

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



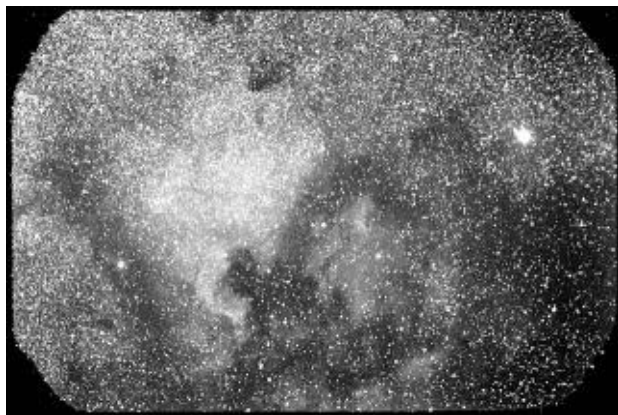
November 1998 — Issue #262

v11.4

A Night Out with the Schmidt Camera

by Chris Schur

I have been doing guided astrophotography, for about 25 years now. In that time I've seen many changes in films, optical systems, and telescopes. Many fancy optical systems, come and go, however one design remains supreme and has been for many years. When Bernard Schmidt invented the Schmidt camera earlier this century, he could not have known how incredibly successful it was destined to become. This is my story, and how I use the Schmidt camera to capture images of the sky and convert them to slides and prints which you view at the club meetings.



NGC 7000: North American Nebula. Photo from Chris Schur.

A few decades back, the rave astrophotography systems ranged from a real photography lenses, to something called a lensless Schmidt, which was just a stopped-down Newtonian that produced mediocre widefield images. Then a decade ago a hot system to have was a 12 1/2 inch Astro-Mac, and although it had a reasonably fast f/5 speed, just the tube alone was in excess of ten thousand dollars. Soon, those bulky instruments went out of style, and in recent times the hot rave seems to be the Astro Physics refractors, which some of them have been optimized for astrophotography. They too command an impressive price tag, a typically priced system for the acceptable aperture of 6 inches is well over most peoples

Quick Calendar

SAC Meeting
7:30 PM, Friday, November 6

SAC Deep-Sky Meeting
September and October Fuzzy Spot Objects
7:30 PM, Thursday, November 12

SAC Star Party
Buckeye Hills Recreation Area
Saturday, November 14

Officer Elections

Dues are Due

See Membership Services Form on the back page.

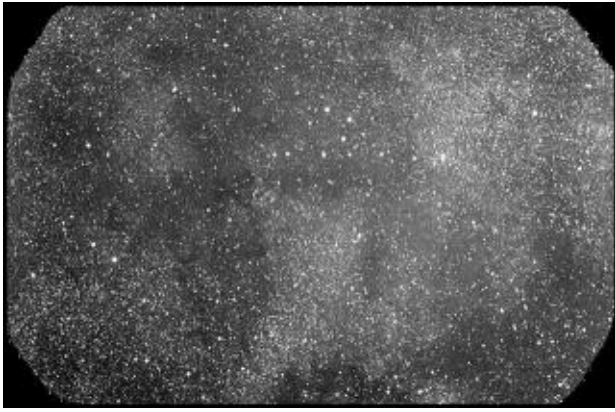
budgets for cars. Again, these are very slow systems, typically f/5 to f/6, but having fairly decent field of views easily able to cover the film plane of 120 type film.

I've seen images produced with all of these systems over the years, and none of them compares to the clarity, speed, and resolution you can obtain with a Schmidt cam-

...real precision astrophotography begins — in the digital darkroom

era. The star images produced by a Schmidt camera that has been well taken care of can be less than the size of a human red blood cell on the negative, and this extends across the entire high-resolution frame. Now that we've discussed a bit of history about the Schmidt camera, now I would like to explain how I do my own photography from my backyard in Payson with my own Schmidt camera.

During the full moon or perhaps a week before, I carefully plan my shots so that the composition will accurately frame the objects desired. These objects may include emission nebula, large galaxies clusters, or groups of star clusters, and even the largest galaxy clusters. All my planning is done with a program called Megastar. I can set the limiting magnitude to 12 or 13th, and set the frame size and can move the frame around to plan the exact shot I want. Charts are produced with Megastar that only show the types of objects I wish to consider.



“Coat Hanger Cluster,” Collinder 399

Next, the exact center of each frame is determined, and that will be the point which I will center in the Schmidt camera during the exposure. After a number of charts have been produced, they're printed out for use under the night sky. My observatory in my backyard is of the roll-off roof type, and sets up very quickly. At the end of evening twilight, the four latches that hold the roof secure are removed, and the roof is rolled back so that the inside the observatory can equalize thermally. As twilight deepens the Schmidt camera is prepared for photography. A white piece of paper is inserted into the film holder which is internal and accessed by a hatch on the side of the tube. A bright star or planet is then centered on the paper that is inserted in the film holder. A 6x30 finder scope, which is mounted on the back of the Schmidt camera is then aimed at the same star or planet and locked down tight.

This ensures the precise centering of the finderscope to Schmidt camera for centering objects that night. When the evening twilight ends, we're ready to begin photography.

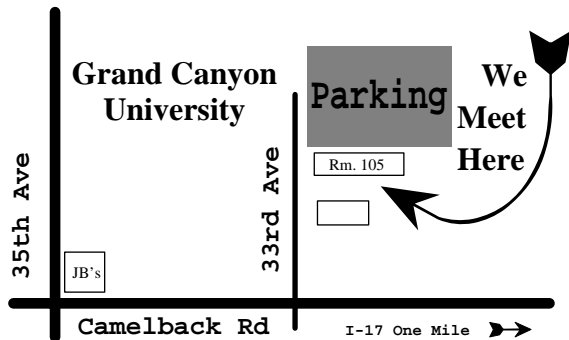
The subject is centered in the 6x30 finder scope to match the exact field of the Megastar plots. But also on the back of the cradle for the Schmidt camera is a Meade 2045 Schmidt Cassegrain used as a guide scope. A medium brightness star is selected and centered in the field, and locked in place. The ST-4 auto guider is attached to the Meade, and takes about one minute for the auto guider to train on the stars directional movement for its corrections. Once this is done it doesn't have to be repeated for the rest of the night. Using a makeshift roll film holder the film is inserted into the camera through a small trap door in the side of the tube, with the lens cap on and the timer set. Exposure times cannot exceed five minutes in duration even with very dark skies because of the extremely fast speed of the Schmidt camera. The lens cap is removed to start the exposure, and the autoguider keeps the objects centered perfectly during the exposure.

Two to three photographs of the same object are taken so that they can be sandwiched in the darkroom later to improve color and contrast. At the end of the evening up to 12 exposures can fit on a standard 36 exposure roll because of the mandatory space required between frames with Schmidt camera. The roof is rolled shut and we're ready to do darkroom work on the negatives.

To perform the next darkroom work, I use the Bessler
Continued on page 4...

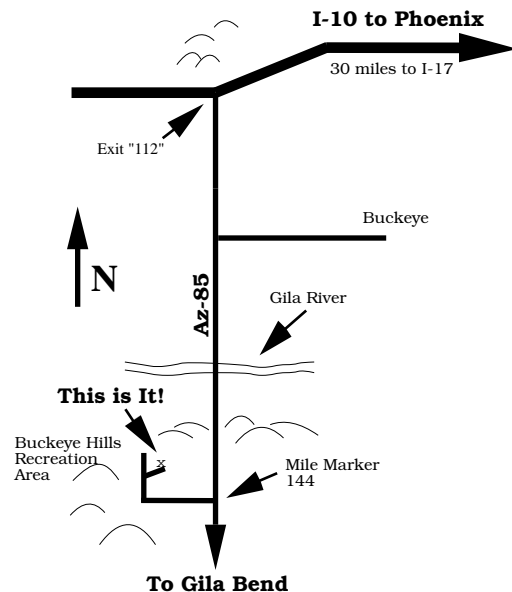
Directions to SAC Events

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.



Comet Comments

by Don Machholz

(530) 346-8963 CC243.TXT October 7, 1998
<http://members.aol.com/cometcom/index.html>
 DonM353259@aol.com

C/1997 J2 (Meunier-Dupouy)

Date	RA-2000-Dec	Elong	Sky	Mag
10-24	20h58.3m	-10°26'	104°	E 12.4
10-29	20h59.0m	-11°30'	98°	E 12.5
11-03	21h00.1m	-12°29'	94°	E 12.6
11-08	21h01.7m	-13°22'	89°	E 12.7
11-13	21h03.5m	-14°10'	84°	E 12.8
11-18	21h05.7m	-14°54'	79°	E 12.9
11-23	21h08.2m	-15°33'	74°	E 13.0
11-28	21h11.0m	-16°08'	70°	E 13.1
12-03	21h14.0m	-16°40'	65°	E 13.2
12-08	21h17.3m	-17°08'	61°	E 13.3

The evening sky reveals four telescopic comets, the latest being **Periodic Comet Howell**, which outburst recently and is now visible at magnitude ten. **Periodic Comet Giacobini-Zinner** is presently at its brightest. Meanwhile, **Comet Williams** swings behind the sun and into our morning sky.

21P/Giacobini-Zinner

Date	RA-2000-Dec	Elong	Sky	Mag
10-24	18h27.9m	+00°11'	69°	E 9.6
10-29	18h46.3m	-02°13'	69°	E 9.4
11-03	19h06.1m	-04°43'	68°	E 9.2
11-08	19h27.4m	-07°16'	68°	E 9.1
11-13	19h50.1m	-09°50'	68°	E 9.0
11-18	20h14.3m	-12°23'	68°	E 8.9
11-23	20h39.7m	-14°49'	68°	E 8.9
11-28	21h06.1m	-17°05'	69°	E 8.9
12-03	21h33.4m	-19°06'	70°	E 9.0
12-08	22h01.1m	-20°48'	70°	E 9.1

On September 13 Roy Tucker found a comet on an CCD image while conducting his asteroid project. It was the same object as (what was first believed to be) an asteroid picked up two weeks earlier by the Lowell Observatory Near-Earth Object Search. This comet, now named **Comet LONEOS-Tucker** has an 8-year orbital period and is expected to remain fainter than magnitude fourteen.

COMET HUNTING NOTES: As seen from the earth, how far are comets from the sun when first discovered? This angle, called elongation, has been calculated for the 78 comets found visually by amateurs since 1975. It ranges from 22 to 171 degrees. Over half of the comets have been found within 58 degrees of the sun. Seventy of the seventy-eight were found within 92 degrees of the sun. Why are they found at such small elongations? Not only do comet hunters concentrate their searches on areas near the sun, but comets generally become brightest in those regions.

88P/Howell

Date	RA-2000-Dec	Elong	Sky	Mag
10-24	18h16.1m	-27°15'	63°	E 10.3
10-29	18h35.1m	-27°05'	63°	E 10.3
11-03	18h54.0m	-26°45'	62°	E 10.4
11-08	19h12.7m	-26°17'	62°	E 10.5
11-13	19h31.0m	-25°40'	60°	E 10.6
11-18	19h49.0m	-24°56'	59°	E 10.7
11-23	20h06.6m	-24°04'	58°	E 10.8
11-28	20h23.7m	-23°07'	57°	E 10.9
12-03	20h40.3m	-22°04'	56°	E 11.1

C/1998 M5 (LINEAR)

Date	RA-2000-Dec	Elong	Sky	Mag
10-24	19h00.9m	+37°24'	87°	E 10.1
10-29	18h56.0m	+36°57'	83°	E 10.1
11-03	18h52.2m	+36°34'	80°	E 10.0
11-08	18h49.3m	+36°17'	77°	E 10.0
11-13	18h47.3m	+36°06'	74°	E 10.0
11-18	18h46.1m	+36°01'	72°	E 9.9
11-23	18h45.5m	+36°03'	70°	E 9.9
11-28	18h45.5m	+36°13'	68°	E 9.9
12-03	18h46.0m	+36°31'	66°	E 9.8
12-08	18h46.9m	+36°58'	65°	E 9.8

C/1998 P1 (Williams)

Date	RA-2000-Dec	Elong	Sky	Mag
10-24	13h28.4m	-25°53'	15°	M 8.7
10-29	13h27.7m	-24°48'	16°	M 8.8
11-03	13h26.9m	-23°44'	18°	M 8.8
11-08	13h26.1m	-22°40'	21°	M 8.9
11-13	13h25.1m	-21°35'	25°	M 8.9
11-18	13h24.0m	-20°28'	30°	M 9.0
11-23	13h22.5m	-19°18'	35°	M 9.0
11-28	13h20.7m	-18°03'	41°	M 9.1
12-03	13h18.4m	-16°42'	47°	M 9.2
12-08	13h15.6m	-15°13'	53°	M 9.2

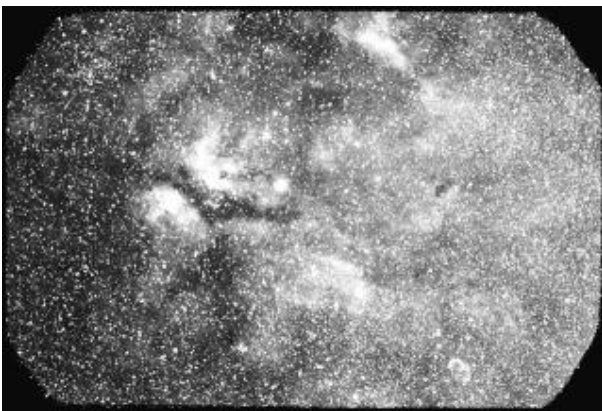
Orbital Elements

Object:	Giacobini-Zinner	Meunier-Dupouy	Williams	LINEAR	Howell
Peri Date:	1998 11 21.32107	1998 03 10.4365	1998 10 17.838	1999 01 24.5733	1998 09 27.19738
Peri Dist:	1.0337095 AU	3.051186 AU	1.14674 AU	1.742213 AU	1.404878
Arg/Peri (2000)	172.54569°	122.6864°	294.473°	101.2873°	234.8593°
Asc Node (2000)	195.39930°	148.8467°	156.379°	333.3766°	057.65738°
Incl (2000):	031.85856°	091.2706°	145.730°	082.2285°	004.39961°
Eccentricity:	0.7064344	1.001019	1.0	1.0	0.5531119
Orbital Period:	6.61 years	Long Period	Long Period?	Long Period?	5.57
Reference:	NK 629	MPC 32410	MPEC 32410	MPC 32410	MPC 31205
Epoch:	1998 11 21	1998 07 06	1998 10 17	1999 01 22	1999 08 10
Absol Mag/"n":	9.0/6.0	4.0/4.0	6.5/4.0	5.5/4.0	7.7/4.0

Continued from page 2...

CN-2 chemistry to develop my color negatives. This simple two-step process is not critically temperature sensitive, and produces excellent results every time. The chemistry is heated to 100 degrees F, and the film developed, and hung up to dry. After the negatives are dry they are cut into six inch strips and inserted into a plastic sleeve until a later time when the scanning is to be completed. This is where the real precision astrophotography begins—in the digital darkroom. The individual frames are cut and mounted in slide mounts. They are carefully labeled with the exposure time, and other data on each subject. This also makes it very easy to handle and store once I'm finished with them. The negatives are scanned using a Polaroid Sprint Scan slide scanner at maximum resolution at 2700 DPI. This equates to a file size for each scanned negative as 25 MB, and takes up a lot of hard disk space on each scan.

Once the negatives are scanned and saved, the digital darkroom work can proceed. Each negative is brought up one time in Adobe Photoshop 5.0, and adjusted for proper brightness, color saturation, and processes done such as repairing scratches or defects on the original negatives. Once I go through all the negatives and they are deemed suitable, the most difficult part of the operation can proceed. Two negatives that were photographed consecutively are brought up, and the images are sandwiched in the computer to produce one integrated image with much greater detail in color saturation. This is a very time-consuming process and take up to 15 minutes per pair of negatives. Once done however the negatives are converted to positives and saved to the disk of the computer. Many different things can happen next to the negatives sandwiches produced by this technique. First of all, and most importantly of course is to prepare them for viewing in the slide show for the SAC club meeting.



Gamma Cygni Region

To do this the files are resized to 5 MB and and put on a ZIP disk. They are then taken to a service bureau down in Phoenix, which takes the files using a film recorder and produces a rich colored slide from the file. Usually no more than 10 files are brought to them at once, this is because it costs seven dollars per slide to produce. Prints can also be made from the files and for this I send the 25

MB file directly to my Epson printer, onto photographic quality paper. The results are unbelievable. They are indistinguishable from an actual photographic print and can be displayed on the wall with pride. The third thing I do with the images is I select the best, and burn a CD to send to the magazines for possible future publication. The CD is an inexpensive way (about two dollars) to get the images to them with a large file size that they demand for quality publication.

So that's the process I go through to produce the slides prints and images you see, and the pictures shown in the magazines from my original photographic experiments. It's not for everyone, but then again, neither is astrophotography!

Dues are Due

It's that time of year once again. 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 backpage of this newsletter.**

Magazine renewals have changed slightly. While *Sky & Telescope* is still \$27, *Astronomy* has gone up to \$29. These prices, while seeming large, are significantly discounted from the news-stand price.

In other news, the 1999 R.A.S.C. Observer's Handbooks have arrived! They will be available at the November SAC meeting as well as the Christmas party in December and on into 1999 until they run out. The 1998 version only lasted through January. They are \$12 a copy.

Paul Dickson will be accepting orders for Guy Ottewell's 1999 Astronomical Calendar. This 11"x15" book has only a subset of the info found the R.A.S.C.'s handbook, but has easy to understand diagrams of the sky and solar system. This book is \$18 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.)

Bits and Pieces

Minutes from the October Meeting

The meeting started at 7:32 PM with the President not being able to find his gavel. Jack Jones gave the Treasurer's Report, and noted that the 1999 RASC Observer's Handbooks would be printed mid-October, and they promised delivery starting the same week. That means we could have them by the Nov 6 meeting, but Gene Lucas said don't count on it if past history is any indication. The price is \$12.00 [Oct 27: They're already

Fuzzy Spot

by Ken Reeves

Cassiopeia

November 1998

Cassiopeia is a well known fall constellation. Usually described as an M, W, or 3, depending on it's orientation in the sky, it is one of the easiest constellations to see, even in the bright city lights.

Cassiopeia, the Queen of Ethiopia, was very proud of her daughter Andromeda and boasted that she was more beautiful than the sea nymphs. This infuriated Poseidon and he vowed to get revenge by sending the sea monster to get Andromeda. Andromeda was rescued by the great Perseus who slew the sea monster.

The Milky Way runs through Cassiopeia, therefore the constellation is rich with open clusters and nebulosity. Don't miss the few nearby galaxies in the constellation either.

NGC 129 (00h29.9 +60°14') This open cluster is very large, pretty bright, pretty rich, but not very condensed. There is a bright star to S of cluster, just N of this star is a nice clump of 7 fairly bright stars, then further N, the cluster fans out to a whole bunch of loose stars. There are 4 levels of stars with about 45 stars counted. The cluster forms a "V" shape pointing to bright star.

NGC 185 (00h39.0 +48°20') Here is a galaxy that is pretty bright, pretty large, slightly brighter in middle. The halo is somewhat faint, using averted vision makes it come out. There is a possible elongation N/S and perhaps somewhat of a darkening on E side. I felt that this was the best of the 3 galaxies in this area of Cassiopeia. This galaxy is a companion to the great Andromeda Galaxy.

NGC 278 (00h52.0 +47°33') One of the other galaxies, this one is pretty small, somewhat faint, brighter in middle, with no elongation noted. There is a fairly bright star to NNW, but other than this, there was no detail seen.

NGC 281 (00h52.8 +56°37') This nebula includes open cluster IC-1590. At 100X, the central star is a nice triple, and there are about 10 stars in middle which is presumably the cluster. The nebula responds quite well to the UHC filter, and is very large and fairly bright around the central star. On the S is a dark area almost forming a V. Some mottling and dark lanes were seen throughout the nebula. There is lots of detail in this nebula, the NE side fades away pretty gradually, and to the E of cluster is a dark lane running N/S.

NGC 436 (01h15.6 +58°49') This cluster is barely resolvable at 70X, and is located just off of feet of Owl Cluster (NGC 457). At 100X, it is pretty small, somewhat faint,

with 13 or 14 stars seen in 3 levels, and a possible granular haze in middle.

NGC 457 (01h19.1 +58°20') The **Owl Cluster** or **Kachina Cluster** is an absolute wow! The bright stars are white/yellow and white/blue. There are 5 levels of stars and another level just on the edge of resolution. I counted 76 stars plus many more using averted vision, not counting the 'feet' area. The cluster is very bright, pretty big, pretty well condensed, and elongated WNW/ESE.

NGC 559 (01h29.5 +63°18') Here is a fairly small and pretty faint cluster. There are 3 bright stars over a layer of fainter stars, which is sitting on some unresolvable but very granular haze. Using averted vision and moving scope makes much of the haze stand out. About 20 stars are seen with averted vision, and many others pop out with the seeing.

NGC 659 (01h44.2 +60°42') Another open cluster which I saw as pretty bright, pretty small, and fairly condensed. The center contains a ringlet of stars with one double star. There are 3 levels of stars, on the SW is 2 bright stars and on the E is another bright star. I counted about 14 stars total plus a few more in the haze which popped out with seeing.

NGC 663 (01h46.0 +61°15') This neighbor to NGC 659 is very large, bright, has 4 layers of stars including some nice double stars. There are many groupings of 2 and 3 stars. I counted about 45 stars not including stragglers. 663 and 659 remind me of M35 and 2158 in Gemini.

NGC 1027 (02h42.7 +61°33') This cluster on the far eastern end of the constellation is bright, very large, very rich, and not condensed. It is elongated NW/SE with a "bump" on NE end. There is a very bright star in the middle with 4 levels of stars and at least 100 stars counted. This is a neat cluster, but is hard to get to.

NGC 7654 (23h24.2 +61°35') This cluster is M-52. For some reason, I tend to forget about this very glorious cluster. At 100X it is very large, very bright, and very rich. On the SW is a very bright star pair. I counted 94 stars plus a faint group of about 25 stars to the E.

NGC 7789 (23h57.0 +56°44') On W end of the constellation, this cluster is very large, somewhat faint, very rich, and very compressed. There are 3 levels of stars over an extremely granular haze that pops out with averted vision and good seeing. I counted about 75 stars plus at least another 50 threshold stars. Notice the several voids in cluster.

Herschel 400 Objects

129, 136, 185, 225, 278, 381, 436, 457
559, 637, 654, 659, 663, 1027, 7789, 7790

SAC's 110 Best of the NGC Objects

185, 281, 457, 663, 7789

here!]. The *Astronomy* subscriptions are now \$29.00, and the *Sky & Telescope* is still \$27.00. Dues are due. We have 7 Club T-shirts left for sale, 6 size XL, one S.

We had four visitors introduce themselves this time. Other announcements were October 8 is Ejnar Hertzsprung's birthday; October 21 is the Orionids meteor shower; there is a Deep-Sky Meeting next month (Nov); the Messier Marathon is March 13, 1999 (weather permitting) at Arizona City; the Xmas Party is at Steve and Rosie's house in Maricopa on December 5; Paul says thanks for the Newsletter articles [Please keep them coming — Paul]. Steve Coe made a motion that \$100/year for maintenance plus \$100 for a replacement hard drive be

paid for operation of the club's website. The membership passed the motion.

Election nominations by the membership were: Pres—Paul Dickson; VP—Steve Coe; Secy—Ken Reeves; Treas—Jack Jones; Props—*Open*. Elections are at the November meeting.

For Show-and-Tell, Paul Dickson showed slides of his tour of Gary Frey's North Pines Observatory in Mayer, AZ. Gary Frey bought Richard Lines' observatory on the hill and added a new dome and installed another 20" Cassegrain on a fork mount. Brian Workman showed his work on the conjunction of 2 Pallas and Jupiter, plotting it on a Urano2000 chart between September 7th through

the 28th, closest on the 22nd at Mag 9–10. Gene Lucas told of the Friends of Science and Technology gathering at the Arizona Science Center. It was hot but several telescopes were set up by SAC and EVAC.

Rich Walker (Public Events Chair) reported the school event at Desert Sage at 40th Ave., N. of Pinnacle Peak. There were 6 telescopes and about 150 in attendance. The next school event will be October 27 at Garden Lakes (4th year).

The evening's talk, "Looking Down the beta Canis Majoris Tunnel," was given by Jason Aufdenberg. He is a grad student at ASU specializing in stellar interiors. "B" stars, the interstellar medium, Hipparcos' role, and using a computer with 64 Pentium 200 MHz microprocessors were all discussed by this knowledgeable future astrophysicist. Approx. 36 members were in attendance, with 12 assembling at JB's afterwards.

—*Jack Jones, Acting Secretary*

Deep-Sky Group Meeting

The Deep-Sky Group is a Special Interest Group made up of people who like to discuss observing and observing techniques. They particularly like to observe objects out past the 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.

Novice Group Star Party Results

by Steve Coe

On Saturday, Oct. 10 the Novice Group held a star party at the club's Buckeye site. Steve Coe and A.J. Crayon gave a short talk during twilight on getting started taking pictures of the sky. Steve spoke on using a tracking mount for astrophotography and A.J. gave the group a demo on how to use your telescope for piggybacking a camera with a telephoto lens. Once it got dark enough to do so the telescopes were put into action and a wide variety of objects were observed. Bands and moons of Jupiter, a star cluster with a comet involved in Ophiuchus, the Ring Nebula, and the Hercules Cluster all showed off for the gathering.

A.J. decided to find out exactly how many people had attended, so he counted 30 vehicles, that adds up to about 45 people. After a peek at the rings of Saturn, the Moon came up and folks started to make their way home. All in all, it was a very well attended star party and many folks stopped by on their way out to ask "when is the next one?" Chatting on the CBs on the way home, it was decided to try for another Novice Group meeting for March. A clear night and lots of folks and scopes, can anything else provide an amateur astronomer with more fun? See you next time.

November 1998

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 Full Moon 10:19 P.M.	4	5 PAS Meeting Brophy Prep. Physics Lab	6 SAC Meeting Grand Canyon University, Fleming Rm. 105	7
8	9 Wednesday Mercury at greatest elongation 19° (evening)	10 Last Quarter Moon 5:30 P.M.	11 EVAC Meeting (SCC: Rm. PS172)	12 SAC Deep-Sky Meeting 7:30 P.M.	13	14 SAC Star Party Buckeye Hills (members&guests)
15	16	17 Leonid Meteors Peak: Noon Z.H.R.: High	18 New Moon 9:28 P.M.	19	20	21
22	23 Sun enters Scorpio 2 A.M.	24	25	26 Thanksgiving	27 Yesterday First Quarter Moon 5:24 P.M.	28 Asteroid Ceres at opposition (Mag. 7.0)
29 Sun enters Ophiuchus 9 P.M.	30 Pluto in conjunction with Sun	<div style="border: 1px solid black; padding: 5px; display: inline-block;">All Times are Mountain Standard Time</div>				

SAC Information

Area Code (602)

President & SACNEWS Editor	Paul Dickson Ans. & FAX: 841-0509 dickson@primenet.com
Vice President	Gerry Rattley 892-5698
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Secretary	Ken Reeves 878-9460 ken.reeves@cas.honeywell.com
Properties	Adam Sunshine 780-1386 asunshine@netzone.com
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. For example, you would send the request for AZ-Observing to AZ-Observing-request@psiaz.com.

SAC Web Sites

www.accessarizona.com/groups/group_access.html
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.

1998 SAC Meetings

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

1998 SAC Star Parties

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

SACNEWS

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

Stamp

First Class Mail

Inside:

- A Night Out with the Schmidt Camera
by Chris Schur
- Comet Comments by Don Machholz
- Fuzzy Spot by Ken Reeves
- Novice Group Star Party Results
by Steve Coe

SAC Meeting — November 6
Deep-Sky Meeting — November 12
SAC Star Party — November 14
SAC Board Meeting — December 5
SAC Party — December 5