



Sacnews

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Reflections

A Sunday Afternoon At the Very Large Array

By Jennifer Keller

"Look at the space between the stars.

If your heart is full of wonder, and your mind of peace, there is a chance you will understand."

From the educational video at the VLA Prompted by Joe Orman's July 8th Earth Science Picture of the Day of some hoodoos N. of Albuquerque: <http://epod.usra.edu/archive/epodviewer.php3?oid=102752> and further enticed by a reminder that the VLA would be enroute home, Friday after work I packed up my children and headed away from the WaxingGibbousMoonset arriving into Albuquerque with the Sunrise.

The Kasha-Katuwe Tent Rocks were a magical sight to behold and well worth the drive in itself; and Albuquerque has the most wonderful aquarium--sharks, sea turtles, rays, eels, Moon Jellies; and a

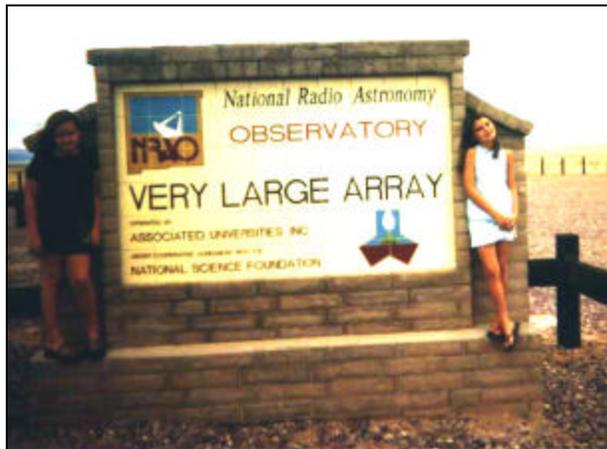
botanical garden complete with a butterfly pavilion--Great Purple Hairstreaks, California Sisters, Question Marks???, Monarchs, Sulfurs. . .and this is an article about the VLA.

Like a camera's zoom lens, the various configurations enable the VLA to "see" the smallest details and also the largest structures of the deep sky.

The Very Large Array with it's 27 humongous (82' diameter) gleaming white radio antennas stands as a magnificent tribute to man's search for answers

in the stars on the vast wide open Plains of San Agustin NM 110 miles E. of Springerville on Interstate 40. On Sunday afternoon we approached the VLA from the W., where we were greeted by the first antenna some 10 miles before the entrance road. As we later learned, the antennas have 4 main configurations A-D, and were set at the 2nd largest configuration of B. The array is larger than Washington DC at configuration A when the antennas are spread 13 miles

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The authors daughters, Ruby (left and Mary) give proof that Jenn really did go to the VLA.

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out on each of its 3 arms. Like a camera's zoom lens, the various configurations enable the VLA to "see" the smallest details and also the largest structures of the deep sky.

The visitor's center is open from 8:30 until sunset 362 days a year. There are displays, videos, a walking tour and usually a graduate student on hand to teach you how Radio Astronomy provides information and a window into the discovery of quasars, pulsars, brown-dwarfs, extra solar planets, star formation, gamma ray bursters and other such Stevedodderisms.

Although every piece of information for study is relayed to nearby Socorro, NM, the astronomers prefer to work at the VLA site of the National Radio Astronomy Observatory, as I understand it has become a meeting place of the minds behind this work. Socorro is also the central control of the Very Long Baseline Array (VBLA)-- a 10 antenna array of radio telescopes extending from St. Croix in the East to Hawaii in the West including Kitt Peak and an interesting little place just W. of the VLA, Pie Town, NM--great pies! A good

coffee stop.

The VLA has recently become the test site for prototypes of the antennas to be used in the Atacama Large Millimeter Array (ALMA), which will be an array of 64 12-meter antennas placed at 16,400 feet in Chile. And the great news is the VLA has just been approved for funding an expansion project: The Expanded Very Large Array (EVLA)--an upgrade to their 1970's computers, change from wave guide transmission to fiber optics, and possibly the addition of more antennas. These improvements will be completed without disruption to the VLA's operations and will increase the "scientific capabilities by a factor of 10 in all key observational parameters."

Leaving the VLA we drove over the Northern arm of the array, which crosses the interstate, and headed West to Pie Town, and then onward into the Arizona Sun-Moon Set.

For more information please visit their website:

<http://www.aoc.nrao.edu/vla/html/vlahome/sitemap.html>



Mary & Ruby Keller pose in front of one of the Very Large Array's 82' diameter radio dishes.



Reflections

The 2002 Grand Canyon Star Party

By Jack Jones

The Saguaro Astronomy Club participated in the Grand Canyon Star Party, June 8 - June 15, again this year and hosted a SAC Luncheon on Sunday June 9th in the Aspen Loop of Mather Campground for the third year in a row. It was pizza this year due to severe fire restrictions, and the group, which numbered 44, supplied salads and deserts to go with it. There was a memorial for the late Bob Goff, long-time GCSP supporter, by some of the group afterwards led by wife Valerie Goff in amongst the beautiful pine trees, and all had their say about Bob and their personal experiences with him.

Several thousand canyon visitors throughout the week were introduced to amateur astronomy or had the first look of their lives through a good telescope. The skies were clear all week with only some windiness the first two days to make things less than absolutely perfect.

Evening astronomy talks were given at sunset every day at Yavapai Point Observation Station with the Star Party following. On Monday the 10th, it was amazing to see over 50 telescopes all pointed at the solar eclipse as the sun set over the rim. Mike Spooner made paper solar telescopes, and demonstrated and gave them out to kids as they passed.

SAC had nine members in attendance, and Tucson, Prescott, Sedona and Flagstaff were well represented, along with astronomers from California, Virginia, Florida, New York, Michigan, and Washington. Thanks go to SAC members Lynn Blackburn, Diane Hope, and Jennifer, Ruby and Mary Keller for participating this year. Steve and Rosie Dodder and Chuck Akers traveled to the North Rim doing much the same thing as us, but at even higher altitude, lucky ducks. I might try that sojourn next year, just to say I did it. Next year's GCSP will be later in the month, June 21-28, I hear, so perhaps it won't be so cold at 8200' then. I'm a desert dweller, OK?

Most Arizona participants camped at Mather Campground and all were treated as VIPs by the Canyon Staff, getting free admission to the park, free soap, shampoo, and towels at the bath house and preferred parking and entrance to parking and trails closed to general vehicular travel. Food was abundant throughout the week. In addition to our luncheon on Saturday, there was a Mostaccioli pasta party on Wednesday, a Huevos breakfast on Thursday, an ice

cream social on Friday, and a feast at Ranger Carol Tepper's house on the next Saturday with roast turkey, jambalaya, pasta, steak, and flat cakes. Orff!

Observing: The lower observing area definitely had the advantage over the upper area for wringing the most observing out of the Star Party. The shuttle buses only lit up the high treetops instead of your eyeballs every fifteen minutes from 9 to 11pm, the wind was much subdued from the windswept upper area, and there was a lot less noise and commotion.

I was there every night with my 14.5" Schwaar Equatorial. Other large telescopes included Erich Karkoschka's 16" EQ, Paul Brown's 12" Byers-drive EQ, Mike Spooner's 18" Dob, Dennis Young's 28" enhanced, and Joe Bergeron's 6" refractor. Joe had a Coronado h-alpha sun filter. There were quite a few others, large, medium and small, but I just can't identify them all. Mike Spooner's mission was to show everyone what 700X looked like on his or her favorite objects. He used it on M13 for spectacular viewing of the core, and when he lowered it to 400X, I was able to see the "propeller" for the first time: a large 3-bladed dark-lane area located just off-center on the cluster.

The visitors came in force from 8 to 10 pm, and Virgo set at 1 am, so I had a 3-hour window to get some of my H400 Virgo galaxies out of the way most every night before going on to other objects in the wee hours. Even so, it started to look like I wasn't going to be able to bag all the galaxies I needed. The last two nights I set up on the crescent Moon early (the Number One Most Fascinating Object for first-timers at a telescope) at 450X so it would look good and wouldn't be too blinding for everyone. Then I switched to M104 when it got dark enough and lectured on the Sombrero Galaxy for a while before sneaking over to the M84-M86 triangle, and lectured on the Virgo Cluster and our place in the universe and our ultimate fate with M87 etc. Using the galaxy triangle as home base I wasn't too far from some true galaxy hunting in the lean periods between visitors. Nobody caught on to my stratagem of course (and I confess it here) and they were absolutely thrilled to see ten galaxies at once in a telescope, as much or more as seeing a deeply cratered Moon.

The way I like to think of it, if you just take the extra mileage to South or North Rims and divide it by the

(Continued on page 8)

Fuzzy Spot, Sagittarius

By Ken Reeves

Welcome to one of the richest constellations in the sky. You can find good examples of every type of deep sky object in this constellation, with globular clusters being especially numerous.

Sagittarius is supposed to be an archer/centaur (who is half man, half horse), but I find it much easier to pick out the teapot asterism. The rich Milky Way cloud even looks like steam coming out of the spout!

As I mentioned earlier, this is a very rich constellation. There are 15 Messier objects, 3 110 Best of the NGC objects, and 18 Herschel 400 Objects. Here is a small sample of these objects, enjoy looking at these as well as the many other objects in Sagittarius.

NGC 6440 (17h48.9 -20 22): Here is one of the many globulars in Sagittarius. At 170X it is pretty small, somewhat faint, round, and slightly brighter in the middle, which is slightly offset. No stars are resolved, even with averted vision it is only slightly granular. It sits in a nice string of stars, but other than that, there's just not much.

NGC 6445 (17h49.2 -20 01): Here's a planetary nebula, at 170X I saw it as pretty bright, pretty large for a planetary, irregularly round, annular, and showing no color. To the NW is a star, and there are bright spots on NW, E, and SW sides. The E spot appears to be on the outside of nebula. These bright spots may be involved stars.

NGC 6494 (17h56.8 -19 01): M-23 is a great open cluster. At 50X I considered it as pretty big, pretty bright, fairly evenly concentrated with 1 prominent level of stars. Overall it contains 3 layers of stars with 70 stars counted, and a real nice string of 6 faint stars leading to a bright star. This is one of the most even of the open clusters that I have observed. In 10x50 binoculars, it is very obvious and just resolvable.

NGC 6514 (18h02.3 -23 02): M-20 is the Trifid Nebula. At 100X it is very obvious, pretty large, fairly round, somewhat bright, and contains 3 dark lanes going through it, which gives it its name. The middle contains a beautiful double star, roughly equal in magnitude. There are a handful of other stars involved. To the N is dark area followed by the reflection nebula portion. This part is not as bright or big as the main portion, kind of half-round shaped with the chopped off end to S. Using the UHC filter, a little bit of detail comes out in the emission portion. A lot of detail comes and goes with seeing and averted vision. Take your time when looking at this one.

NGC 6531 (18h04.6 -22 30): M-21. Here is an unusual

shaped open cluster near M-20. It is not too big, pretty bright, not real rich, and contains 2 fairly bright stars with a smattering of fainter stars. The central part is real nice with 2 bright stars; a string of 4 stars, and a horseshoe of 9 stars looping WNW away from the central. The whole area looks like a diamond ring.

NGC 6568 (18h12.8 -21 36): This open cluster is close to 6583, but they are not like the double cluster. This one is very large, somewhat bright, somewhat loose, slightly rich, and not that well detached from the Milky Way. There are 3 levels of stars with many nice arcs and triangles. I counted about 100 stars, but it is hard to tell where edge is. More patterns come out the longer one looks at it. The stars are mostly blue, but there are a few yellow ones.

NGC 6583 (18h15.8 -22 08): Next to the loose cluster 6568, this open cluster requires power. At 140X it is pretty small, pretty faint, very condensed, pretty rich, and elongated N/S 1.5:1. There are perhaps 2 levels of stars over some granular haze, using averted vision makes the stars pop out. It is hard to count stars since they are so faint. I could hold about 10 stars; others pop out with seeing and averted vision. An arc of 3 stars to S and a pair of stars to E were noted. At low powers, it looks more like a globular. It kind of reminds me of the cluster at the end of the coathanger.

NGC 6629 (18h25.7 -23 12): Here is a small planetary nebula that required high power. I went all the way up to 240X to see a pretty bright, very small, round and non-annular nebula. The middle fades evenly to the halo. Using the UHC filter doesn't bring out any more detail, but it was helpful in finding the planetary. The central star was suspected, especially with averted vision. Stars were noted to SE, the NW, and the ENE.

NGC 6642 (18h31.9 -23 29): At 170X, this globular cluster was seen as somewhat bright, pretty small, and containing a somewhat brighter middle that is offset to the NW. I resolved perhaps 5-6 stars with averted vision, and possibly a few more stars were resolved on the outskirts. During moments of good seeing, it did resolve a little better. The middle is granular, but the halo is at best suspected granular. The cluster sits in the middle of an uneven "y" asterism of somewhat bright stars.

NGC 6818 (19h44.0 -14 09): This nice planetary sits well east of the teapot. At 240X it is very small, very bright, slightly elongated NNE/SSW maybe 1.2:1. I noted a definite blue glow with a slight darkening to the middle. Otherwise it glows fairly evenly and fades quickly to the edges. The nebula is bright enough you can really crank up the magnification. While in the area look slightly south and see if you can find galaxy 6822 (19

(Continued on page 8)

Seeing Double

First Light Part 2

By Thad Robboson

Last month I talked about First Light at the Twin Points Observatory, This month We'll look at some of my first observation's: Virgo Doubles....

Observer...Thad Robboson

Location...Twin Points Observatory 33° 26.725n, 112° 18.902w

Equipment: 8" f/6 newt on EQ mount. 5mm Radian; 10 and 15mm Vixen Lanthanum; 22mm Panoptic, Celestron MG.

Conditions...Pleasant 70 degrees F, comfy 25% humidity, slightest of breezes. LM of 4.5, seeing of 7/10

Ambiance: Considerably quieter than my old home. Only the faint drone of traffic from a freeway 3/4 a mile away. A loud rock band is playing at some party in the neighborhood. Ducks on the pond nearby are making their night time "Qwaaaaa" noises. None of this is near as distracting as the old home with it's traffic, sirens, and police helicopters. Many times more peaceful and relaxing.

First up...Porrima: Seeing how everyone is hot on this one, I take a swing at it first. After locating it in the FOV, I put in the 10mm for 120x. First suspected an elongation at 135°, but I was wearing my glasses which doesn't erase my astigmatism as well as my contacts. Different focuses didn't help, so I decide to pump up to the 5mm (240x). This did the trick. My eyes were deceiving me at first, as now I had clearly found a double star. Mostly notched, with fleeting glimpses of dark lane. Approx PA of 60°. If seeing were a bit better, this would've been no problem for the 8". Comparing to my early view of ζ Cancer (.6"), I would have to estimate that this was only slightly tougher, say about .5". I rate this one a 2.

Struve 1677: Very pleasing with the 22mm (55x). PA is near 350°. A comp is slightly yellow with a barely bluish companion. Rate a 3

Struve 1627: Very nearly equal pair easily seen at 55x. Both are bright white. PA at 195° Rate a 3

Struve 1619: 55x showed all 3 components clearly. "a" seems white and "b" is slightly orange. "c" is too dim to

determine. A/B is at 260°, and A/C is at 165°. Rated a 3
Struve 1763: Even with a low power 55x, this shows as a double. Most definitely notched w/ moments of Dark. PA est. at 220°. Did not note the C component at this power. 80x gave up a definite split. C comp. was noted with averted at PA 350°. A/B were noted as white. Rated a 3

Struve 1788: 80x showed easy split of A/B. B was yellowish, and A was noted as white. The C comp. appears to be much closer than it's stated 125". Brought out the MG to help with this. 7 divisions at 17.059 =119". Closer to the published than I thought. Need to work on my distance estimations I guess. Rated this a 4.
Struve 1799: Not quite equal pair. A slight hint of bluish white for A, yellowish for B. Easily split w/ 80x. Pa of 285°. Rated a 3.

Struve 1807: Very nearly equal pair. Both are bluish white. Easily split w/ 80x. PA near 25°. Rated a 3

Struve 1833: Equal pair of bright whites! 80x shows lots of black between at PA 175°. This one is attractive to me. Rated a 2.

Struve 1802: Unequal pair of white stars. 80x clearly splits the pair. Est pa at 270°. Rated a 3.

Struve 1593: Toughie! 120x Elongated, no dark between. Approx. PA of 20°, both white. 240x show definite elongation with several moments of dark lane. Rated a 2.

I was getting tired at this time, so I decided to hit some show pieces before packing it in. M13 was easily resolved and very captivating. I spent at least 10 minutes staring and tracing all the chains and loops of stars. Next I decided to pick off Ikeya-Zhang. Conveniently located near Draco's head, I didn't spend much time looking for it. The tail is much more diffuse than a month ago, although I did note a dusty appearance to one side of the nucleus. The head of this thing is huge and bright. Catch this one now while it's still bright. At this point, my mind was ready to shut down, and I had a big day ahead of me. I reluctantly tear down, and head inside to the comfort of my own bed.

August 2002

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Schedule of Events for August 2002

Aug. 1st	Moon at Last Quarter 1022mst
Aug. 3rd	SAC Star Party at Either Flat Iron or Cherry Rd. Check AZ <input type="checkbox"/> Observing for location depending on fire restrictions. Sunset 1930, Ast Twilight Ends 2104, Moonrise 0132.
Aug. 8th	Moon is New at 1915mst
Aug. 15th	Moon at first Quarter at 1012mst
Aug. 22d	Moon is Full at 2229
Aug. 23rd	SAC General Meeting at Grand Canyon University, 1930 Several SAC members will speak on various topics.
Aug. 31st	Moon at Last Quarter 0231
Aug. 31st	The To Heck with the Monsoon Star Party at Cherry Rd. Sunset 1858, Ast. Twilight Ends 2024, Moonrise 0009

Future Planning

Sept 5th-7th	Northern Arizona Star Party at Mingus Mountain. Go to: http://www.pacorg.net/2002nasp.htm for more info, or contact Gary Frey, NASP Registrar at P.O. box 1178, Mayer, AZ 86333-1178
Oct. 3rd 5th	City of Rocks Star Party, Sponsored by the National Public Observatory. City of Rocks State Park, Near Deming, New Mexico. For more info go to http://Members.aol.com/StarsnParks/RockCity.htm or contact the NPO at: P.O. Box 19, Radium Springs, NM 88054
May 1-3 2003	Desert Sunset Star Party, Kartchner Cavern State Park. See http://chartmarker.tripod.com for more information

Bits & Pisces

Minutes of the June 21st, 2002 Board Meeting

By A. J. Crayon

In attendance were David Fredericksen, Diane Hope, Paul Dickson, AJ Crayon, Rick Walker, Rick Tejera and Thad Robosson.

Paul Dickson began the first order of business; the topic was budget and newsletter distribution. There was some discussion about charging for e-mail distribution but since no consensus could be reached the topic was tabled for a future discussion.

Expenses and income were in reasonable condition for this time of year but we must be careful of expenses for the meeting room at Grand Canyon University. The current charge is \$10.00 per hour but may go up to \$40.00 per hour after the current pay period expires. The Arizona Science Center was discussed but was ruled out as it is not opened during the time SAC meets. We would like a place that has audio visual aids and storage room available.

The constitution change for spending limits by the Board on prior budgetary expenses was approved at \$500.00.

Rick Tejera agreed to rewrite wording for the constitution for pro-rating dues to continuing members.

Rick Tejera also distributed new SAC brochures for review.

The next topic had to do with the Scholarship and Grants Committee and its management. After much discussion the following choices became evident; either continue the process or terminate, with much of the discussion on termination. Finally, AJ Crayon made the motion for the Board to act within their constitutional rights and vote to remove the current chair, Peggy Kain. The motion was seconded and the vote passed. It was further agreed the President, David Fredericksen, would take a vote at the next regular meeting that would either continue or terminate the committee.

(Continued from page 4)

44.9 -14 45). This is Barnard's galaxy and one of the many faint dwarf galaxies surrounding the Milky Way. Mel 197 (18h17.0 -18 35): What the heck is a Mel object? Melotte open clusters are normally very large clusters that escaped the small field of observers such as Herschel. They include such objects as the Hyades, the Coma Star cluster, and in this case, M-24, the Small Sagittarius Cloud. Use very low power, or binoculars on this object. At 35X, I saw it as very, very large, very

bright, extremely rich, and much condensed. Even at this power, it takes up about 3 fields of view. There is some very nice dark nebulosity in it, with one particular nebula that is very dark with a single star in the middle and several dark lanes leading away from it. Notice open cluster NGC 6603 embedded in the cloud. In 10x50 binoculars, I could resolve about 20-30 stars and noticed the elongation NE/SW. The SE edge tended to drop off much faster than the NW edge.

(Continued from page 3)

nights you observe, you find it is much more economical than going once to a desert site for one night. That's in addition to the freebies, the food, the luminaries, the telescopes, the events, the people, the scenery, the clean cool air, and all the wondrous daytime activities you can pack into the rest of the time

available. You're guaranteed to come back to the Valley very exhausted but very happy.

Jack Jones

Bits & Pisces

Minutes of the June 21st, 2002 General Meeting

By A.J. Crayon

The meeting was called to order by president David Fredericksen and the standard call for visitors and new members was issued.

The treasurer's report was given by Paul Dickson; we have \$1173 in checking, \$2354 in savings and \$100 for Scholarships and Grants.

The rewording for the constitutional change for spending activities by the board was read. Basically it allows the board to spend up to \$500.00 in pre-approved budgetary items for unforeseen expenses. The vote was taken by hand and passed.

David Fredericksen discussed the current status of the Scholarships and Grants Committee and proposed the following vote. Vote to terminate or continue the committee. A vote to continue would not change the current status other than to find a new chair. A vote to terminate would require current equipment to be sold and that money, along with existing monies, be distributed to deserving college or university students to help finance their continued studies in the field of astronomy. After more discussion the vote was taken and the club decided to terminate the Scholarships and Grants committee. A vote was also taken to allow the Board of Directors to act as the interim-committee to handle the termination process.

Paul discussed our meeting location situation. Basically we are paying \$10.00 per hour for the current pay period. When this is up the charge may go to \$40.00 per hour! The membership was requested to be on the lookout for potential meeting venues that could hold up to 75 people. Suggestions included fire stations, libraries, community colleges or schools. Preferably free or cheap; we could also provide public star parties on an periodic basis in lieu of payment.

Jack Jones discussed the success of the Grand Canyon Star Party and the south rim lunch hosted by SAC. In all there were six from SAC and 44 in all for the lunch and the cost was \$203.00.

Rick Walker discussed the solar eclipse setup at Paradise Valley Library and that a good time was had by all that showed up.

Steve Dodder began Show-n-Tell with a slide presentation of the Grand Canyon Star Party at the north rim.

AJ Crayon showed some belated pictures from Sentinel-Schwarz Star Gaze, Messier Marathon and the novice astrophotography SAC star party at Cherry Rd.

Rick Rotramel had a nice slide show of Riverside Telescope Makers Conference which he dubbed, "The Greatest Show On Earth; the Universe!" Included in the presentation were many telescopes and telescope equipment that won awards.

Chris Schur displayed some of his slides and discussed his experiments to squeeze more detail from galaxies and nebula.

Rick Tejera showed some slides from the Thunderbird Park Public Star Party.

Joe Macke ran a video tape from his PC164 video camera from an asteroid occultation.

For this evenings program, instead of having a speaker, we had a swap meet and a lot of equipment changed hands.

New SAC Webmaster

After maintaing the SAC website for the past few years, Steve Coe announced that he no longer has the time to devote to this task. He asked for a volunteer to take over. One of our newest members, Stan Clark offered his services. Stan is an Instructor at the ITT Technical

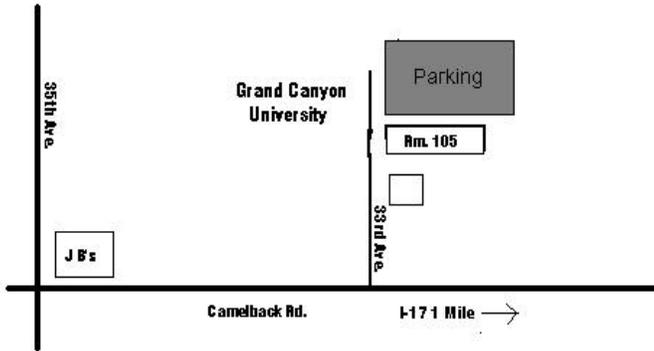
Institute in Phoenix. As Steve put it, "Stan's forgotten more than I'll ever know about maintaining a website". Let's thank Steve for the job he's done the past few years and welcome Stan into this position. It's nice to see new members stepping up to get involved.



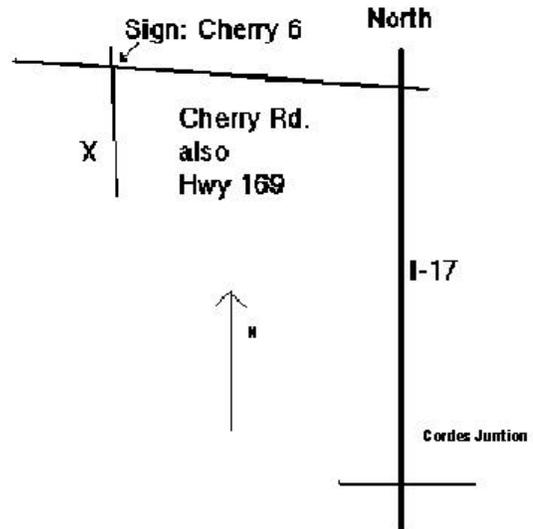
SAC Meeting and Observing Sites

General Meetings

7:30 p.m. at Grand Canyon University, Fleming Building, Room 105: 1 mile west of I-17 on Camelback Rd., North on 33rd Ave., Second building on the right.



Cherry Rd. Star Parties



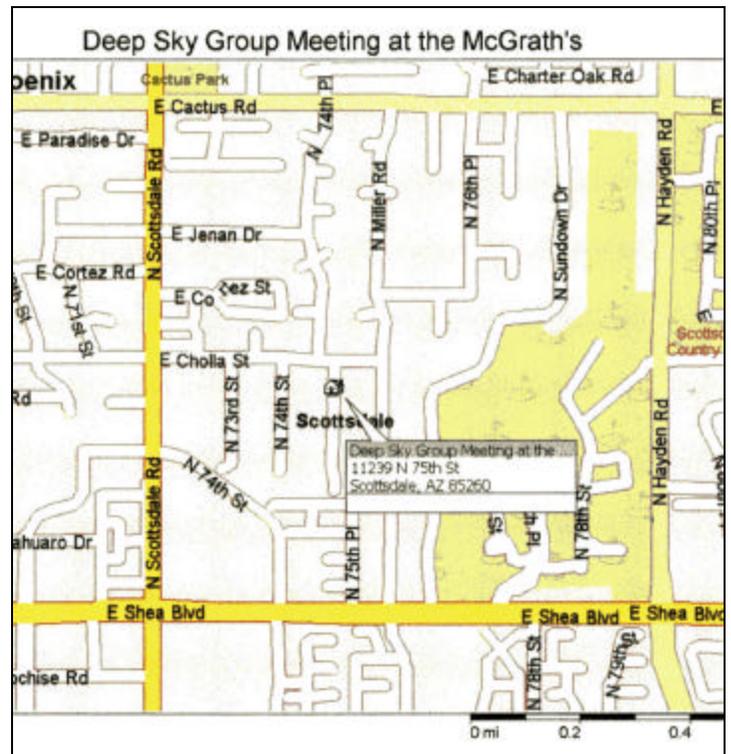
Flatiron Star Parties



Take I-17 north to the Cherry Rd exit. Turn west (left) and continue on Cherry Rd for about 5 miles. Turn Left on the dirt road just past the sign that says Cherry 6. Note you turn in the direction Opposite the arrow on the sign. The site is 1/2 mile in through a fence on your right. Please close the gate behind you and make sure it remains closed at all times

Head west on I-10 to the 339th Ave exit (exit 103). Turn North (right) and go two miles to Indian School Rd. Turn West (left) on Indian School and go 1 mile to 355th Ave. Turn North (right). This will turn into Wickenburg Rd. Follow this road for about 12 miles. Just after mile marker 23 you will go through Jackrabbit wash and pass a cattle guard sign. There is a dirt road just after the sign, marked by white painted rocks. Turn on to this road and follow it about .9 miles. Just after you pass through a wash, you'll see the field on your left. If you hit the cattle guard, or the dirt road your on is next to a fence, you've missed the correct road. Go back and look for the white rocks.

Deep Sky Group Meeting



SAC Membership Services

Membership– Memberships are for the calendar year and are pro-rated for new members as follows: Jan– Mar: 100%; Apr– Jun: 75%; Jul–Sep: 50%; Oct–Dec; 25%.

- \$28.00 Individual Membership
- \$42.00 Family Membership
- \$14.00 Newsletter Membership
- \$ 7.50 Nametag for members
(will be mailed to address below)

Magazine Subscription Services

The following magazines are available at a discount to club members. Check the magazines you wish to subscribe to or renew, and pay the club treasurer. Please allow 3-4 months for the order to be processed.

- Sky & Telescope \$30.00/yr
- Astronomy \$29.00/yr

Please Print

Make Check Payable to : SAC

Name: _____

Bring completed form to a meeting or mail it with your remittance to:

Address: _____

SAC Treasurer
c/o Paul Dickson
7714 N 36th Ave
Phoenix, AZ 85051-6401

City: _____ St: _____ Zip: _____

Phone: _____

E-Mail: _____

Sac on the Internet

SAC has several E-mail mailing lists. If you check the boxes below, the E-mail address above will be subscribed to that list.

- SAC-Announce@freelists.org: SAC-Announce is a mailing list for just club announcements, Typically 3-5 messages per month.
- SAC-Forum@freelists.org: SAC-Forum is a general discussion mailing list. Topics should be related to Astronomy or SAC
- SAC-Board@freelists.org: SAC-Board is a mailing list for discussions of club business. If you'd like to see how the club is run (or not run), or have a question about the club, this is the list to read. Typically month to month matters are discussed.
- AZ-Observing@freelists.org: AZ-Observing while not a Sac list , is well attended by SAC members. This is the list to with observing places around Arizona. Find out where people are going and what they saw.

E-mailed Newsletter

Sac can save a lot of money if you download the PDF version of the newsletter. PDF files are readable by both PC's and Macs. When the newsletter is published, a message will be sent to the address indicated above with the URL of the newsletter. Check the box below if you don't have access to the internet or if your prefer a printed copy.

- Please send me a hard Copy of the newsletter

SAGUARO ASTRONOMY CLUB

July 2002

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Videmus Stellae



SAC Schedule of Events 2002

REVIS-
ED-
DATE

SAC Meetings

Jan. 25th, 2002	July 26th 2002
Feb. 22nd 2002	Aug. 23rd 2002
Mar. 29th 2002	Sep. 20th 2002
Apr. 26th 2002	Oct. 18th 2002
May 17th 2002	Nov. 15th 2002
June 21st 2002	Dec. 20th 2002 (Holiday Party)

SAC Star Parties

Date	Sunset	Astronomical Twilight Ends	Moonrise
Jan 5th	1737	1906	0049
Feb 2nd	1803	1929	2346
Mar 2nd	1829	1951	2238
Apr 6th	1856	2021	0355
May 4th	1917	2050	0230
June 1st	1937	2118	0102
July 6th	1945	2127	0258
Aug 3rd	1930	2104	0132
Aug 31st	1858	2024	0009
Sep 28th	1820	1942	2250
Oct 26th	1745	1909	2136
Nov 30th	1723	1851	0410
Dec 28th	1731	1900	0305

Deep Sky Group Meetings

Feb. 28th 2002	Aug. 29th 2002
May 2nd, 2002	Oct. 24th 2002
June 27th, 2002	Dec. 26th 2002