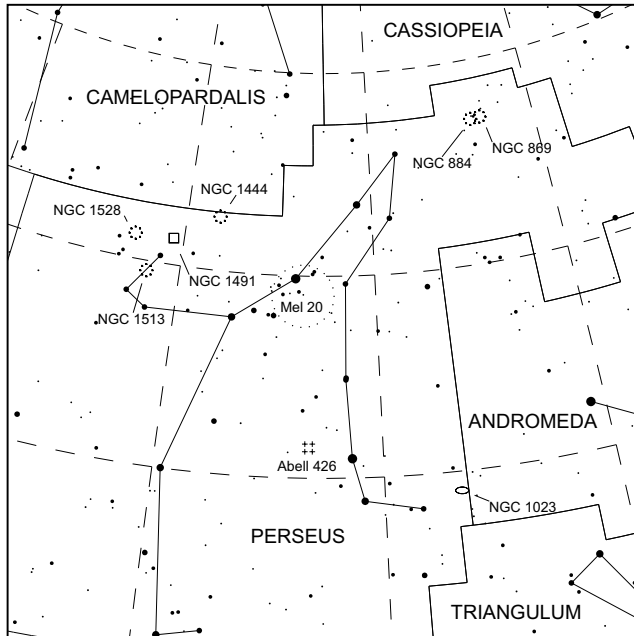
Object:	Hale-Bopp	Tabur	P/Wirtanen	P/Wild 2
Peri Date:	1997 04 01.13453	1996 11 03.52688	1997 03 14.14299	1997 05 06.62789
Peri Dist:	0.9141030 AU	0.8398272 AU	1.0637469 AU	1.5826156 AU
Arg/Peri (2000)	130.59083°	057.40724°	356.34322°	041.77000°
Asc Node (2000)	282.47069°	031.40177°	082.20387°	136.15458°
Incl (2000):	089.42936°	073.35813°	011.72255°	003.24276°
Eccentricity:	0.9950969	0.9989006	0.6567490	0.5402220
Orbital Period:	4700 years	Long period	5.46 years	6.39 years
Reference:	MPC 28052	MPC 28052	MPC 27080	MPC 28272
Epoch:	1997 03 13	1996 11 13	1997 03 13	1997 04 22
Absol Mag/“n”:	-2.0/4.0	9.5/4.0	9.0/6.0	7.0/6.0

Fuzzy Spot

by Ken Reeves

Perseus

January 1997



Welcome to the first installment of the Fuzzy Spot column. This column is a follow-on to Steve Coe's "What's Up" column. Steve has some new projects he is working on and he asked me to take over the Deep-Sky column. I am going to try to keep the same general format as his column, but since I don't have the experience (2 years versus 20 years) or the observations (about 200 objects versus about 2000 objects, I'm guessing), I will be listing mostly brighter objects, some of which I may not have even observed myself. If the notes are not from my observations, I will cite the source, most likely *Observe the Herschel Objects* by the Ancient City As-

tronomy Club (available directly from the Astronomical League, 901 S 10th Street, Burlington, IA 52601) or *Observing Handbook and Catalog of Deep-Sky Objects* by Christian B. Luginbuhl and Brian A. Skiff (unfortunately out of print). Two other sources I will frequently reference are *Burnham's Celestial Handbook* by Robert Burnham Jr. (3 volumes, available at most book stores or astronomy mail order companies) and *The Deep Space CCD Atlas* by John C. Vickers (2 volumes, directly available from John C. Vickers, Back River Observatory, P.O. Box 1292, Duxbury MA 02331).

I will be focusing on the **Herschel 400** list and the **SAC's 110 Best of the NGC** objects, but will include some other objects for variety. I will also include a list of all Herschel 400 and 110 Best NGC objects in the constellation of the month since in many cases there won't be room to include each object.

One last thing, I am always open to ideas and comments (both good and bad), so feel free to give me any suggestions.

Now let's get on with this month's constellation, Perseus.

Perseus is a great Winter Milky Way constellation in the north, loaded with open clusters. Take some time sweeping the constellation with binoculars, the rewards are high and it's a great way to kick back and relax. All observations noted here are in a 10 inch, *f*/4.5 telescope.

NGC 869 and **884** (02 19.0 +57 09, 02 22.4 +57 07) The **Double Cluster**. From my front yard (fairly light polluted), I called both of these very easy, very large, very bright, and pretty rich at 70x. In 869, I counted about 50 stars with a nice group forming a Christmas tree pattern. 884 is not quite a condensed or bright with 40 stars counted. Both had some unresolved haze from in town which would probably resolve into many more stars at a better site. This is a very beautiful sight that I return to again and again and a very good object pair to show to friends.

Asteroid (5460) Now Named TseNaatai

by Brian Skiff

The following was posted to sci.astro.amateur on 30 October 1996. It is printed here with Brian's permission. Brian's E-mail address is: bas@lowell.edu.

At the end of September the 1996 Festival of Science was held in Flagstaff. This is a week-long event which highlights the many science and technical establishments in town. It's a way for those of us working at such places to show our stuff to folks in the city, as well as a way to get kids interested in science subjects.

As part of this event, I offered a numbered but

unnamed asteroid to be assigned a name chosen from among suggestions submitted by participants in the festival. Most of the legwork for this was done by my co-author friend Chris Luginbuhl (USNO-Flagstaff), who was also on the organizing board for the festival. We got many entries from school kids as well as the general public from all over Arizona, and even one from England. Among about 120 names submitted, we chose a Navajo name, Tse' Naat'a'i', which appropriately enough means "flying rock." A rough pronunciation for English speakers is: tsay-naht-ah-ee, with hard glottal stops between the syllables indicated by the apostrophes. Now say it real fast...

Anyway, this name was suggested by Derekson Bert, an 8th grade student at Rocky Ridge School, located in a place called Denebito out on the Navajo Reservation. While you grab your atlas, I'll mention that the reserva-

NGC 1023 (02 40.5 +39 03) I see this galaxy as pretty bright, pretty big, very elongated E/W at 140x. It has a bright middle with a nucleus suspected (one of my notes said stellar and one said sub-stellar) and a pretty large but faint halo. This is a nice galaxy for being in a Milky Way constellation. I also believe that I have seen this galaxy from my front yard, which is unusual for galaxies.

NGC 1444 (03 49.4 +52 40) At 100x, I saw this open cluster as a double star with 7 or 8 stars mostly to the NW of the double star. This is a very loose cluster. Had this not been marked as a cluster on the maps and in the catalogs, I probably would have passed it over. I'm pretty sure I was at the right place for this cluster, and I was surprised for such a poor cluster to be included in the Herschel 400 list. Also since it is not included in the *CCD Atlas*, I was unable to check my observation against that.

NGC 1491 (04 03.3 +51 18) 100x shows this nebula is somewhat small and not too bright. The nebula fans away SW from a bright star. It also responds quite well to the UHC filter although the filter didn't bring out much more detail. I was unable to see any color in this nebula.

NGC 1513 (04 10.0 +49 31) At 70x, I saw this cluster as somewhat small and somewhat faint with about 20 stars. What is unusual about this cluster is that it appeared horseshoe shaped opening to the NE. On the N tip of the horseshoe are 2 bright stars while on the E tip is a circlet of 5 stars. This is one of the more unusual shaped clusters I have seen to date, and is probably my favorite cluster (outside of the double

cluster) in Perseus.

NGC 1528 (04 15.4 +51 14) An open cluster which is very bright and very large, elongated E/W. I saw 3 levels of stars with some nice strings. At 70X, it fills about half the field of view. An all around nice cluster.

A few other objects worth mentioning.

The **Alpha (α) Persei** group (**Mel 20**, 03 22.0 +49 00) is a very nice grouping of stars for binoculars. Note the saxophone shaped string to the S and SE of alpha. This asterism was pointed out to me by Ron Schmidli.

Eta (η) Persei is a nice wide Yellow/Blue double star. I came across this one by accident while sweeping around in my front yard. It is always nice to stumble upon an object this way.

Finally if you want a good challenge, try **Abell 426** (03 19.7 +41 30), the **Perseus I Galaxy Cluster**. At 140x, I saw 3 galaxies with 2 of these only being suspected. I was unable to line up my drawings with the image in the *CCD Atlas*. Finally a photo in Burnham's matched my field almost exactly. The three galaxies turned out to be 1272, 1275, and 1278. The *CCD Atlas* shows 15 objects and *Uranometria 2000* shows 22 objects, so those of you with very large aperture telescopes should have a good time here.

Herschel 400 Objects

650/651 (M74), 869 and 884 (the Double Cluster), 1023, 1245, 1342, 1444, 1513, 1528, and 1545

SAC's 110 Best of the NGC Objects

869 and 884 (the Double Cluster), 1023, 1491

tion covers most of the northeastern quarter of Arizona, and extends into Utah and New Mexico. Today's adventure was to go out to the school and present him (and the school) with a small award and a savings bond, which was the contest "prize" donated by the Flagstaff Medical Center. I went with Chris and with Kathy Dean, the hospital's PR person, who served also as photographer and note-taker for the Flagstaff media.

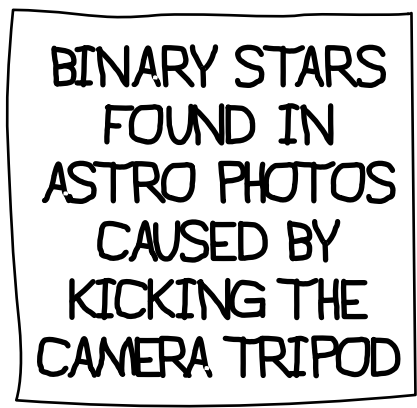
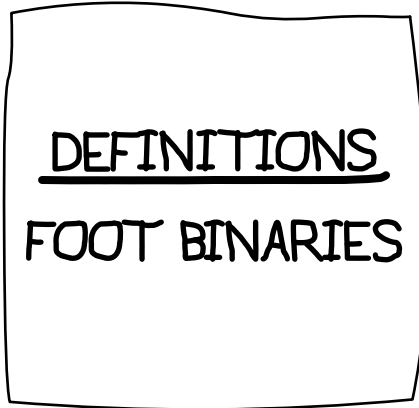
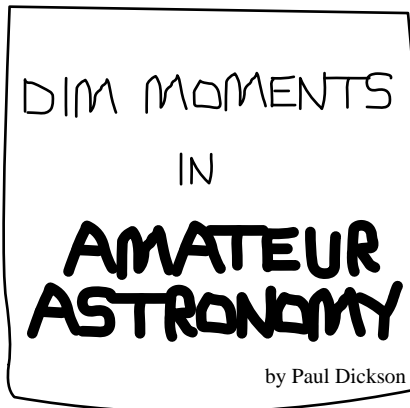
Denebito is in the middle of proverbial nowhere in a desolate, treeless, and nearly uninhabited land of rocky mesas and "big sky;" it is a deeply quiet landscape of profound beauty. Even here, a hundred miles from Flagstaff, the San Francisco Mountain was visible on the horizon, like the focal point of the world.

Passing through a reservation town is like going into a grimy third world village, and Denebito was no exception. The school was bustling with activity at lunchtime, the sand parking lot packed with pickup trucks. It turned out that the local "chapter" (administrative district on the reservation) was having a meeting dealing with the very serious land-dispute issue between the Navajo and Hopi, which was recently settled. The school principal and the "asteroid" class teacher arranged for us to come in to the assembly hall for the presentation just before the chapter

meeting broke for lunch (mutton and fry bread). Thus Derekson was to be embarrassed not just by having to stand in front of his classmates, but the community of about 100 tribal elders, too. The Navajo don't like being singled out for attention, so this was especially acute for him — as any 13-year-old would be.

Derekson Bert turns out to be a fairly ordinary kid, though obviously sweet-natured and shy. Apparently he is known as being somewhat creative, his teacher told us, and so really needed a little recognition despite the self-consciousness he suffered. Both the teacher and the principal were quite pleased we were doing this both for one of their students and for the school. We were briefly introduced (in Navajo) to the assembly by the principal and we made the presentations without much ceremony. Chris had cleverly prepared three-paneled picture frames with enlargements from the discovery photographs with the asteroid marked, along with a printed citation. One was done up for Derekson and another nearly identical to it for the school to keep.

The audience, who, apart from the eighth graders, had been dealing with the land dispute stuff all morning, were evidently ready for some light relief, and clearly quite pleased. It is not certain they were fully aware of what it



was that had been named by one of the young people, but that they saw that his idea was appreciated was enough. The Navajo myth for the origin of the night sky (in short form) is that a committee of Old Ones (ghosts to you, son) were sitting around trying to decide on the specific arrangement of the stars when Coyote came along and said "this is taking too long," and grabbed them and strew them across the sky all at once. There is naturally no Navajo word for asteroids, but perhaps this new name will do.

Bits and Pieces

Minutes from the November Meeting

The November Meeting was called to order by Gerry Rattley at 7:30.

The elections were held with the following results: President: Unfilled, Vice President: Gerry Rattley, Treasurer: Regina Lawless, Secretary: David Fredericksen, Properties: Adam Sunshine. We will discuss the position of President at the January meeting.

A vote was taken to accept the constitutional amendment that was discussed at the last two meetings. The amendment was passed.

Regina Lawless gave the treasurers report.

Paul Dickson said that he had copies of the *SAC 110 Best of the NGC*. He hopes to have the Messier Logbook finished by the Christmas Party. There was also the Steward Mirror Lab sign-up sheet for an open house in January.

Rich Walker talked about the four different events that were held in October. There were 2 events in November, so it has been busy the last 2 months.

Pierre Schwaar talked about trying to see an old Moon on Nov. 10, but no one could find the Moon. He

also discussed the young Moon sighting that was in Sky and Telescope. Pierre and Steve Redman went out and did the Leonid Meteor Shower as well as several others in the club. It was reportedly a fine show.

Steve Coe talked about the club members that have been in the magazines recently. Our Holiday Party will be at Steve Coe's House on Dec. 14 and will be \$10 a head. He also spoke about the eclipse cruise on the Princess Lines. If you want a cabin, you'd better get a reservation soon.

We had several people for Show and Tell. A.J. Crayon showed us pictures from Sentinel. Paul Dickson had some overheads from his *Dim Moments in Amateur Astronomy*. The last person for Show and Tell was Chris Schur who talked about some of his techniques for his pictures. He showed us 7 challenge objects and had us try to figure out what they were.

At the break, there were 30 people present.

Steve introduced our speaker, Jim Crisman, who talked about how the Hubble Tuning Fork Diagram is being revised. Great talk with the slides.

Afterwards we adjourned to JB's, where 17 people showed up.

—David Fredericksen, 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.

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—Meade 16" Starfinder Dobsonian. Includes Orion dust cover, plywood aperture cover, adjustable counterweight assembly, 2" rack & pinion focuser with 1.25" adapter, study step ladder. Almost new. Doesn't fit in our observatory. \$975. Jim Crisman, 584-0896 after 6 PM.

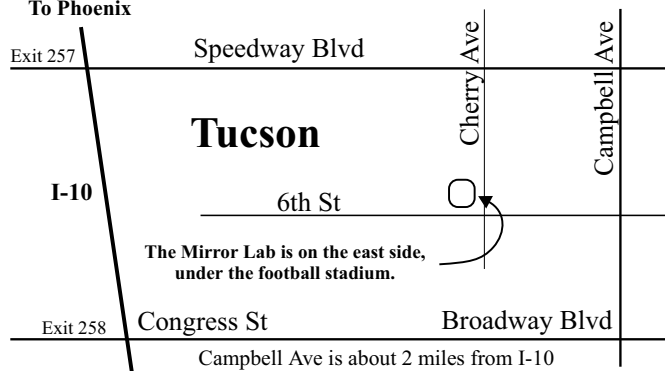
8.4 Meter Spin Casting and Mirror Lab Open House

17 January, 1997

by Dean Ketelsen

The University of Arizona's Steward Observatory Mirror Lab is anticipating spin casting of the first 8.4 meter blank for the Large Binocular Telescope on the 17th of January. The Mirror Lab traditionally has an open house as the mirror spins and you are invited! Because of security concerns, you must preregister **BY JAN 5TH** for this event. Please contact Paul Dickson ((602) 862-4678, by E-mail at dickson@primenet.com, or by FAX at 841-0509) to let him know you will be attending, and he will forward the list on to personnel at the Mirror Lab. Friends and family will be permitted — a list of all attendees should be supplied to Paul.

To Phoenix



Tentative schedule calls for glass loading of the mold on January 2nd and 3rd and heating of the oven on the 12th. It is anticipated that spinning will start (as the temperature approaches the melting point of glass) at 8 AM on the 17th. Max temperature (1200° C) should be at 6 PM that evening. The open house plans are still uncertain, but is likely thru the afternoon and evening of the 17th. If you tour the facility that day, you are likely to see the finished 6.5 meter MMT upgrade, the telescope cell for the MMT and early work being done on the Magellan 6.5 meter mirror blank. And of course, you will be able to feel the heat in your face from 20 tons of molten glass spinning in an oven at 7 RPM from a few feet away. It should be fun — see you there!

P.S. For the latest updated information, call my office number at the Mirror Lab — (520) 621-8764.

Received on Thursday, Dec. 19 1996:

The last schedule before the holiday came out and there has been a slip of a day in the casting schedule, probably for an extra day to take down the Magellan 6.5 meter before casting. The current schedule has maximum temperature on the 19th, oven starts spinning morn of the 18th, with pretty views of glass chunks melting through

the evening of the 18th. Folks can call my office number (520) 621-8764 for the current schedule after the 6th of January or so.

Cruise to '98 Eclipse Steve Coe

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

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

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

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

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

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

Being an active Arizona astronomer for 20 years, I know for a fact that there are lots of interesting, exciting, knowledgeable and fun-loving folks around here. That is really the motivating factor about trying to get this together, an opportunity to meet and spend some time with a fun bunch under the Moon's shadow!

Starting my eclipse tan NOW!

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 January Deep-Sky Meeting we will discuss the objects in Steve Coe's November *What's Up* column, which were 5 objects in Sculptor. A.J. Crayon, the chair of the group, will announce any other objects at the January SAC meeting.

Dating the Earth

Don Ware

Don Ware is the President of The Peoria Astronomical Society (that's Peoria, Illinois.) This article is from a message from their web site for the Fall of 1996 and is used with permission.

"What we take for the history of nature is only the very incomplete history of an instant" — Denis Diderot

In a moment of weakness I turned the TV on (the only screen I usually watch is one with a computer attached to it) a couple of nights ago and watched a religious program on the age of the Earth. The "scientist" was explaining how all of our current methods of dating elements, estimating the rate of erosion, and the rate of sedimentary build up were completely wrong in determining the age of the Earth. The age of the Earth, he concluded, can be no more than 6,000 years old, with dinosaurs roaming the Earth as little as 4,000 years ago.

I was intrigued. How do we know with certainty how old the Earth really is? We do know that the Earth is at least 5,000 years old as we have written records dating back to 3,000 BC, or BCE if you prefer.

I decided to look back into the records to see how our present day notion that the Earth is 4.6 billion years old was arrived at.

Our western civilization held that the Earth was 6,000 years old right up to the 1800's. They held this belief based on faith in the teachings of the Bible, but science is not based on faith, but rather on observations and evidence.

A French scholar, Bernard Palissy who lived from 1510–1589 believed the Earth was much older based on his observations that rain, wind, and tides were the cause for much of the present-day appearance of the Earth. He wrote that, these forces could not work over such a short period of time to produce the changes. He was burned at the stake in 1589. A bad time for scientific inquiry.

Another was Thomas Burnet, a member of the English clergy, who lived from 1635–1715. He had written a book around 1681 supporting the idea of a worldwide flood, but in 1692, he wrote another book in which he

questioned the existence of Adam and Eve, that ended his career.

The notion that the Earth is much older than 6,000 years comes from a book written in 1795 by James Hutton, called "The Theory of the Earth." Hutton presented evidence that slow, gradual changes acting over a long period of time were responsible for shaping much of the Earth's landmasses. It took almost 50 years for science to begin to accept Hutton's ideas. Hutton's ideas became known as uniformitarianism.

Science began to study the changes taking place at the present time and worked out how rapidly those changes were happening. The assumption is that if the rate of change remains more or less constant, then the time it takes to create the change could be estimated mathematically.

Edmund Halley was the first person to attempt to calculate the rate of change. His idea was to determine the rate at which the oceans became salty. He observed that the fresh water rivers carried salt, dissolved from the land during the process of erosion, to the oceans. Halley thought that at one time the oceans must have been free of salt, and the salt contained in them must have been carried there by the rivers. So he set out to find out how much salt the rivers carried into the oceans each year. He arrived at an age of 1 billion years for the oceans to reach their present levels of salinity.

In 1896, only one hundred years ago, French physicist, Antoine Henri Becquerel discovered by accident that atoms of uranium gave off radiation. Marie Currie studied the phenomenon further and concluded that the radiation was the result of radioactivity. In 1915, Frederick Soddy discovered that over time the radioactive atoms of uranium and thorium broke down into simpler elements. This decay continued until lead was produced which were not radioactive, and the decay stopped.

Ernest Rutherford, working with Soddy, showed that every radioactive element had a half-life. This being the amount of time it takes for half of the radioactive atoms to be lost. The half life of uranium turns out to be around 4.5 billion years, thorium has a half life of 14 billion years. This set an upper limit for the age of the Earth. If the Earth was a trillion years old, no radioactive uranium would exist.

Bertram Boltwood an American physicist worked out how to calculate the age of rocks containing uranium and lead. Boltwoods method took into account that the rock might contain some naturally occurring lead. He was able to isolate an isotope which was not present in lead formed through radioactive decay, but was only present in lead formed naturally. Using this method some rocks were dated at more than 1 billion years old. In 1931, rocks were found that were 3.8 billion years old in Greenland.

The point: There is some evidence today that scientific inquiry is on the wane, that people seem to accept the mystical more readily than the empirical.

Our view of the universe is based on what we see and what we reason the cause can be to explain what we see. This is the difference between humans and animals.

January 1997

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> All Times are Mountain Standard Time </div>			Last Quarter Moon 6:47 P.M. 1	PAS Meeting Brophy Prep. Physics Lab 2	TAAA Meeting (Tucson) 3	SAC Star Party Buckeye Hills (members&guests) 4
5	6	Tomorrow New Moon 9:26 P.M. 7	EVAC Meeting (SCC: Rm. PS172) 8	9	10	11
12	13	14	First Quarter Moon 1:03 P.M. 15	16	Neptune at conjunction with Sun 17	18
Jupiter at conjunction with Sun (moves into morning sky) 19	Comet Hale-Bopp Crosses the Orbit of Mars 20	21	Tomorrow Full Moon 8:11 A.M. 22	Mercury at greatest elongation 25° (morning) 23	SAC Meeting Grand Canyon University, Fleming Rm. 105 24	Yesterday Uranus at conjunction with Sun 25
26	27	Mars at Aphelion 28	29	SAC Deep-Sky Meeting 7:30 P.M. 30	Last Quarter Moon 12:41 P.M. 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:

Regina Lawless
SAC Treasurer
5808 E Turquoise
Scottsdale AZ 85253

SAC and SAC Meetings

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

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

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

1996 SAC Meetings

Jul. 26
Aug. 30
Sep. 27
Oct. 25
Nov. 22
Dec. 14 Party

1997 SAC Meetings

Jan. 24
Feb. 21
Mar. 21
Apr. 25
May 16
Jun. 20

1996 SAC Star Parties

Date	Sunset	Moonrise
Jul. 6	7:43PM	11:57PM
Aug. 10	7:16PM	4:46AM
Sep. 7	6:43PM	2:26AM
Oct. 5	6:06PM	1:11AM
Nov. 2	5:35PM	11:54PM
Dec. 7	5:21PM	5:02AM

1997 SAC Star Parties

Date	Sunset	Moonrise
Jan. 4	5:37PM	3:50AM
Feb. 1	6:03PM	2:35AM
Mar. 1	6:28PM	1:23AM
May 31	7:34PM	3:01AM
Jun. 7	7:44PM	1:43AM

SACNEWS

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

Stamp

Inside:

- Old Moon Observation Attempt by Pierre Schwaar
- How to Better Use Comet Comments by Don Machholz
- Comet Comments by Don Machholz
- Fuzzy Spot by Ken Reeves
- Asteroid (5460) Now Named TseNaatai by Brian Skiff
- Dim Moments by Paul Dickson
- Mirror Lab Open House by Dean Ketelsen
- Cruise to '98 Eclipse by Steve Coe
- Dating the Earth by Don Ware

Do you need to renew your membership?

First Class Mail